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Guard Against

BLACKLEG IN SHEEP

Blackleg in sheep, due to *Clostridium chauvoei*, is becoming prevalent in all districts. Prevention is possible by vaccination, and advice is available from officers of the Department of Agriculture in the control of the disease.

By
M. B. BUDDLE,
Veterinary Research Officer, Animal Research Station, Wallaceville.

BLACKLEG in sheep differs from the disease as seen in bovines, in that it is usually evidenced as a gas gangrene infection following injuries at shearing, dipping, or from dog bites, or following parturition in ewes or the operations of castration and docking of lambs. In the past, farmers have recognised the disease as blood poisoning.

Observations over the last few years have indicated that true blackleg is apparently widespread throughout New Zealand, and it has been observed in districts where the disease has not been reported in cattle. Even on the same property, some paddocks are notoriously more dangerous than others, due apparently to the heavy contamination of the soil with the casual organism on these areas.

Often, symptoms are entirely overlooked until animals are found dead two to three days following the operations of castration and docking, shearing, or following lambing, but if the animals are more closely observed, they may be seen to exhibit the symptoms one would expect from an acute wound infection with subsequent blood poisoning. The animal ceases to feed and to ruminate, remains apart from the flock, and exhibits accelerated respiration. The course of the disease is very rapid; the animal is soon unable to stand and becomes comatose, and death quickly supervenes. Recovery from the disease is very rare.

Post-mortem Examination

Putrefaction sets in very rapidly after death, and an examination of the internal organs a few hours after death reveals advanced decomposition. Gas formation in the musculature appears to be a variable feature, but the muscles in certain regions, such as the thighs, under the tail, the forearms, or the facial region, are darker in colour than normal, and in some cases they may be of a drier consistency, or there may be an excess of blood-stained fluid in the subcutaneous and intermuscular tissues. A constant feature, if the examination is made shortly after death, is a peculiar sour odour from the discoloured musculature.

A similar disease is described in sheep as *malignant oedema*, which is identical clinically and pathologically with ovine blackleg, but a different bacterial causal agent is considered responsible. Thus, it is necessary to have conducted a bacteriological examination on a specimen of discoloured musculature from a recently dead animal. It is particularly important in the diagnosis of blackleg that the specimen should be as fresh as possible, as bacteria from the intestines quickly invade the carcass after death and may obscure the true causal agent of the mortality on bacteriological examination. The organism causing *malignant oedema* is frequently a post-mortem invader in animals dying of other diseases, and as its growth is more rapid than the organism responsible for blackleg, the examination of material from an animal dead for some hours may give an erroneous diagnosis of the primary causal agent.

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Prevention by Vaccination

When heavy annual losses from the disease occur on a property following castration and docking in lambs or following shearing, experiments have shown that these animals can be protected by vaccination carried out a fortnight before these operations.

Vaccination has been shown to be very effective in preventing losses from a spontaneous form of the disease occurring in hoggets, and is thus analogous to the disease as seen in young cattle. On one particular property where six hundred of the most forward hoggets were lost in one year, annual vaccination of all the young sheep has successfully controlled the disease, and it is suggested that mortalities of a similar nature on other properties, if reported, may be reduced by vaccination.

This vaccine is supplied free of charge from the Animal Research Station, Wallaceville, but as the vaccine is specific against blackleg, it is essention that the diagnosis of blackleg be confirmed by bacteriological examination conducted at this laboratory so that where the mortality is severe losses in the future may be prevented.

Disposal of Carcasses

It is particularly important in the control of blackleg that the carcasses of animals dying from the disease should be deeply buried or burnt. As the organisms are present in great numbers in the discharges and the carcass itself, failure to dispose suitably of the carcass perpetuates the disease on the property and intensifies its incidence.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the five months, May-September, 1941, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island.						
Meat Export Slaughterhouses—						
Auckland	81,019	468,847	42,912	16,303	140,823	82,187
Poverty Bay-Hawke's Bay	29,982	45,252	34,782	5,386	218,373	8,558
Taranaki-Manawatu ..	39,912	177,161	10,721	1,476	144,705	38,011
Wairarapa-Wellington ..	23,360	20,322	24,231	5,210	128,888	7,086
Totals	174,273	711,582	112,646	28,375	632,789	135,842
Abattoirs	51,955	18,147	215,237	109,249	20,577	47,731
North Island Totals ..	226,228	729,729	327,883	137,624	653,366	183,573
South Island.						
Meat Export Slaughterhouses—						
Nelson-Marlborough ..	692	8,595	11,214	5,937	70,906	3,621
Canterbury	5,136	24,334	162,258	127,686	388,180	10,806
Otago-Southland	3,754	24,471	139,658	129,467	467,254	2,642
Totals	9,582	57,400	313,130	263,090	926,340	17,069
Abattoirs	23,668	5,061	112,881	61,853	9,849	18,527
South Island Totals ..	33,250	62,461	426,011	324,943	936,189	35,596
Dominion.						
Meat-expt. Slaughterhouses	183,855	768,982	425,776	291,465	1,559,129	152,911
Abattoirs	75,623	23,208	328,118	171,102	30,426	66,258
Grand Totals	259,478	792,190	753,894	462,567	1,589,555	219,169
Same Period, 1940— Meat Export Slaughterhouses and Abattoirs ..	301,364	770,823	1,009,417	636,370	1,441,377	197,941
Same Period 1939— Meat Export Slaughterhouses and Abattoirs ..	242,311	775,674	751,772	397,257	1,499,073	150,431

Slaughterings of Pigs

The 32,701 pigs slaughtered in meat-export slaughterhouses and abattoirs during September were distributed in weight ranges approximately as follows:—

Under 60 lb.	247
60-120 lb.	18,735
121-160 lb.	9,834
161-180 lb.	757
Over 180 lb.	1,176
Sundries	1,952

The grading of porkers is 87 per cent. of first quality and 13 per cent. of second quality, and the grading of baconers is 82 per cent. of prime 1's, 14 per cent. of prime 2's, and 4 per cent. of second quality.

In the different weight ranges of baconers, the grading is as follows:—

121-160 lb.	83%, 13%, 4% of P1, P2 and 2nds respectively.
161-180 lb.	72%, 17%, 11% of P1, P2 and 2nds respectively.

THE Director-General's PAGE

Britain Wants More Bacon

ARRANGEMENTS have now been finalised with Great Britain to purchase 11,000 tons of baconers for the year ending September, 1942. Some time ago it was announced that Great Britain would purchase 5,090 tons. These 5,000 tons are now included in the 11,000. All carcasses are to be shipped as Wiltshire sides, made from pigs of 111 to 160 lb. carcass. The 11,000 tons represents the slaughtering of 210,000 baconers for export, and these, along with the 250,000 baconers for local use, mean that for the next twelve months more than half the pigs slaughtered will have to be taken to bacon weights. The Marketing Department will continue purchasing baconers throughout the season.

IN addition to the 11,000 tons of baconers, there will be a certain amount of porkers for export. Although the absence of any prospect for the export of bacon during the last six months turned the attention of many producers to pork, a number of circumstances, particularly the increase in the manufacture of cheese, have caused a reduction in the number of pigs now on hand.

The whole of our production for the year ending September, 1942, is limited to the pigs already born or due to be born before the end of this month. There is little possibility of increasing the number of pigs killed during the next year by mating sows from now onwards. It is estimated that for the year ending September, 1942, the killings of all pigs will be about 800,000, and on this basis there will be about 150,000 porkers for export. As in the past two years, the killing of porkers for export should be deferred as much as possible to the latter part of the season, as otherwise the requisite tonnage of baconers may not be realised.

In view of the fact that producers are now asked to turn more pigs into bacon, there will be requests for further supplies of meal. Copra has given satisfactory results over the last year, and the Government is making every effort to have further supplies available. Because of transport difficulties, it is impossible to give any definite assurance that supplies of copra will be available, and producers are advised to make full use of meat-meal, maize, and the copra-meal, which is being imported from Australia, if and when extra meals are required to bring pigs to bacon weights.

Collection of Ergot

A BIG drive is being made this year for the collection of ergot, and it is hoped that a large quantity will be collected.

The campaign will be directed by an executive committee consisting of Messrs. R. B. Tennent, Director of the Fields Division (chairman); O. G. Thomas, New Zealand Farmers' Union; H. B. Martin, secretary of the New Zealand Grain and Seed Merchants' Association; S. G. Phillips, Wright, Stephenson, and Co., Ltd.; W. M. Hamilton, Department of Scientific and Industrial Research; and J. E. Bell, Land Utilisation Officer, Department of Agriculture.

A conference has been held of representatives of organisations which are able to assist in the drive for the collection of ergot, and it is pointed out that while various organisations can do much in obtaining an unprecedented quantity of this valuable drug, the campaign can be a real success only if every individual in a position to do so makes a special effort to collect as much ergot as possible.

Among the organisations whose support has been enlisted are the Farmers' Union, the Women's Division of the Farmers' Union, the Women's Institute, the District Councils of Primary Production, the Young Farmers' Clubs, the Boy Scouts, the Girl Guides, and the grain and seed merchants.

Details regarding the collection of and payment for ergot are to be found elsewhere in this issue.

New Type of Ryegrass

A NEW type of ryegrass for short rotational pastures has been tried out by the Grasslands Division of the Plant Research Bureau. This new grass is the result of crossing Italian ryegrass with pedigree perennial ryegrass, and the careful selection of the best strains.

The type which has been evolved is admirably adapted for sowing down short rotational pastures, as it is high in yield and more perennial than Italian ryegrass. This new grass will shortly be put under certification by the Department of Agriculture, and it is hoped before long that this succulent, high-yielding grass will be available to farmers.

It will be particularly suitable for the South Island, where short rotational pastures are widely sown.

Increase in Amount of Wool Scoured

THERE has been a remarkable increase in the amount of wool scoured in New Zealand. The whole of the scouring plants are working double or treble shifts under contract to the British Government, and in the coming season will handle about 16 per cent. of the total amount of greasy wool produced in the Dominion.

This activity in New Zealand will speed up the further processing and manufacture of the wool in the United Kingdom, and there is no doubt that it is a valuable, if little known, part of our war effort.

Agricultural Regulations.

By A. E. MORRISON, Solicitor, Department of Agriculture.

IMPORTATION OF PIGS.

BEFORE the making of the Stock Importation Amending Regulations, 1941, persons desiring to import pigs from Australia were required to obtain a permit to import from the Minister of Agriculture. Where permission to import was granted, it was necessary that each consignment should be accompanied by a declaration of freedom from disease duly verified by the certificate of a Government Veterinarian of the State of exportation.

As the result of the discovery of the disease kidney worm in pigs which had been imported from Australia, the amending regulations impose further restrictions on importations from the Commonwealth. In addition to requiring a permit to import, the amending regulations call for a declaration by the shipper as to the locality or place where the pigs were bred or raised and a declaration that they have been in the State of exportation since birth. The declaration must be supported by a veterinarian's certificate to the effect that the disease kidney worm does not exist in the locality where the pigs were bred or raised, and that the agglutination test for *brucellosis suis* (abortion infection) was applied to the animals with negative results.

FEE FOR INSPECTION OF PIGS.

THE fee for the inspection of pigs slaughtered in an abattoir or a freezing works as laid down by the Meat Regulations, 1940, is 4d. per pig, 2d. of which has, since 1937, been set aside as a special fund to provide an instructional and advisory service for the development of the pig industry by means of the setting up of a National Pig Industry Council and District Pig Councils representative of all interests in the trade.

As the revenue from the 2d. per pig as so set aside has not been sufficient to defray the annual expenditure of the pig councils in providing the instructional and advisory service, the amending regulations increase the inspection fee on pigs by 1d. per pig in order that the revenue derived from the increase in the fee can be made available for the benefit of the pig industry through the organisations already referred to.

FERTILISER CERTIFICATES.

IN setting out in invoice certificates to be supplied to purchasers of superphosphate the percentage of soluble phosphoric acid present in the fertiliser, vendors are, by regulations under the Fertilisers Act, 1927, allowed a limit of error of 0.75 per cent. of the whole bulk.

As a substantial proportion of lower-grade phosphate is now being received for manufacture, the amending regulations increase as a temporary measure during the continuance of the present war the limit of error in respect of the certified percentage of soluble phosphoric acid present in superphosphate to 1.15 per cent., and also make a proportionate increase in the limits of error in respect of the percentage of soluble and insoluble phosphoric acid in compound manures containing superphosphate.

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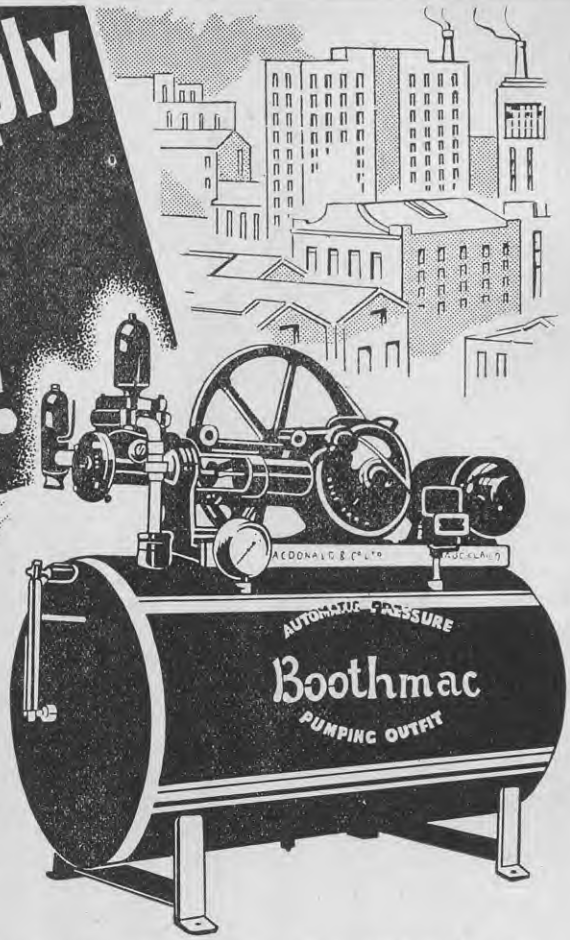

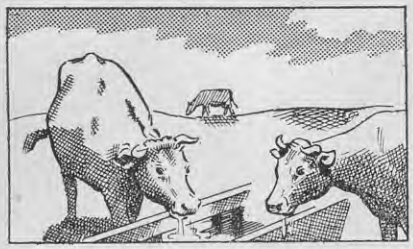

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The White Butterfly and the Diamond-backed Moth

By

J. MUGGERIDGE and B. B. GIVEN,
Entomology Division, Department of Scientific and Industrial Research, Cawthron Institute, Nelson.

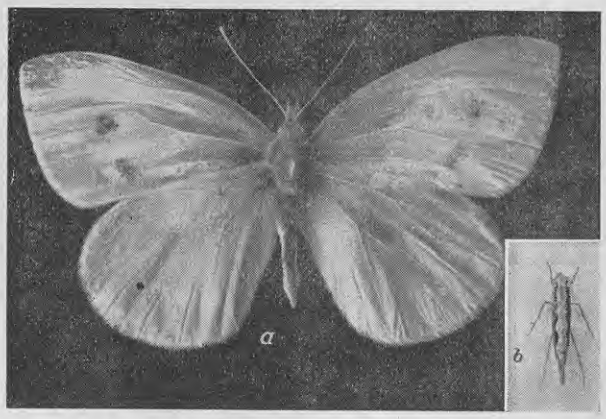

Fig. 1.—(*a*) White butterfly and (*b*) diamond-backed moth compared in regard to size and general appearance at rest.
[*W. C. Davies, photo.*

TWO of the most common pests of cabbages, rape, turnips, chou moellier, etc., are the white butterfly and the diamond-backed moth. No doubt a good deal of confusion exists among the farming community in regard to the damage caused by the white butterfly and the diamond-backed moth, and injury caused by the latter insect is all too commonly blamed on the white butterfly. The fact that butterflies are seen over a crop is not sufficient evidence for attributing any injury to their presence, and the only way to determine the cause of the injury is to examine the crop. In the following account differences between the two insects and the type of injury they cause are described.

THE white butterfly, which has been in this country for about eleven years, is probably far better known than the moth, which has been here for more than sixty years. The white butterfly is a conspicuous object, and its size and creamy whitish colour make it readily seen from a distance. It may be seen flying by the roadside, over grass paddocks, over some crop in the field, or visiting flowers of different kinds for the nectar they contain.

The moth, on the other hand, is inconspicuous. It is a small, greyish, night-flying moth which rests during the daytime amid the crop foliage, and unless searched for is hardly likely to be seen. Its presence may be readily detected, however, if by strolling through a crop, the foliage is sufficiently disturbed, when numbers of the moths will be seen to rise, fly a short distance, and then settle again. In Fig. 1 the two insects are compared in regard to size and form.

Both the butterfly and the moth lay their eggs on the crop foliage. The butterfly eggs (Fig. 2) are small, sculptured, bullet-shaped objects. They are deposited singly in an upright position, generally (but not necessarily) on the underside of the leaf near its edge, whereas those of the moth are very much smaller, oval in outline, and are usually found on the undersurface of the leaves, where they are deposited either singly or in batches beside the ribs or veins. Either insect may

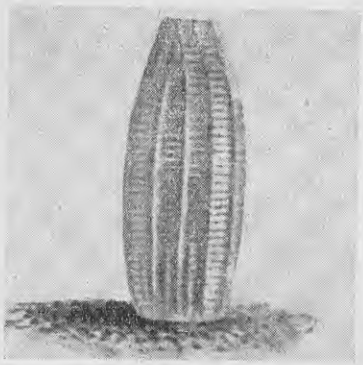

Fig. 2.—Egg of butterfly. Note the bullet shape, and sculpturing.
[*After Frohawk.*

Fig. 3.—Cabbage plants showing:—(*a*) typical butterfly injury, (*b*) plant protected from injury, (*c*) typical moth injury.

lay 400 or more eggs, although the average number laid would be considerably less. The eggs of both the butterfly and the moth hatch in about five days, although the time taken may be longer or shorter, depending on temperature conditions. Under cold conditions, for example, the eggs may take up to forty days to hatch. The tiny butterfly and moth grubs both look the same to the untrained eye, and shortly after hatching they begin to feed on the plant foliage.

How the Damage Is Caused

The butterfly larva begins feeding on the surface tissue, but as it grows older and stronger it eats right through the leaf, continuing to feed where the hole is made. By eating around the edges the larva considerably enlarges the original hole, and if there are sufficient caterpillars to a leaf, in time the whole of the tissue between the main ribs will be eaten out, and the plant will appear as shown in Fig. 3a. In Fig. 4 the results of the butterfly injury on a field scale illustrates this point.

The young moth larva, on the other hand, first burrows into the leaf, and once inside, begins to eat out all the soft green matter between the upper and lower surface of the leaf, with the result that a whitish irregular patch appears. As the larva grows it emerges from its burrow and begins to feed on

the lower leaf surface, in time eating out all the green matter and leaving only the upper leaf surface and the veins. When eaten in this fashion, the leaves have a white, tissue-paper-like appearance (Fig. 3c) and, seen from a distance, an entire crop affected in this manner has a white, blasted appearance. Quite frequently, when the foliage is very tender, the larvae will eat right through the leaf, leaving holes similar to those caused by the butterfly larvae. In this case it is almost impossible to tell which of the two insects was responsible for the damage, although usually the holes made by the moth are relatively small.

Which Is Which?

As has already been pointed out, it is difficult to distinguish between the larvae of the butterfly and the moth in their younger stages. The writers have found that the simplest method to determine which is which is to touch the grubs at the posterior extremity. The result is that the butterfly larva will shift but little, whereas the moth larva will begin to wriggle, and if the leaf is held at a suitable angle the larva will drop from it towards the ground on a silken thread attached to the leaf surface (Fig. 6).

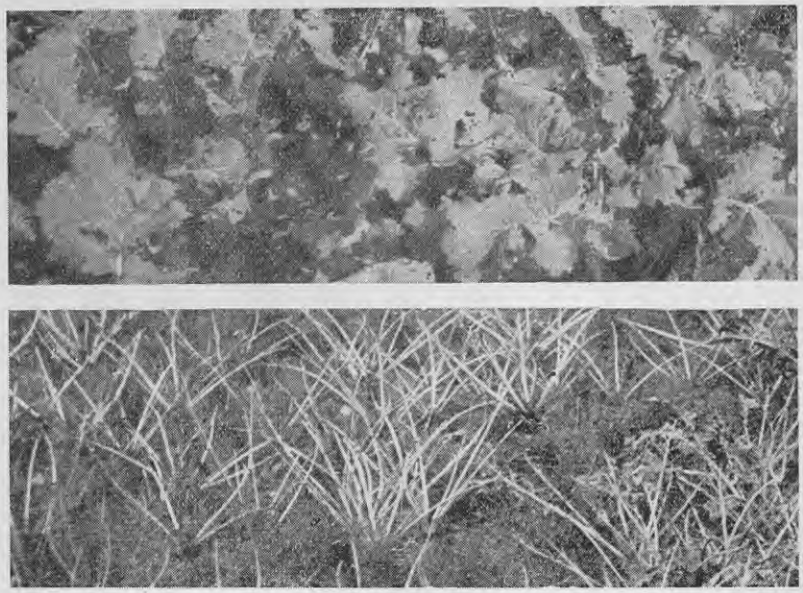

Fig. 4.—Butterfly injury on a field scale compared with a crop photographed before the appearance of this pest.

As the larvae grow older the differences between them become quite marked. That of the butterfly, at first light green in colour, becomes intense leaf-green as it grows to full size. A thin orange stripe appears down its back, and the whole body is covered with a short pile of hairs, which give it a soft velvety appearance. It measures approximately one inch when full grown, and varies but little in width from head to tail. The moth larvae

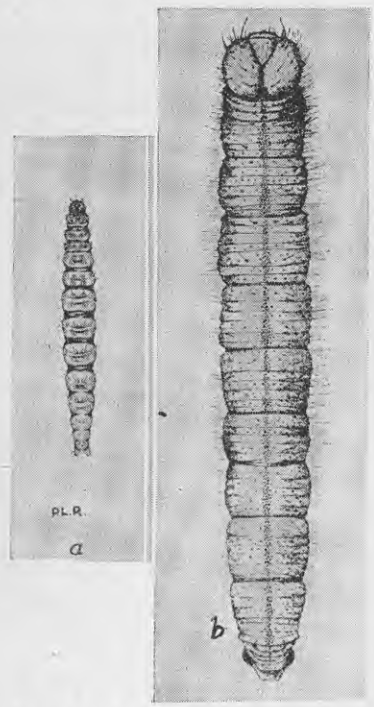

Fig. 5.—(*a*) Moth (after P. L. Robertson) and (*b*) butterfly larva (after Wilson) compared in regard to size, shape and general appearance.

vary a good deal in colour, probably the largest proportion of them being light green. When full grown the larva measures 3-8ths of an inch in length, and the body is widest at its middle, tapering towards the head and tail ends. In Fig. 5 the two larvae are compared in regard to size and shape.

Fig. 6.—**Moth larvae shown suspended from cabbage leaf by means of silken threads.**

Danger in the Larval Stage

It is in the larval stage only that the two insects are destructive to crops, and it is at the conclusion of this stage that both, well fed at the farmers' expense, repair to a suitable spot to transform to the passive pupa or chrysalid. The butterfly larvae usually leave the plant on which they have been feeding, and seek some surrounding object on which to pupate. They will travel quite a distance to find a suitable place, although what the exact requirements are it is difficult to say, as they may be found on dried leaves near the host plant, on Scotch thistles, on the foliage of grass or other vegetation bordering a crop, on bulrushes 80 or 90 feet away from the nearest host plant, on fencing posts, on gates, on trees, on the weather boarding of houses, under the eaves or even inside the house itself. In fact, it would be difficult to say on which objects it would not pupate.

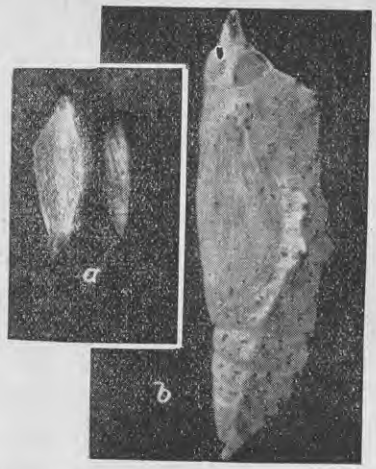

Fig. 7.—**(*a*) Moth pupae (the one on the right removed from the network cocoon) and (*b*) butterfly pupa compared in regard to size, shape, and general appearance.**

[W. C. Davies, photos.

The chrysalid measures approximately ¾-inch in length (Fig. 7b). It may be green or greyish in colour, and very frequently changes to a colour in harmony with its background. In contrast to the butterfly, the moth larva generally remains on the host plant to pupate, although it occasionally pupates on nearby objects. When about to pupate it first spins an open network cocoon (Fig. 7a), inside of which it transforms to the pupa or chrysalid form. The backs of leaves infested with the moth frequently have large numbers of these cocoons attached to them.

The times occupied in completing the egg, larval and pupal stages of both the moth and the butterfly are all very indefinite, as all are governed to a very large extent by prevailing climatic conditions, and in this respect, temperature in particular is important. For example, the egg, larval, or pupal stage of either the butterfly or the moth may be lengthened or shortened by prevailing temperature conditions. Low temperatures lengthen the cycle, while high temperatures shorten it. In the accompanying table the approximate minimum and maximum period for the development of each stage is given, and beyond these limits this range cannot be lengthened or shortened by any further temperature adjustment.

Minimum and maximum number of days occupied in completion of the life cycle of the moth and butterfly.

	Butterfly			Moth.		
	Min.		Max.	Min.		Max.
Number of days to complete egg stage	3	to	35	3	to	40
Number of days to complete larval stage	7	,,	55	6	,,	50
Number of days to complete pupal stage	6	,,	49	3	,,	36
Full cycle, in days, which ranges from	16	,,	139	12	,,	126

During the winter months the butterfly remains dormant in the pupal stage, and as daily temperatures rise in the spring, development again proceeds and butterflies begin to emerge. As far as the moth is concerned, all stages continue to develop at a very slow rate throughout the winter months.

White Butterfly Parasites

The parasite liberated against the butterfly is now well established throughout New Zealand. It has proved very successful as a controlling factor, as in the field 80 to 90 per cent. parasitism of the host is common. Because of climatic conditions, however, in a wet locality or in any place where the rainfall is persistent to the extent that crops and their surroundings are kept in a fairly wet condition, the parasite is less effective than under dry conditions. Again, a crop infested with flowering weeds, Scotch thistles, etc., always appears to be a source of attraction to butterflies, even though the butterfly population as a whole in the vicinity is relatively small. When the butterfly increases to epidemic proportions under the conditions referred to, there is not much that can be done to check it by parasite control.

The idea that the liberation of more parasites would rectify the position is hardly supported by facts, as the conditions which bring about an increase in the butterfly population are also responsible for reducing the effectiveness of the parasite. The position might be improved by introducing species of parasites which would prove effective under a wider range of climate, and which would thrive under wet conditions, and work on this aspect of the problem is now being carried on.

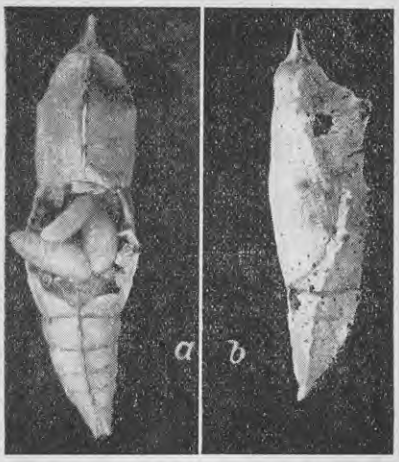

Fig. 8. — (*a*) Butterfly chrysalid broken open to show presence of parasite larvae. (*b*) Showing holes in butterfly chrysalid through which parasites have escaped.

[*H. Drake, photos.*

The parasite (technically known as *Pteromalus puparum*), which is already doing such good work throughout New Zealand, is a small inspect approximately one-sixteenth to one-eighth of an inch long (Fig. 9c). It is black or green in colour, with four clear wings. Its eggs, laid in the chrysalid stage of the butterfly (Fig. 7b), hatch into small grubs, which devour the contents of the chrysalid. A chrysalid which has been attacked usually becomes dry and brittle, and if it is broken open it will be seen to be packed with the small parasite grubs as shown in Fig. 8a. These grubs eventually turn into the small winged parasites already referred to, which escape from the chrysalid by cutting a small hole in it (Fig. 8b). They then take to the wing in search of other chrysalids to parasitise.

Diamond-backed Moth Parasites

Two kinds of parasite have been introduced and liberated against the moth, one to attack the larva and the other to attack the pupa. The larval parasite, *Angitia cerophaga* (Fig. 9a), attacks the larval stages (Fig. 5a) from the youngest to the half-grown caterpillar. The egg, which is laid inside the moth larva, hatches into a small grub, which feeds and grows at the expense of its host, which it eventually destroys. The parasite then spins a silken cocoon and passes into a pupal stage. After a short time an adult winged parasite emerges, and so the cycle goes on. The parasite which attacks the pupal stage lays its eggs inside the pupa (Fig. 7a). A small grub hatches out which eventually destroys the moth pupa, after which the grub itself changes into a pupa and eventually into a winged parasite (Fig. 9b).

Both these parasites have been liberated and are now well established in New Zealand. They are as yet not widespread throughout the country, but they are being spread as fast as circumstances permit. There is no doubt that they will play some part in reducing the moth pest, but whether they will give control in an economic sense remains to be seen.

Protection Methods

In the event of parasites being unable to control the moth and the butterfly to the extent required (and this may sometimes be the case where the home garden or the market garden is concerned), spraying, dusting, or some other means of protection must

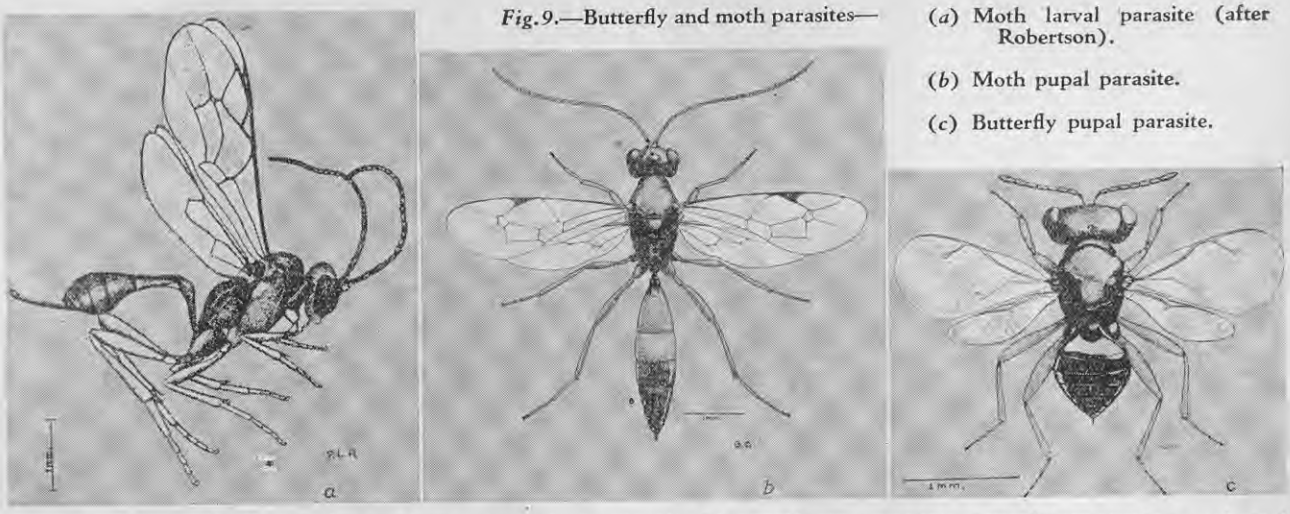

Fig. 9.—Butterfly and moth parasites—

(*a*) Moth larval parasite (after Robertson).

(*b*) Moth pupal parasite.

(*c*) Butterfly pupal parasite.

be resorted to. As the methods of treating the home garden and the market garden crop differ somewhat, the treatment of each is dealt with under two separate headings.

HOME GARDEN.

The average home garden contains relatively few plants for treatment, and white butterfly eggs or grubs when the infestation is light can be dealt with by hand picking the caterpillars or by crushing the eggs (while on the leaves) between the fingers. If this method is not found suitable, sprays or dusts can be used. These are best applied by means of small hand spray or dust guns obtainable at florist or hardware stores. Various proprietary sprays and dusts are on the market, but those most suitable for the home garden are the non-poisonous variety, such as derris or pyrethrum, both of which are sold under various proprietary names. For control of a mixed population of moth and butterfly caterpillars some writers consider derris dusts as superior to pyrethrum. The derris dust should have a rotenone content from 0.5 to 1.0 per cent., and should be freshly packed. Dusts and sprays of this kind which have been packed for a long time tend to deteriorate.

It is important to keep the heart of the plant free from injury, and if dusts are not available one of the proprietary pyrethrum sprays (as used in the house against flies, etc.) applied with the household spray gun will prove quite suitable for the task.

MARKET GARDEN.

Crops grown on a commercial scale for human consumption require to be kept in good condition if they are to command a good market price and show a good return to the grower. Gui* found that the best control of moth and butterfly was obtained by spraying or dusting with Paris green or derris powder at intervals of ten days. Paris green dust is mixed with a carrier, such as talc or lime, in the proportions of one of the former to ten of the latter. Flour may be substituted as a carrier, as it improves the adhesive qualities of the dust. Paris green, if used as a spray, can be mixed in the proportions of 2lb. of Paris green to 40 gals. of water, plus a spreader. Calcium arsenate dust applied at the rate of 15 to 20lb. per acre of crop is also said to be effective.

It is pointed out that poisonous compounds such as Paris green or arsenicals should be used only when the crops are young or up to 40 days before harvesting; derris compounds should be used after this period. Derris compounds are marketed under various proprietary names, and such products generally have all necessary instructions on the container or package, and these instructions should be adhered to. Whether home-mixed or commercial, the rotenone content should not be less than 0.5 to 1 per cent. Thorough application of the sprays or dusts is important if good results are to be expected.

* Rev. App. Ent., vol. 26, p. 651.

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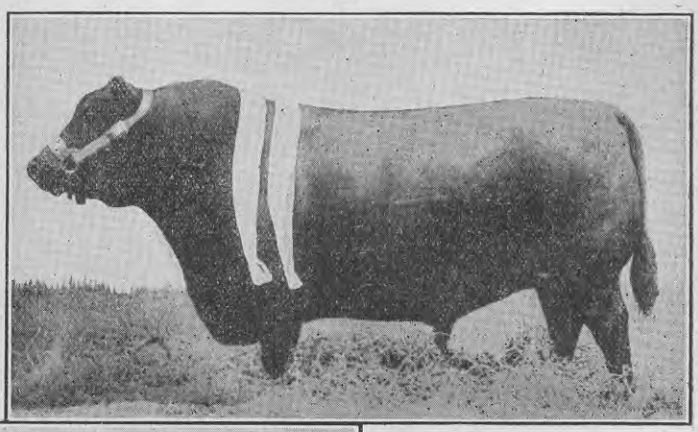

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How Your Milking Machine Works

The PULSATOR

By

W. G. WHITTLESTON,
Animal Research Station,
Wallaceville.

BEFORE discussing the individual types of milking machine pulsators it will be necessary to cover certain general ground. Hence, in the introductory portion of the article we will attempt to deal with—

The Function of the Pulsator.

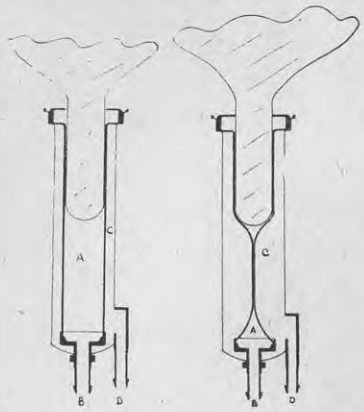
The Action of the Milking Machine Teat Cups.

Methods of Testing the Pulsator.

Function of the Pulsator

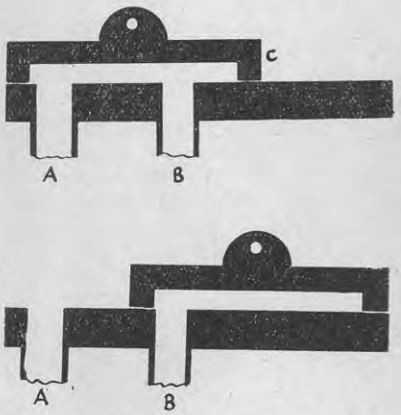
The pulsator in a milking machine is a device which, by the production of an intermittent vacuum, causes an alternate compression and release of the cow's teats through the medium of a rubber liner or "inflation" in the teat cup.

Now, what is the object of this intermittent squeezing and releasing of the inflation by the pulsator? Firstly, let us look very briefly at the history of the pulsator. A steady vacuum was employed in the earliest vacuum-operated milking machines, but they were not satisfactory. They were followed by machines in which the vacuum was caused to swing up and down (as in the so-called "vacuum break" machines). Some used metal cups, and others used solid rubber cups which, under the influence of a varying vacuum in the inside, caused a certain amount of regular squeezing. These were not a great success. They did not milk quickly, and in many cases would not stay on the cows during a rapid flow of milk. Omitting some minor developments, the next important step was the development of the double-chambered cup in which a separate intermittent pulsator vacuum was applied to the outside of the inflation and a steady vacuum applied inside—the modern cup with very few exceptions.



Figs. 1 and 2.—Cross-sections of a typical "Thule" type cup.

Modern cups employ two types of inflation in general—the soft and the moulded types. The former collapses generally when squeezing and so closes under the teat, as shown in Fig. 2. The action of a moulded inflation when collapsed is shown in Fig. 5. In



Figs. 3 and 4.—Diagrammatic illustration of a pulsator valve.

the latter case the inflation does not close beneath the teat, and so does not at any stage obstruct the flow of milk.

The general principle of the modern pulsator is as follows:—Figs. 1 and 2 show cross-sections of a typical "Thule" type cup. In Fig. 1 the rubber liner or "inflation" is shown in a relaxed position, which applies when the vacuum is the same on either side. Now the inner chamber A is connected by the nipple B to the milk pipe via the claw, while the outer chamber C is connected by the nipple D to the pulsator valve. The latter connects the pulsator chamber of the cup C alternately to the vacuum (in the milk pipe in a single pipe machine, in the vacuum pipe in a double pipe machine) and to the air. In order that the relation of the squeeze and release phases, as we shall call them, may be clear, a pulsator valve is illustrated diagramatically in Figs. 3 and 4. In Fig. 3 the valve is shown connecting the pulsator claw lead A to the vacuum lead B. In this position the inflation is at the position shown in Fig. 1 if the machine is of the orthodox type. Fig. 4 shows the pulsator valve connecting the claw pulsator lead A to the air. The vacuum lead in this position is simply blocked by the pulsator slide valve C. This position corresponds to the position of the inflation shown in Fig. 2. In this position the atmospheric pressure acting on the outside of the inflation squeezes its walls together (the inside being partially evacuated) and so causes it to collapse.

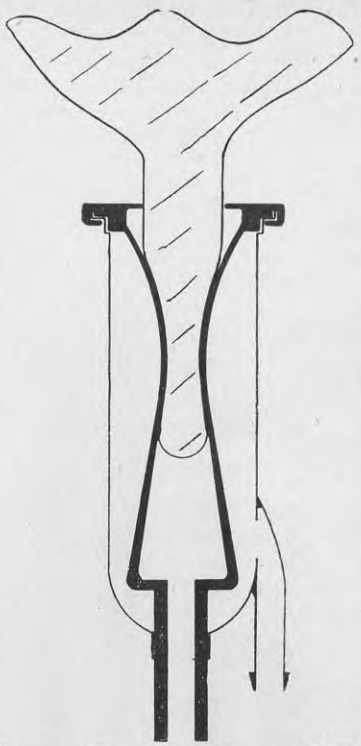


Fig. 5.—The action of a moulded inflation when collapsed.

How Does the Teat Cup Milk?

Sometimes we hear it said that a milking machine "milks on the squeeze." By this is meant, of course, that the milk flows from the teat when the inflation is squeezing and the flow stops when the inflation releases. In order to solve this problem the writer constructed cups with glass walls and fitted with inflations which had small celluloid windows let into them. As a matter of interest a photograph showing details of one such cup is given as Fig. 6. The following notes sum up many observations.

In most cases milk flows within a few seconds after the cups are put on the cow, and is continuous for the first two or three minutes. There is no

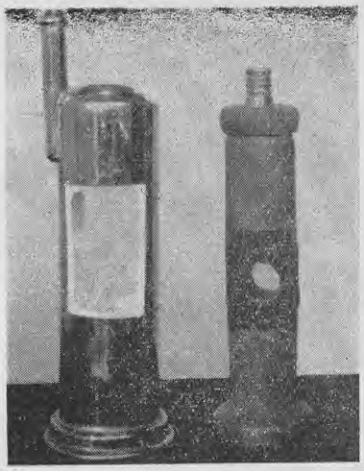


Fig. 6.—The inspection cups.

visible evidence of a rise or fall in rate of flow with the action of the pulsator. There is certainly a slight choking of the milk during the squeeze with a slack soft inflation, but with a well-tightened inflation the milk seems to "get away" quite effectively during the squeeze phase.

Towards the end of the milking the flow becomes erratic and shows little regularity, while when the machine is "stripping" in some cases there is a tendency for what little milk there is coming out to come on the squeeze. It is interesting to observe that if the pulsator is shut off the milk at first seems to flow normally in continuous streams, but it soon ceases. However, as soon as the pulsator is turned on the flow is resumed.

Theory of Milking Process

From the above, it would appear that the action of the machine is entirely different from hand-milking. In hand-milking the milk is actually extruded by blocking the upper portion of the teat and forcing the contents out through the bottom sphincter. In machine-milking the milk is continuously drawn out by the action of the partial vacuum to which the teat is subjected.

If we are to accept Dr. J. Hammond's views (Vet. J. Vol. XVI, 17, 520) the following is briefly what happens. When the cow is about to be milked quite a fair portion of the total yield is contained in the milk cistern and the larger milk ducts. This is the milk drawn away by vacuum alone without the pulsator. However, the remainder is contained in the finer milk tubes (alveoli and ductules), and cannot drain from these tubes without some mechanical action. This is provided by tissue in the udder which, under certain conditions, causes the fine milk tubes to contract, thus squeezing the milk out into the larger tubes, from which it runs freely to the milk cistern. Such action is brought about by the application of a suitable stimulation of the cow's teats.

If this theory is correct—and it seems to fit most known facts about the milking process—it means that the sole function of the pulsator is to stimulate the teat and so to set up a nervous reflex action which will cause certain tissue in the udder to swell and force the milk down from the fine milk tubes of the udder.

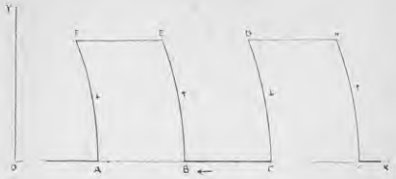


Fig. 7.—A graph of a pulsator test.

Testing the Pulsator

It is important to ascertain just how a pulsator is functioning. This is most readily done by the use of a recording vacuum gauge. A suitable instrument has been worked out at Wallaceville, and the accompanying figures show the type of graph obtained when the vacuum at the pulsator nipples of the claw is recorded.

Firstly, let us consider Fig. 7. In this diagram the vertical axis OY represents vacuum and OX represents time (the direction of motion of the tracing pencil is shown by the arrows). The graph represents the way in which the vacuum would vary in a perfect pulsator system operating at a 50:50 ratio, that is one-half of the total cycle is occupied by the squeeze phase, and one-half by the release.

In all subsequent references to pulsator ratio we shall mean the ratio duration of squeeze phase/duration of release phase. Sometimes the reciprocal ratio is used, but for convenience we shall always employ the above.

The curvature of the "vertical" portions of the graph is due to the use of a recording instrument employing a simple arm with no correction for parallel motion. This is no disadvantage in the graph provided it is borne in mind when reading it, and it simplifies the instrument considerably.

Pulsator Ratio

Theoretically, the pulsator ratio is the ratio of the area BCDE to the area ABEF. In the ideal case this is equal to the ratio BC:AB, and for most practical purposes we may take the latter. In Figs. 8 (a, b, c) we see three different pulsator ratios:—

a = 40:60
b = 30:70
c = 60:40

The "snappiness" of the pulsator is indicated by the sharpness of the angles at A, B, C, D, E, and F. In a poor pulsator these angles become

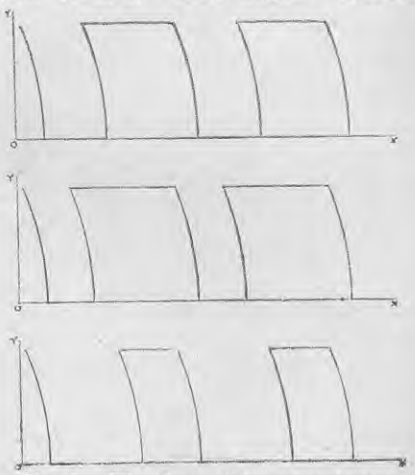


Fig. 8.—**The three different pulsator ratios.**

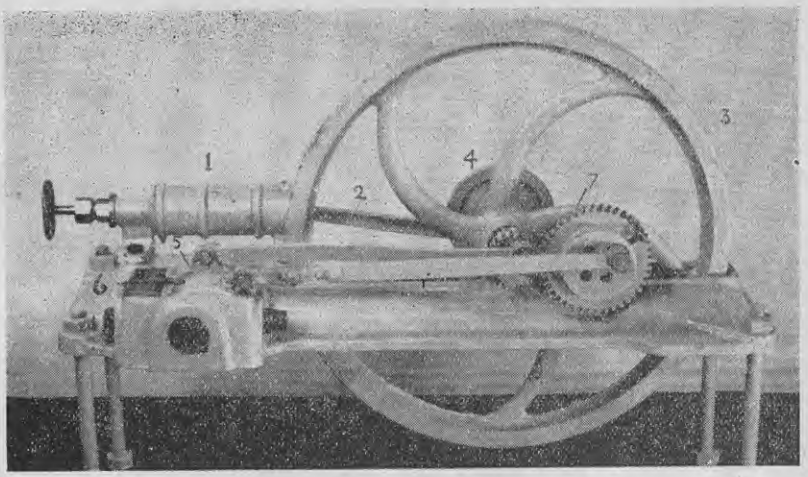


Fig. 9.—A general view of an automatic pulsator.

round curves, while a really snappy pulsator approximates to the form of the ideal graph. Needless to say, there are very few, if any, pulsators like this in practice. It must be borne in mind that the portions DC and FA represent the squeezing action. When this line slopes it means that the squeeze is sluggish and unstimulating. Similarly, the portions BE and GH represent the release phase when the vacuum is applied again after the squeeze.

Mechanism of Pulsator

Figs. 3 and 4 show the essentials of the pulsator valve. However, there are other types, and we shall endeavour to describe typical examples in order to show how they work and how to adjust and care for them. Pulsators may be classified into three main groups:—

(1) **Automatic Pulsators.**—These are essentially valve mechanisms operated by vacuum-driven motors. This class of pulsator was once much more popular than it now is, but in view of the fact that many are still in use a description will be given of the main types.

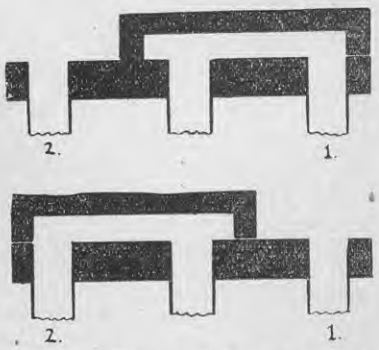


Fig. 10.—Diagram of the automatic pulsator valve.

(2) **Mechanically-driven Pulsators.**—In this type the pulsator valve is driven through suitable mechanism from the motor which drives the vacuum pump.

(3) **Miscellaneous.**—The two chief types in this group, which is difficult to classify accurately, are the diaphragm-controlled shuttle type of pulsator and the magnetic pulsator valve.

Automatic Pulsators

A general view of an automatic pulsator is shown in Fig. 9. It is essentially a small, single-acting vacuum engine which drives a double-acting pulsator valve. The driving force is generated in the cylinder (1), which contains a piston coupled to the connecting rod (2), which drives the flywheel (3) by the crank (4). When the piston is just past the bottom of its stroke the

small slide valve (5) driven by the flywheel shaft connects the cylinder to the vacuum line. Atmospheric pressure acting on the outside of the piston forces it into the cylinder, thus rotating the flywheel. When the piston reaches the top of its stroke the slide valve (5) opens the cylinder to the air, permitting the inertia of the flywheel to pull it back to the position where the cylinder is once more evacuated. The pulsator valve (6) is operated at one-half the speed of the slide valve (5) by means of gearing (7). This valve is shown diagramatically in figures 10a and 10b. In the positions shown in Fig. 10a the valve is connecting lead (1) to the vacuum and lead (2) to the air. Fig. 10b shows the valve in the opposite position.

This type of pulsator requires adequate lubrication. As the speed varies greatly with the load on the driving mechanism, it is important to use an oil which is not too viscous and to clear away regularly any old oil containing dust and dirt, which would impede the smooth working of the valves. All valves should be ground once in a while, although with care these pulsators will run for years without attention if well lubricated.

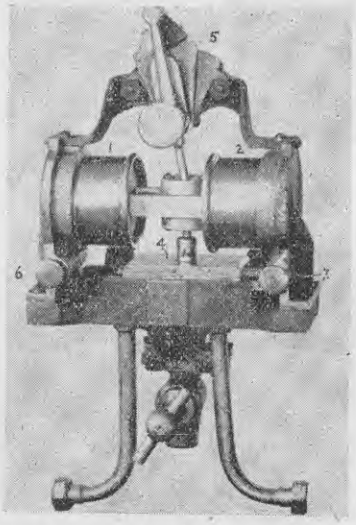


Fig. 11(a).—**Another type of automatic pulsator.**

Another type of automatic pulsator is essentially a double-acting vacuum engine directly coupled to the pulsator slide valve. The device is shown in Figs. 11a and 11b. As can be seen, it is in appearance rather complex, although the action is relatively simple. The two driving cylinders are shown at (1) and (2). These are connected to the vacuum via the piston valve system in the cylinder (3). The main pulsator valve (4) is of the double-acting variety, and on the same slide are drilled small auxiliary ports which operate the valve system. The mechanism shown at (5) is an ingenious device for halving the pulsator rate for the releaser.

The action of the device is as follows:—When the pulsator valve reaches the end of a stroke the auxiliary ports connect the valve piston to the vacuum in such a manner that the piston moves to connect the main cylinder on the opposite end to the vacuum, and the other main cylinder to the air. This causes the pulsator valve to move back to the opposite end of the stroke, where the process is repeated. The speed of the pistons is controlled by the two needle valves shown at (6) and (7).

The chief factors governing the speed of the pulsator once the needle valves have been set are:—(a) The vacuum: the higher the vacuum the faster the device operates; (b) the viscosity of the oil in the driving cylinders and in the valve cylinder. This also applies to most automatic type pulsators, and the same precautions are required for regular action.

Such devices need adequate cleaning and oiling from time to time, and the valves should be kept free from grit.

Pendulum Type Automatic Pulsator

The objection to both the previously-mentioned automatic pulsators is the fact that they vary their speeds with such factors as temperature, vacuum, etc. The pendulum pulsator is an automatic pulsator, operated by two diaphragms and a slide valve mechanism. A pendulum is connected to the slide mechanism, and controls its speed of operation. This method effectively overcomes the problem of maintaining a steady speed with an automatic pulsator.

There are several types of automatic pulsator used only on bucket-type machines. As these have a very limited interest to New Zealand farmers, a description will not be given.

The importance of automatic pulsators lies in the fact that they may be used on milking machinery not driven by mechanical vacuum pumps. When a water-operated pump placed some distance from the shed is used it is not possible to employ a mechanically-operated pulsator unless a special motor is installed for this purpose only. It was this fact which made such pulsators so popular before the widespread use of electrical power developed and when water-operated vacuum pumps were used in considerable numbers.

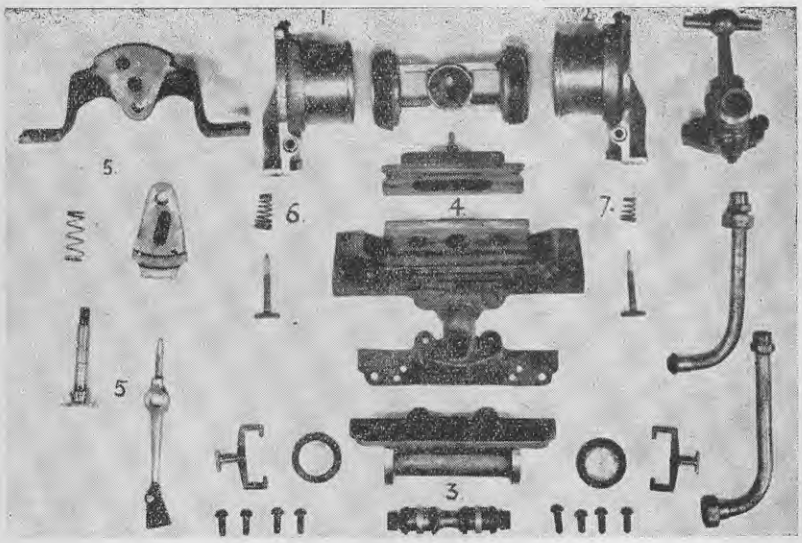
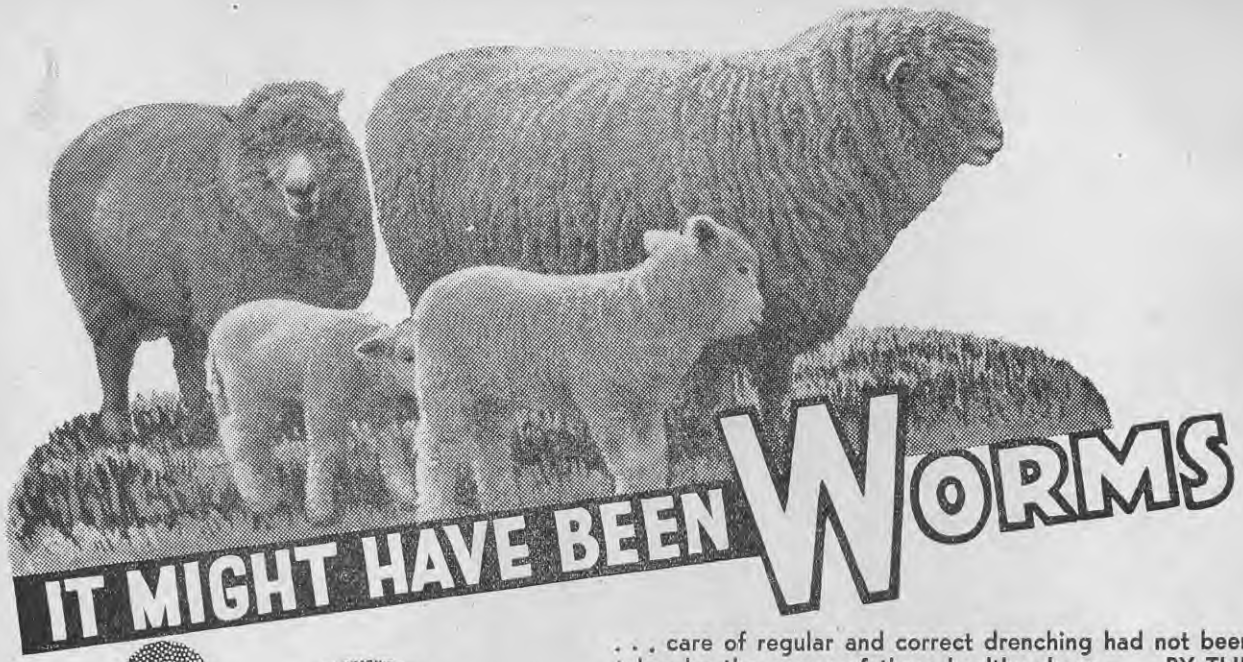


Fig. 11(b).—The parts of the pulsator shown in Fig. 11(a).

(To be continued.)



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An interesting case of congenital goitre in lambs was investigated during September. The loss involved from 90 to 100 lambs. The full particulars of the outbreak and the history of the flock over the season is of direct interest to sheepowners.

CONGENITAL GOITRE IN LAMBS

It is proposed to forward soil and pasture samples from the farm for analysis and iodine estimation. A salt mixture with potassium iodide is to be used throughout the year so that the sheep may have access to it at all times.

By

C. V. DAYUS, District Superintendent, and B. A. TAYLOR and G. A. THOMPSON, Veterinarians, Dunedin.

THE farm consists of 140 acres of low-lying flat land, a portion of which is alluvial and the remainder drained swamp. This has a clay subsoil, containing decaying vegetation, although not peaty, and a portion of it still grows swamp grasses, such as floating sweet grass, knee-jointed foxtail, creeping bent, etc. The area was once subject to flooding, but this is now largely controlled by the excavation of a contour channel and the erection of a protective stop-bank.

Drainage is still not perfect, but has very much improved in the last five years. Most of the area consists of very old-established pasture, sown down with ryegrass, red and white clover, cocksfoot, and Timothy, and some 45 acres have been resown in the past six years. In addition to this flat area, the farm consists of about 390 acres of hill country, comprising native tussock and grass.

The present owner has been on this farm about eight years, and at first went in for dairying, changing over to sheep about four years ago.

Because of the nature of the flat land, it has never had the reputation for "doing" young stock well, calves and hoggets. At present, it is the custom to winter the two-tooths on the hill country. In the growing season the flat carries considerable feed, and heavy stocking is possible—five sheep per acre, including cattle to keep down the rank growth. Older stock getting past the growing stage do well, and last season fat lambs were got away off the mothers, which was a new procedure attributed by the owner to the use of lime.

Fertiliser Used

About five years ago the paddocks concerned received a dressing of 10cwt. of lime and 2½cwt. of superphosphate per acre. In 1940 the whole area (140 acres) received one ton of lime per acre. Some was applied in the autumn of last year, but most went on in the spring.

In 1941 the area of flat carried 550 Romney cross ewes all winter without any other feed (four ewes per acre). The ewes were mixed ages, four-tooth to aged. Actually, all these ewes, with the exception of a few bought in (which will be referred to later), had been on the same area since they were two-tooths.

All the paddocks were in occupation during the winter, and the ewes received no change-round (the first time this has occurred) until close to lambing, when they were put together on more occasions to leave some paddocks free into which to place the ewes as they lambed.

The two-tooths, numbering 150, wintered on the hill, and at the conclusion of lambing they will be brought down on to the flat, bringing the stock on this area up to 700 for the summer. The rams were put out on April 12, 1941, and lambing began on September 12 and finished on or about October 3.

Freedom From Goitre

There were some ewes, 58 in number, which lambed earlier than the main lot. Some of these were aged ewes—28 were left over from a draft which went to the freezing works, and the remainder were ewes of mixed ages, the rams gaining access at an earlier date. These 58 ewes lambed in August, and the lambs were "marked" before the main lot began to lamb. **No cases of goitre occurred in the lambs from these ewes.**

Another lot, of "bought-in ewes" (numbering 60), mostly six-tooth and eight-tooth, were bought at a local sale and put on the flat in July. **No cases of goitre occurred in the lambs from these ewes.**

No cases of goitre occurred in the lambs from the 150 two-tooth ewes wintered on the hill.

Among the remaining 430 ewes on the flat between September 12 and 29 70 to 80 lambs had been lost from congenital goitre, and by the time lambing finished, about October 3, 90 to 100 lambs were actually lost—a loss equivalent to 15 per cent. over all, or 20 per cent. in the lambs of the ewes in which the incidence was actually recorded.

Evidence of Thyroids

A few lambs affected were premature but the majority were up to time. Some affected lambs were born dead, but most appear to have been born alive, but with vitality extremely low, so that many of them died in a short period without ever gaining their feet. There were cases where one lamb of twins was markedly affected and died, while the other was apparently normal and lived. Possibly, if it had been practical to palpate the thyroids of the surviving member some degree of enlargement of the thyroids would have been detected. Several affected lambs showed a tendency to "hairiness," although this feature is sometimes a genetical characteristic, especially of the Romney breed. There were lambs affected from four-tooth and 6-tooth ewes, but it is safe to say that the majority of cases were in lambs from ewes full-mouth and over.

The thyroids of affected lambs varied in size or palpation from a filbert nut to a large duck egg (that is, one lobe, both lobes did not always show uniform enlargement).

Although cases occurred in practically every paddock on the flat, it was thought by the owner that one paddock more than any other was implicated. This was one of 24 acres, ploughed and sown down many years ago. It is one of the wettest of the paddocks on the flat, and four years ago was heavily covered in rushes. This paddock carried 100 ewes since the middle of May, 1941.

The rams on the property were palpated, but no enlargement of thyroids could be detected.

Some of the ewes were examined (half a dozen), and there were two in which a slight enlargement of the thyroids could be detected.

Four Basic Principles Are Essential to Success

By
A. A. COPLAND,
Instructor in Agriculture,
Timaru.

TWO small irrigation schemes already operate in South Canterbury, but within a year or so large areas will be reticulated in Canterbury following the completion of the big Rangitata Works. These works are costly undertakings for so small a country, but while the initial cost is necessarily high, it will be considered small when the future advantages are taken into account.

If, however, the greatest advantages are to accrue from irrigation, the fullest possible use must be made of the water. This can be done only if at the very start we realise that the irrigation schemes were constructed in Canterbury for the sole object of supplementing a low rainfall. Many farmers view irrigation as a drought remedy only—that is, that the farms will not be made dependent on irrigation, but that the present system of dry land farming which has been evolved to fit into a natural environment will carry on and that irrigation will be called on only to tide over an unusually dry period.

It cannot be stressed too strongly that irrigation must not be viewed and adopted merely as a standby in times of a drought, and the farmer must realise this if he is to get profit from the use of water. In Canterbury the ultimate aim should be farms of high production dependent on the continual use of water. The intensive use of irrigation will so increase the carrying capacity of the land that the stage will be reached where the water, in effect, becomes the life blood of the farms.

There are four basic principles about irrigation which the farmer must remember.

(1) Good Pasture Is Keynote to Success

The first step towards success in irrigation—and this applies equally to farming in general—is the establishment and maintenance of good pastures. In pastoral or agricultural farming the good grass and clover paddock is the keynote to success. It carries and fattens the sheep, it builds and repairs the fertility. In just the same way as it is false economy to spend good time and money in cultivation and then sow poor strains of grass and clover, so it is false economy to irrigate poorly-established and run-out pastures. The greatest returns from expenditure on irrigation will result if the water is used to grow grasses and clovers and not weeds.

This question of good pastures is of paramount importance, and if the

farmer is really to succeed he must pay particular attention to this branch of his farming. New Zealand has grasses and clovers of unrivalled persistency and high production, but these seeds are only to be found in sacks bearing a certification tag and seal. These are the seeds—and these only—which will give high producing and persistent pastures. At the same time, the sowing of first-class seeds will not be a guarantee to success unless equal attention is paid to cultivation and their establishment. It is like making a chain, every link must be sound and able to take its full share of the weight. Point No. 1, then, in developing a farm for irrigation is a good pasture.

A good, dense-bottomed pasture can be established and maintained only if the right species of grasses and clovers are sown and a constant programme of irrigation is carried out.

(2) Consistent Programme Of Irrigation

After the pasture is sown the next step in management on the dry plains land is to ensure that the pasture is not allowed to suffer reverses through lack of moisture. Without irrigation this is entirely beyond our control, but with irrigation the water can be applied at will. At all times the pastures must be fed with sufficient soil moisture; they must never be allowed to wilt, brown off, and burn up.

Heaviest growth is produced by grasses and clovers on light silt loams when the soil moisture is 20 per cent. or greater. Soil moisture surveys carried out in Canterbury during the last six or seven years have shown the moisture content to drop as low as 4 per cent., often for long periods, which must never happen on the pasture lands when irrigation is available. This means, therefore, that the farmer must adopt a programme of irrigation that is consistent, or, shall we say, persistent.

It is a faulty practice to irrigate a paddock and then leave it until the plants are burnt up and nearly dead before applying further irrigation. This

Poor, run-out pasture. It does not pay to water weeds.

very common mistake arises through the fault of viewing irrigation as a standby for a drought. The true value of irrigation lies in the initiation and maintenance of high production, together with the building up of the food supplies and fertility of our soils. Past farming practices on these light lands have resulted in the draining out of the inherent fertility, thus lowering the productiveness of the farms. Farmers have capitalised on this fertility, and now they must put it back.

With irrigation, not only can the farms carry more stock, but by the maintenance of good pastures and clovers (the clovers are essential) and by the passing of these pastures back per medium of the stock to the soil, the farm lands can once again be built up. This can be done only by following a consistent programme of irrigation. Once a farmer begins to irrigate he must follow it through. The cultivation entailed in constantly renewing pastures is expensive, not to mention the cost of seeds and manures. If some of this money is now spent on water and the farmer ensures that the paddock does not become drought-stricken, then not only will the pastures produce considerably greater quantities of feed, but they will also hold for very many years longer.

(3) Control Stock On the Pasture

The third important principle is that a plant lives not only by its roots but also by its leaves ,which perform the dual function of breathing and manufacturing plant food. This principle must be kept in mind when stocking the paddock. If too many sheep are crowded on to a pasture and left on too long, the plants are severely punished, and inevitably they are weakened and lose vigour. A continuation of this practice results in their complete ruination. This overstocking of pastures occurs too often under irrigation, and again one is forced to the conclusion that it is the result of using irrigation as a drought measure only.

The following is a common practice, and is essentially wrong. Because of drought conditions more prolonged and severe than usual, the farmer becomes short of feed. He turns to irrigation as a way out, and the paddock is ditched and irrigated. Immediately the grass begins to show green—it is just at a stage when it is recovering from a severe setback and requires careful nursing—on go the stock and they stay on. A little later it may

rain, and the farmer is through the drought, but the paddock is also through. A good pasture of ryegrass will stand heavy stocking, but this stocking must be controlled and never at any stage carried to the extreme.

As with a horse after a hard day's work, a pasture requires a spell to build up, rejuvenate, and so make itself ready to carry on. While it is not my intention to discuss topdressing or the details of pasture management, it will be realised that if high production is called for, an adequate manurial programme must be carried out. What is taken out in the form of phosphate and other plant requirements must be put back.

(4) Gradual and Thorough Development

The development of a farm should be gradual and thorough. The farmer should start, say, with a small portion of his farm, having first prepared it for irrigation and sown it down. If he now continues to irrigate and carefully manages this pasture he will be growing more feed than he had in the past. He can then increase the number of his stock, but at the beginning and until he has gained considerable experience with irrigation, the farmer should always err on the conservative side. With the increased number of stock he will not be out of pocket for expenses for irrigation.

The whole aim is to bring about the change-over to irrigational farming gradually, using the gradual increase in stock and other returns to offset the cost of establishing the pastures, constructing races, and laying out the paddocks for watering. This means that in this development under irrigation the increases in acreage should coincide with the increase in stock or the equivalent of stock in extra crop for sale. At the same time, as more grass comes under irrigation, lucerne must be established so that hay can be cut to carry the stock through the winter.

At present, one of the greatest difficulties facing the Canterbury farmer is shortage of feed in January, February, and early March. With irrigation, this gap can readily be bridged, but unless attention is paid to the winter feed problem the farmer will not receive the benefit, as his stock-carrying capacity is limited to that period of the year when his feed position is lowest. For this reason, a correct balance must be maintained between the area of pasture irrigated and the area of lucerne established to give the winter hay.

Followed along sound lines and followed consistently, irrigation cannot but help greatly to increase returns from farming, and at a profit. Irrigation in Canterbury is as yet in its infancy, but in every case at Redcliff and the Levels where the farmer has made consistent use of the water he has benefited greatly.

Conclusion

Irrigation is the means of high production, but if this is to be achieved certain principles must be remembered.

(1) A good pasture is the most valuable asset on the farm. The pasture paddock is the manufacturer of 95 per cent. of our stock foods. Its efficiency depends upon its composition. If greatest returns are to be obtained from irrigation every care must be taken to establish good pastures. It does not pay to water weeds.

(2) Irrigation must be followed through; adequate soil moisture must be kept up to the plant at all times.

(3) A pasture must be controlstocked and not overstocked.

(4) Irrigation development must be gradual, a steady and thorough building-up programme.

Development of the Light Lands of the West Coast

Arable Crops for Sheep Is An Essential Factor

WHEN an old pasture of reasonable stock-carrying capacity and white clover-content is ploughed under in the ordinary course of mixed farming operations one may expect the following crop to benefit by the latent soil fertility, but disappointing results usually follow the breaking-up of the old matted turf of browntop, moss, and sweet vernal, which is characteristic of much of the light land of the West Coast district.

This article suggests certain measures for dealing with the problem of bringing into production the tussock plains

— By —

A. D. MERCER,
Fields Instructor, Greymouth.

of the Maruia Valley, which lies between Murchison and the Lewis Pass, but similar treatment is indicated on the light land of Inchbonnie and on some of the Wataroa flats. All of this light land with varying depths of soil, some of it barely capable of supporting a sheep to the acre, is capable of maintaining four sheep to the acre on the better class land.

Limiting Factors

To bring land of this type to that state of fertility which will ensure good fodder crops or high production pastures, it must first be subjected to heavy stocking by sheep in order to add the organic matter or humus that gives "body" to a soil. The tussock plans which comprise a considerable area of the Maruia Valley offer great opportunities for improvement. There is no initial expense of clearing and draining, and the land is all ploughable, but a certain capital outlay is involved to tide over the first two years of development.

As previously stated, heavy stocking with sheep is necessary, but this is impossible on the sparse natural herbage, while the experience of one enterprising farmer on this country has shown that the first crop of soft turnips or rape is not good enough to ensure adequate stock concentration. As all farmers are aware, the limiting factors to successful crop growth on most soils in New Zealand are lime and phosphate, but in this case both were supplied in ample measure. The result is partial failure, and it appears obvious that nitrogen must be supplied in addition to secure success in the first crop. The "golden hoof" will see to the rest.

Methods of Supplying Nitrogen

(a) **Topdressing.** — The obvious method is to apply 1½cwt. per acre of sulphate of ammonia with the rape or turnip crop, or 2cwt. of blood and bone. Sulphate of ammonia is now unprocurable, while the price of blood and bone is very high. Nitrogenous topdressing is out of the question today.

(b) **Leguminous Forage Crops.**—As root crops are unsuccessful, an alternative first crop might be oats for autumn green feed, and the chance of success would be vastly improved by the addition of one-half to one bushel of blue lupins to the feeding. This legume, by the fixation of atmospheric nitrogen, would not only benefit the oat crop, but subsequent decay of the roots would add to the store of soil nitrogen, while its deep-rooting habit penetrates and aerates the subsoil. This, or a similar cereal-legume mixture, is likely to provide more feed under these conditions than the rape or turnips.

(c) **Inducing a Clover Sward Before Ploughing.**—Suitable treatment of poor pasture for two years before turning it over would, where time is not a prime consideration, do much to alleviate the nitrogen deficiency. A dressing of one ton of lime per acre plus 2cwt. of superphosphate not only encourages the growth of volunteer white clover, but also hastens the decay of the old turf when ploughed in. In a sour soil this old turf will remain unchanged for years, but a liberal prior dressing of lime will bring about those conditions necessary for its decomposition and conversion into humus and eventually to available nitrogen.

The establishment of clover may be hastened by the surface-sowing of subterranean clover, which on these plains has succeeded admirably where lime and superphosphate have been applied. On one area, no lime—no clover.

Surface-sowing of white clover in the spring should, in this district, prove equally effective. Whatever the means adopted, they are all designed to the same end, namely, the establishment of a tolerable amount of clover before breaking up in order to ensure soil fertility for later crops.

Following Crops

Whether the course followed is the cereal-legume green feed or the pretreatment of worthless grazing, ploughing for the next stage should be completed by the end of June, taking advantage of the beneficial action of the frost and securing a good seed bed for rape or turnips. Rape fed off in January would leave time for an early autumn sowing of Italian ryegrass and red clover, which would provide valuable feed for the flock in early spring and for two years afterwards.

Turnips fed later in the autumn would entail spring sowing of the seeds as soon as weather permitted, making green feed available well on in the summer when natural pastures are drying off. The useful life of such grazing is two years, when the area may be sown down to permanent grass. The gradually-increased stock-carrying capacity and the accumulation of fertility brought about by the concentration of sheep will maintain a productive pasture capable of supporting at least four times the present number of stock.

Maintenance of Fertility

Once the first hurdle is surmounted —namely, the problem of sufficient feed to carry a heavy concentration of stock—subsequent maintenance of fertility is a matter of efficient stock management, bearing in mind the following points: Of the main elements essential to a fertile soil, nitrogen, potash, phosphate, and lime, very little is removed by grown fattening animals, either beef, cattle, or wethers. Considerable quantities of phosphates and calcium are, however, retained by dairy cows and ewes with lamb, but with all classes of grazing stock most of the potash returns to the land in the urine. Sheep feeding off roots or green crops return to the soil nine-tenths of the nitrogen in the drop, so that once a sufficient store is accumulated, dressings of phosphatic fertiliser and lime periodically will maintain the balance.

When good pasture is finally established, one ton of lime per acre every four years plus 2cwt. of superphosphate every second year will complete the transformation of these plains from inferior sheep grazing to good sheep and cattle country.

Summary

Old, inferior grazing country does not possess the stored-up fertility usually associated with pasture land.

In addition to the usual deficiency of lime and phosphate, this type of country is likely to be lacking in available nitrogen, resulting in crop

failures when broken up for roots or rape.

This deficiency may be made good by the manurial action of heavy concentrations of sheep, but the difficulty in the initial phase is to secure sufficient feed for this purpose.

As nitrogenous topdressing is impracticable at present, two alternatives present themselves:—

(a) A change from the cruciferous first crop to a sowing of oats and lupins for autumn green feed.

(b) Prior treatment of the sward with lime and phosphate to induce clover growth, and possibly surface-sowing of subterranean or white clover.

Answer to Correspondent

Crops for Winter Feeding Pigs

"COCKY" (WAIKATO),—

I would be much obliged if you could give me some advice on the best crop to grow for the winter feeding of pigs. I find it exceedingly difficult and expensive to keep the pigs growing from the time the milk falls off in late autumn until the cows flush up again in the spring.

I have a piece of drained peat swamp that has now consolidated, and having had it cleared of stumps and timber have started to plough it. I would be grateful if you could advise me what crop would give the best results under the above conditions, and any further information as regards amount of seed and manure and when to plant. The area of the land is about two acres.

FIELDS DIVISION—

Maize for cob would be the most satisfactory crop for the purpose required. This crop requires a thoroughly cultivated seed bed and a soil that is naturally rich or well fertilised. Sowing should be done during November, and drilling can be done 14in, 21in, or 3ft apart. If 3ft apart, pumpkins, marrows, or kumi kumis can be grown between the rows.

Seeding at the rate of 25 to 30lb per acre is recommended. A suitable fertiliser consisting of three parts superphosphate, one part blood and bone, should be applied at not less than 4cwt. per acre.

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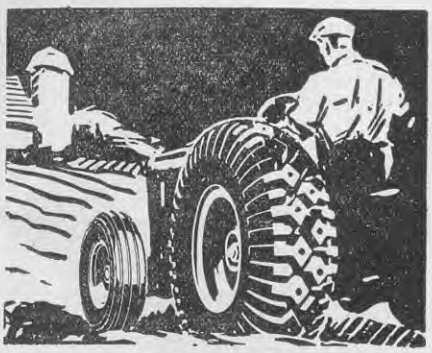


GOODYEAR TRACTOR TYRES

Britain Wants Ergot From N.Z.!

How Country People Can Help A Most Worthy War Effort

By J. C. NEILL,

Field Mycologist, Plant Diseases Division, Department of Scientific and Industrial Research.

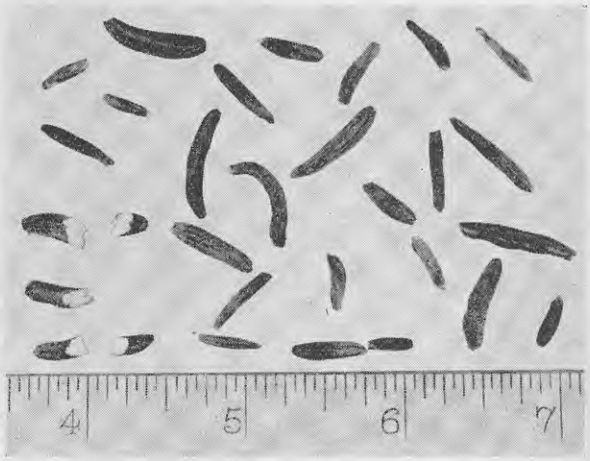


Fig. 1.—A sample of commercial ergot. On the left are three ergots cut to show the white interior.

A WONDERFUL opportunity is open to country people living near swampy areas to help in a most worthy war effort—the collection of ergot—and, incidentally, to tap this hitherto neglected source of personal and national income. Ergot is a fungoid disease of grasses that attacks the seed, replacing it with a leathery, elongated growth, black on the outside and white within. (See Fig. 1.)

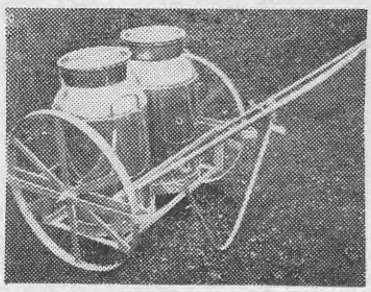
Care should be taken, however, not to confuse smut disease with ergot. Smut disease, particularly of prairie grass (see Fig. 3) is sometimes collected in mistake for ergot. To test, break the black mass in half. If it is black all through and leaves a black powder on the fingers, then it is smut and valueless. Ergots break cleanly and show a whitish, cheesey centre.

Ergots are common on many grasses throughout New Zealand, but the largest and most valuable occur on tall fescue—a grass which flourishes profusely in swamp areas all over the North Island and in many places in the South Island. Marram, cocksfoot, and water-grass are also good sources of ergot. From ergots there is extracted a drug that is of the utmost value in maternity and in the treatment of wounds.

Fig. 2.—Ergot on tall fescue.

Value as Medicine

Before the war supplies of ergot were obtained by British and American manufacturing chemists from Central Europe, Hungary, Rumania, Spain, and Russia, where they were collected, mostly by children, from crops of rye-corn. Now, of course, these sources of supply are cut off, and, just when the need is greatest for the treatment of



wounded soldiers and air-raid victims, a great scarcity has arisen. The Imperial Government has asked New Zealand to send all possible supplies for urgent requirements.

Many tons of first quality ergot go to waste every summer in the swamp areas of New Zealand. Ergot is worth just now up to 8s. a pound in money value, but is worth infinitely more in terms of human lives and suffering. It is obviously the duty of everyone who has the opportunity to collect every pound for despatch to Britain.

How to Collect Ergots

The collection of ergots is very simple, and can well be done by children during the Christmas holidays, as the ergots ripen in January. It is probable that the fastest method would be to work in teams, as for cocksfoot seeding, cutting the tall fescue heads with a sickle, and subsequently collecting, threshing, and winnowing. The ergots should not be broken or damaged in any way, as this detracts very much from their value. They are very easily parted from the seed head, especially if the latter is allowed to dry somewhat, so that a light blow with the grass-head across a horizontal piece of wood should usually suffice and give the minimum amount of seed to clean out afterwards.

Fig. 3. — Smut on prairie grass. Left: smutted; right: healthy.

Careful cleaning for market is essential, as the final sample must be quite free from seed, straw, or rubbish—that is, it must consist of ergots only. It is very important to dry the cleaned ergots quickly and thoroughly either by spreading out in the wind and sun or inside. Ergots should never be packed to send away while any dampness remains. When dry, they should be packed in airtight tins or other suitable containers and consigned to any grain, seed, and produce merchant in the district, who will assess the value according to quality and condition, and return a cheque for the value. For good quality, well-cleaned ergot 8s a pound will be paid or 6d. an ounce.

Although ergots are poisonous if swallowed in any quantity, they are perfectly safe to handle in collecting, threshing, and packing.

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How to Harvest and Clean Ergot

By

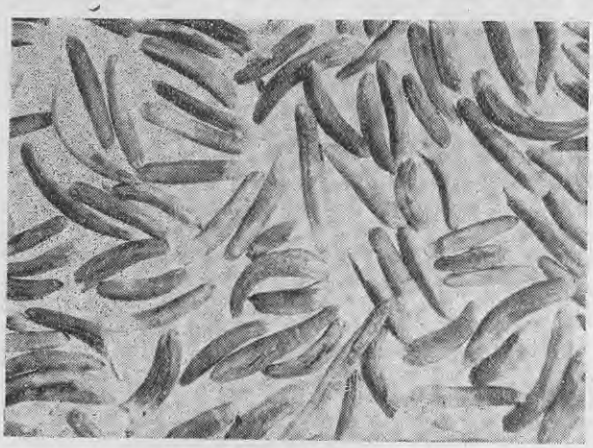
J. E. BELL,
Land Utilisation Officer,
Wellington

AT the time when ergot is most urgently required for the treatment of wounds, it is in short supply. Supplies which, in the past, were obtained chiefly from the mainland of Europe have now been cut off. Ergot is obtainable from the seed heads of grass plants, but it is most prolific and most easily collected from tall fescue, a tall grass which flourishes in rich alluvial swamps, particularly in the North Island.

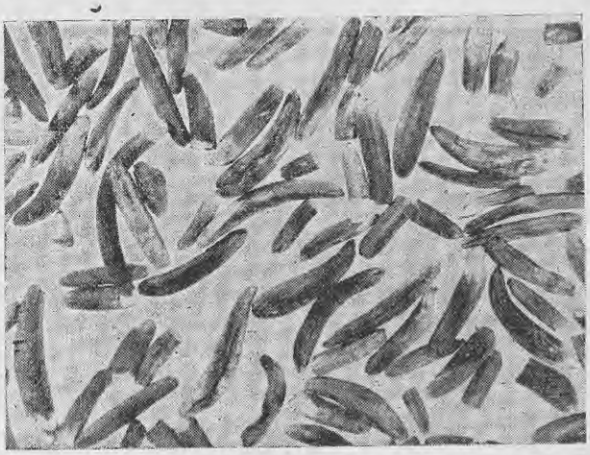
Harvesting and Cleaning

The ergot is ready for collection in December. From then onwards, it can be harvested by cutting the heads with a sharp knife or sickle or by hand stripping of the heads. If the heads are cut they should be stood on end in a sunny position against a house or shed or spread out on the ground or, better still, on sheets of iron, bags, or canvas until they are thoroughly dry. On wet days and in the evenings it is advisable to place them under cover. When thoroughly dry, the ergot is threshed by tapping the heads sharply against a piece of wood, so that the ergot falls out with a minimum of grass seed. The hand-stripped ergot should be laid out on sheets of iron or other material until thoroughly dry.

The mixed ergot and grass seed so obtained from the cut or stripped heads should then be winnowed to remove, as much as possible, all the foreign matter and to obtain as pure a sample of ergot as possible. In winnowing, as in all operations, care



Grade 1.—Clean, unbroken, dry ergot, 8/- per lb., or 6d. per oz.



Grade 2.—Clean dry ergot but with some broken grains, 6/8 per lb., or 5d. per oz.

Grade 3.—Unbroken, dry ergot mixed with chaff, etc., 5/4 per lb., or 4d. per oz.

Grade 4.—Dry ergot mixed with chaff, etc., including broken ergot grains, 4/- per lb., or 3d. per oz.

Note: Grades 2, 3 and 4 are subject to variation in price according to amount of broken ergot grains and chaff.

should be exercised not to damage or break the ergot. Winnowing can be achieved, in the absence of a machine, by throwing the material in a draught of wind in the open, or such as is obtained through an open doorway. Bags should be placed on the ground to catch the ergot. Being heavier, the ergot will fall closer to the thrower, while the lighter seed, straw, and dust will float further away. The operation will probably require repeating several times to secure a reasonably clean sample.

Cleaning can also be obtained by throwing the mixed ergot and rubbish in a pail of water. The heavier and better-class ergot will immediately sink, and by judicious stirring, the remainder of the ergot will be induced to fall, leaving the straw, seed, and other light rubbish floating on top of the water. The floating material can then be poured off, leaving behind the ergot at the bottom of the pail. The ergot should then be thoroughly dried immediately in the sun.

Purchasing Price

The thoroughly dried pure or practically pure ergot should be put in air-tight containers, such as tobacco tins, and taken to the nearest produce merchant, who will purchase it on the following basis:—

Grade 1.—100 per cent. clean dry whole ergot, 8s. per lb. or 6d. per oz.

Grade 2.—Not less than 80 per cent. clean dry whole ergot; not more than 20 per cent. clean dry broken ergot, 6s 8d per lb. or 5d. per oz.

Grade 3.—Not less than 70 per cent. clean dry whole ergot; not more than 30 per cent. straw, seed, and foreign material, 5s 4d per lb. or 4d per oz.

Grade 4.—Not less than 50 per cent. clean dry whole ergot; not more than 30 per cent. straw, seed, and foreign material; not more than 20 per cent. broken ergot, 4s. per lb. or 3d. per oz.

Here is an opportunity for service in alleviating the suffering of men who are fighting for us. It is an opportunity which offers itself particularly to children in country districts, and contributions of even 1 oz. will be welcome. Ergot from many grass plants is useful, but that from tall fescue in particular and marram grass is most valuable. Let us see that the tons of ergot which soon will be present on the tall fescue of our swamps do not fall to the ground unharvested.

Tall fescue is easily recognised. It is a tall, upright plant with coarse leaves, the edges of which are liable to cut the tongue if drawn across it. The base of the stem next to the root and close to and slightly below the ground has a red colouration.

Export to Britain

After the ergot has been collected the merchants purchasing the ergot will forward it split into the four grades to a central merchant, where it will be inspected before being forwarded for machine dressing. After machine dressing the ergot will be exported to Britain. The Government has set aside £14,000 for the purchase of ergot, and it is to be hoped that all this money will have been expended by the time the ergot harvest is over. The produce merchants are being put to a considerable amount of trouble in the handling of the numerous small amounts that are liable to come forward, and it is to their credit that they have agreed to give their support to the scheme.

MONTGOMERY RED CLOVER SEED PRODUCTION

A steady demand now exists for certified Montgomery red clover seed. This article discusses the production of this seed, and describes the requirements and management necessary for success. It is emphasised, however, that practices vary considerably, not only from district to district, but also within districts.

Production of Seed In Suitable Areas

By

S. H. SAXBY,
Instructor in Agriculture,
Dunedin.

FOR seventy years or more broad red clover (or cowgrass as it is often called) has played an important part in New Zealand pastures. Certain districts have specialised in the production of this seed, which has earned a high reputation overseas because of its consistently good quality.

It is, however, only in comparatively recent years that Montgomeryshire extra late flowering red clover (to give it its full and descriptive name) has come into use in this country. Critical experimental work on this strain was begun in New Zealand as recently as 1926, and it was not until 1929 that Montgomery red clover (as it is now usually called) was regarded as having proved its worth sufficiently to warrant its widespread use for grazing, haying, and seed production. Certification of this seed was started in the 1931-32 season, and as soon as the value of the type was recognised by the farming community a steadily increasing demand for its seed set in. The imported seed was usually high in price, and sometimes of indifferent quality.

It is not surprising, therefore, that the production of Montgomery red clover seed for our own farming requirements began to interest farmers in those districts which had in the past been regarded as producers of good quality red clover seed. And it is these districts, with certain exceptions, that are now the main producers of Montgomery red clover seed.

Description

Montgomery red clover is a long-lived and leafy type with a dense, low crown. Growth begins rather late in the spring, and carries on well into the autumn. As its name (extra late flowering) implies, it flowers much later in the season than broad red clover. From the seed producers' point of view, its extreme leafiness and lateness in flowering are points that should be fully appreciated in order that successful results may be achieved.

Districts Suitable For Seed Production

Before entering on Montgomery red clover seed production farmers should make sure that their district is suitable for this purpose. As Montgomery red clover flowers late in the season and consequently ripens late, it should be realised that districts which usually experience a wet, late autumn are unsuitable. One of the chief requirements for any seed production is good harvest weather. Because of the lateness of the harvest and the bulk of leaf to be handled, this is of special importance with regard to Montgomery red clover.

The following table shows the number of paddocks and acreage of Montgomery red clover entered for seed certification in the 1940-41 season:—

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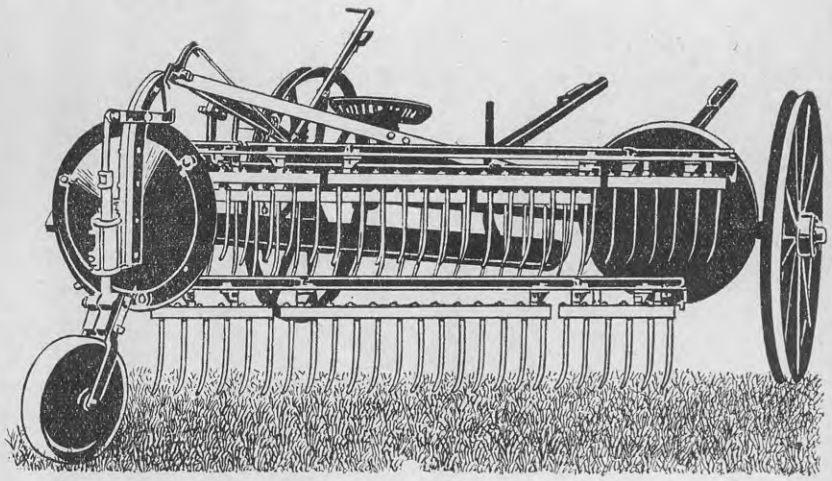

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Montgomery red clover seed production should be concentrated on good, second-class country where satisfactory yields of good quality seed are obtained.

Cover crops are satisfactory provided they do not result in a smother of the establishing clover plants.

	Areas.	Acreage.
North Island (mainly Hawke's Bay)	25	152
Marlborough	1	5
Canterbury (north of Waimakariri)	30	326
Canterbury (Waimakariri to Rangitata)	35	485
Canterbury (south of Rangitata)	155	2,111
North Otago	40	663
Central Otago and Maniototo	8	66
Otago (Waihemo and Waikouaiti Centres)	52	424
South Otago and Southland	12	149
	357	4,381

From this table it may be seen that at present the greatest number of seed-producing areas are in Canterbury and the Northern Coastal districts of Otago. Nevertheless, certain other districts could profitably extend their activities in seed production.

In the following discussion on the production of Montgomery red clover seed it should be borne in mind that practices vary considerably, not only from district to district, but also within districts. It is impossible to deal at length in this article with every successful local practice, but an attempt has been made to emphasise any particular practice or practices which, although unusual, may be regarded as sound in certain districts.

Soil Requirements

Although Montgomery red clover as a grazing proposition is valuable over a fairly wide range of soil conditions, experience has shown that seed production should, on the whole, be concentrated on the better second-class country. On heavy rich country it grows very luxuriantly, and the large amount of leaf and stem produced is out of all proportion to the amount of seed set. This luxuriant growth results in a large amount of material to cut, dry, stack and thresh, all of which operations take place from late autumn to midwinter.

In addition, there is the quality of seed to be considered. Heavy lying crops will usually produce a large proportion of partly formed browned seed, which is disliked by the seed trade. On the other hand, crops on the lighter land produce a much lower proportion of useless leaf and stem and a much better quality of seed.

Class of Seed To Sow

In order to obtain the maximum returns from Montgomery red clover seed production, only the best seed should be sown—and the best seed is one of the higher grades of certified seed, the produce from which may also be certified.

The following shows the present position in regard to the various classes of seed available, and the class of seed which may be produced from the first harvest of each, subject, of course, to a satisfactory report following field inspection:—

(1) Government Stock Seed produces Pedigree Seed.

(2) Pedigree Seed produces Mother Seed.

(3) Mother Seed produces Permanent Pasture Seed (First Harvest) (a).

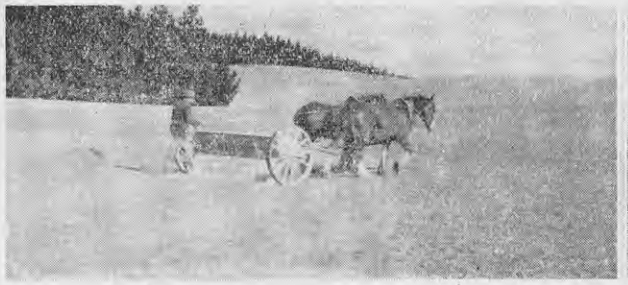
(4) Permanent Pasture Seed produces Uncertified Seed (b).

(5) Uncertified Seed produces Uncertified Seed (b).

NOTE:

(a) Subject to a satisfactory plot trial report, Mother seed may be produced in the second and subsequent harvests.

(b) Subject to a satisfactory plot trial report, Permanent Pasture or



Above.—Late spring topdressing with phosphate is advocated.

Right.—Working the ground down to a fine, firm seed bed ensures a good strike of all the seed sown.

Mother seed may be produced in the second and subsequent harvests.

Certification Procedure

The farmer who desires to have his seed certified finds it necessary to give attention to certain matters of detail. In the first place, he should preserve the insert slips, one of which is to be found inside each bag of seed. These insert slips record the identification numbers of the seed sown, and must be forwarded to the local officer of the Department of Agriculture, together with the grower's application for certification. It is not necessary for an officer of the Department to be advised by the farmer before the seed is sown, but application for certification should be made early in the season in order that the necessary field inspection may be made at the correct stage.

A charge for certification is made at the rate of 1s per acre (with a minimum charge of 10s). The farmer is informed by letter of the result of the field inspection, and if the area is passed for certification is asked to advise the local office of the Department when threshing is about to take place. This action enables the local officer to give supervision to this stage of the proceedings, and to brand and seal the sacks of seed so that they may be identified when the seed reaches the machine dressing store.

It is to the advantage of the farmer who has more than one area in certification to stack and thresh the produce of each paddock separately. If this is not done and the produce of the different areas is eligible for certification in different classes, the whole line of seed can be certified only in the lower grade. Thus, if Mother and Permanent Pasture seed is threshed together, all seed is automatically classed as Permanent Pasture.

Seed Mixtures To Sow

As is the case with most other pasture plants, the optimum rate of

Although Montgomery red clover makes first-class hay, areas for seed production should be grazed rather than hayed.

On heavy country, closing up in mid-November or later is desirable in order to avoid the handling of a large bulk of material at harvest time.

seeding of Montgomery red clover is not absolute, as the success of a pasture depends on so many other influencing factors. Under good conditions a seeding of 2 lb. per acre will give a satisfactory sward, whereas under adverse conditions a seeding of 10 lb. per acre might result in a failure.

The aim in sowing of **most** crops for seed is to produce a dense cover, but with Montgomery red clover a dense cover is not desirable. This is because at the time the crop is harvested drying conditions are, as a rule, not good, with the result that it not infrequently happens that great difficulty is experienced in getting what appear to be first class pure stands of Montgomery red clover into the stack in good condition. A stand which has the appearance of spaced plants rather than of a carpet of clover almost invariably produces a crop that dries out better, matures more evenly, and gives a higher yield of seed.

In order to obtain this type of sward different rates of seeding are required for different types of country. On the second class country which is recommended for the growing of Montgomery red clover for seed production, a seeding of 5 lb. per acre is usual. In parts of Central Otago where very dry summers are experienced and where the clover is sown pure, a seeding of up to 10 lb. per acre is adopted. On heavy country the rate of seeding should be reduced to 3 to 4 lb. per acre, which amount provides a sufficient cover of plants.

It is the usual practice to sow at least one accompanying species when laying down a Montgomery red clover seed-producing area. Whatever is sown with the clover, there should be sufficient of it to fill up the gaps instead of allowing the weeds to take charge. At the same time, a seeding heavy enough to result in a smother of the clover in the early stages should be avoided.

In Central Otago, where experience has shown that weed competition is negligible, pure sowings are quite successful.

Both Italian ryegrass and perennial ryegrass are used to a considerable extent as accompanying species, and are sown at rates varying from 10 to 25 lb. per acre. A seeding of 5 to 6 lb. of cocksfoot has also been included on the lighter land with quite satisfactory results.

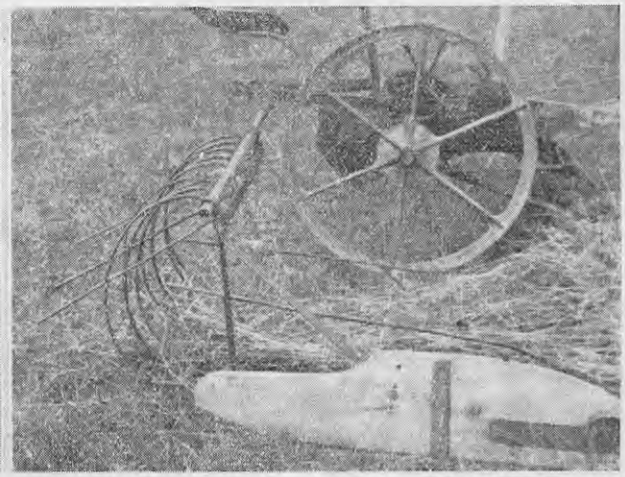
The following mixtures should be suitable for the two main classes of land under consideration:—

	Light land.	Heavy land.
Montgomery red clover	5 lb.	3-4 lb.
Italian ryegrass .	—	15 lb. or
Perennial ryegrass	20 lb.	15 lb.
Cocksfoot (if desired)	5 lb.	—
Timothy (if desired)	—	3 lb.

Cover Crops

The sowing of pasture mixtures with cereal or other cover crops has been

In light crops which are difficult to collect after being mown the use of the clover buncher has been found very satisfactory.



The clover buncher is, in effect, a miniature foot-tripped hay rake that is fitted on behind the mower knife.

Out of every 100 pigs born . . .

- 25 die before weaning (8 weeks of age)
- 7 die between weaning and porker weights
- 2 die between porker and baconer weights
- 8% of Baconers slaughtered are not passed for export. *(The above Figures are New Zealand Averages)*

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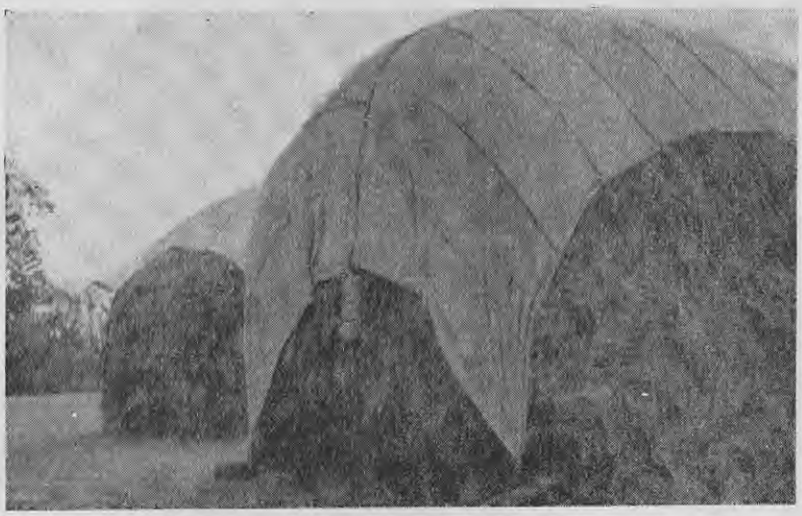

Careful attention to the covering of the stacks pays handsomely.

a controversial subject for many years and is likely to remain so. The fact that it is a controversial subject can, in itself, be regarded as an indication that farmers in various localities secure successful stands of Montgomery red clover by either one or more of the following methods:—

(a) Sown at the same time as a cereal crop;

(b) Sown at the same time as a "feeding off" crop (for example, rape, kale);

(c) Sown in the spring on top of autumn-sown cereal crop;

(d) Sown without an accompanying crop.

The general concensus of opinion and experience is that, on the whole, sowing with an associated crop is not as satisfactory as is sowing without one.

The sowing of Montgomery red clover with a crop such as rape or kale cannot be recommended because of the punishment the clover receives while the crop is being fed off.

In South Canterbury, where the greatest amount of Montgomery red clover seed is produced, the spring sowing of the clover on top of autumn-sown Cross 7 wheat or oats (preferably Gartons) is a common practice. For successful establishment under these conditions the land must be free from weeds and in such a condition that a good seed bed can be secured with the use of the roller or the harrows.

In other districts satisfactory stands have been secured by sowing the clover at the same time as spring-sown oats, wheat and linen flax.

The question of sowing clover with an associated crop may be summed up by stating that the practice is satisfactory provided the "cover crop" does not turn into a "smother crop," and provided the clover does not interfere with the harvesting of the cover crop. This latter trouble is liable to occur in the case of late sown wheat. The farmer's past experience with regard to cover crops on his own property should be a valuable guide.

Time of Sowing

Both autumn and spring sowings are practised in most seed-producing districts with satisfactory results. On the whole, late autumn sowings are not advisable, particularly in districts which experience hard and continuous frosts. Spring sowing, on the other hand, should be late enough to miss the frosts and yet early enough to enable the plants to become thoroughly established before the dry weather sets in.

Another point to be borne in mind is that spring-sown Montgomery red clover will not produce a seed crop in the subsequent autumn, whereas an autumn-sown crop may produce a satisfactory crop in the following autumn.

Other things being equal, early autumn sowing may be recommended, provided experience, has shown that a seed crop in the following season is possible in the particular district.

Summer sowings are very satisfactory in parts of Otago and Southland where the rainfall is fairly evenly spread.

In Central Otago, autumn sowings are recommended, as spring sowings are likely to fail during the very dry summer months except in isolated localities and on irrigation areas.

Lime and Fertilisers

On the second class soils which are suited to the production of Montgomery red clover seed experience has shown that the use of lime and phosphate is desirable. Land which has been limed for a previous crop is to be recommended, although in some districts crops establish quite well without lime. Periodical liming in subsequent years should be carried out.

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Annual topdressings with superphosphate are recommended, and the fertiliser should be applied in mid to late spring when the flush of growth is over. The full effect of the phosphate will then be shown during the summer flowering period, when stimulation is required.

Preparation of Soil and Sowing

The universal rule for clover seed beds, fine and firm, applies to Montgomery red clover, although an extremely fine bed such as is required for white clover is not so essential, especially for autumn sowings. Firmness is necessary, however, if a good, quick, even strike is to be obtained irrespective of the season.

The seed should be sown on a rolled surface and covered with the lightest of harrows. Light grass harrows turned on their backs, chain harrows, and the old-time brush or scrub harrow are all satisfactory. The chief thing to watch in covering the seed is to see that it is evenly covered, but not dragged down too deep. Long-tined harrows on a loose seed bed bury far too much seed too deeply, which, of course, reduces the effective rate of seeding.

Treatment Before Closing Up

Experience has shown that for the spring treatment of Montgomery red clover seed producing areas, grazing is, on the whole, better than haying. Grazing with either sheep or cattle is satisfactory provided the growth is evened off when the paddock is closed up. When cattle are used it is advisable to trim the paddock with a mower to eliminate the unevenness usually associated with cattle grazing.

The objection to haying before shutting up is that Montgomery red clover is, as a rule, incapable of producing both a good hay crop and a good seed crop. This haying has been carried out to a certain extent on some of the heavier country, but even here the lateness in the season by which the hay is cut prevents the clover stand from reaching its maximum development as a seed crop. On the lighter country the position is accentuated in that dry weather may set in, with the result that only a very light seed crop is secured.

Time of Closing Up

The aim in seed production is to obtain the maximum amount of high quality seed, and this is influenced to a very large extent by the time at which the paddocks are closed to stock.

Early closing up is liable to result in a prolific growth of leafage, together with an uneven and prolonged flowering season. This large amount of leafage increases considerably the work involved in handling the crop at harvest time. In addition, extremely leafy crops often contain a considerable proportion of shrivelled seed.

On the other hand, late closing up has the disadvantage of causing a normally late harvest to be extended still further towards the winter.

The ideal time to close up varies greatly from district to district and from season to season, such times varying from the middle of October to the middle of December.

On average country early to mid November is early enough, but on heavy country paddocks may be grazed for another month.

On light land which is liable to dry out badly in the summer, closing up as early as mid October is desirable.

Time to Harvest The Crop

Although weather conditions do not allow any set date of cutting to be predetermined, crops may be regarded as being ready to cut when 80 per cent. of the heads are completely brown. No attempt should be made to wait for the whole crop to ripen, as by the time this has taken place the season will be well advanced and much of the seed already set will have shaken and possibly sprouted.

On the lighter soils crops are usually ready to cut about the middle of March, or earlier in dry seasons. Seed crops on the heavier soils are not usually ready to cut until the end of March or sometimes even late in April.

Methods of Cutting

Three methods of cutting the drop are in use. These are:—

(1) The field mower.
(2) Side delivery mower.
(3) Header harvester.

(1) THE FIELD MOWER.

The majority of crops are cut with the field mower. This may be attributed, in part, to the fact that it is largely satisfactory, and in part to the fact that a mower is already standard equipment of most farms. This second point is important, especially when areas to be dealt with are not large. In good average crops the mower makes a good clean job, leaving a minimum amount of material on the ground, and causing a minimum of shattering.

In heavy crops it is usually necessary to have an extra man on hand to clean knife and shedder blockages. With short crops, the mower in its ordinary conditions leaves much to be desired because of the difficulty of picking up the cut material. To overcome this difficulty, many attachments are fitted to mowers, most of them home-made. These range from two sacks trailing behind the knife to a more elaborate apparatus, the clover buncher. Many of the attachments work satisfactorily, provided the time and labour factors are not important. The clover buncher, however, deals admirably with very short crops, provided a certain amount of grass seed stalk is also present. It also has the advantage that it can be worked economically by one man in light crops.

(2) THE SIDE DELIVERY MOWER.

The great advantage of the side delivery mower is its ability to cut the crop and swing the cut portion out of the danger of damage in the subsequent round. It also leaves the cut herbage in a comparatively narrow or bunched windrow with the heads up, which makes for easier subsequent handling. In addition, no turning is necessary, even under bad weather conditions.

In good average crops which are not badly tangled the side delivery mower is excellent. On very heavy crops difficulty may be experienced, as the arms are not powerful enough to separate the crop even when every arm is sweeping the board.

(3) HEADER HARVESTER.

During the past few years the header harvester has been used to an increasingly large extent for the handling of Montgomery red clover seed crops, particularly in South Canterbury.

Any crop must be absolutely dry or "rotten ripe" if it is to be direct headed efficiently, and this condition, it must be remembered, is hard to obtain in a normal season in much of South Otago and Southland.

While direct heading of Montgomery red clover is carried out, it is most satisfactory on the lighter land and on old stands. The habit of the plant of sometimes remaining green even after the seed head is ripened prevents the practice from becoming general. Headers are, however, used with the pick-up attachment to harvest either from the swath or from side delivery cocks. If good judgment is used and threshing takes place only during the

North Island Lambing Estimates

Current Season is Highest Since 1933

LAMBING estimates in the North Island for the current season are estimated at 90.74 per cent.—the highest since 1933, when the season's estimate of 91.23 per cent. proved slightly better than the actual lambing.

From information supplied by the various Inspectors of Stock, the average rate of lambing for the current season in North Island flocks is estimated at 90.74 per cent., compared with 89.01 per cent. in 1940.

With 11,268,384 breeding ewes in the North Island, as shown in the 1941 sheep return, the estimated number of lambs is 10,224,786. Previous estimates have for some years underestimated the actual number of lambs tailed, so that it is probable last year's record total will be exceeded this season.

Dominion returns by counties, and the South Island estimates, will be published in next month's issue of the "Journal."

The following is the estimated percentage of lambing in the North Island for the year 1941, and a statement for the previous five years showing also the actual number of lambs tailed.

District.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland	2,715,473	93.00	2,525,556
East Coast—Hawke's Bay	4,337,477	87.39	3,790,601
West Coast—Wellington	4,215,434	92.72	3,908,629
NORTH ISLAND TOTALS:	11,268,384	90.74	10,224,786

Year.	Number of Breeding Ewes.	Estimated Average Lambing Percentage.	Estimated Number of Lambs.	Actual Number of Lambs Tailed.
1940	10,917,684	89.01	9,717,488	10,348,649
1939	10,889,802	84.40	9,190,994	9,476,647
1938	10,735,829	80.11	8,600,625	9,034,385
1937	10,570,388	86.52	9,145,849	9,401,496
1936	10,300,826	90.50	9,322,476	9,387,749

The most satisfactory threshing machinery is the clover huller. Threshing in bright weather is a distinct disadvantage.

An officer of the Department of Agriculture branding and sealing bags of certified seed.

best part of the day, there is nothing to prevent the crop being successfully harvested in this manner.

Care must be taken, however, as, if threshing is begun too early in the day, the clover is difficult to shell. The drum is then speeded up in an effort to separate the seed, which results in cracked and broken seed later in the day when conditions are better. These cracked and broken seeds are extremely difficult to remove in machine dressing, making it impossible to bring the sample up to the required purity standard, as many farmers know to their cost.

Drying and Stacking

The period between cutting and stacking the clover crop is the most critical and most anxious one in the whole process of Montgomery red clover seed production. Ten days of fine, windy weather will enable a moderately heavy crop to be stacked with a minimum of loss. On the other hand, broken weather may result in a crop remaining out in the paddock for a month or six weeks, by which time the continued handling of the crop will have resulted in the loss of much seed. Continued wet weather also results in discoloured seed, and losses through sprouting are not uncommon in wet seasons. The only advice that can be given is to keep shifting the crop until it is ready.

Cocking the crop is not advocated, as clover cocks become wet right through very easily, and the subsequent breaking down of the cocks will result in greater loss of seed than if the crop had been left in the windrow.

The crop should be dry for stacking, as damp clover will heat rapidly. Slight heating does little or no harm, and will not affect the germination, but if the stack becomes properly heated the only thing to do is to pull it down and let it dry out. As clover seed requires to be perfectly dry for threshing, several small stacks are preferable to one large stack when conditions are not good and when it is a case of rushing into the stack material which is not in perfect condition. Provided they are well covered, small stacks will not take the rain any more than large stacks, and they have the advantage of better drying condition. Nevertheless, the long stack, say 12 ft. x 30 ft., is frequently built, and cannot be bettered when the clover is in good condition. When stacking, the heart should be kept well up and the material spread rather than being "lumped" in.

Whatever the type of stack erected, good protection is essential. A foot or more of straw laid over a few branches or hurdles makes an excellent and nearly waterproof foundation. Red clover stacks take up moisture very rapidly, and considerable care in making them as waterproof as possible is usually taken. The best method is to top the stack fairly steeply (the body of the stack being well sprung) and cover it thickly on the top with good, fresh straw. The covering should be carried down the stacks as far as possible and weighted in the usual way. Following this, it is advisable to finish the work with a good waterproof stack cover. Particular attention should be paid to the covering of the weather side.

On heavy country a large quantity of roughage is often left after mowing. This should be cleaned up as soon as possible by cattle or some other means.

In weighting stacks it is not advisable to attach the weights to single wires running over the stack, as they are liable to "gully" the stack, with the result that the rain enters very easily. Weights attached to the stack covers or to wire netting laid over the stack do not cause this "gullying."

If treated with bluestone, sack stack covers will last for four seasons at least. Because of the value of the seed, every endeavour should be made to ensure that the crop, once it is in stack, is given all possible protection.

Threshing

Threshing should not be carried out until the clover has finished sweating, usually about six weeks. In general, the longer a crop is in stack the better will it hull. An ordinary wooden threshing mill is, as a rule, virtually useless for dealing satisfactorily with clover seed, as, although some seed is hulled, a large proportion is left unhulled. Nevertheless, odd cases have been noticed where a reasonably good piece of work has been done with one of these mills.

Tin mills are also used to a certain extent and, when properly managed, give good results. They are, however, liable to crack the seed unless they are fitted with clover teeth and the machine is driven at a reduced speed. This is best done by fitting a larger driving pulley.

There is no doubt that the specially constructed clover huller is the best threshing implement available. With the crop in good condition, this threshes efficiently with regard to both the quantity and quality of the seed saved.

Yields

Farmers contemplating seed production naturally want some information regarding the yields. In estimating yields no account of yield off the mill should be taken, as, according to the variation in the purity of the mill-dressed seed, so does the amount of pure seed harvested vary. The only reliable way of estimating the yield is to divide the amount of seed that comes out of the dressing plant as firsts by the acreage closed up for seed production.

SUBSCRIPTION RATES.

The *Journal* is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Box 3004, Wellington.

The following table shows clearly the fallacy of estimating yields on field-dressed weights:—

	F/D (seed per acre). lb.	M/D (seed per acre). lb.	Loss lb.
Pdk. A. ..	171.7	142.7	16.9
Pdk. B. ..	184.1	110.5	40.0

Yields recorded during the past few years have been very variable. Some exceptional yields of over 450 lb. (in one case 770 lb.) of seed per acre have been recorded. On the other hand, there have been some very low yields, amounting to 20 lb. per acre and less. Examination of certification records shows that over the last few years the average yield of seed in New Zealand has been approximately 100 lb. per acre. This yield may appear to be low, especially to those farmers who have been fortunate enough to secure higher average yields, but it should be realised that the gross value per acre of a crop yielding 100 lb. per acre is approximately the same as a 44 bushel crop of wheat, which average yield is not likely to be obtained on the second class country which is recommended for the growing of Montgomery red clover.

Maintenance of Pastures

The maintenance of Montgomery red clover seed-producing areas deserves some consideration. On the lighter soils the only important point in this connection—namely, liming and top-dressing—has already been dealt with. On the heavier country, however, there is one important feature that must be attended to. Here, where heavy, tall crops are grown, the crowns of the plants have been able to obtain no light and little growth is made from the crown for some time before the crop is cut. When the crop is cut the soft and sappy crown is left to fend for itself like a shorn sheep. Any encouragement that this crown can be given to produce fresh leaves before the frosts start will assist materially in its preservation.

It is therefore advisable to clean up the paddock as quickly as possible by grazing or mowing and raking in order to remove any of the half-dead stems that may have been missed. By this means the air and light are let into the crown to encourage growth again. The removal of these stems also reduces to a considerable extent the chance of the crowns rotting during the winter. This rotting is not infrequent in crops which continue to carry much dead growth during this period.

Irrigation

In parts of Canterbury and Central Otago, Montgomery red clover seed is being produced under irrigation. Under these conditions the grower is able to exercise greater control of the growth, with the result that the consequent crop is more assured.

Under irrigation paddocks may be closed up fairly late (mid-December). The amount of water required is the minimum quantity which will maintain the crop in a healthy condition. If irrigation is carried out too frequently a large bulk of clover is produced, and flowering is not satisfactory and carries on too long. This means that the harvest is carried on until the early winter, with all its attendant risks.

Acknowledgment

Grateful acknowledgment is made to those officers of the Fields Division of the Department of Agriculture who have kindly supplied certain of the information embodied in this article.

CONTROL OF HYDATIDS

Country Dog Owners Must Assist In Checking the Disease

By SIR LOUIS BARNETT, Emeritus Professor of Surgery, University of Otago, and Chairman of the Hydatids Committee.

IN the following article Sir Louis Barnett emphasises the need for something more than persuasive measures if the spread of hydatids in this country is to be checked. He points out that years of intensive and systematic propaganda designed to educate people have yielded discouraging results, and he has something to say to some country dog owners for their lack of co-operation. "A considerable number of more intelligent dog owners," he states, "do try to keep their dogs free of the parasite worms . . . but unfortunately there is a considerable number—perhaps, indeed, the majority whose attitude is apathetic, neglectful, or even scornful."

IN a recent statement Mr. R. A. Nicol, S.P.C.A. Inspector for the Wellington Province, points out the harmful effect of allowing hungry dogs to wander about the farms and countryside seeking what they might devour. Not only do they seize upon discarded offal when an animal is slaughtered at the homestead, but they nose around in distant pastures, and if they find a dead sheep they tear into its inside for the food they lack.

Mr. Nicol deserves the thanks of the community for his plain speaking, and no doubt many dog owners will profit by his helpful advice. Many will read it and heed it, but, alas, many will do neither. That conclusion has been arrived at by the Hydatid Committee—Drs. Hercus and D'Ath, of Dunedin, Dr. Ritchie, of Wellington, and Dr. Hopkirk, of Wellington, with myself as chairman—after years of intensive and expensive efforts on educational and persuasive propaganda. We have concentrated mainly on an attempt to drive home the importance of the two outstanding lines of prevention, namely,

1. **Not allowing dogs to feed on raw offal, such as the liver and lungs of sheep.**
2. **Dosing dogs regularly with a safe and efficient worm-expelling medicine, such as arecoline.**

Risks to Children

The other precautions advised—those for example, that deal with the evils of food, water, and hand pollution by dogs, and with the special risks to children from caressing country dogs—are of importance, too, but not to be compared in preventive value with the two first mentioned.

Over and over again these recommendations and the reasons for them have been brought under the notice of dog owners in the hope that the knowledge imparted, plus a little commonsense, would lead to their widespread adoption, and now, after years of this educational and persuasive campaign, what is the result? A considerable number of the more intelligent dog owners do try to keep their dogs free of parasitic worms. They do feed them properly and dose them regularly. On their farms and in their districts it has been noted that the prevalence of hydatid disease has been reduced.

But, unfortunately, there is also a considerable number of dog owners—perhaps, indeed, the majority—whose attitude is apathetic, or neglectful, or scornful. Their dogs continue to harbour and spread the hydatid parasite, and New Zealand remains a country notorious for its prevalence.

Persuasive Methods

The New Zealand Government has so far favoured persuasive methods only. It is true that last year legislation was passed making it illegal to feed dogs on raw offal, but no steps have been taken so far to enforce this measure. The practical difficulties associated with enforcement have no doubt led to this hesitation.

The Government also distributes annually worm-expelling medicine in the form of arecoline tablets, with full instructions for use, to every dog owner at the time of dog registration. By law, the dog owners have to pay an extra registration fee of one shilling to cover the cost of the tablets, but there is no law compelling them to dose their dogs, and a very large number neglect or refuse to do so.

There are about 200,000 dogs in New Zealand (1 in 8 of the population), most of them country dogs, and of these about one-third are carriers of the hydatid tapeworm. The dog, be it remembered, is the only animal in this country that harbours the parasite in the worm stage, and the dog, therefore, is the sole distributor of the hydatid eggs, which, if swallowed by other farm animals or by human beings, grow into cysts.

Every year a hundred or more new cases of hydatid disease are admitted into our hospitals. About 14 per cent. of these cases end fatally, and the others may suffer years of disability.

Millions of Carriers

There are approximately 32 million sheep in this country, and nearly half of them harbour hydatid cysts in liver and lungs. The lives of these animals are short compared with human existence, and the cysts they carry have not, as a rule, had time to cause notable impairment in the quality of wool or meat.

The farmer reckons on getting the same price for his sheep whether they have cysts or not, and unless one of his own family falls a victim to hydatid infection he is apt to think preventive measures are not worth bothering about.

If he thought hydatid prevalence would hit him economically he would probably take more notice, and, as a matter of fact, he does unwittingly share in a considerable economic loss. All animals killed in abattoirs and freezing works are inspected by veterinary officials, and every liver that harbours visible hydatid cysts is con-

demned as unfit for sale and is sent to the destructor.

Now, livers have high nutritive and medicinal value. They are worth from 6d to 9d or more each. Last year the Government actually received £400,000 for exported livers, and that sum was earned on the clean livers only, which represent only about half the total inspected. It is easy, therefore, to see that the prevalence of hydatid cysts in sheep and cattle, for cattle are as badly infected as sheep, is entailing an annual loss to the farming community of hundreds of thousands of pounds.

Payment for Livers

A suggestion, made originally, I think, by Mr. W. C. Barry, Director of the Livestock Division of the Department of Agriculture, and recently revised, is that carcasses with clean livers should be regarded as worth more than those showing hydatid infection, and that payment should be regulated accordingly. If this suggestion, despite certain practical difficulties, were adopted, it would undoubtedly strongly reinforce preventive propaganda.

The fact remains that a very large number of dog owners, perhaps the majority, are doing little or nothing to help in the hydatid campaign. This does not matter much in the towns, because town dogs do not, as a rule, get the infected kind of food, namely, raw livers or lungs and livers of sheep, which country dogs so habitually feed upon whenever they get the chance. Town dogs, therefore, do not constitute a serious hydatid danger, but country dogs do, and so it is in the country districts that preventive precautions should be universally and thoroughly carried out, and why not?

Reasons for Laxity.

Here, in conclusion, are the reasons for this regrettable laxity or opposition on the part of country dog owners in carrying out the recommendations of the Hydatid Committee:—

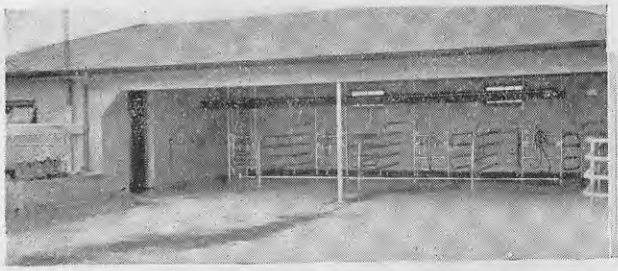
(1) In Regard to the Feeding of Dogs.—Dogs enjoy and thrive on raw offal, and the farmers say it is too much bother or it is impracticable or wasteful to sterilise it by boiling, or, to prevent it being consumed, burning it, burying it, or in other ways keeping it out of the way of the dogs. They say, too, that dogs, even if not fed by their masters on raw offal, find this food for themselves in dead sheep about the countryside. As a matter of fact, however, it is not so very much trouble to make a practice of boiling sliced up offal for a quarter of an hour before giving it to the dogs, and the alternative should be disposal of this offal by burning or burying and the feeding of the dogs on some other part of the sheep's carcass. The offal of sheep found recently dead might be cut out and dealt with similarly, and it is worth noting that pronounced putrefaction in the carcass itself kills hydatid infection.

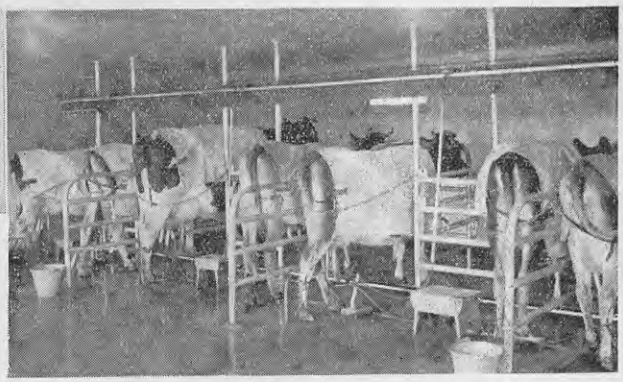
(2) In Regard to the Dosing of Dogs.—The most effective drug for the eradication of worms in dogs is arecoline, and that is what the tablets issued by the Government contain. Alleged ill-effects, even the death of good dogs after arecoline dosing, have been reported in the papers, and unwarranted rumours and talk and gross exaggeration have combined to create a scare against the use of the drug. Careful research work in the field and in the laboratory on thousands of dogs has shown that these tablets, when properly administered according to instructions, are safe and effective in the vast majority of cases. Only in a minute proportion have there been any serious ill-effects.

It is admitted that there are rare cases of abnormal sensitiveness to the drug, particularly in dogs of delicate or impaired constitution. Animals, like people, sometimes show peculiarities in this way. Some folks, for instance, are badly upset by even a small dose of aspirin or quinine, and honey, strawberries, and shellfish sometimes cause distressing reactions.

One has to remember that there are about 200,000 dogs in New Zealand and that thousands of them are dying every year in the ordinary course of events. Even if arecoline is responsible for three or four extra deaths, that fact should not weigh against the great benefits accruing to the welfare of the community by its administration.

Improvement in Quality of Town Milk Supply In New Zealand





Above.—A view of the easily cleaned shed and holding yard. The fall of the floor and yard is such that drainage is towards the lower left-hand corner, as is shown by the still damp patches.

Right.—A view taken during the evening milking.

[*H. Drake, photos.*

By
E. J. CALLAGHAN,
Veterinarian, Hastings.

MUCH progress has been made during the past few years in the supplying of pure, wholesome milk to the people of New Zealand.

The two main factors with which the Department of Agriculture is concerned are, firstly, those under the control of the Dairy (Milk Supply) Regulations, 1939, such as the erection of suitable milking sheds and milk houses, the production of a clean, wholesome milk supply on the farm, and the protection of milk and cream from contamination; and, secondly, the general inspection of herds and the tuberculin testing of herds supplying the milk.

Although tuberculin testing is not compulsory, it is pleasing to note more and more herds being tested each year, with the result that in the Hawke's Bay area the milk supply of such towns as Dannevirke and Wairoa is obtained from tuberculin-tested herds—that is, the herds are free from tuberculosis. The milk supply of the various hospitals and schools in the district—Pukeora Sanatorium, Hawke's Bay Children's Home, and Woodford House School—is also obtained from tuberculin-tested herds.

The accompanying photographs are of the Napier Hospital milk supply being taken on their Park Island Farm. The building is ideal from the point of view of health, sanitation, and ease of cleansing, and the herd, including the heifers and bull, is tuberculin-tested.

A point of interest is the "change room," which is complete with a porcelain wash-hand basin, hot and cold water, and a medicine chest. This much-appreciated facility enables those engaged in the milking shed to perform their duties under the most hygienic conditions. A "change room" could, with advantage, be worked into the plan of many proposed new sheds.

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Improved Vacuum Relief Valve Developed by Department of Agriculture Officer

By
W. G. WHITTLESTON,
Animal Research Station,
Wallaceville.

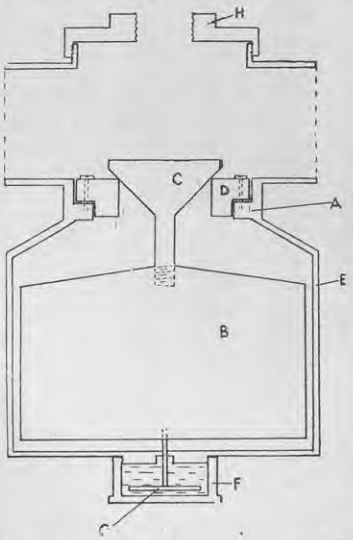
MENTION was made in an article in the "Journal of Agriculture" for December, 1939, and January, 1941, of an investigation into the properties of relief valves and of work on the problem of relief valve design being carried out at Wallaceville. A full report on the results of our work on relief valves will appear in the "N.Z. Journal of Science and Technology." The present article describes an improved valve which has been developed at Wallaceville, and which, after vigorous test, has proved itself to be superior to any valve yet examined.

As a result of our studies on relief valves we suggest the following as a suitable standard of performance.

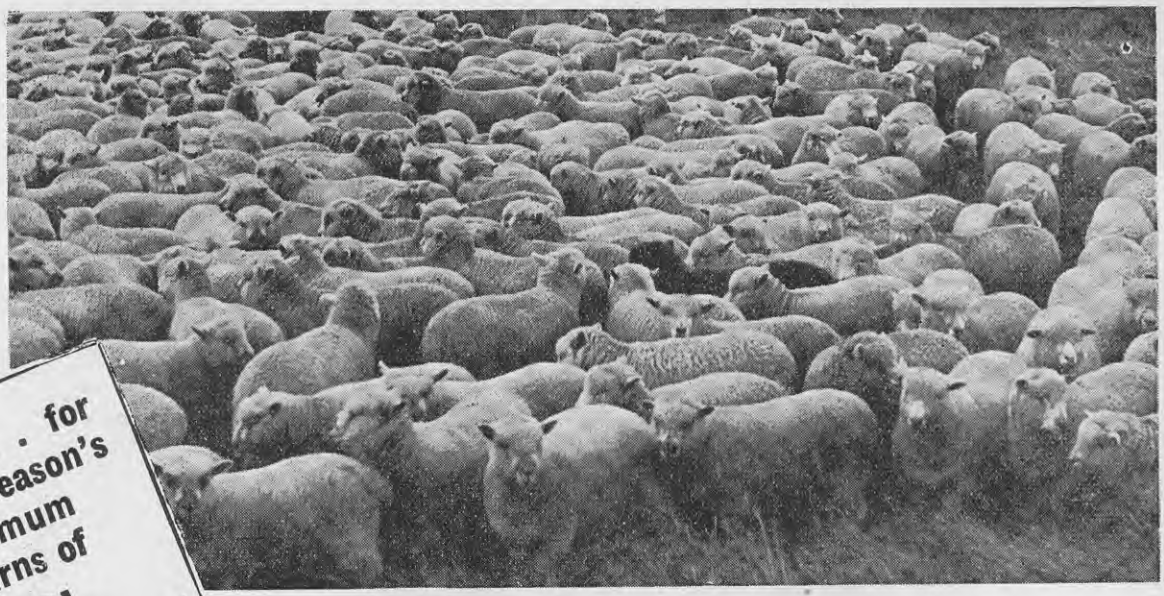
When the valve is adjusted to blow off at a 15 inches vacuum with a flow of air (at room temperature and pressure) through it equal to 0.10 cubic feet per second, the vacuum should not vary any more than one inch of mercury between the limits of 0.00 and 0.10 cubic feet per second air flow through the valve.

A valve reaching this degree of sensitivity is desirable on a milking machine because, firstly, it will in no circumstances permit the vacuum to rise to dangerous levels, and, secondly, it will close completely immediately the vacuum falls by one inch of mercury, thus preventing unnecessary loss of vacuum. However, while it is possible to obtain such sensitivity in a variety of ways, the valve must be robust, stable, and reliable. There are a few valves on the market which approach the above standard, but they are unstable. Further, the valve must be of reasonable cost and not liable to become contaminated.

As a result of earlier work on this subject, a diaphragm type of valve was evolved which was very sensitive and fairly robust. It was, however, too costly to produce. We were, therefore, compelled to turn to a different principle. It was evident from our studies on different types that two factors were, in the main, responsible for loss of sensitivity in a valve—(1) friction in the guide, and (2) pressure drop across the inlet ports. These have been reduced to negligible proportions in the new valve and stability has been maintained. When reliability is wanted the weighted valve is ideal. Further, such valves may be con-



Components of damped weighted vacuum relief valve. — A, Main casting. B, weight. C, conical valve head. D, removable valve seat. E, damper support bracket. F, damper (containing oil). G, damper piston. H, valve cover cap (with provision for screwing in vacuum gauge).



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structed without guides, thus eliminating friction.

Overcoming Instability

But such valves are unstable. It has been noted that any restriction between the valve and the vacuum pipe tends to cause instability. A weighted valve opening directly into a 1¼-inch pipe may be quite stable at a 15 inches vacuum, but, with the increased air flow through it (the pump speed remaining constant) at a 10 inches vacuum, the valve may become hopelessly unstable. This problem has been solved by the use of an oil-filled dash-pot attached by a small spindle to the bottom of the weight. The small spindle passes easily through a guide, and has at its lower end a light plunger which moves in a shallow cylinder screwed on to the cross-piece carrying the guide. From its position, this guide, which, being light, can cause little friction, is always lubricated. Such an arrangement prevents the weight from swinging, and supplies sufficient damping to prevent "flutter" at the greatest air flows without loss of sensitivity. The dash-pot, once filled with ordinary rotary vacuum pump oil, will remain in action for very long periods, while the filling operation is extremely simple.

The details of the valve are shown in the accompanying figure.

It is evident that it is not convenient to alter the weight on such a valve when the blow-off vacuum is to be altered. This is overcome by the use of replaceable valve seats. The seat may be altered by unscrewing the valve cover cap, removing the head and, after removing the holding screws, replacing the seat with one of smaller diameter for higher vacuum, and larger diameter for lower vacuum. Such an arrangement involves the use of a valve head capable of seating accurately in a number of different sized seats. Both hemispherical and conical valve heads have been found equally satisfactory in this respect. Small variations in vacuum could readily be arranged for by, for instance, having a partly hollow weight into which lead shot could be poured, or by the use of rings which could be fitted without moving the main weight. However, once the valve is set it cannot readily be altered by unauthorised persons, and it is suggested that a fine gauze cover could be fitted to assist in preventing large particulars of dust, etc., from finding their way into the machine via the valve.

Outstanding Performance

Several such valves have been constructed at Wallaceville, and in all cases the performance has been better than the suggested standard. One such valve is in use on the experimental milking machine, where it has given outstanding service.

It is evident that valves of this type could be constructed in several ways. No attempt has been made to work out the almost unlimited arrangements which would be equally satisfactory. We have established the principles of a valve which is capable of the performance required for optimum working conditions on a milking machine. The details of design may well be left to the manufacturers, limited only by certain considerations affecting the efficiency of the valve.

The following points are important:—

(1) The valve seat should not be less than approximately 1 inch in diameter for use at a 10-inch vacuum.

(2) There should be no obstruction between the valve and the machine.

(3) There should be no obstruction in the path of the incoming air.

Acknowledgments

The writer is indebted to the following for assistance in the work described:—Mr. H. G. Sawtell, who did most of the mechanical work involved in the investigation; Mr. S. Anderson, who operated the experimental milking machine on which tests were made and so assisted by giving practical criticism.

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Veterinary Notes for the Farmer

Proper Housing and Feeding of Dogs Will Prevent the Spread of Hydatids

Contributed by the LIVESTOCK DIVISION.

NO apology is offered for again discussing the important part played by the sheep dog in his relationship to sheep farming in this country. The value of the sheep dog in the management and handling of the sheep flocks has been fully recognised, and sheep dog trial associations and other kindred bodies have demonstrated to the public the wonderful work which the dog is capable of doing in the interests of his owner. It is not too much to ask, then, that such dogs should be adequately fed and looked after at all times. Each animal is not necessarily a trial dog, but each animal, if properly cared for and trained, will respond by giving useful service in return.

One feature of the close association of the dog with livestock is the ready means thus provided for the propagation and spread of the notorious hydatid disease in animals and man. The dog is the distributor of this disease, and the country dog is more troublesome in this respect than the city dog. This position should not obtain if the country dog's movements and feeding were under proper control, and means has already been provided for the removal of the disease worms from dogs. All owners are supplied wtih a reliable remedy to be used for dosing dogs to remove the worms responsible for hydatid disease. Every owner should see that his dogs are dosed at regular intervals, and should insist that all shepherds' dogs on the farm are also treated. If the dog's food is then under control, the risk of hydatid disease in farm animals and farmers themselves is in like measure reduced.

Apathy of Public

The fact that a marked reduction in the incidence of hydatid disease in animals and man has not taken place since the introduction of the worm remedy is a direct reflection on the apathy of the dog-owning public in country districts. The time has arrived when an improvement in the incidence of hydatid disease in all lambs and younger animals going forward for slaughter should be apparent. The following notes on the treatment of the sheep dog in regard to housing, feeding, and the prevention of the spread of hydatid disease have been repeated in the hope that more owners will endeavour to rid all dogs on the property from worms, and thereafter endeavour to keep the dogs free from such serious disease-producing parasites. It is in the interests of the farmer, his family, his livestock, and his dogs.

In a country which excels in many other aspects of public health it is a serious reflection to think that New Zealand holds such a notorious position in regard to the incidence of hydatid disease in man and animals.

Housing

The ideal housing is a dry and well-ventilated kennel, free from draughts, which can be easily cleaned out at intervals. The addition of a small yard will eliminate the necessity of keeping the dog on a length of chain for long periods, which is not beneficial to the dog's health. Short of the above, much can be done to ensure the dog being reasonably warm, dry, and comfortable. Kennels can, for instance, be made easily movable, and sites should be changed at frequent intervals. Surroundings should be sheltered, sunny

in winter and clean, and drinking water should always be available.

Feeding

The working dog must be adequately fed. The common practice is to kill for "dog-tucker" at suitable intervals. Under the Meat Regulations, 1940, it is an offence to give dogs raw livers or cause them to be fed with any diseased meat or offal in view of the grave menace to human health from hydatids. The meat is apt to become somewhat high during summer unless a large number of dogs are kept on the place. Furthermore, it has been proved that an exclusive diet of flesh for the working dog does not give as good results as a mixed diet containing a proportion of starchy foods.

Some bones must be provided, as they are essential to the proper functioning of the dog's digestive processes. Rabbit and poultry bones are, however, not suitable, as they are hard, dense, and splintery, and can cause laceration of the gut, or may accumulate in the gut into dense, compact obstructions.

It is suggested that a more suitable and simple method of feeding is by the use of meat-meal, such as is fed to pigs, combined with a proportion of household scraps and bones, the last being essential for the dog's good health. In one instance which came under notice, working dogs have been kept in excellent order for a number of years on:—

10 to 12 ounces of meat-meal daily, made into a thin soup, with skim-milk and with a proportion of household scraps and bones added.

The meat-meal costs 12s. per cwt. On other places, a proportion of pollard mixed with meat-meal has given good results. It is stated that dogs so fed have far less tendency to wander when let off the chain or to interfere with dead carcasses.

Before leaving the subject of the feeding and housing of the farm dog, it is earnestly desired to suggest that "the labourer is worthy of his hire," and the great services rendered to his owner by the sheep dog are worthy of comfortable kenneling and good feeding. In particular, the practice of allowing sheep dogs off the chain daily to feed on the nearest dead carcass is not wise. The dog is not naturally a feeder on carrion, in which he differs from the jackal and the hyaena, and sheep dogs which are allowed to feed on dead carcasses run a grave risk of sooner or later becoming sheep-worriers.

Health

The farm dog which is allowed to feed on hydatid-infested offal or carcasses is a grave menace to human health. Meat-meal, whether used continuously, as above, or as a supplement to specially-killed carcasses, will prevent this, in conjunction with the arecoline dose issued with the dog license and administered quarterly. This dosing also eliminates the large tapeworm of the dog, if present, which definitely affects canine health. Economically increased returns will result from no carcasses or offals being condemned at the works for hydatid infestation.

A Method of Castrating Pigs When Assistance Is Not Available

By

G. R. MACKINTOSH,
Inspector of Stock, Taumarunui.

METHODS commonly employed in castrating pigs usually require two men to perform the operation. Some farmers adopt the same method as is used in similarly operating on ram lambs, while others employ various other methods, such as holding the pig in a trough or flat on the ground. The accompanying photographs illustrate a much easier and quicker method by which the operation can be performed by one man alone.

In these days of labour shortage, when many farms are being carried on single-handed, it is a great advantage not to have to call on extra assistance for this job.

There is also a definite saving in the amount of time required to complete this task. It is within the scope of any man to perform the operation in one minute, and, therefore, once the sow has been separated from the litter and the litter is enclosed in a small pen, the whole job takes as many minutes as there are boars in the pen.

Another important advantage is that by holding the pig with its head downwards, as is shown in the photograph, the weight of the abdominal contents is towards the chest cavity, and, consequently no weight at all is upon the scrotum This is a very decided gain when dealing with ruptured pigs.

As with other methods of castration, it is important that strict cleanliness be observed in carrying out the operation. When this method is adopted it is very necessary to ensure that the incision is made at the lowest part of the scrotal sac in order to prevent pockets where blood and pus may accumulate. Strict cleanliness, free drainage to the wounds, the absence of pockets, and an adequate incision are all essential factors in preventing pus formation and in eliminating the risk of abscesses in the scrotal sac.

The litter remains after the removal of the sow. Note the size of the piglets.

A side view showing how to hold the pig correctly.

The last cut.

Answers to Correspondents

After-calving Douche.

W.M. (HAVELOCK) :—

Will you please advise me what your Department recommends as an after-calving douche for dairy cows? For years past I have successfully used a proprietary disinfectant for irrigating cows, but am now unable to procure it. I may say that while using it practically all cows proved in calf at first service, while last season, when no precaution was taken as regards irrigation,

the majority failed to do so, some even at the second service, hence this inquiry.

LIVESTOCK DIVISION:—

Permanganate of potash (Condys) and salt may be used. Make a strong solution by dissolving a dessertspoonful of Condys crystals in a pint bottle of clean water, which is kept as a stock solution. For a douche add just enough of the strong solution to a gallon of warm water to colour it a pale pink (probably a dessertspoonful) and a teaspoonful of salt.

It is by no means certain that the failure to douche cows last season was the cause of cows being more difficult to get in calf, as this might have been due to seasonal conditions, or to deterioration of bull, or perhaps to change of bull.

Where cows calve and clean normally, the practice of douching after calving is not desirable.

Blood Scours in Calves.

A.F.M. (MARTON):—

Would you please give me advice concerning the following:—

(1) For several seasons I have had great difficulty in rearing calves because of blood scours. They are quite all right until they start to eat grass, that is, about two weeks after birth, and then the trouble starts. I always tie a calf affected with blood scours up so that it cannot wander about and graze until the trouble has been overcome, but in many cases the hemorrhage is so severe that the calf dies. I can find nothing wrong with the paddock, and a gorse hedge, the flowers of which I thought they might be sucking, was fenced off, but the trouble still persists.

(2) I have two heifers I cannot get in calf. They had the first calf in normal fashion, but since have failed to hold to the bull. Each time they come in season there is a rather abundant show of blood. I have kept them away from the bull during the winter months, and intend to put them again with the bull shortly. Is there any prospect of getting them in calf?

LIVESTOCK DIVISION:—

(1) Calves with blood scour. This may be due to a parasitic infection (coccidiosis) or to a type of dysentery caused by irritation from food or bacterial infection.

Coccidiosis appears to be a likely cause, except that it would be unusual in calves quite so young. I should be very glad if you could arrange to send a small sample of the droppings actually containing blood clots, etc., in a small glass jar or tin, well packed, to the Superintendent, Animal Research Station, Wallaceville, asking him to examine for coccidia. If these are present it would be advisable for you to give up your present yard or paddock completely for a season to allow the disease to die out. In any case, this might be a wise step.

For treatment of affected calves you might try small (half-teaspoonful) doses of sulphate of iron, dissolved in 4oz. of water, with a dessertspoonful of vegetable turpentine, shaken up with about 6oz. of milk, as a drench. Give once a day for two or three days.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

For prevention, keep calves in cleanest and driest available conditions, feed regularly, measured amounts, add a cupful of lime water to each feed for three weeks about susceptible age.

(2) Heifers failing to breed. It is reasonable to expect that after a season's spell these heifers will now breed normally. The blood discharge does not necessarily indicate any disease of the organs.

Black Pox in Cows

A.M.L. (WANGANUI):—

This week I received a letter from my son, who is share-milking for me, that about 12 cows have recently become infected with what he says is "black pock." He says the trouble commences with tiny sores about the size of a pin-head, and that these sores gradually grow and grow. He did not know what the trouble was, and put Condy's crystals in the washing water and milked the infected cows separately. Later, he sent for a proprietary treatment, but before it arrived one cow, he said, had the trouble through her system and died.

I shall be grateful if you will give your opinion and advice on this trouble. The farm is one of 150 acres, easy hilly land, near Wellsford, North Auckland, and about 50 cows are at present being milked.

LIVESTOCK DIVISION:—

Black pox is caused by an infection with a dirt or soil organism and, once established, is difficult to eradicate. It is most important to milk the affected animals last, or, better still, to have them milked by someone not engaged in the general milking.

The following preparations have given good results:—

(1) 3 per cent. solution of salicylic acid in glycerine.

(2) Salicylic acid, 2 drams; benzoic acid, 1 dram; lanoline, 6 drams; petrolatum, 1oz. Applications should be made after each milking.

A common seat for this disease is the point of the teat, over which a hard black scab develops, making milking difficult if not impossible. The ointment referred to above will soften this scab. The use of a teat siphon is strongly condemned, as it will almost certainly produce mammitis. This may possibly have caused the death of the cow mentioned in your letter. In some cases where the teats are badly affected and milking is painful, a piece of the inner tube of a bicycle stretched over the teat is helpful.

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Radio Broadcasts

THE following programme of radio broadcasts for farmers will be given under the auspices of the National Pig Industry Council during December:—

4YA, December 8, 7.15 p.m.—Subject not decided. Mr. N. Macdonald, Otago and Southland District Pig Council.

2YH Napier, December 11, 7.30 p.m.—"Common Ailments of Pigs and their Treatment," by N. Owtram, Tairawhiti District Pig Council.

1YA, December 18, 7.15 p.m.—"Pig Breeding—the relationship between the Pedigree Breeder and the Commercial Producer," by C. P. Harington, Waikato District Pig Council.

IT STAYS SATISFACTORY

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This is the time of the year when too many cows begin to "hold up" their milk—by hay-making time milking will become a real problem because too many machines fail you just when you most need them. The "New L.K.G." will milk fast and clean—all the year round—because IT STAYS SATISFACTORY.

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McEWAN'S MACHINERY LTD., Auckland and Hamilton. Agents at Galatea, Pukekohe, Rotorua, Te Aroha, Tauranga, Thames, Wairoa and Whangarei.
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ANOTHER STERLING Mac Ewan PRODUCT

Cows "Blown" on Red Clover

F.B. (SOUTH CANTERBURY):—

(1) What is the correct treatment for a cow "blown" on red clover? In regard to this:

(2) Is washing soda better than baking soda, and what quantities?

(3) Is a clover paddock less dangerous the first year after being sown than in the following years?

(4) Would grazing sheep with cows be an advantage?

LIVESTOCK DIVISION:—

(1) When a cow becomes "blown" on clover the condition is the result of the rapid fermentation of the clover in the cow's rumen. Large amounts of gas, chiefly carbon dioxide and marsh gas, are produced and cannot escape by the normal processes. Treatment naturally lies in assisting the escape of the gas and preventing further fermentation.

It is frequently found that by putting a gag in the cow's mouth the expulsion of gas is greatly assisted. The simplest gag is a piece of stick placed in the mouth and tied behind the horns or pole. This method is generally effective.

At the same time. it is advisable to give the cow a drench of 2oz. of oil of turpentine (not mineral turpentine) in a pint and a half of linseed oil. The turpentine, aids in the expulsion of gas, and the oil acts as a purgative and rids the system of the toxic products of fermentation.

As an alternative treatment bicarbonate of soda in half to 1oz. doses may be given in water every two to four hours.

(2) With reference to the relative merits of washing soda (carbonate of soda) and baking soda ((bicarbonate of soda), these differ only in the degree of their action, and in consequence of the tendency of the carbonate to irritate, the bicarbonate is almost invariably prescribed. If the carbonate is used, the dose rate is half that of the bicarbonate as stated above.

(3) The danger of "blowing" on clover seems to depend more on the climatic conditions than on the age of the pasture. Cows should not be turned on the clover early in the morning when it is heavy with dew or after rain. When there is a danger of "blowing" the cows should be grazed on the clover for short periods and then only after they have been on other pastures, as empty cows turned on to succulent clover will gorge themselves, frequently with disastrous results.

(4) It is unlikely that any advantage would be gained from grazing sheep with cattle, as sheep would graze part of the area too short for cattle to touch, and the area which the cattle could graze would have its normal effect on them. I can see no short-cut to prevention in this method.

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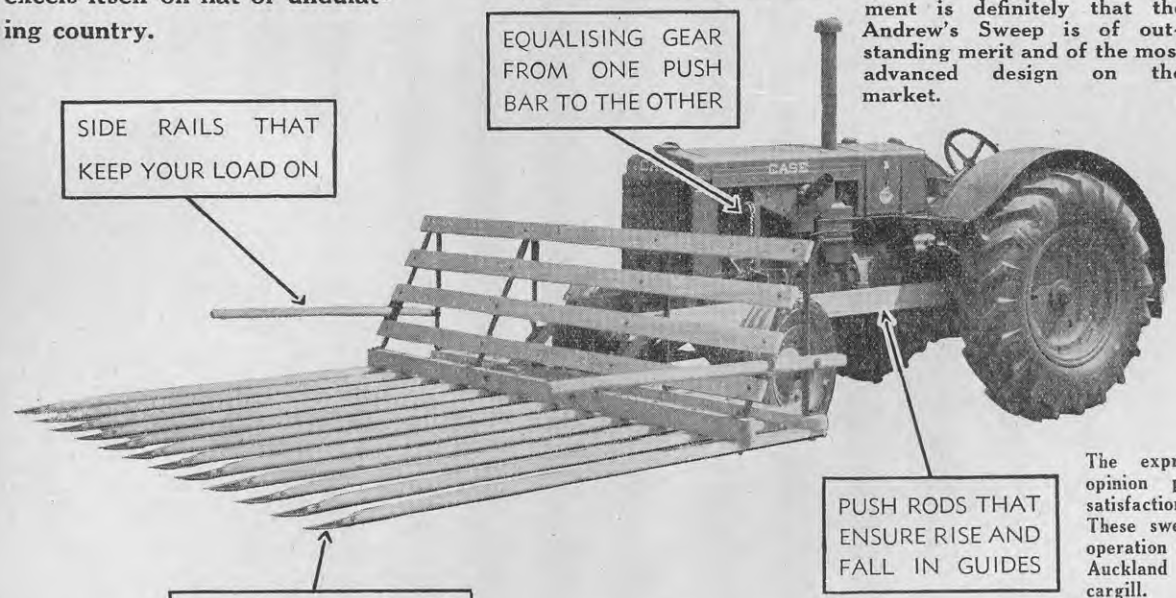

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Mr. KEITH D. MATSON of Ohoka, writes: "It sweeps quite clean right after the Mower and I had no trouble in keeping the Baler going; in fact it was so easy to manipulate that my son, aged 12 years, drove the Tractor and worked it with ease."

MESSRS. MOORHEAD BROS., of Southbridge, writes:—"We swept up and down gullies as easily and efficiently as on the level. In our opinion, it is superior in every way to a Horse Sweep."

Mr. H. W. BARKER, of Hexton, Gisborne, states:—"The paddock was a very rough one with quite a few drains, and after fitting the 'Andrews' Sweep, I experienced no further trouble. I recommend it to any farmer."

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To ANDREWS & BEAVEN LTD., Box 138, Christchurch.

Please send me leaflets and full details of the "ANDREWS" HIGH SPEED HAYSWEEP.

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Subterranean Clover on Coastal Hill Country

A view of typical ratstail country on which subterranean clover is being established.

Above.—A close-up view of a dominant ratstail sward, now carrying strong subterranean clover. Both are well grazed.

MUCH of the coastal hill country north from Napier to well beyond Gisborne is good, sound, warm country, but because this land dries out severely in the summer the pastures are now largely ratstail with danthonia filling in. There is little if any clover except for a brief showing in the spring of one or other of the annual trefoils.

Topdressing gives an improvement, but it is too slow to be really a profitable proposition. The introduction of subterranean clover on this ratstail country, however, followed by regular topdressing with superphosphate at 1½ and 2cwt. per acre, has given remarkably good results by rapidly converting dry, harsh, and coarse dry-stock pastures to quite satisfactory fat lamb country. Subterranean clover establishes very readily among the ratstail, growing up through the clumps, which protect it well during the early stages of development. The clover spreads

Comparison of land on which subterranean clover has been established with the original sward. Note the absence of roughage.

over and through the ratstail, and both cattle and sheep readily chew down the clumps. Regular topdressing with 1½ to 2cwt. of superphosphate will eventually result in the re-establishment of such grasses as perennial ryegrass and cocksfoot, together with white clover

The photographs, which were taken in August, 1941, show a sward of dominant ratstail which was oversown with subterranean clover in March, 1938, and topdressed since with 2cwt. per acre of superphosphate each year. The subterranean clover grows well through the winter, and continues to give good feed until about the end of December, and it can produce good early fat lambs.

—R. P. HILL, Fields Instructor, Hastings.

Dual Cropping on Maize Areas

Photo above—
Maize stalks and kumi kumis ready for winter feeding.

IN most districts where maize is grown primarily for consumption by stock on the farm it is a sound practice to grow cattle marrows or kumi kumis in association with this crop.

As a general rule, dual cropping of a piece of land has serious limitations as most crops will not yield well unless grown alone on an area. However, maize and kumi kumis have been found to grow in association so well that any maize grower can be confidently recommended to sow kumi kumis in the same field.

Admittedly, the individual crops may not yield so heavily as when grown alone, but the combined production, measured in stock feed, will be greater. Moreover, should one or the other partially fail for any reason, the associate crop usually benefits as a result, so that such dual cropping may be regarded as a more certain means of producing stock feed than the growing of these crops singly.

Methods of Sowing

The usual practice in sowing is to include kumi kumi seed at the rate of 2 lb. per acre with the maize. Thus, it is drilled in every row and rapidly covers the ground. While this may be fairly satisfactory, the practice has a number of defects. Firstly, where annual weeds are troublesome, intercultivation becomes impossible once the vines begin to run. Again, by sowing in every row, great care has to be taken in the early stages of cultivation to prevent serious damage to the kumi kumi plants.

A sounder method of sowing these crops is to sow the maize alone in the usual drills. Then, about two weeks later, sow the kumi kumi seed in every fourth row. This seed may be dibbled in the maize rows, which can be done quickly by using a spade.

The advantages of sowing in this manner are: Firstly, that the kumi kumis are confined to every fourth row, so that cultivation of most of the crop can continue for much longer; secondly, by sowing the kumi kumi seed two weeks after the maize a longer period of maize intercultivation can be given; and thirdly, this later sowing enables most of such work to be well forward before the kumi kumis

begin running, so that they suffer less damage.

Utilisation of Crops.

Once the maize has been harvested, the maize stalks may be grazed off by cattle. While this material is not of high feeding quality, it does provide a useful source of winter feed—a fact that is recognised by farmers, who are usually prepared to pay up to £1 per acre for grazing rights.

In addition, the kumi kumis may be used for cattle feed or for wintering pigs. There is no real necessity to gather and store them; instead, stock may be turned in on them, where they can be rationed by splitting a proportion each day.

Kumi kumis are a useful crop for wintering stock, perhaps not so valuable as a good root crop, but nevertheless well worth considering as a companion crop to maize.

—C. WALKER, Instructor in Agriculture, Thames.

Answer to Correspondent

Ryegrass in a Lawn.

B.O.F. (FEILDING):—

I would be glad if you could tell me some means of getting rid of ryegrass in a tennis court. The ryegrass grows in tufts on the back line and in fairly large patches in other places on the court. It will not cut cleanly with the mower, and the tufts make the surface uneven.

FIELDS DIVISION:—

There is no treatment that could be used to kill the ryegrass and at the same time leave the ground in suitable condition so that the other lawn grasses would cover over the bare patches or, if these are large after the ryegrass is killed, the soil is fit for the sowing of lawn grass seed.

The only method is to fork or dig out isolated ryegrass plants as you would any weed, taking care to get out all the root. If the soil is pressed back into place carefully the other grasses, such as browntop and chewings fescue, in the lawn will soon cover over small bare places. A little clean soil could be used to fill up hollows left by the ryegrass plants.

Where, however, the ryegrass has reached the stage of forming patches of any size, returfing is the only method that can be used. The ryegrass turf is taken out to a depth which will ensure all the crowns being removed. It should be possible to get pieces of suitable lawn grass turf from some part of the court area that is not immediately important for play. If returfing is carried out the turfed area should be kept well watered and not allowed to dry out too much until the turf has knitted again to the subsoil. If turfing is not possible, then the forking out of the perennial ryegrass, levelling with fresh soil, and resowing these areas must be done if the court is to be cleared of ryegrass.

This work must be done as early as possible in the autumn to give the new grass time to harden up before play, a condition which would not be possible if reseeding were done now.

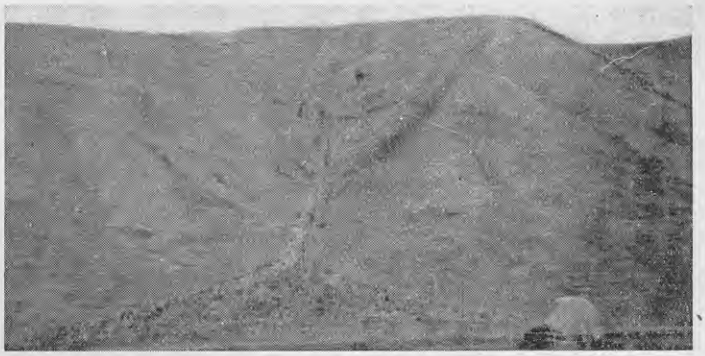
Ryegrass comes into lawns generally as isolated plants, which should be taken out of the lawn with a fork or other implement as they appear. If dealt with while quite small, no difficulty should be experienced in keeping the lawn free of this very objectionable species.

Erosion on the "Whither" Hills

APPROPRIATELY named, the Wither Hills is a large block of hilly country immediately south of Blenheim. About 50 years ago this land, it is said, was heavily clothed in tussock, and in this condition carried a good number of stock with success. Evidence of land deterioration was not apparent.

During the last 50 years, however, a vast change has taken place. The attentions of rabbits, stock, and the firestick combined have wrought an amazing transformation, so that today the land is clothed mainly in danthonia. Even this in parts is very sparse, and appears chary of continued existence.

In spite of the fact that the district enjoys only a light rainfall—on an average 20 inches to 23 inches—eroding hillsides are to be seen almost all over the block, and an idea of the extent and rapidity of this erosion can be gained from the fact that within the last three years definite changes have taken place in the scour under investigation.



The extent to which erosion is taking charge on the Wither Hills.

Measures to counteract this tendency have already been in operation for several years. Firstly, the rabbits, once plentiful, have been reduced almost to zero, while burning also has lost most of its advocates. Thus, the two factors which played a large part in bringing about the present condition of the hills have been eliminated. In areas where this applies, the land is responding in that tussock growth can be seen coming back, which is probably the forerunner of better cover and greater resistance to erosion. Much of the area is, however, so denuded that it will be several years before substantial results can be expected from the measures mentioned.

—D. R. WILKIE, Instructor in Agriculture, Blenheim.

Orchard Notes

Spraying for the Control of Diseases

OPERATIONS in the orchard during this and the following months will be directed mainly to the production of a good crop. Spraying for the control of disease, cultivation of the soil, and thinning of the crop must be given full attention, for it is upon these operations that the health and vigour of the trees depend, and without which best quality fruit cannot be produced.

From this period onwards fruit trees will be in heavy foliage and it will be more difficult to effect a complete spray coverage, but every part of the tree must be completely wetted if maximum results are to be obtained. This can be accomplished only by attention to pressure, spray nozzles, discs, and thorough application of the spray. Sufficient pressure to ensure good penetration to all parts of the tree should be the aim of every fruitgrower.

Codling Moth

Codling moth will become more active as the warmer weather approaches, and unless the spraying is thorough, complete control cannot be expected. Spraying at regular intervals should be carried out as the season advances so that the growing fruit will always be well covered.

Slight modifications to the spray programme recommended in previous notes may be necessary mainly because of weather conditions and prevalence of disease. To guard against foliage injury, lime sulphur should be reduced in strength to 1:180 with the addition of colloidal sulphur at strength 2:100. In many cases it may be preferable to delete the lime sulphur from now on, using only colloidal sulphur, especially on such varieties of apples as Cox Orange Pippin, Dunns Favourite, and other varieties known to be susceptible to spray injury. Should wet weather intervene soon after spraying operations, it is advisable to apply an extra spray rather than risk the disease spreading throughout the orchard.

This is the season when the apple leaf hopper usually becomes active. Although the hopper may not be noticed, the mottling of the foliage caused by these insects in the nymph stage will indicate its presence, and steps should be taken for its control. Impairment of the foliage is likely to cause considerable dropping of fruit at a later stage. The addition of nicotine sulphate to the ordinary spray programme at strength 1:800 is effective for the control of apple leaf hopper.

Red Mite

Red mite not destroyed by sprays applied during the dormant period will become active during this month, especially if warm weather is experienced. The injury caused to the foliage by this pest is reflected in the quality of the fruit produced, both size and colour being affected. Its first appearance may be noticed by the bronzing of the foliage, impairing it to such an extent that functioning powers are greatly diminished. No effort should be spared to rid fruit trees from the ravages of red mite. The only spray recommended up to this stage of growth is summer oil at strength 1:100. One spray will suffice if it is applied thoroughly and the mite has not gained too strong a hold, otherwise a further application at the same strength will be necessary. Care must be taken not to apply an oil spray within from ten to twelve days after a sulphur spray has been applied, otherwise considerable damage to both fruit and foliage will be done.

Much damage is caused by leaf-roller caterpillar, more especially towards the end of the season, and it is advisable to keep a close watch for this pest. It may be necessary to apply an extra lead arsenate spray or lessen the intervals between sprays should leaf-roller become troublesome. Reports indicate that where lead arsenate at strength 1½ lb.:100 has been applied earlier in the season than is the case with many growers, leaf-roller caterpillar has been kept to a minimum.

Spraying Pear Trees

Spraying as previously recommended should be continued during the month and future months for the control of pests and diseases of pear trees. Where Bordeaux mixture is used on some of the hardier varieties and those more susceptible to black-spot in preference to lime sulphur, the strength

recommended is 1½:3:50. If used stronger, roughening and russeting of the skin may result. Here, again, thoroughness of application is the key-note to success. Pay attention to the lead arsenate spray for the control of codling moth, especially with the earlier varieties.

Stone Fruit Spraying.

Applications of sulphur sprays for the prevention of brown-rot will be necessary on peaches, nectarines, and plums from now on to the end of the season. Humid conditions, favourable for the production of brown-rot, are liable at this time. Consequently, lime sulphur at strength 1:180 to 1:200 plus colloidal sulphur at 2:100 should be applied at intervals of from two to three weeks. Any fruits seen on the trees affected with brown-rot should be destroyed to stop the spread of infection, and in no case should clean fruit be handled at the same time as diseased fruit. It will be necessary to apply nicotine sulphate at strength 1:800 for the control of black and green aphis, while leaf-roller caterpillar can be controlled by an application of lead arsenate 1½:100 plus hydrated lime 3:100.

Thinning of Fruit

The judicious thinning of fruit is not carried out as much as it should be. Good quality fruit is always in demand, and any money spent in this important operation will be more than recovered when grading and packing. Not only will size be increased by proper thinning, but uniformity of size will be achieved, another important factor when considering handling costs. All diseased and malformed fruits should be eliminated at thinning time, leaving only those which will be of marketable value.

While there is no hard and fast rule regarding thinning, as much depends on the size of the crop and the capabilities of the tree to carry the crop, generally speaking, it is advisable to reduce the crop of apples to, at most, two or three fruits in a bunch of five and often to a single fruit, especially with short-stemmed varieties, to prevent them from being pushed off the spur as the fruit grows, and also to prevent damage to fruit by rubbing against each other. Fruits which are allowed to remain in close contact with one another make spraying more difficult, and also create a good harbour for codling moth and leaf-roller caterpillar. As the centre fruit in a cluster of apples is usually short stemmed, this is the first to be eliminated, the others being reduced as necessary to produce good, average-sized fruits.

Care should be taken not to damage the fruit spurs when thinning. If thinning shears are not available the work can be done quite easily without damage to fruit or spurs by the pressure of the thumb and forefinger, severing the stalk at the base of the apples. In fact, many growers prefer this method because of the damage which sometimes occurs in the piercing of the remaining fruits by pruning shears, especially when in the hands of an inexperienced thinner.

With peaches, apricots and nectarines, the best time to begin thinning is soon after the stoning period. If left later, much value will be lost in the size and quality. These fruits should be reduced to singles, and if the crop is very heavy with close fruit spurs, it is often advisable to denude some spurs entirely.

Attention to Grafts

Fruit trees grafted during the season will require some attention during November. Scions will be starting to grow, and it will be necessary to release any ties to prevent injury to and possible death of the scion by strangulation. This release can be done very simply by drawing the sharp edge of the knife through the tying material. Should the newly-grafted trees be in an exposed position, protection from wind damage can be obtained by tying the new shoots to stakes until they have grown sufficiently strong to withstand any chance of breakage.

—G. STRATFORD, District Supervisor, Dunedin.

Citrus Notes

Recognition of Mandarins

CONTINUING with the recognition of the varieties of citrus fruits most commonly grown in New Zealand, we have now to consider the mandarins.

The mandarin species is characterised by small foliage; the rind of the fruit is easily separated from the pulp and the sections of the pulp from each other. As a general rule, the smoother the rind, the more juicy the fruit. As a class, mandarins dry out more quickly than sweet oranges. It is not possible to subdivide the mandarin varieties according to growth habit, as the habit is inclined to vary according to soil conditions.

Satsuma or Oonshiu

This was formerly the standard Japanese variety. It is thornless and a pendulous dwarf grower, and is the most frost-resistant of all mandarins. The fruit is at its best just as it reaches maturity. If pulled, the rind is readily broken, and part remains attached to the pedicel or fruit stalk. The fruit is flat in shape, bright orange colour, rind rough, loose, and easily separated from the pulp. There is almost no core, but a small cavity of 3-8in. is present; there are few seeds, the flesh is orange colour, darker than the rind, and not very juicy.

Three Satsuma sports—Wase, Owari, and Silverhill—have arisen, and two of these are being distributed in New Zealand.

Owari is a thornless tree of spreading dwarf habit. The fruit is large, up to 3in. in diameter, flat, and carries a high colour; there are about nine segments, and the pith is open and generally seedless.

Wase is similar to Owari, but the tree is more frost-resistant and fruit ripens earlier.

Thorny, also known as China or willow-leaved, is generally renowned for the flavour of its fruit. It is claimed to be the best flavoured of all mandarin varieties. The tree is very slender in growth and almost thornless; the leaves are small, narrow, and deep green, and the fruit is usually borne singly at the tips of the slender branches. The tree is a prolific mid-season variety. The fruit is an average size, paler in colour than many, and the rind is smooth and loosely attached. There are 10 to 13 sections, irregular in size but well defined, and the flesh is coarse-grained. There are generally between 15 to 25 seeds present, which is a major disadvantage of the variety.

Navel Mandarin

This is possibly a sport from Thorny. It differs from Thorny in being larger, having a thinner rind, and also having a distinct navel. The flavour is good, but generally not up to the standard of Thorny.

Canton has pointed leaves similar to Thorny, and the wood is free from thorns. The rind, however, has not the same pleasant aromatic perfume, but is deeply coloured and thin. This variety is hardy and prolific, the flavour of the fruit being fairly good.

There is a wide group of mandarin hybrids, but only a few can be mentioned. These are King, Clementine, Temple, and Ellendale Beauty.

King.—This variety appears to be a mandarin-sour orange hybrid, as the shape of fruit, rough rind, and susceptibility to *verrucosis* are sour orange characteristics. The tree is upright in growth, generally thorny, and foliage is a dark green, resembling sweet orange foliage. The fruit is large, with rough rind separating easily from the flesh. There are 13 regular sections. which are easily separated from each other, and about 20 seeds. This is a late variety, which is generally prolific and palatable.

Clementine is another sour orange mandarin hybrid. It is very hardy, matures early, and has a delicate, spicy flavour entirely different from any other citrus fruit. The rind is round, pebbled, and with a groove at the apex. The rind fits tightly to the segments, but it can be peeled like a mandarin. There are nine segments and about five seeds.

Temple is a sweet orange-mandarin hybrid, characterised by the size and colour of the fruit, which is larger than any of the mandarins. The fruit is a deep orange red colour, and the rind is smooth and leathery but thin, and separates easily from the pulp. There are 10 to 12 sections with very thin partitions, the flesh being free from rag and very juicy. The flavour is characteristic, and there are about 20 seeds.

Ellendale Beauty is another sweet orange-mandarin hybrid. The tree has a very compact growth. The fruit is not as large nor of as deep a colour as Temple, but is flatter and a brighter red; otherwise it is very large, smooth, and has a thin rind. It is orange-shaped and has a pithy core.

In next month's notes reference will be made to the remaining miscellaneous citrus varieties and their recognition.

—A. M. W. GREIG, Citriculturist, Auckland.

Reminders for the Month.

Citrus trees must have adequate water at all times, so conserve what is available.

Build up organic matter in the soil.

Mulch your citrus trees.

Apply 3:4:50 Bordeaux for verrucosis.

Now is the budding season.

Cool Storage Notes

Re-packing Fruit for Marketing

THE season is now well advanced, and the cool storage stocks of fruit will be considerably reduced. All lines of fruit still held to supply market requirements during the remainder of the season will need to be opened up for examination. Very few lines will be suitable for marketing without re-packing in order to remove fruits which have deteriorated during storage.

Granny Smith apples which were placed in storage at the correct stage of maturity wrapped in oil wraps and held at a flesh temperature of 32deg. to 33deg. F. should still be in sound condition. The larger sizes should be carefully examined and placed on the market first to avoid undue deterioration. They may be tested for the development of discoloration by removing samples of the fruits into ordinary atmospheric temperatures and keeping them under observation for several days. The Delicious variety should not be held for a further period unless they are in a crisp and firm condition.

It would be beneficial if fruit required for re-packing is removed from cool storage chambers in small quantities and immediately returned to the cool chamber when re-packing has been carried out. If not marketed within seven to 10 days it should be re-examined and any faulty fruits removed before despatch to the market. This precaution will assist in maintaining the fruit in good condition until it is required for marketing.

When the fruit has been removed from the cool chambers at the close of the fruit season the chambers should be thoroughly cleared of refuse and waste fruit; this also applies to the packing shed. Rejected fruit should not be left in cases, and all waste fruit should be immediately removed from the vicinity of the packing shed and cool store.

—A. A. POWELL, Cool Storage Officer, Wellington.

Guide for the Home Garden

Care of Cabbage Plants and Leeks

DECEMBER to mid-January is the period in which all plants of the cabbage family which are expected to mature towards the end of autumn or during winter should be planted out.

Provided the recommendations relating to cruciferous crops for winter made in the October issue of the "Journal" have been adopted, no great difficulty should be experienced in obtaining a good start with the plants, even if the weather is unfavourable. When it is intended to water a bed of seedlings in the morning, less shock will be experienced by the plants if the water to be used is drawn the night before, as it will have warmed up considerably during the night. Rain water, however, is the ideal liquid for this purpose.

Seasonal Don'ts

Don't

forget to pay special attention to the crops which are in season from April to October. It is important to get them established before summer droughts occur. During December sowings of swedes and parsnips may be made. It is a busy month for transplanting seedlings of crops sown in October. Among these are borecole, broccoli, cabbage (savoy and winter varieties), celery, celeriac, leeks and silver beet.

Don't

lose your cruciferous crops (cabbage family) through the attacks of white butterfly or the diamond-backed moth. Derris dust very effectively destroys the grubs of these pests. As prevention is better than cure, it is advisable to apply the dust before the young plants are seen to be attacked and to repeat the application at frequent intervals so that while the egglaying insects are hovering about, the plants will be coated with the dust. The dust is quite harmless to animals and humans. Its thorough and efficient use will assure a winter supply of these valuable crops. Every gardener should possess a small blower, and the few shillings involved is well spent.

Leeks

This vegetable, which is somewhat despised in favour of the onion, is, in fact, an almost indispensable addition to the winter supplies usually grown in the home garden. Many people to whom the strong flavour of the onion is objectionable will find the leek much milder and more palatable. The crop will withstand the severest frost, and, when well grown, should be available until the end of October. In addition, it has the reputation of being more immune from attacks by disease and insect pests than any other vegetable. As roughage in the meal, it possesses excellent laxative properties. Surely these commendable qualities merit the leek a place among the winter vegetables being grown?

Soil

The better the soil the better the product, but reasonably good crops may be grown in almost any kind of garden soil, except that of a very light sandy composition. A clay loam, rich in organic content, is the ideal soil, as this will retain an abundance of moisture which is so necessary during the dry period while growth is proceeding.

Manuring

Blood and bone is the safest manure to use. This may be applied along the lines of planting at the rate of 1lb. to 20 feet of row, and well worked into the soil.

Planting

A trench about four inches deep should be opened up, and at the bottom of this a hole made sufficiently deep to permit the green top of the plant to be exposed. Into this opening the plant should be dropped, followed by water. If the soil is of a type which is inclined to "set" hard, do not use a dibber—a trowel is better. When a dibber is pressed into such soil and turned round before being withdrawn, a "wall" is created, which has already started the "setting" process. The plants may be set at any distance to suit the convenience of the gardener—5 to 6 inches apart, in rows between which 12 to 15 inches have been allowed. This distance will be sufficient to permit good development.

As growth proceeds, cultivation will fill in the trenches. This will assist in blanching the stems of the plant, the portion which is usually consumed as a vegetable. Later, the soil may be drawn higher up the plants, which will increase the length of the blanched stem.

While the plants are maturing occasional applications of liquid manure will be helpful. The leek, however, will not flourish under dry conditions. For best results a plentiful supply of water is necessary, and, in addition, constant use of the hoe. No vegetable in the garden will so well repay the small amount of labour involved in the production of this crop.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Protecting Tomato Plants From Pests

WORK with the tomato crop during December should consist mainly in the removal of all unnecessary shoots, cultivation, spraying, and keeping the plants well tied to the stakes.

Fertiliser

Provided steady growth is being maintained, no additional manure should be necessary. After picking has started, an application of suitable fertiliser might be beneficial.

Diseases

It may be well to indicate the nature of some of the more important diseases from which the tomato plant is liable to suffer.

Potato blight of tomatoes, which is generally known as late blight, is caused by the fungus *Phytophthora infestans.* In addition to the remarks concerning this disease which appeared in this section in the May issue of the

What To Do In The Garden Next Month

Summary of Operations During December

VEGETABLE SECTION

SUCCESSIONAL SOWINGS.

Beans, corn, lettuce (grow without transplanting), peas, (maincrop varieties till middle of December, then delay further sowings till advised), radish, spring onions (keep well moistened), turnips.

OTHER SOWINGS.

Carrots (shorthorn varieties if not sown last month), swedes (for cool districts, if not sown last month), parsnips (for use in late winter).

SEEDLINGS TO TRANSPLANT.

Broccoli, Brussels sprouts, cabbage (Savoy, winter and red), cauliflower, celery, celeriac, late crop of tomatoes (sown October).

PERENNIAL CROPS.

Rhubarb.—The harvesting should be discontinued towards the end of December, and the beds cultivated and dressed with farm and artificial manure so that plant food reserves, from which production will be obtained next spring, may be accumulated in the roots.

GENERAL WORK.

Tie up tomatoes and remove side shoots.

Use hoe frequently to destroy weeds and to conserve moisture.

Apply liquid manure to salad crops.

Thin out seedlings.

Spray to prevent disease and use derris dust to control white butterfly.

Earth up potatoes and other crops. Kumeras should receive this treatment before they begin to run.

FLOWER SECTION.

Complete the planting of gladioli.

Plant out dahlias and chrysanthemums.

Take tip cuttings of hydrangeas and set them in sandy loam to strike.

Lift narcissi and other bulbs as the foliage yellows and will break away from the bulbs without difficulty.

Narcissi bulbs should be replanted promptly, but some other bulbs, notably hyacinths and irises, are better dried off completely. Tulips and narcissi, which sunscald readily, should not be exposed to the sun.

"Journal," the fruit is attacked, and the blight is easily recognised by the appearance on the tomatoes of large, grey-black blemishes. Spraying with Bordeaux mixture is the best practical preventive.

Early blight of tomatoes is caused by the fungus *Macrosporium solani*. The plant is attacked in much the same way as with late blight, and similar preventive measures are recommended. Spray for prevention, not for cure.

Wilts

The tomato plant is subject to three wilting diseases—Bacterial wilt, Verticillium wilt, and Fusarium wilt. The only positive method of distinguishing the difference between the two last-named diseases is by the isolation of the fungus in the laboratory. Bacterial wilt may be identified if, when the main stem of the plant is cut through, a slimy substance is seen to ooze from it. This does not occur when plants otherwise affected are dealt with in a similar manner. The results of attacks on plants by these three diseases are, for all practical purposes, the same—a general wilting of the leaves followed by collapse and ultimate death. In the absence of wilting, the foliage may turn yellow, and death will be gradual from the base of the plant upwards.

The wilting above referred to is primarily caused by the fungi and bacteria gaining access to the stems of the plants, resulting in the disorganisation of the channels through which food and water pass upward. Entrance is first made through roots which have been injured, probably when transplanting, or by placing stakes too close to the plants. In this respect the reasons for the recommendation made in the September issue of the "Journal" for staking will be obvious.

The fungi above referred to are capable of living in the soil for many years, and are always ready to attack tomato plants when they are available.

Spotted Wilt

Spotted wilt, which may appear at any stage of the development of the plant, is easily distinguished by the sudden appearance of a bronze or rusty colouring on the younger top growth. It is assumed that the disease (a virus) is transmitted by the thrips *Frankiniella insularis*. There is no evidence that it is transmitted by seed or through soil; nor is it easy of transmission by the usual methods adopted for inoculating healthy plants. Plants attacked should be removed without delay. Provided the season is not too far advanced, replacement may be made.

Virus

Tomato plants are liable to be affected by virus diseases, but satisfactory preventive or remedial treatment is still undetermined.

Pests

Insect pests which seriously affect the tomato plants can be effectively controlled by the use of Derris as a dust or spray, arsenate of lead, and nicotine sulphate. The two last-named can safely be mixed with Bordeaux mixture, but not Derris.

Crop rotation should be rigidly practised in the home garden. By this means the incidence of plant disease may be modified, if not entirely prevented.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Seasonal Work for Beekeepers

Prevention of Swarming

SWARMING usually coincides with the beginning of the main honey flow, which takes place in New Zealand late in November or early December, according to location, but the intensity of swarming fever varies with different races and strains of bees, and also with seasonal conditions in different years. While a colony should be induced to bend all its efforts towards building up a large population of worker bees, the beekeeper must also see that the bees are kept constantly at work without swarming until the main honey flow begins, when the desire to swarm usually ceases; otherwise, a series of swarms may result which seriously disorganises the work in an apiary, and also considerably reduces the surplus honey crop.

The prevention of swarming is one of the beekeeper's biggest problems, and he must have a knowledge of the causes before he can apply the principles of control. In nature, swarming is a natural process as a means of populating the earth with the species, but in modern apiary practice it is totally unnecessary and undesirable.

Contributing Factors

Conditions likely to cause swarming in modern hives are lack of suitable ventilation, insufficient room for the expansion of the brood nest, and lack of combs for the storage of pollen and honey. Ample comb room is also required for the young bees that are continually hatching at this time of the year. All units which comprise a normal colony and its organisation must be kept steadily at work without a check, otherwise the nursing and storing instinct is curtailed and preparations for swarming begin. Beekeepers should, therefore, keep a special watch on all strong colonies during intermittent changes of weather conditions. Colonies headed by old queens very often have a greater tendency to swarm. This condition can be remedied by a plan of systematic re-queening at least every second season.

Drones

The male population of a colony varies considerably with the season of the year under normal conditions. Their sole purpose and duty are to mate with any new queens that may develop. Therefore, they are tolerated by the worker bees just so long as there is likelihood or necessity for this normal function, but at the close of the summer period they are driven out of the hives to die, except in colonies that are queenless, or in extreme cases where the queen is failing. Drones first appear in the hives early in August or September, according to location and seasonal conditions, and, unlike worker and queen bees, they enjoy the liberty of entrance to any hive, provided it happens to be the season for drones and nectar is available in the fields.

The period from the laying of the egg to the adult drone is twenty-four days. It is difficult, however, to assess the longevity of the male bees, as they appear to live until the worker bees, or the performance of their natural function, cause their death. The worker bees kill them off at the close of the season by forcing them to remain outside the colony cluster and denying them food. A concentration of wailing drones will very often be found along the bottom bars of the frames or on the floor board in the early autumn.

The workers will also destroy drone brood in late summer when there is a sudden check in the yield of nectar brought about by low temperatures.

Control Desirable

While it is necessary to have good quality drones flying in an apiary where queens are to be raised, it is essential for the beekeeper to control the number raised in honey hives; otherwise, excessive swarming may result, with consequent loss of honey crop.

If the beekeeper neglects to provide full sheets of comb foundation, or if any irregularity of the comb surface occurs through bad wiring, bending, or sagging of the comb foundation, the bees will build drone comb, in which the queen will deposit male eggs, according to the number of drone cells available. A large population of drones in a hive tends to induce the swarming impulse, and should be avoided by providing the bees with full sheets of good quality comb foundation properly fixed in the frames so that no cells are damaged and very little or no opportunity is left for the bees to build drone comb.

Where it is not possible to supply the bees immediately with suitable comb foundation or good worker combs, the beekeeper should decapitate with a sharp knife any drone brood present, and continue to do so until all combs containing patches of drone cells have been removed from the brood nest.

These combs need not be destroyed immediately, but may be used in the supers for the storage of honey after the main honey flow begins. If, however, they are placed on the hives before that period the queens will usually find their way to them, resulting in great loss of time, energy, and stores to the colony.

Where a good strain of bee is established with young queens at the head of each colony, swarm control is largely a matter of comb and hive manipulation before the start of the main honey flow, but care should be taken not to place more super accommodation on the hives than is actually required by the bees from week to week; otherwise, it will not be possible for the bees to maintain the necessary temperature for successful brood raising and ripening of freshly-gathered nectar.

Use of the Smoker

Success or failure in handling bees during the honey season with a minimum of discomfort to the beekeeper depends on the general condition of the colony, climatic conditions, the strains of bees, and the amount of food available to them, and, finally, the correct use of smoke.

(*Continued on page* 448.)

Determination of Sex in Chickens

By S. G. HADDON,
Poultry Instructor, Auckland.

SUPERSTITIONS still survive among all classes of people, including poultrykeepers. One of these superstitions is that the sex of the yet unhatched chick is determined by the shape of the egg—a long one would give one sex and a short, round one the other sex. Actually, the shape of the egg has no influence on the sex of the chick at all. More often than not a badly shaped egg is infertile, but there is no doubt that the shape of the egg plays a big part in the physical quality of the chick hatched from it.

In the past, quite a few appliances have appeared which claimed to show whether an egg would produce a pullet or a cockerel chick when hatched, but no method has yet been found to indicate whether an egg was even fertile or not, except the obvious one of incubating it. Naturally, the first step along this road would be the possibility of detecting life in the egg before placing it in the incubator. Determination of the sex in the egg would follow later. However, the determination of the sex of day-old chicks is an accepted fact, and the practice of chick-sexing is established on commercial lines.

Method of Sexing

It is not proposed to give a detailed account of how sexing is done. The underlying principle has been known for some time, but was first exploited by the Japanese. Briefly, it entails the recognition of a small protuberance just inside the vent. To make this examination, the vent is turned inside out, and with care and practice this manipulation will not harm the chicks at all. The sexing must be done while the chicks are very young, as the structural differences by which the sexes are distinguished lose their distinctiveness in a matter of a day or so. Canadian and American investigators also worked on this problem and evolved a slightly different technique, but their method is still based on the recognition of the "genital protuberance."

Essentials for The Work

There are quite a few New Zealanders sexing chicks in this country, and there is enough work for many more. The chief essentials for this work are supple fingers (slender for preference), really good eyesight, and an ability to concentrate for long periods. Many young people are taking up sexing while their sight is still good and their hands are not yet set. The equipment needed is merely a good electric lamp of, say, 300 watts, and a suitable shade to concentrate the light in the desired place. Some sexers use a pair of magnifying anatomical spectacles or a single lens on a stand.

Learning Sexing

Two or three publications on sexing illustrated with diagrams and photographs are obtainable, and persons of average intelligence should not have any difficulty in obtaining a grasp of the required procedure from these books. It is then a case of continual practice, which may become rather expensive, as the chicks need to be killed and opened up for verification as soon as they have been sexed. The beginner will learn more by this method than by rearing the two sexes separately, as by the time the sex of the chicks has become apparent some six weeks later the value of the test will have been lost.

Some of the sexers in this country give tuition in sexing, and this tuition is available at at least one agricultural college. Most sexers will agree that accuracy and speed in sexing are largely influenced by correct methods in holding the chick, and on this point alone practical instruction is of far more value than any amount of theoretical study.

Advantages of Sexing

The biggest advantage from sexing is the saving in the amount of brooder equipment needed to rear any given number of pullets. A farmer might have brooder room for 500 day-old chicks, but by using sexed pullet chicks the same results are obtained as if twice the amount of brooder equipment were used to rear 1000 unsexed chicks. The final result would be the same—about 450 pullets. In other words, the use of sexed day-old chicks will just about double the existing brooder capacity.

Another important point is the saving in the amount of food used. Unwanted cockerels have to be kept

until they are old enough to be picked out with certainty, usually four to eight weeks, and during this time they will consume an appreciable amount of food. This unproductive consumption will be obviated by the use of sexed chicks. Nevertheless, enough unsexed chicks must be kept to ensure a really good choice of future breeding cockerels. The usual procedure is to keep intact the first hatch or one of the early hatches of the season from special pens. At first, quite a few breeders did not realise this necessity and consequently found themselves short of good breeding cockerels.

Disadvantages of Sexing

It is well recognised that the advantages of sexing outweigh the disadvantages. Perhaps the biggest objection is that the hatching programme must be arranged and strictly adhered to in order to suit the convenience of the person sexing the chicks. This sometimes means close co-operation between neighbouring farmers, and in this respect is a blessing in disguise, as the closer the co-operation among poultrymen the stronger will their industry become.

Possibility of Harm Through Sexing

The sexing of day-old chicks will definitely not harm them either for laying purposes or as future breeders, provided it is done by a competent sexer. It is the ovaries which produce the egg, not the vent. Complaints are sometimes received of sexed chicks not rearing too well. Sexing is blamed for this, but the writer is of the opinion that in many cases the trouble was caused by the chicks being chilled at the time of sexing and not by the actual practice.

This chilling can easily occur while the sexer is at work. The chicks are often held in the incubator or in boxes with the lids on until the sexer is ready for them. They are then placed in front of him in open boxes, and it is probably about this time that chilling occurs. The remedy is to have the sexing carried out in a warmed room, which will prevent any tendency of the chicks to chill.

Sexing by External Appearances

Where it is impossible to obtain the services of a chick sexer, it is neces-

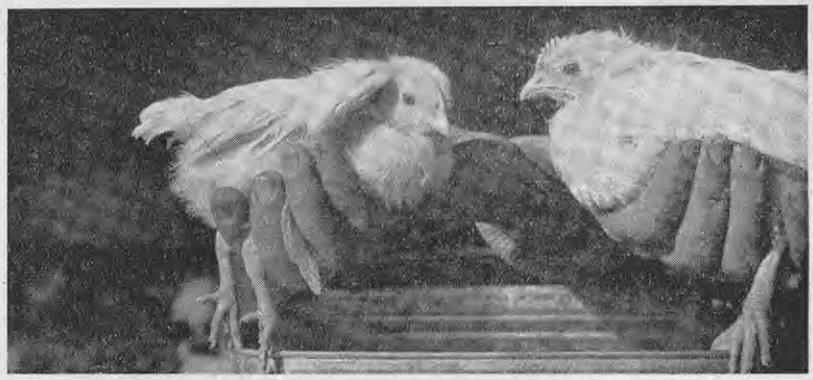


Fig. 1.—The indications of sex in a pullet and a cockerel.
[S. G. Haddon, photo.

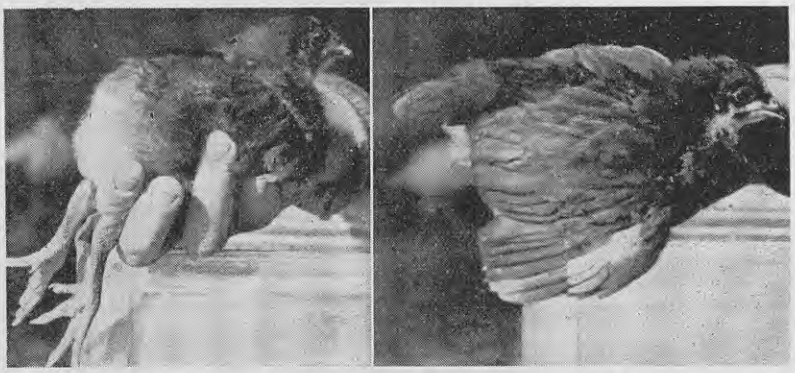
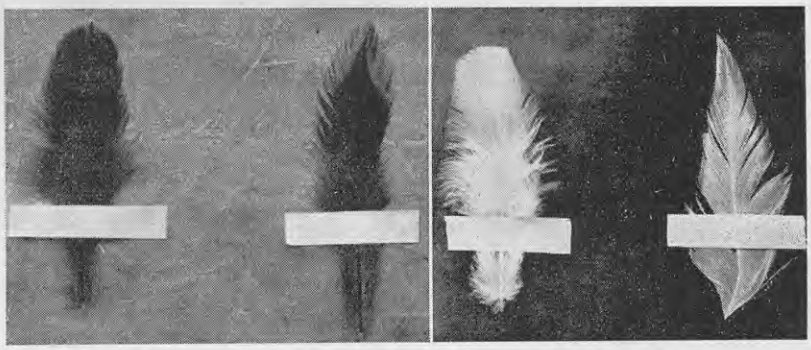


Fig. 2 (left).—A four-weeks-old Black Orpington cockerel. Compare with the pullet of the same age in *Fig. 3* (right).
[S. G. Haddon, photo.



Figs. 4 and 5.—Showing the distinct differences in the hackle feathers of the two sexes.
[S. G. Haddon, photo.

sary to rear both pullets and cockerels until the cockerels have reached an age at which they can be distinguished and removed from the brooders. Unwanted cockerel chicks can easily be distinguished when they are about three to four weeks old. At this stage definite indications of sex begin to show, and it is on these indications that the cockerels are picked out. With Leghorns and most light breeds, the first indication is the rate at which the comb of a cockerel develops. This will often become apparent when the chick is in its third or fourth week, although some birds are quicker than others. At the same time, although not to such a marked degree, the wattles of the male begin to show up.

Fig. 1 demonstrates this point. The cockerel (right) has a definite upstanding comb, with the wattles just beginning to show up. The pullet still has barely more than a line of demarcation where the comb will be. Both the chicks in this photograph are four weeks of age, yet there is no difficulty in differentiating between the two. This difference in the rate of growth of the comb is perhaps the strongest indication of sex in White Leghorns, but it is not the only one. There is also a distinct difference in the rate and order in which the two sexes feather up. Fig. 1 shows a definite feather tail to the pullet, while in the cockerel these tail feathers are absent. This trait is perhaps more prominent in the heavy breeds than in light breeds. Figs. 2 and 3 demonstrate this point more clearly than Fig. 1.

Fig. 2 is a four-weeks-old Black Orpington cockerel. The wattles are beginning to develop, and the comb is already becoming prominent. The most striking feature is the lack of feathers on the back, and particularly the shoulders. Note, also, the entire absence of tail feathers. This lack of feathers contrasts strongly with the strong feather growth of the four-weeks-old pullet shown in Fig. 3. The pullet's comb and wattles are not yet showing up, but its fast rate of feathering is sufficient to mark it out as a pullet. The slow rate of feathering on the shoulders of the cockerel has been remarked and should be emphasised, as this is the surest indication of a cockerel of the heavy breeds. This distinction applies to young drakelets also, and to a lesser degree to cockerels of the light breeds.

General Indications

These are particular indications. Summarising the general indications there is a decided masculine appearance about a cockerel chick which is hard to put into words, but it is apparent in the heavier bone in the legs, in the stronger head of cockerel chicks, and their bigger size when compared with pullets of the same age. It can sometimes be observed in their behaviour, which will often savour of bullying or a tendency to domineer over the other chicks.

It is sometimes difficult to separate the sexes until the chicks are several weeks old, in which case a fresh indication becomes apparent. There is a distinct difference in the hackle feathers of the two sexes, which is demonstrated in Figs. 4 and 5. The cockerel feather (right) is definitely more pointed than the pullet feather, which tends to have a rounded tip. This pointed effect is confined chiefly to the web of the cockerel's feather, while the outer fringe is often rounded at the tip. This fringe is largely absent in the pullet feather, as the inner portion of the web itself is rounded right out to the feather tip, leaving hardly any fringe at all. There will be cases where this difference is not so distinct as in the photographs, but when all the various indications are taken in conjunction with each other, there should be no real difficulty in separating the sexes

Cost of Production of Market Eggs

THE Senior Investigational Officer, Mr. W. R. Paton, of the Investigational and Statistical Section of the Department of Agriculture, has presented some interesting figures relative to the cost of producing market eggs during the 1940-41 season. The costs were obtained from 62 farms on a proportional representation sampling basis for flocks of 250 layers and over. According to the 1936 census, there are approximately 1,000 flocks within this range, of which roughly 500 fall within a group ranging from 250 to 500 layers, and a further 200 fall within a group ranging from 1,000 and over; the remaining 300 fall between these two groups.

Labour cost, as it is very involved, must be decided by negotiation rather than by costing processes. The size of flock is one of the principal factors governing hours of labour, and after excluding any private marketing and transport expenses, the total hours for all other duties have been ascertained as 2,367 hours for a flock of 500 layers; 2,950 for 750; 3,333 for 1,000; 3,687 for 1,250; 3,973 for 1,500; 4.273 for 1,750; and 4,554 for 2,000. Roughly two-thirds of these labour hours are taken up in feeding layers and in collecting and crating eggs, cull fowls, etc. The raising and feeding of replacement stock to laying age accounts for about one-fifth of the total hours of work for the year.

In working out costs per dozen eggs, the farm produced hatching eggs used for raising replacement pullets have been recorded as a charge against production costs, and are therefore not included in arriving at the costs "per dozen eggs."

Subject to the foregoing exceptions, a net production cost of 14.66d. was obtained, being 15.68d. less credits (sales of culls and manure) of 1.02d. The break-up of these costs is 11.90d. for food, grit and milk; 0.29d. for litter, disinfectants and medicines; 0.14d. for repairs and upkeep; 0.21d. for cultivation, seeds, etc. (green feed); 0.46d. for hatching and brooding costs, chick sexing, purchases (if any) of hatching eggs and/or young replacement stock; 0.30d. for sundry items; 0.16d. for rates on poultry land; 1.15d. for depreciation on poultry buildings, plant and equipment; and 1.07d. for interest on poultry enterprise capital.

The preceding paragraph gives the general average, but considerable variations occur between districts. For instance, 16.30d. is the figure for Auckland, 14.89d. for Wellington, 13.52d. for Canterbury, and 12.98d. for Otago. The weighted average for these four sets of figures is, of course, the 14.66d. already mentioned for the Dominion.

Poultry farmers called on by Departmental officers for cost details co-operated wholeheartedly. Much additional information was also obtained from some 180 postal returns, and the time and care which those poultry farmers devoted to detailed compilations warrants commendation.

Federation of Young Farmers' Clubs

Y.F.C. Dinner to Members Going Overseas

A SUCCESSFUL dinner was held recently in the Central Tea Rooms, Pahiatua, under the auspices of the Mangatainoka Club. The function was arranged primarily in honour of members of the local clubs who are going overseas with the armed forces. Mr. J. E. Hewitt, patron of the Mangatainoka Club, presided, and referred to the progress that had been made in the Y.F.C. movement and stressed the need for the coming generation of farmers to keep themselves conversant with every new phase of development in farming. He wished the young men going overseas "Godspeed," and expressed the hope that when they returned they would carry on the good work of the Y.F.C. organisation.

The toast list honoured during the evening was as follows:—Mr. J. E. Hewitt, "The Boys Going Overseas," responded to by Mr. G. Cotter; Mr. H. Bairstow, "The R.S.A.," responded to by Mr. M. A. Lawson, president of the Pahiatua R.S.A.; Mr. S. K. Siddells, "Young Farmers' Clubs," responded to by Mr. Ken Mitchell; Mr. J. Aislabie, "Our Lecturers," responded to by Mr. Carlyon; Mr. Ron Day, "Farmers' Organisations," responded to by Mr. J. H. Bremner, president of the Pahiatua Farmers' Union, and Messrs. F. Anderson and H. Cotter; Mr. Keith Pryde, "Our Patron," responded to by Mr. J. E. Hewitt, and Mr. F. Ward, advisory president of the Mangatainoka Club.

The various toasts and responses provided opportunity for some very interesting and thoughtful material. Mr. G. Cotter, of the Mangatainoka Club, in replying to the toast of "The Boys Going Overseas," stated that those going away would always remember the Y.F.C. Movement for its lectures, field days, and the valuable information so gained. He referred to the increased membership throughout the district in the face of present difficulties. Among other activities he mentioned the support accorded to the many patriotic appeals—appeals to which the clubs had made a ready response.

Mr. M. R. Lawson, replying to the toast of "The R.S.A.," spoke highly of the Y.F.C. Movement as being valuable, not only as a means of imparting practical farming knowledge, but also in a civic capacity. He hoped that the clubs would be able to carry on in order to be of value to the boys when they came back. The R.S.A., he stated, was watching carefully the interests of the young men overseas, and it was necessary that every assistance should be given them when they returned.

Proposing the toast of "Young Farmers' Clubs," Mr. S. K. Siddells mentioned the Ballance Club as being one of the first to be formed in the Dominion, and instanced the very fine work done by Mr. Bremner in this connection. He said that upon the youth of the country would devolve the important tasks after the war, and that every possible training should be carried out. In reply, Mr. Ken Mitchell, of the Woodville Club, referred to the very fine achievement of the Dannevirke Club in raising the sum of over £1,400 for patriotic purposes by means of a stock drive. The Y.F.C. movement was not only valuable from an instructional and educational viewpoint, but also engendered good fellowship among members. He referred to an acquaintance who had remarked that to take an interest in such organisations "cost money"! Mr. Mitchell agreed with this, but stressed the fact that, with the Y.F.C. movement, good value was definitely obtained for money expended.

In proposing the toast "Our Lecturers," Mr. J. Aislabie, of the Mangatainoka Club, expressed thanks to those who had devoted their time to imparting knowledge and giving members the benefit of their own experience. Mr. Carlyon, in replying, stated that so far as he was concerned, it had been a pleasure to lecture to clubs. The Y.F.C. movement provided young men with the opportunity of gaining knowledge in their early years—knowledge that had often only been acquired in mature years by previous generations.

Mr. Ron Day, of Ballance Club, expressed the movement's thanks to "Farmers' Organisations," which toast was replied to by Mr. J. H. Bremner, who referred to the need for establishing short-term scholarships for farm training at Massey and Lincoln Colleges. Mr. F. Anderson, who also replied, spoke highly of the value of the Y.F.C. movement, and on behalf of the Farmers' Union wished "Godspeed" to those members going overseas. Mr. H. Cotter stated that he had been particularly struck with the speeches made by the young farmers present at the function. In his day the young farmers did not have the opportunity to express themselves as they did today—in fact, they did not have the nerve! The Y.F.C. movement permitted the study of collective knowledge gained. He also referred to the very capable and courteous manner in which Y.F.C. members had carried out duties in connection with A. and P. Show exhibits, etc.

The toast of "Our Patron" was proposed by Mr. Keith Pryde, of Mangatainoka Club, and was replied to by Mr. J. E. Hewitt, patron of the Mangatainoka Club. The name of Mr. F. Ward, advisory president, Mangatainoka Y.F.C., was coupled with the toast. In rising to reply, Mr. Ward was greeted with a hearty round of applause, indicating his popularity among the farming community. He added his praise to that of previous speakers for the Y.F.C. organisation.

The arrangements for the dinner were undertaken and carried out by the Mangatainoka Club, and strong support was given by adjacent clubs to this most successful and interesting function.

Wanganui District Junior Debating Competition

A. R. DINGWALL, Instructor in Agriculture, Wanganui.

A CONTEST in the Junior Section of the District Debating Competition was held in St. Andrew's Hall, Marton, on the evening of Thursday, October 9, the teams competing being representatives of the Bulls and Mangaweka Young Farmers' Clubs. The District Secretary presided, and Mr. S. G. Laurenson, Marton, acted as adjudicator, and Mr. S. G. V. Avery as timekeeper.

The teams were as follows:—

Bulls.—W. Bowen (leader), and W. Anderson and P. Anderson.

Mangaweka.—J. Murphy (leader), and D. Murphy and N. Weston.

The subject for debate was: "That the Young Farmer of Today has Greater Opportunities than his Grandfather." The Mangaweka team took the affirmative.

The chairman, in opening the meeting, extended a welcome to members of teams and their supporters, and intimated that the present function was the first of the activities arranged by the District Committee for junior competition only. He pointed out that the District Committee had recently given serious consideration to the need of catering for and fostering the interests of the younger members of Y.F. clubs, more especially at the present time, when the maintenance of club membership largely depended upon the support given by and the enthusiasm of the younger members.

Credit to Juniors

The debate was opened strongly and confidently by the leader of the affirmative, and his opening address replied to as confidently by the leader of the negative. Thereafter it was soon apparent that, contrary to what might have been expected in view of the difficulty experienced by most clubs in getting junior members to participate in activities that involve speaking before an audience, the juniors were not lacking in confidence, and were out to acquit themselves in no uncertain manner. Poor old grandfather must have been subjected to a pretty tough and unenviable time in the "good old days," according to the convincing arguments put forward by the affirmative speakers, and his opportunities appeared to have been conspicuous by their absence.

However, those speakers in support of the negative of the subject were quick to his aid in pointing out the delinquencies of these modern times in comparison with those of a generation or so ago, and in stoutly maintaining that the rosy picture of modern opportunities as portrayed by the opposition was not all that it might have been in comparison with those of earlier times. In fact, it would almost seem that grandad must have had a particularly care-free and prosperous, if not exactly hectic, time with his firestick by which he set his little world alight, and by his freedom from all the cares and woes that have followed in the train of so-called amenities of modern life. Further, in vindication of grandfather's honour, it was adroitly pointed out by one speaker for the negative that "forty" rhymes more aptly than "ninety" with "naughty."

However, despite all that the advocates of grandfather's time had to say, the supporters of the present era and its opportunities were not to be outdone, and they proved sufficiently convincing to carry off the honours of a very closely contested and interesting debate by the narrow margin of two points. The judge's final summing up accorded a win to the affirmative (Mangaweka team) by 326 points to the 324 points scored by its opponents (Bulls team).

Judge's Comments

In his very constructive comments and criticism of the debate given after the announcement of the results, Mr. Laurenson congratulated both teams on their manner of debating, and expressed pleasure in finding that the juniors had evidenced a good deal more confidence than had been expected. Both teams had made a good all-round approach to the subject, and had shown equally good teamwork throughout. There had been a little hesitancy on the part of one or two speakers, and both leaders had failed to pay sufficient attention to the point of adequately summarising the arguments in favour of their respective sides of the debate when making their closing addresses, though their criticisms of opponents' arguments had been quite good. The judge concluded by giving some useful guidance on some of the finer points of debating.

The chairman congratulated the members of both teams upon the confident, able, and interesting manner in which they participated in the evening's event, and expressed the opinion that the standard of debating shown was little, if at all, below that of the recently-held Senior Section finals, on which occasion the judges concerned had both commented most favourably upon the standard shown. On behalf of the District Committee and the teams and other Y.F. club members present, he conveyed thanks

Roll of Honour

It is intended to compile a Y.F.C. Roll of Honour, to be published in the "Journal of Agriculture," commencing with the December issue, with additions appearing at regular intervals.

It is desirable that the Roll should be a complete record, as far as possible, and to that end Club Secretaries are requested to send in at an early date particulars relating to members who are already serving overseas, or are in active training for any of the fighting services. Details and particulars should be given as fully as possible; Regimental Number, Rank, Division, Unit, etc. Should be included. It should also be stated if a member has been "killed in action," "wounded," died of wounds," or is a "prisoner of war," or "missing." Any decorations or promotions should also be detailed.

The fullest co-operation of clubs is solicited in the compiling of this Roll of Honour, and it would be appreciated if the information is sent to me as soon as possible. Further information should be forwarded from time to time as it is available.

S. FREEMAN.
Organising Secretary.

to Mr. Laurenson for his very much-appreciated assistance in acting as adjudicator and for the very able and constructive criticism given in his summing up of the evening's event. Thanks were also conveyed to Mr. S. G. V. Avery for his assistance as time-keeper.

Cup Presented

In presenting to Mr. J. Murphy, leader of the Mangaweka team, the cup trophy, kindly donated by Mr. J. Bartosh, Taihape, the chairman congratulated the team upon its success. Mr. Murphy, in reply, thanked the chairman for his comments and congratulated the Bulls team for the very strong opposition which it had afforded, and thanked its members for the very friendly spirit in which they had conducted their side of the debate. He also expressed thanks to Mr. Laurenson for his very informative summary of the debate.

Mr. W. Bowen, leader of the Bulls team, added his team's congratulations to the Mangaweka team on its win and the friendly and interesting manner in which it had contested the evening's debate, and wished the team further success in the future. He also thanked the judge for his summary and constructive criticism of the contest.

Mr. P. J. Murphy, Senior, of Mangaweka, also congratulated the Bulls team upon the very stout effort made, and endorsed the previous speakers' remarks in praise of Mr. Laurenson's able adjudication of the contest.

Canterbury Council Stock Judging Competition

THE Canterbury Council Stock Judging Competition took place at Winchester recently, and was well supported, seventy-seven members from various clubs throughout Canterbury taking part. Judging was carried out in six classes:—Romneys, Southdown and Corriedale sheep, Ayrshire cattle, beef cattle, and pigs.

At the conclusion of the judging interesting talks were given by Professors E. R. Hudson and C. P. McMeekin, of Lincoln College, dealing with the breeding and care of stock. Messrs. McBride Bros., of Winchester, addressed members on Shorthorn cattle and the qualities desirable in this breed.

The results of the judging were as follow:—

Romneys.—J. Tait (Hinds), 1; G. D. Crossman (Milford), 2; H. Bennett (Ashburton), 3.

Southdowns.—G. H. Worner (Geraldine), 1; S. F. Jackson (Pleasant Point), 2; R. M. Fechney (Darfield), 3.

Corriedales.—N. E. Palmer (Milford) and E. J. Crossman (Milford) (equal), 1; G. D. Tait (Hinds) and N. Reid (equal), 3.

Ayrshires.—N. E. Palmer (Milford), 1; L. P. McLaughlan (Darfield), 2; M. Crawford (Cannington), 3.

Pigs.—J. Tait (Hinds), 1; G. D. Tait (Hinds), 2; P. Temple (Geraldine), 3.

Beef Cattle.—E. J. Crossman (Milford), 1; G. D. Crossman (Milford), 2; N. E Palmer (Milford), 3.

Aggregate Points.—E. J. Crossman (Milford), 744 points, 1; N. E. Palmer (Milford) and G. D. Tait (Hinds), 727 points, 2.

The awards were announced by Mr. A. Talbot, chairman of the Canterbury Council, and also chairman of the South Canterbury District Committee, which body was responsible for the general arrangements and successful carrying out of the activity. Much of the success of the undertaking can be ascribed to the District Secretary, Mr. C. C. Leitch, and to the work of a committee comprising members of the Milford, Geraldine, and Pleasant Point Clubs. Stock for judging was kindly provided by Messrs. A. Bisdee, T. Lyon, T. McGregor, S. Muff, H. Palmer, and the McBride Bros.

Catering was carried out by members of the Winchester Sub-Centre of the Red Cross Society, under the direction of the president, Mrs. Stone-Wigg, and resulted in a very satisfactory sum being raised for local Red Cross funds.

Plantations for Farm Shelter

(Compiled by the Cardiff Young Farmers' Club.)

PLANTATIONS on a farm are extremely valuable as shelter and timber, and they are necessary for the adequate protection of stock and pastures. The ill-effects of cold winds in the early spring are greatly offset by shelter, while the saving of soil moisture in the drier districts is considerable. Well-sheltered stock require less food for body maintenance, and hence are able to produce more from the available feed, while for lambing ewes shelter is almost a necessity. In warm weather, shade is a valuable adjunct to successful farming. Cows milk better, lambs reach maturity earlier, and pigs thrive well when ample shade is provided.

The cost of posts and battens is rising, and an ample supply can be grown in waste corners of the farm, or suitable varieties may be incorporated in the windbreaks for future use. The smaller limbs have a value as firewood, a decreasing commodity.

Adequate planting improves the appearance of a farm and its value. In Central Taranaki, especially, where cold mountain winds alternate with hot sunny days, every farmer should plant shade, shelter, and timber plantations.

Varieties to Plant

No hard and fast rule can be laid down about the varieties of trees to plant for shelter. A farmer should decide upon a plan for planting, and find out which trees are suitable for his purpose, either by observing the varieties which do well in his district or by consulting any good nurseryman or the Department of Agriculture's fields officer, who will be glad to give advice.

Climate, elevation, soil conditions, prevailing winds, and distance from the coast must all be considered, and a type of tree should be bought suitable for the object, such as windbreaks, or hedges, or timber production. For example, in Taranaki for subdivision hedges African boxthorn makes a good hedge in coastal regions, and barberry (either common or seedless) further inland. Boxthorn grows rapidly, and makes a strong, thorny, stock-proof fence, resistant to salt winds. It must be kept well trimmed, however, or it will spread rapidly, and care must be taken to burn all trimmings so as not to injure the feet of cattle.

For small ornamental hedges around the homestead, escallonia and eleagnus are excellent if kept trimmed, but stock must be kept away from these varieties or the hedges will be eaten. Lawsoniana is probably the best hedge plant for Central Taranaki conditions, but unfortunately, it requires double fencing, and this considerably increases the cost of establishment and maintenance, whereas the other varieties mentioned (boxthorn and barberry) actually protect and lengthen the life of a fence. Lawsoniana may also be used in a windbreak with rows of macrocarpa and pines to the windward. Some farmers prefer to use one or more of the eucalypts (macarthuri or eugenioides) instead of pinus insignis; later on, they use the timber for posts and firewood.

Windbreaks

For windbreaks, a single row planting cannot be recommended, as this type of shelter opens up at ground level and causes draughts. An authority has quoted the following as a first-class belt to arrest bad winds:—Two rows of pinus muricata planted 4 ft. apart each way on the windward side; two rows of pinus radiata, 6 ft. apart each way; one inner row of Cupressus Lawsoniana or Cupressus Benthami, according to soil, planted 12 ft. from the radiata and 3 ft. apart in the row, and kept trimmed. The pinus radiata, being of quickest growth, soon reaches a fair height, and should be topped at 20 ft. Attention should be given to topping every second year thereafter. For coastal districts subject to salt spray, one or two rows of pinus pinaster should be added to the seaward side.

In districts not affected with salt sprays, a cheaper and quite effective windbreak may be obtained by planting a row of macrocarpa with a hedge of barberry 15 ft. away on the eastern side, but it is necessary to trim the macrocapra branches so that they do not shade the barberry; otherwise it will become thin and weak, and useless as a draught-arrester.

In very wet situations the Lombardy poplar can be used to make an effective windbreak. Plant four rows, allowing 4 ft. between the rows and 4 ft. between the plants or cuttings. When the trees have attained a height of 15 ft. cut down one of the outside rows, and the following year, cut down the other outside row. If this is done in the early spring, a dense undergrowth will result during the following summer, and thus provide an impenetrable wind barrier. The poplar may also be grown in semi-dry areas with a deep, loose soil.

(To be continued.)

New Club Formed

A NEW club has been formed in the Te Kuiti district, and will be known as the Paewhenua Young Farmers' Club. The club officials are as follow:—Advisory president, Mr. P. D. Crowley; chairman, C. D. Dean; deputy chairman, W. Mexted; secretary, W. N. Oakden; treasurer, W. Dean. Much of the credit for the formation of this club is due to the energy and enthusiasm of members of the Otorohanga Club, members of which attended the initial meeting.

The Paewhenua Club is starting off in a modest way with ten members, but with the support of the Otorohanga Club and the assistance of local farmers and others interested, it is expected that the new club will be able to do good work even in these difficult times. It is certain that Y.F.C. members throughout the Dominion will wish the new club every success.

FOUND.

After the inter-district debate at Ashburton: 1 fountain pen. Owner may obtain same by applying to Mr. S. Watson, Hon. Secretary, Ashburton Y.F.C., Wakanui, Ashburton.

Among the Clubs: Reports on Activities

EASTERN SOUTHLAND.

Five Rivers.—Talk by Mr. T. Elder, Inspector of Stock, entitled "The Stock Act Explained."

Otama.—Talk by Mr. A. Dickie on "The Winter Feeding of Stock when the Root Crop is a Failure."

SOUTH OTAGO.

Clinton.—Mr. J. G. Richards, Department of Agriculture, addressed the meeting on the Y.F.C. Experimental Scheme; two members undertook to carry out trials.

Clutha Valley.—Impromptu speeches by club members.

Lawrence.—Film exhibited by Mr. J. G. Richards, Department of Agriculture, including "The Blitz of London" and "The Linen Flax Industry."

Warepa.—Talk by Mr. W. F. Ashman, a club member, on "First Aid to the Unconscious." The speaker dealt with various types of unconsciousness and the suitable remedies.

CENTRAL OTAGO.

Upper Clutha.—Field day on the A. and P. Showgrounds. Stock were judged and demonstrations given as follows:—Horses (Mr. W. Scaife), hoggets (Mr. J. Morrow), Southdown ram (Mr. T. Lynch), Shorthorn bull (Mr. W. Studholme), and seeds (Mr. G. G. Calder).

DUNEDIN.

West Taieri.—Messrs. C. Cameron and J. Anderson addressed the meeting on "Angling"; the speakers described the different kinds of rods and reels, and the numerous varieties of bait and tackle.

NORTH OTAGO.

Enfield.—Talks by all members present on selected subjects.

SOUTH CANTERBURY.

Arno.—Address by Rev. A. H. Acheson, "Farm, Factory, and New Zealand's Future." At the previous meeting a talk on "Road Regulations" was given by Traffic Inspector D. McKay.

Geraldine.—Business in connection with stock-judging competitions to be held shortly. Short talks on farm topics by members present.

Milford.—Business relative to stock-judging competition. Lecture on "Pruning and Spraying" by Mr. A. Ward, Department of Agriculture.

MID-CANTERBURY.

Ashburton.—Report by R. Copland of the recent annual general meeting of the Federation at Hamilton. Report on the District Committee meeting by S. Watson. Interesting talk by L. Driscoll, illustrating the value of irrigation on his farm; mangolds, in particular, were three to four times as large as those not irrigated. Short impromptu speeches by S. Watson ("Preparation of the Wool Clip"), B. Lambie ("Linen Flax in Belgium"), and I. Watson ("Flax").

Hinds.—Impromptu speeches by members to be given at the next meeting, to decide the holder of the cup donated by Mr. B. J. Simmons. The sum of £25 raised by the club for patriotic purposes. Report by Mr. H. L. Chisnall, advisory president, on the recent annual general meeting at Hamilton.

Methven.—Team selected and other arrangements made in connection with the Canterbury Council's stock judging competitions at Winchester. Presentation to G. Macale, a member recently married. Talk by Mr. H. Garrett on "The Work of Lincoln College," illustrated by films depicting activities at the college.

CHRISTCHURCH.

Ellesmere.—Short talk by the local Postmaster on "National Savings." Lecture on "Sheep Dips" by Mr. Bruce McLeod, of Lincoln College.

Springston.—Social evening.

NORTH CANTERBURY.

Amuri.—Deputy chairman elected for remainder of year. Arrangements for next meeting. Short talks by club members.

Cust.—Amount of £6 donated to Red Cross Society. A ping-pong tournament was held.

Scargill-Omihi.—Films exhibited by Dr. C. P. McMeekan dealing with Great Britain, Europe, and South America. There was a good attendance, 20 members being present (out of a membership of 27) together with 12 members of the Farmers' Union.

MARLBOROUGH.

Blenheim.—Letter of sympathy to be sent to G. Millard on the death of his mother. Discussion re debate with Seddon Club. Address by Captain Noble Campbell; the speaker reviewed the Royal Air Force of the last World War, and dealt with trials and experiments leading up to the growth of various types of aircraft.

Flaxbourne.—Films depicting "Farm Machinery" exhibited by Mr. G. G. Cuddon. At the previous meeting an address on "Ante Partum Paralysis and Bearing Trouble in Ewes" was given by Mr. G. D. Shand, Inspector of Stock.

Seddon.—Recent activities included a social evening, and meetings at which addresses were given as follows:—"Cable and Telephone System" (Mr. G. Gamble); "Linen Flax" (Messrs. Buick and D. R. Wilkie); "How to Conduct a Meeting" (Mr. Lochart); "Petrol Engines" (Mr. R. Stretch); "Wool, Preparation for Markets, etc." (Mr. Holdsworth); an exhibition of films was given at the last meeting by Mr. G. Cuddon.

NELSON.

Moutere.—Three members to act as junior stewards at Motueka A. and P. Show: G. Kemp (Jersey cows); T. Beuke (sheep); and J. Drummond (pigs). New member elected. Debate with the Dovedale Club, the subject being "That Farmyard Manures are Superior to Artificial Manures." The Dovedale team, led by W. Kenyon, took the affirmative, the Moutere team being led by C. Heine. Mr. Dowd acted as adjudicator, and gave his decision in favour of the affirmative.

MANAWATU.

Apiti.—Appointment of a new committee member in place of P. Galyer, who has gone overseas. Arrangements for a field day and the laying down of experimental plots. Talk by Mr. G. Watkins on "Flavours and Grading of Cream."

Feilding.—Reports of meetings in connection with forthcoming Y.F.C. Show. Raffle in aid of club finance and activities realised £20; the dinner set was won by R. Beazer. Lecture by Mr. A. M. Lascelles on "America."

Rongotea.—New member elected. Letter read from member overseas. Invitation received for two members to attend the W.D.F.U. birthday anniversary. Delegates to be sent to Feilding Y.F.C. Show Committee meeting. Next club meeting to be a Parents' and Friends' Evening. Mr. L. H. Yarrall, Rongotea, gave an interesting talk on his personal experiences and observations while resident in North America, using a large-scale map; he also dealt with Y.F.C. activities there since the inception of the organisation in 1914.

Waituna.—Delegates elected to attend the Feilding Y.F.C. Show Committee and the Feilding A. and P. Committee meetings. Arrangements for next meeting. Lecture by Mr. J. Stewart on "Trees for Timber and Shelter Purposes"; the speaker dealt with the raising of trees from seed, methods of establishing and plantation and the types of trees suited to the district.

Whakarongo.—W. Berry, a member overseas, reported missing; decided to send him a parcel if he is later reported a prisoner of war. Mr. G. Cameron (Reid and Gray, Ltd.) exhibited films dealing with "Farm Machinery."

WANGANUI.

Mangaweka.—General business and junior debating practice.

NORTH TARANAKI.

Mangorei.—Arrangements for next meeting. Club debate, "Cheese and Butter"; this was evenly contested and resulted in a draw.

SOUTHERN HAWKE'S BAY.

Woodville.—Debating team selected, consisting of A. Campton, A. Arrow, J. Christian, and A. Curry. Lecture by Mr. Blatchford on "Sheep Control."

CENTRAL HAWKE'S BAY.

Onga Onga.—Ten members journeyed to Takapau to attend a combined meeting of Y.F.C. and Farmers' Union members, at which Mr. J. W. Palmer, District Secretary, exhibited some interesting sound films on various subjects, including the "Growing of Linen Flax."

POVERTY BAY.

Gisborne.—Selection of stewards for forthcoming shearing competition. Arrangements for dance. Eight new members elected. Talk by

Mr. G. F. Barnwell on "The Dutch East Indies."

TE KUITI.

Mokauiti.—General business. Short talks by all members present.

WESTERN BAY OF PLENTY.

Paengaroa.—General business. Short talks by seven junior members; part of a series of talks to be given by all members, in a contest for a trophy presented by Mr. Cawte for the most improved speaker in the club. At the previous meeting arrangement was made for the annual dance, and also for the first debate between Eastern and Western Bay of Plenty teams. A lantern lecture was given by Mr. A. V. Allo, Department of Agriculture, on "Ensilage and its Benefits as a Winter Feed for Livestock."

Te Puke.—Practice debate for final of Bay of Plenty debating contest. The Te Puke team were later successful in this contest against a team from the Waimana Club, the team being P. Nichol, L. Ashe, D. Galdwell; the Dominion President, Mr. D. S. Ross, presented the shield to the winning team.

Te Puna.—Travel talk by Mr. Nottage, dealing with voyages to the Cook Islands. At the previous meeting arrangements were made to join with the Women's Auxiliary in running a dance for patriotic purposes. Members each brought a written question dealing with some farming matter; keen discussion resulted.

EASTERN BAY OF PLENTY.

Edgecumbe.—Arrangements for presentation to Mr. C. R. Taylor, District Secretary, who is being transferred to Rotorua. Impromptu speeches by all members present; subjects drawn from hat.

AUCKLAND.

Harrisville.—Election of new members. Talk by Mr. W. E. Longath on "Farming Experience and Impressions in U.S.A." At the previous meeting a report was given on a recent card party, which showed a profit of £3 13s 6d. Discussion on field day. Talk by Mr. Patterson on "Soil Erosion and Manure Distribution"; general discussion followed.

Hunua.—Talk by Mr. I. Sexton on "Amateur Radio Transmission."

Mauku.—Report on dance, profits amounting to £11 to be handed to Red Cross Society. Donation of £1 1s to Mauku School Calf Club. Talk by Mr. A. Jenkins on "Udder Complaints and Remedies."

WAIKATO.

Kakepuku.—Election of new members. Arrangements for annual dance. Cup donated by Mr. T. Rushbrooke for calf-rearing competition. Address by Mr. G. Melrose, Inspector of Stock, on "Stock Ailments."

Te Awamutu.—Debate between three club members and three young ladies, the subject being "That it is not in the best Interests of the Community for Women to enter Social or Political Life." The ladies won the debate by a comfortable margin. Dance held to welcome home two club members returned from overseas, Cyril Eyre and Les Lawry. A field day was held on Mr. C. Bones' farm at Kaipaki. Mr. Bones gave a demonstration of artificial insemination; he pointed out that its greatest value was that up to 1,000 picked cows could be fertilised by one proven sire in a season. Members also inspected Mr. Bones' modern piggery.

WARKWORTH.

Kaukapakapa.—Five new members enrolled. Exhibition of sound films by Mr. J. M. Smith, Department of Agriculture. A field day was held on the property of Messrs. Berr Bros.; demonstrations and addresses included "Pampas Grass Species" (Mr. P. S. Syme, Department of Agriculture), "Shelter and Laying Down of Pasture" (Mr. J. Berr), and "Sheep-shearing and Skirting of Wool" (Mr. J. Berr).

Health Notes for the Farm

Electricity Has Some Bad Habits

Contributed by the
HEALTH DEPARTMENT

STRANGE and painful things are liable to happen when you least expect them. Many a time the handy-man-around-the-house wished he had not been so handy when he's been pulled up short with an electrical shock. It may simply have been carelessness, of course, but, on the other hand, it might have been because he just didn't know quite enough about it.

Even from a simple household appliance an electric shock is no joke, and in certain circumstances it can be fatal. With the multiplicity of electrical gadgets in the home these days, particularly the country home, the risk has increased accordingly. If anything goes wrong, leave it to the power board officials or other experts. Don't try to fix it yourself. Treat electricity with the respect it deserves.

Above all, don't handle anything electrical with wet hands, or while standing in the wet. Frequently, fatal accidents have been caused in the bathroom because a person has tried to switch on a plug while standing in the bath or on the wet floor. Never try to switch on the bathroom light while your other hand is on the tap.

Similarly, in the kitchen. Never turn on the tap with one hand and switch on the electric stove, or the jug, or anything else that switches on, with the other hand at the same time. Even if everything looks all right, there may be a tiny leak of current somewhere. And a tiny leak is enough.

Keep Away From Power Lines

Outside, there is danger also, mainly to children. They should be taught to keep away from power lines. For instance, the pleasant and innocent little diversion of flying a kite might not be so pleasant and innocent if the kite happens to be near a power line. The string might get entangled with the power line, it might even touch it only for an instant, and, if the string is wet, or damp, the small person holding the string might suffer death or grievous injury.

Children should never climb a power pole or a tower. The pole may have become highly charged.

The mischievous habit of trying to break insulators is inexcusable. A broken insulator might not cause only a pole to become dangerously electrified, but it might easily cause a live high-voltage wire to fall to the ground.

The cause of death in many cases of electrocution is paralysis of the nerve centre which controls breathing. If the heart has not been directly affected by the current, artificial respiration applied by the well-known Schafer's method often restores natural breathing. This allows the still-circulating blood to be aerated in the lungs. Full details of this treatment are given in pamphlet No. H-3 issued by the Health Department.

Treatment for Electrocution

The first thing to do in the case of electrocution is to free the victim from the electric contact. The longer the contact the more liability there is to fatal injury. Knock the electric wire away with a dry stick or a dry coat.

If the patient has to be handled, do so with rubber gloves, or, if these are not available, improvise with a rubber tobacco pouch, golosh, or hot-water bag. Avoid touching the armpits, which may be moist with perspiration. A loop of dry rope, or a dry woollen garment, may be used.

Note the emphasis on the word dry. On no account touch anything damp or made of metal.

Having released the patient and placed him face downwards in a warm, dry place, artificial respiration can start. The paralysis of the nerves may last for some considerable time, and treatment sometimes must continue for hours. Keep the body warm, and don't discontinue your efforts until it is absolutely certain that the heart has ceased beating.

In the meantime, of course, send for medical help.

APIARY NOTES.—Continued from page 438.

It is surprising how few beekeepers know when and how to use the smoker correctly.

At the entrance to a hive guards are stationed to protect the colony from robbers of their kind, and when a beekeeper opens a hive he, too, is subject to attack if the guard bees are not forced back into the hive by a gentle puff of smoke from a bee-smoker, which also quietens the bees within the hive. Where a gentle strain of bee is kept very little smoke applied in this manner is usually sufficient, provided further light puffs are wafted over the tops of the frames while the lid and mat covering are being removed, and also an occasional puff directed at any bees which appear to be moving upwards over the top bars from the combs below. This will cause the bees to retire between the combs while the work of examining the hive continues. A little cool smoke is also useful in gently driving the bees from the ends of the frames in order that they may be placed down without crushing any bees, which would excite other bees to sting.

Where smoke is roughly poured down between the combs, the bees will rush madly about in utter confusion and cluster in heaps along the side of the hive and under the alighting board. Such treatment disorganises the work of the colony for a considerable time, and makes the bees angry for days afterwards. Every motion while manipulating the combs and bees should be smooth and deliberate, with as little jarring of the hive parts as possible.

The ideal smoker fuel is one which burns very slowly and will not readily go out. Dry, clean, weather-worn sacking is best for these requirements, and, if rolled so that it fits neatly and fairly tightly, gives off a cool, clean smoke when the bellows of the smoker are not worked too vigorously.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

THE Good Neighbour

BY MARY

From Me To You

FOR days past I have been searching my dictionary, seeking one word—the word which I think is the most inspiring to us in these days of strife and worry. And I have found it at last! I wonder if you will agree with me in my choice. For, to me, the most inspiring word I can tell you of today is "hope."

Hope—it is a beautiful word. Say it aloud, and it rings in your ears like a carillon of bells pealing in the darkness. Today many of us are living on the strength given to us by that one small word. We all have our hopes, but today I think our hopes are all united in the one great hope—Victory! And with victory will come the return to us of our many loved ones. It is many years now since the poet Pope wrote, "Hope springs eternal in the human breast," but he knew human nature, and human nature does not alter. Hope still springs eternal, and it is a beautiful quality, like faith and charity, and it enriches our spirit, and endows us with unfailing optimism. As long as there is hope in our heart, there is life in our body —when hope dies, then we die too.

Never let your hope die. On the contrary, I think it is often the evergreen qualities of hope that keep us alive, keep us and help us in our striving towards those things we desire so much. Do you remember the last line of that great book, "The Count of Monte Cristo?" Valentine was speaking, and he said, "Has not the count just told us that all human wisdom is summed up in two words, 'Wait and hope'?"

Now, as then, I think hope is the essence of our existence — in our hoping we lose our fears, and all our joys will come true when our hopes are realised.

But you may know other words as inspiring. A search through your dictionary will probably reveal other words which will imbue us with the same spirit of confidence and optimism. Do write and tell me what you find.

Mary

Mary's "At Home"

IN our fowlhouse there are several cats, who live all the time with the fowls, and never touch the hens. During the winter when I was feeding the hens with hot cooked oats I noticed that one of the cats was eating the wheat. She seemed to prefer that to the scraps of meat, etc. Since then I have noticed that she has been eating the wheat, even when it has not been cooked. She has a fine, glossy coat, too, so I wonder if she knows of the vitamins in the wheat?—**M. Cowie, Winton.**

I DO enjoy your "At Home." It is comforting to read of other country women facing up to the same difficulties and problems as I do myself. One is apt to forget at times that others struggle on, cheerfully bringing up a young family, managing a home, and other outdoor jobs. It is quite bracing to read of how light some of your contributors make of their difficulties.—**J. McLagan, Maraekakaho.**

TO my mind a successful marriage is experienced only when there is no one in the world to take your husband's place, and vice versa. Real happiness is enjoyed when he is the only worthwhile person. Then give-and-take, and other things, come naturally and beautifully to each other.—**E.C., Edendale.**

IT has just put the finishing touch to the "Journal" to have pages for us to share. It is interesting to learn the other woman's point of view; it broadens our all too narrow horizons. It is the little things that make all the difference between existing and living: the kindly word, the cheery smile. Do you know a little poem which ends: "A few more flowers as we go through life, and fewer on graves at the end of strife"?—**Maire, Hokianga.**

I HAVE some ducklings just hatched —rather late, I'm afraid, but what can we do when we have to await the hen's pleasure? They are really silly old things to sit there for three or four weeks. I wonder what they think about in all that time—or do they think at all?—**Mary Ann, Bell Block.**

I DON'T seem to be able to squeeze in time to write to you very often —I think it is the garden's fault. It has been a glorious spring—so many flowers, after a winter with not one thing to pick. I simply can't stay inside these days, so with my four

WHEN THE SANDS OF THE DESERT GROW COLD...

On active service! . . . that is where the Onehunga Blankets are to-day . . . protecting our soldiers, sailors and airmen at home and overseas. If you have any difficulty in buying Onehunga Blankets remember that the need of the fighting forces is greater. At the moment the Onehunga mills are weaving for defence, but in common with the rest of our countrymen we hope that the day will soon come when Onehunga will take its place again as a "household" word.

ONEHUNGA *Blankets*

ONEHUNGA TRAVEL RUGS ★ AIR CELL BLANKETS ★ ONEHUNGA WOOLLENS

wriggly little people to sew and mend for I just don't write.—**Mary Marie, Halcombe.**

IN between our nursing, we have been having fun sightseeing—we went to the bazaar, which was an amazing place, narrow, winding street packed closely with dozens and dozens of shops, with the greatest variety of wares you could ever wish to see. We had a splendid guide the day we went, and he took us into all sorts of places. We have been to the Pyramids of Gehizah, and the Sphinx. There we saw excavated tombs and other things that I have read so much about—but to see them myself! I didn't ride on a camel, which I should have done —there were dozens out there in gay and colourful trappings. But I have ridden on a donkey, in native boats, in trains, trams, taxis (you've no idea what a taxi driven by a native is like —it has a horn you wouldn't be seen within a mile of in New Zealand, and is driven on the opposite side of the road from what we are used to), in army cars, transports, ambulances, private cars, and, not least, in garis—funny little vehicles with a hood (up or down) drawn by horses. I like riding in these better than anything. We went to church on Sunday evening—the Empire's soldiers and sisters were all represented. It was great to see so many people from so many parts of the world all gathered together to worship.—**Sister Goody, Middle East Forces.**

TWICE recently I have been the ungrateful recipient of gifts, one a smart hat, and the other two lovely bowls which were given to me at a birthday party. Yes, I know it sounds incredible to be ungrateful for a new hat! My family have always taught me that it is wrong to deny the giver the joy of giving, but it seems to me that people, in certain circumstances, should think first of the comfort of their own dependants.

One gift was from a young mother with a very delicate child. I nursed this girl through a short but severe illness, which might have ended fatally, so that I was more than repaid for any time and labour I had expended when my patient was up and about again. But the mother had to spend money and energy to give the party for me, and quite honestly I couldn't enjoy it knowing that her child needed specialist care. The other giver, an elderly woman drawing a meagre pension, and one who needs medicine and warm woollies these nippy days, was very thrilled when she handed me the hatbag. In my usual tactless and impulsive way I raged and growled until I saw the look on her face, and the tears in her eyes as she faltered: "I'm sorry; I thought you'd like it." And then, of course, I felt like a criminal.

Flowers that bloom in the spring make gay the unbleached muslin frock worn by Kay Harris, who plays for Columbia. The full skirt is set with a red and blue solid colour band above the hemline, and the large pockets drop from a tie on the sash. Her sunbonnet is lined in blue muslin.

But knowing that both these people have had to deny themselves warm clothes and essential medicines, how can I really enjoy these gifts? A handkerchief, or a bunch of flowers, would have amply conveyed their thanks to me, and I could have enjoyed these gifts with a clear conscience. My friends tell me I am ungrateful and too fussy. What do you think?—**Huia, Pukekohe.**

WE have had a very severe winter, with very little rain, but plenty of hard frosts. But last week great, grey clouds loomed in the sky, and the heavens opened. Today there is an even worse flood. My home being in a valley, one sees the tiny creeks swell into raging torrents. The creek that passes through our lawn has overflowed its banks, and alas for the shrubbery, the lawns, and flower beds! Wild waters are swirling round the motor garage and bridge. It is really fascinating to watch, if only one could keep out of mind the damage the flood waters are doing. Even Monday's washing is waving madly in the wind, while the horses and cattle stand meekly by in the paddocks, heads down, seeking what little shelter they can find from the elements of the storm. The dogs and cats have long since found cosy nests to snuggle into. The hens keep to their house, but look so forlorn, as they do not like the wet. The birds have ceased their joyous singing, but the ducks and geese are in seventh heaven, and enjoying the flood to the full!—**Peggy, Pleasant Point.**

. . . How Does Your Garden Grow?

YOU all seem to have enjoyed our new feature last month—so much indeed that we are going to have it for you every month. That will be something for you to look forward to, Garden Lovers. And I know you will be interested to learn that these garden articles are written specially for you by Mr. Wm. C. Hyde, Horticulturist, Department of Agriculture, Wellington. And everything he says is right—so out with your spades, and do as he tells you.

WITH planting completed, maintenance will be the chief concern during this month—weeding and thinning seedling crops when the ground is moist after rain; hoeing and cultivation in dry, bright weather to destroy weeds too small to pull, and to maintain that shallow mulch of cultivated surface soil which is so invigorating to the young plants. In dry districts, and localities with sharp drainage, a light mulch of fermented organic material will assist in retaining moisture and feeding the young crop; it generally takes the form of lawn mowings or decayed stable manure graded down by passing it through a sieve.

Rhododendrons and azaleas now make new growth on which they set flower buds for the coming season. It will greatly assist the younger and less vigorous varieties if the seed pods of the blossom just passed are removed so that energies are concentrated on desirable development.

Climbing and rambler roses will be sending up strong young shoots from the base. Tie in carefully such as are required for replacements later in the pruning season, and stop back the weaker growths. The tender tops are favoured feeding grounds for teeming colonies of aphides, and if the plants are to do their best these aphides must be destroyed. A weekly application in the evening of a fine, misty spray composed of tobacco extract stirred into soapy water is most effective. A popular extract is known as nicotine sulphate; mix a teaspoonful to two gallons of soapy water, or a strong soap solution alone will often do good work in controlling this persistent pest.

Along hedge bottoms and in odd corners about the farm homestead rough grass and weeds are now coming into flower. It may sound like a "counsel of perfection" to suggest these areas should be cut down short with a weed scythe or sickle, but it will have the effect of facilitating transport and controlling weeds and insect pests, including some of the worst diseases of crops—many of the virus class, for instance. One good cut each year at this stage of growth will practically control this dangerous source of infection. Stacked on the compost heap and fermented with farm manure, this rough growth often makes a considerable contribution to that very valuable supply.

We cannot escape from our human nature, but the attraction of the garden for many is the close insight it affords to the lives of the inhabitants of the vegetable, animal, and mineral kingdoms: its wonderful comedies and tragedies, successes and failures. From the experience, one acquires a knowledge of those principles that are fundamental to created life, a knowledge of which is necessary for success in our own sphere.

As a rule the farm flower garden in a few years becomes involved in complexities, and the gardener in charge often feels humbled and discouraged, but there is no need to abandon hope no matter what may be the conditions. It has probably been found that certain plants are suited to the locality, and when they are arranged on rather broad and simple lines good service may be obtained at all seasons. It is not so difficult as one would imagine, in a garden of moderate size, to turf down a garden bed or border and cut new ones and plant afresh, to lift from a lawn overplanted the superfluous shrubs and group them together in a bed. Holes made can be filled with soil and turfed over, making an almost invisible repair to the lawn. Whether they be small or great, now is the time to plan any alteration of this kind. The problem should be given careful consideration and decisions fully recorded in notes and sketches for execution during autumn, winter, and spring.

Of greatest interest, usually, are specialised gardens quite suited to the locality. At high altitudes and southern latitudes hardy trees, shrubs, and herbaceous plants thrive as they never do in warmer localities. Many conifers are outstandingly superior under such conditions. In warm districts with a generous rainfall such as we have in the western and northern provinces, native plants are at their best, and rhododendrons, azaleas, camellias, palms, tree-ferns, and citrus trees readily attain a high standard of perfection. In the drier eastern districts, with their bright, clear atmosphere, cypress trees, roses, irises, carnations, and many bulbous plants and succulents find a congenial home.

On simple lines and of a size well proportioned to that of the homestead, the farm garden performs a real service at a reasonable cost in maintenance, and will be most effective if planted with varieties of species of trees, shrubs, and herbaceous plants which are naturally adapted to local conditions.

WM. C. HYDE, Horticulturist, Wellington.

LAST NIGHT . . .

Last night I found my youth again
As, breathless, hand in hand,
We raced beneath the moon's soft light,
Across the sinking sand.
You laughed—and bent to find a shell,
And I laughed with you too;
The storm-tossed seas came breaking in,
And then a mad wind blew . . .
Keen tang of salt upon your lips,
Blue, eager pools your eyes:
Just for an hour the world gave way—
For us—to Paradise.

Salute To Summer

SUMMER'S here! Yes, I know it—shop windows are full of sheers and prints, college girls are in tennis sox, and the beaches are ablaze with beauty. Summer has almost caught us unawares this year—we have had so many cold winds, and so much heavy rain, that we had almost forgotten the old saying: "If winter comes, can spring be far behind?" And following it a little further, we could add: "And after spring, there's summer."

Summer means sunshine. And too often, when the first lovely days of warmth come along, we are tempted to don our bathing suits and revel in the heat and sunshine. It's a great feeling while it lasts—but what about the feeling that comes after—sunburn? Sunburn can be one of the most painful afflictions, especially if you are fair-skinned, and do not tan easily. So I would warn you to make the tanning process gradual—do it little by little, even if you do want to just lie in the sun more than anything else on earth.

As in many other things, prevention is better than cure, so when you are going sunbathing smear yourself well with coconut oil before you go outside. If you have managed to get burnt quite successfully, carron oil will come to your rescue. And if you are sunning by the sea, don't forget to wear sun glasses—eyes are not used to the glare of summer days yet, and dark glasses are kind to them. Hats, too, are important—see that yours is cool, and shady, and light.

Bathing suits are very colourful and gay this year—they are very pricey, too, and there seems to be a lot less of them than before (if that seems possible!) Our grandmother's mother would certainly feel faint if she saw the modern girl out on the beach today, letting the sun and the air caress her skin, looking her loveliest in new bathing costume, or perhaps as smart as Fifth Avenue in a play suit—but she would only envy the girl of today, really.

Summer and sunshine are Nature's greatest gifts to us—make good use of them, get outside whenever possible, and as long as you let common sense rule, and exercise moderation in your doses of sunshine, you, too, will feel your fittest and look your loveliest.

Helpful Hannah Says . . .

When mending a run in a stocking and you have not a fine crochet hook to catch up the loop, instead of using mending silk, use a thread from an old discarded pair.

* * *

If you want to renew a used transfer, mix washing blue and sugar with water to make a thick liquid, dip a pen in the solution, then go over the used lines of the transfer, and it takes on another lease of life.

* * *

Smear petroleum jelly lightly over outside brass work after it has been cleaned, and it will not tarnish so quickly.

* * *

Put a marble in the foot of your silk stockings when hanging them out to dry on a windy day. This prevents them twisting round the line.

* * *

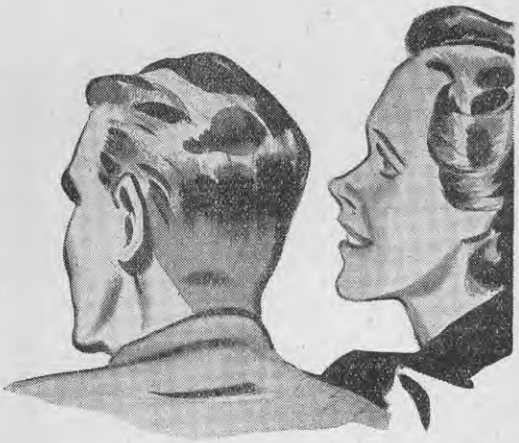
Cover your cookery books with oil baize, then a quick wipe-over with a damp cloth will keep them fresh and clean.

A squeeze of lemon juice added to steak and kidney pie will bring out the flavour, and make the meat more tender.

* * *

When putting away winter clothes in the spring, have them laundered or dry cleaned first. It is easier to store clean clothes, and moths are less likely to attack them. Moths eat the spots first—they seldom attack a thoroughly clean fabric.

A SHEEP AT A TIME... and plenty of room for MILK, VEGETABLES, BUTTER, ICE COLD DRINKS and PUDDINGS!



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Serve Vitamins With Your Meals

VIM and vitamins go together, and because of this it is very necessary for us to know how to preserve the vitamins and salts in preparing our greens for the table. The following notes have been taken from the "British Medical Journal," and should prove very valuable to the average housewife.

Conservation of Vitamins

Vitamins are lost or destroyed in the preparation and cooking of greenstuffs by many of the methods now in common use. As it is of special importance at the present time to secure the maximum nutritive value from all the foods available, it is desirable to employ methods of preparation and cooking of foodstuffs which conserve their nutrients to the utmost.

The following generalisations summarise our knowledge of the behaviour in greenstuffs of the vitamins most likely to be affected in the course of preparing green vegetables for the table. Some simple rules based on these generalisations are given, and cooking methods for greenstuffs are recommended.

Fat-soluble vitamin A is unlikely to suffer damage; water-soluble vitamins B and C are the most likely to be lost on preparation and cooking. This is so for the following reasons:—

(1) Because they are water-soluble, they are dissolved out by soaking or cooking water; they also run out in the watery juice.

(2) Raw vegetables contain enzymes, which are active in destroying the vitamins, particularly if the raw foodstuff is left lying about after being bruised or cut up. These substances which destroy the vitamins become more active as the temperature rises during cooking up to a point at which they themselves are destroyed. This point of destruction is only a few degrees below boiling temperature.

(3) The water-soluble vitamins are themselves also destroyed by heat to an extent which depends on the length and severity of the heating.

(4) The water-soluble vitamins are found to diminish in amount in foods left standing after they are cooked.

(5) Salt or sugar added to vegetables before cooking lessens the amount of destruction under conditions described in (3) and (4) above.

(6) Vitamins B and C are more stable in the presence of acid, which is sometimes added as vinegar. The addition of alkali (carbonate or bicarbonate of soda) will, on the other hand, hasten the destruction of the vitamins.

Practical Rules for Treating Green Vegetables

(1) Obtain as fresh as possible.

(2) Keep in a cool damp place in order to reduce wilting.

International Wool Secretariat Fashion.
Pale grey flannel for the graceful bias skirt with sunpleated godets; grey flannel combined with handknit ribbing in fine grey wool for the short-sleeved jacket . . . red leather belt and buttons, red scarf and hat.

(3) Take precautions to avoid damage due to crushing or bruising during transport or handling.

(4) If vegetables are soaked, use salt water (two teaspoonfuls to one pint).

(5) If vegetables are to be shredded or finely chopped for salads, prepare immediately before serving.

(6) Use the smallest possible amount of water for cooking.

(7) Have water boiling before adding vegetables.

(8) Add salt to water before adding vegetables.

(9) Add vegetables gradually or in small amounts at a time, in order to prevent water going off the boil.

(10) Cook vegetables no longer than is necessary to render them tender.

(11) Plan cooking arrangements so that vegetables are dished up and served immediately after they are cooked. On no account allow to stand for a long time on a hotplate.

(12) If there is water left after cooking, drain off and use in the preparation of soups and gravies; alternatively, if successive batches are being cooked on the same day, use the same water again, adding more if necessary.

Methods Resulting in Least Loss of Vitamin C

Method 1.—Boil for the shortest time in a small quantity of boiling salted water. Use water left over for boiling other batches and for addition to soups and gravies.

Method 2.—Slice the fresh vegetables into ribbons about 2 to 3 inches long by ¾ wide and cook briskly for half to one minute in a small quantity of hot oil or dripping to which salt has been added (two teaspoonfuls oil and half teaspoonful salt to an average-sized cabbage). Add a small quantity of boiling water (half to one cupful for above) and stew for about ten minutes in a closed container. Keep the lid on so that no steam escapes. When the vegetables are cooked only a very little water should be left. This method is used throughout the Far East and India. In Europe the nearest approach to it is the French method of "casserole" or "conservative" cooking, by which the vegetables are placed in a closed fireproof dish with a little water and fat and cooked in the oven or over a low flame for 15 to 25 minutes.

In hay-box cookery vitamin C is destroyed, so that this method should not generally be used for cooking green vegetables, which are particularly valuable in the diet for their vitamin C content.

Steaming of vegetables even with the best equipment is not as satisfactory as the methods described above.

Conservation of Salts

If the precautions described above are carefully taken, it can be relied on that effective conservation of the valuable salts present in green vegetables will also be secured.

Our Competition

"HOW I MAKE MY CHRISTMAS GIFTS"

I CAN see a busy month ahead for all my "Good Neighbours" after they have read our competition entries this month. So many good ideas from you all that it was difficult to decide which to use. But here are some of them for you, and first prize this month goes to "Ajax," Oxford, with "London Lass," Wellington, second.

Be sure you get a good supply of wrapping paper, stickers, and tinsel—wrappings can make all the difference to Christmas presents. And don't forget—it is not the size of the gift that matters, because after all the very best gift of all is love and best wishes, for it will not wear out, ever.

First Prize

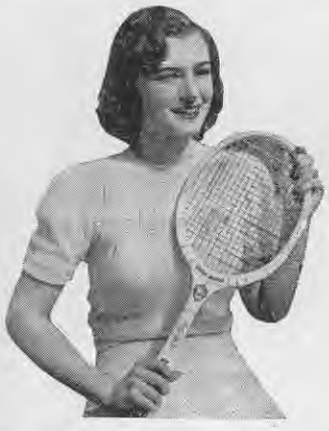
I LIKE to begin in January, planning just what I shall make during the year, so that there are always a few things on hand when the rush begins. One girl friend is going to receive two dinner mats—actually they are two round asbestos mats, but I have covered them with a circular crocheted mat, made from that old-fashioned, thick white crochet cotton. Another friend will receive a dainty bed jacket made from a yard of crepe de chine which I have had for a long while. It is such an easy pattern—only two four-inch seams to sew. I'll forward it to you if anyone would like it. And I always give handkerchiefs, so I've made some already. I found tatting in a little shop, and that helped—embroidered initials help, too. For a wee boy I have a bathing suit still on the needles—I unpicked an old scarf for this—and his sister will go to sleep with a cuddly dog in her arms, made from pieces not required for my last apron.

I have several coffee bottles waiting to be filled with my favourite orange drink, and nearby friends will receive my Christmas greetings, and add a tablespoonful to their glass of water. Try using parchment paper for bookmarkers. I like drawing trees, and printing small verses in Indian ink—so will you. It is easy, too, to cover small notebooks for address books, and larger ones for recipe books. I know a friend who never has pencil or paper near her telephone, so I have designed a large piece of parchment for her, on to which I shall sew a small pad for notes, and tie a pencil. A little turpentine mixed with linseed oil, and smeared on to a good quality drawing paper, makes ideal parchment paper, and I always use water colour paints. And outside there are several fluffy goslings, one of which has a reserve tag on it—Mother always has a goose for Christmas. So a merry Christmas to you all!—**Ajax, Oxford.**

Second Prize

THE Christmas presents that are occupying my mind and fingers this year are anthologies. And lest that word suggests only a volume of rather dull quotations on no particular subject, think of it for a moment under the rough translation of its Greek meaning, "A bunch of flowers." Flowers, that is, of verse and prose, collected so that the varied shades of one kind may be enjoyed together. You need an exercise book as foundation, and a seven-leagued pen, for the subject once chosen, and the book begun, material crops up everywhere. I began by making a book of "Spring," for a friend who delights in spring's leafy moods. Then, for myself, I gathered poems, quotations, and pictures, all of trees, and straightway knew I must make three separate copies for three special friends. For another, I am making "With the Wind and the Birds," and for a special friend "Christmas." I have planned for my own refreshing a "Rain" book.

These anthologies are destined for folk whose chief interest lies in these subjects, but out of the gleanings of years, I have made a collection of party games and competitions, and for another friend I collected rare and beautiful prayers such as spoke to my own heart. The secret lies, I think, in choosing the one idea above all others that appeals to the person. One specially happy feature of gifts of this sort is that they need never cease to grow. Both giver and receiver can add continually to each other's treasures. Anthologies entail time and thought—yes—but they bear the hall-mark of a true gift, the personal offering of friendship.—**London Lass, Wellington.**



Tennis days are here again—you will look every bit as smart as this star from the Metro-Goldwyn-Mayer studios if you choose a neat white jersey for the coming season.

Highly Commended

MY latest effort has been the making of bead sprays. These sprays are so pretty to wear on dresses or costumes, and anyone with a little in-

What Do You Think?

IF you have read "From Me to You" this month, you will know just what I mean when I ask you, "What do you think?" Because I really want to know what word you think is the most inspiring one you can find in your dictionary for present-day conditions, and why you think so.

"WHAT IS THE MOST INSPIRING WORD TODAY, AND WHY?"

Do let me know—10/- for the first prize, and 5/- second.

Send your entries to me not later than December 20th, 1941.

"MARY,"
C/o "Journal of Agriculture,"
P.O. Box 3004,
Wellington.

¶Closing date: December 20th, 1941.

genuity can fashion many different kinds of sprays. Beads from old lamp shades and suchlike can be used for these, and thread them on florist's wire.—**Violet, Auckland.**

MAKE Christmas stockings—not necessarily filled with rubbish. Obtain coarse mesh mosquito netting, cut into stocking shape, machine with bright cotton, and fill according to the recipient. Crayons, pencils, sweets, marbles, whistles, oranges, soap, and small toys. For the garden-lover, make a sugar bag apron, with pocket for gloves, and a small trowel. Trim with brightly coloured material.—**Economical Susan, Waikato.**

IF your friend goes motoring, make her a hat hanger. Crochet around a brass ring, thread ½ yard of 1 inch ribbon through, and sew the two ends around a spring peg painted with gold paint. Cover the stitches with a scrap of rosebud trimming. She will find this very handy to hang her hat on in the car. For the person who is always looking for a piece of string, make a "Dinah" string bag. Cut two circles of either felt or cloth in black or dark brown, 6 inches in diameter, and flatten the top a little; sew up, leaving the top open. Make a cap of any gay colour, sewing one piece on the back, and tying a knot in the front piece, make eyes of white tape, with black pupils, red flannel nose and mouth, which should have an eyelet worked in it. Sew small brass rings for earrings, and two more to hang it up, and with a ball of twine inside it makes a very acceptable present.—**L.M., Otago.**

MY first idea is one which I am sure interests most of us—flowers. If your friend has favourite shrubs or flowers, set to work and get good cuttings, and get them well rooted. Old tins painted are good to present these in, and for smaller flowers low bowls, painted, are ideal.

Now with well-washed flour bags hem squares for serviettes, and work a dainty spray of bright colours in the corner. Press well, and box up with coloured paper. Mothers of school children will appreciate these for school lunches.—**M., Feilding.**

DAINTY gifts can be made from small wooden pill boxes. Paint the boxes inside and out, and on the lid work tiny coloured sealing wax flowers, or paint them on. The box can be filled with small safety pins, perhaps a thimble, or a tape measure.

Here is an idea for an unusual luncheon set. Buy a yard of scrim, also some stranded cotton in light green, or perhaps the predominating colour in the dinner set. Cut out the mats from a transfer, and iron them on to the scrim. Leave a good space between the mats so that you can handle them comfortably when working. Outline the mats with a running stitch, using three or four strands of cotton. A bold design looks best. I have made mine without a transfer,

(*Continued on next page.*)

Decorating the Christmas Cake

THE prize of 2s 6d for the best idea for decorating the Christmas cake is awarded to Miss K. E. Goulter, Seddon, Marlborough, for the following entry:—

FIRST ice the Christmas cake in the usual way, finishing with a smooth coat of royal icing. The scheme of decoration I have in mind is meant to represent a garden. You will need 1 to 2 oz. of coconut, a little cocoa, green and pink colouring, and about half a pound of icing sugar. Make a very stiff icing, adding the cocoa to colour it dark brown, and sufficient coconut to make it able to be moulded in the fingers. Now with this mixture model a rustic wall around the perimeter of your cake, leaving a small gap, from which is traced, with a needle, a winding path diagonally across the cake. Toast a little coconut in the oven until dark brown, then cover thickly all over the path.

Now draw two circles, to represent flower beds, on each side of the path. Cover all the rest of the cake top, except these circles, with coconut coloured green. (Put a drop of green colour on a plate and rub the coconut on it till coloured.) Fill your beds with flowers made by little dabs of pink icing (use the rose tube if you have a forcer, but a screw of paper will do just as well), and put little dabs of green icing around each one to represent leaves.

A finishing touch is given by placing a circular purse mirror face upwards in one corner as a pond. A rockery can be built around it in the same way as the garden wall, and the effect of rock plants given by trailing green icing from forcer, or paper screw, all over it. If coconut is hard to get, sugar can be coloured in the same way as coconut and used for the path and lawn.

LOVELY icing ornaments can be made so easily. Dissolve 1 teaspoon gelatine (powdered) in 2 tablespoons boiling water. Sift 1 cup sugar into a bowl, and mix till it forms a pliable, firm mixture (of plasticine consistency). Divide, if several colours are required, add a few drops of colouring, and knead well. This may be modelled or rolled out, and cut into shapes for houses, boats, etc. Attach to the cake with wet icing.

Flowers are very effective, for instance, a briar rose on a pale pink cake.

For those who do not care for modelling, wafer biscuits make houses, and animal biscuits are still procurable. Marshmallows are sweet bunnies, with big ears of white paper, painted pink inside; and then paper shapes can be cut out, e.g., teddy bears, Christmas trees, etc. Place a pin at bottom, with point protruding to stick into cake. Cover this with suitably coloured icing.

If coconut is procurable, it can be coloured for grass, etc., by shaking in a small jar with a few drops of colouring. I keep a set of different colours in small screw-top pill bottles ready to sprinkle on various dishes. It is surprising how small people enjoy this trimming. Coarse sugar is nearly as good, but the colours are inclined to run more easily as it melts.—**"Mary Marie," Halcombe.**

HAVING been the "family cake decorator" for a good many years, out of experience I have gleaned certain very useful principles. I always use the juice of 1½ to 2 lemons to each pound of icing sugar. This gives a pleasant piquancy, and avoids any fear of over-sweetness. I lift it from the mixing bowl in my hands, mould it as round and thin as I can, then put it on the upturned BASE of the cake (which

CHRISTMAS GIFTS.—Continued from previous page.

using a dinner plate, pencilling the edge, and drawing a lattice design.—**Alys, Masterton.**

THE menfolk are the hardest to cater for, but remnants come in useful for working handkerchiefs. Materials of suitable colour in print make serviceable handkerchiefs. While making your Christmas cake, it is no trouble to divide some of the mixture into smaller tins. These small cakes make very acceptable gifts for the bachelor man or woman.—**Mary Ann, Bell Block.**

GIVE that old friend who now lives in town two sacks of cones, and see how she enjoys the resulting bright fires! Nurse would appreciate a black velvet coal glove, piped with red. Pill boxes make useful rattles. After putting in some small stones to rattle, seal the box with insulation tape, cover with print, and crochet a cover, leaving a loop for baby to hold.—**Janet, Invercargill.**

MY friends like my bath salts. Here is the recipe: 3 1 lb packets of Glauber salts (very reasonable in price), bottle of oil of verbena, and a drop or two of vegetable colouring. Put the salts in a bowl large enough for free mixing. In a small vessel put verbena and colouring. Mix well, then add to the Glauber salts, and mix with the hands until all are thoroughly blended and coloured. Put into pretty jars, cover with cellophane, and tie with ribbon.—**Lady Jane, Wellington.**

MY girl friends always appreciate make-up capes. They are easily made from organdie, or pretty materials, edged with lace, and tied with gay ribbon. So handy for slipping on over your frock when you are ready to powder your face.—**Joan, Eketahuna.**

VICTORIAN lady handkerchief bags are good gifts. The cardboard top, made in the shape of a bonnet, hides the face completely. Paint the top to match the skirt. The skirt is a bag gathered and sewn to the cardboard top. It has a slit in the back for the handkerchiefs, and sewn to the gift is a slip of paper saying:

"For soiled hankies or hose
There's a place in my clothes."
—**Anno Domini, Otago.**

is perfectly flat), and spread it to the edges. Then with a table knife frequently dipped in a cup of hot water, I smooth the surface.

Glace cherries, red, green, or yellow, cut in halves, form perfect candleholders. Angelica, for "grass" and stems, is hard to get—strips cut from green jubes serve equally well, also diamond-shaped "leaves" of the same. Blanched almonds make marguerite daisies, two slices from an orange or lemon "quarter" make a butterfiy, three slices a daffodil. Letters for names or greetings can be written in strips of almond nuts.

Christmas time, of course, crowns the year for cakes as for everything else. A frond of fern makes a truly lifelike tree, beside which a cheery Santa Claus stands. A curved path of "hundreds and thousands" or silver cachous will suit him very well.

Candles are scarce, so I make rosebuds in their place. Scraps of georgette or silk, cut on the cross, about 2 inches wide, are needed. Fold the material lengthwise, gently roll it up, and secure with a few firm stitches. The result is a lifelike rosebud. Clip off the spare material, and put a pin carefully down between the "petals," by which to stand it in the cake. Each slice can then have its flower, that is just as easily removed.

If the ready-made frill for the sides of the cake is not available, coloured paper, folded and fringed with the scissors, is just as good. It may be tied with ribbon, or have a narrow strip of wallpaper border as a finish.

The "proof of the cake" is in the eating—but it is certainly helped by the looking.—**"Young Tyke," Wellington.**

ICE the sides with white or cream-coloured icing, and mark doors and windows in brown icing with a forcer. Then coat the roof with deep pink icing. Have ready some square lollies (plain caramels are suitable), and before the icing hardens, set eight in an oblong formation, three on each side and one at each end, to one side of the ridge on the roof. This is the foundation of the chimney; continue building it up until it is the required height, cementing the "bricks" together with a little white icing. A small sack of muslin or other thin material dipped in a solution of Condy's crystals until it is the required shade, and filled with tiny presents for the guests, is placed in the top of the chimney. A small cardboard ladder leaning against the bricks is also very effective.

These decorations can be done quickly and easily by the novice, while those more experienced can add to the appearance of the cake by making flowers along the base of the walls to represent a garden.

It is an excellent centrepiece for a kiddies' party, not the least attraction being that the decorations are edible, while the sack of toys which Santa so thoughtfully left in the chimney is, of course, much appreciated.—**"Jezebel," Waipu.**

Salad Suggestions

SUMMER days are with us again, and what is more enticing than a cool, crisp salad on a hot day? Have you a new way with salads? We would like to share it.

2/6 for the best salad recipe sent to the "Mixing Bowl" by December 20th, 1941.

OLD-FASHIONED lady in her garden.—First ice the cake pale green (including sides). Using a china doll, set it in the green before it dries. Now with marzipan make her quilted dress and fashion a bonnet in white. Crystallised violets and pale pink crystallised rose leaves are used circled around her feet. Press four violets into the dress. (Make your own crystallised fruit.) Use deeper green icing for stems and leaves. Present cake at the table with a wreath of dark green leaves in place of the usual paper frill. —**"M.," Feilding.**

BLANCH some almonds, cut some cherries in rounds. Mince some lettuce or spinach and catch the drips of juice to colour the icing pale green. Now slit the almonds and place in daisy shape, with a red cherry slice for centre.—**"Fintry," Southland.**

SAVOURY BAKED FISH WITHOUT SAUCE.

Boil 2 onions until soft. Chop and mix with 1 cup breadcrumbs. Season well with salt and black pepper, and mixed herbs, 1 small teaspoon. Add 1 tablespoon of soft butter, and ¼ cup milk.

Prepare and skin a medium-sized fish. Fill with the stuffing, sew up, and place in a greased tin. Brush over with egg, and sprinkle thickly with greased or brown crumbs. Bake slowly for about ½ an hour. Serve on a hot dish, and garnish with slices of lemon.

ABERDEEN SAUSAGE.

One pound steak, ½ lb. fat bacon, 2 small teacups breadcrumbs, 1 dessertspoonful Worcester sauce, 1 egg, 1 teaspoon salt, pepper, ¼ teaspoonful mixed herbs, little grated nutmeg, and lemon rind.

Mince the steak and bacon, add other ingredients, bind with the eggs, and a little gravy. Form into a roll. Tie in a floured cloth, and boil slowly about 1½ hours. Cover with breadcrumbs, and serve cold, or hot with brown sauce.

DEVILLED KIDNEYS.

Six kidneys, some fat bacon, pepper, mustard, and chopped parsley.

Prepare kidneys, and cut in half, lengthwise. Sprinkle with pepper and lemon juice. Roll each kidney in a slice of bacon. Place on a plate. Bake in a quick oven about 20 minutes, sprinkle with mustard and chopped parsley, serve very hot on buttered toast.

BAKED TRIPE.

Half-pound tripe, 1 cup breadcrumbs, ½ cup milk, ½ cup tripe liquid, pepper and salt.

Cook tripe until quite tender, cut into neat pieces, and fill a greased pie-dish with alternate layers of tripe and crumbs. Mix tripe liquid and milk together, and pour over tripe. Bake about 20 minutes, and serve hot. The last layer must be breadcrumbs.

NEW ZEALAND BUNS.

1 breakfastcup flour, 1 tablespoon sugar, 1 egg, 3oz. butter, 1 heaped teaspoon Edmonds baking powder.

Rub butter into the flour, add sugar and baking powder, then add the egg well beaten and enough milk to make a stiff dough. Divide into buns and put in cold greased oven shelf. Bake in quick oven (400 deg. F.) 10 to 15 minutes.

STUFFED PANCAKES.

Make a plain pancake batter. Fry as ordinary pancakes. When brown on both sides spread with a savoury mince, roll up, cut into small rolls about an inch thick, and pile on a hot dish. Pour over hot brown gravy, grate nutmeg over, and serve at once.

If preferred, these pancakes can be cut into small rolls, dipped in beaten egg, and breadcrumbs, and fried. Serve with gravy.

STEWED APPLES AND BANANAS.

Four large apples, 3 or 4 bananas, little lemon rind and juice to flavour, ½ cup sugar, 1 breakfastcup water.

Make a syrup of the sugar and water; slightly colour. Add the apple cut in quarters, lemon rind, and juice. Cook gently until the apples are soft. Peel and cut bananas into inch cubes. Lay on top of the apples, and steam for a few minutes. Serve hot or cold.

MACAROONS.

¾ lb. flour, 2 eggs, ¾ lb. sugar, 2 teaspoons baking powder, 2 teaspoons essense of almond. Mix all ingredients together, roll into balls, and place an almond on each. These spread a lot.

MERINGUE SHORTCAKE.

¼ lb. butter, ⅔ cup sugar, yolk of one egg, 1½ cups flour, 1 teaspoon baking powder.

Rub butter and sugar, add flour, add egg. Roll out, and press into tins, as with shortbread. Beat the whites of 2 eggs well, add 2 small cups of brown sugar, and 1 cup walnuts. Spread on top of mixture, and cook for ½ hour.

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