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British War-Time Agriculture . . . . .

Early this year a party of six New Zealand agricultural scientists arrived in England on loan to the British Government for the duration of the war. Mr. G. A. Holmes, B.Ag., M.Sc., formerly Crop Utilisation Officer, Department of Agriculture, Wellington, and leader of the party, recently broadcasted in the Pacific Session of the B.B.C. In his broadcast, reprinted hereunder, Mr. Holmes referred to the work his party will be doing and also gave his impressions of British War-Time Agriculture.

"I AM speaking this evening as the senior member of the party of six men who came to Britain from New Zealand at the request of the Ministry of Agriculture, and with the object of assisting in the Food Production Campaign.

We travelled on a cargo steamer, and, although fears to the contrary were expressed at the time of our departure, we had a very pleasant voyage, and, what is more important in war time—a speedy and uneventful one. From a certain north-western port of England we ran through industrial towns with their forests of chimneys, through gloomy and bustling railway junctions, over many canals and rivers, and on through the glorious English shires at the height of summer to reach Euston, and make our acquaintance with the world's greatest city.

During our first few days in London we were privileged to meet the Minister of Agriculture (Mr. R. S. Hudson) and also to have a conference with Sir Wm. Gavin, who is Chief Agricultural Adviser to the Minister. Our first visits to English farms were paid during the course of a most delightful and memorable day in the county of Kent when we joined a party conducted by Lord Cornwallis on a tour of inspection of areas which are now being farmed by the War Agricultural Executive Committee. As you know, Kent is most renowned for its cherry orchards, and you can imagine what a welcome change it was for us, after leaving New Zealand in mid-winter, to sit down for lunch in a field, and to take our dessert from baskets of luscious cherries.

A few days later our party was split up, each man being sent to an Agricultural College or Research Institute determined according to the work to which he had devoted most attention in New Zealand. For the benefit of relatives and friends, I may say that recent letters I have had advise that my team are all very fit and well, and that they are finding the work in all cases of absorbing interest.

I count myself fortunate in having been able already to visit some of the southern counties, the Midlands, the Welsh Plant Breeding Station at Aberystwyth, and all the counties of North Wales which come under the Agricultural Department of Bangor University as an Advisory Centre. My first impressions of British farming may be summed up by saying that, while much has been done since the outbreak of war, a great deal remains to be done to bring the standard of farming on the whole up to the level of efficiency as would be economically practicable.

Colossal Organisation

Much has been done, and this reflects great credit both on those who have planned, and on those who have carried out the policy. The change-over from a peace-time to a war-time economy has necessitated colossal organisation. Britain developed since the industrial revolution mainly as a manufacturing, a maritime and trading nation—her farming lands were in many cases left to become derelict, and the production of milk, and of meat was maintained to a considerable extent by the importation in pre-war days of some 7 million tons annually of concentrate feeding-stuffs for stock. Now all this has changed, and a new enthusiasm is seen on every hand to make farms self-supporting in stock foods and productive of the maximum possible yields of grain, potatoes, vegetables and sugar beet—crops which contribute directly to the human larder.

The supervision of this campaign has been de-centralised by the appointment of County War Agricultural Committees. These Committees have been given wide powers to serve and enforce ploughing-up orders, and to direct the management of any land, including such improvements as clearing, ditching, under-draining, and destruction of pests. The greatest credit is due to these Committees for the manner in which, while maintaining the goodwill and co-operation of the general body of farmers, they have exercised the necessary firmness to the occasional careless individual who neglects to comply with instructions. This firmness may, and frequently does, extend to the summary dispossession of the offender.

I should like to pay a sincere tribute also to the officers of the County Committees who have worked early and late on their multifarious duties, and to the advisory agricultural scientists whose ordinary work has been vastly extended to cope with the problems of the rejuvenation of agriculture. Landowners, tenant farmers, agricultural labourers and members of the Women's

Land Army have all played their parts in changing the face of the countryside —as I am assured it has been changed during the past three years.

Impressive Achievements

The achievements are impressive. The area **additional** to that of pre-war years under the plough in the past season reached a total of nearly 6 million acres, the output of agricultural lime has increased from 400,000 tons in 1937 to nearly 2½ million tons for this season, while the area of potatoes now being grown is in the vicinity of 1 million acres—an assurance of plenty for all requirements.

You may ask how, in face of such accomplishment, there can be any major opportunity for the use of Dominion farming methods. To this I can only reply that a great deal remains to be done, and I consider that our efforts will be concentrated along three main lines:—

The reclamation of derelict, and semi-derelict lands.

The introduction of labour-saving methods.

The demonstration of economies in the farmer's purchased raw materials.

Land Reclamation

Dealing firstly with the question of land reclamation, I was astounded to find quite fertile land within 50 miles of London growing dense, waist-high bracken. There should be no great difficulty in the control of bracken, even on unploughable hill land, while much of this growth occurs on easy country, and is now in process of conversion to good cropping land under the direction of County Committees.

Hill country of a mossy or peaty type presents a more difficult problem than does similar country in New Zealand owing to the more severe winters, and the shorter growing season here. Salt marshes also are not easy reclaiming propositions on account of the very high rise of spring tides round Britain's coast line. Apart from these special cases there are millions of acres of indifferent pastures scheduled to be ploughed, many of these being virtually non-productive on account of the high percentage of weeds, thorn bushes, gorse, and ant-hills. Such land must be treated as a pioneer farming area and broken in by the use of powerful tractor-drawn machinery.

Labour-saving Methods

Turning now to the introduction of labour-saving methods, I find that practices which are common-place in the Dominions seem to be virtually unknown here. As a small illustration of this, I have recently seen thousands of fields of oats or of wheat cut by the binder, but without a sheaf carrier, the use of which would save half the time now spent in stooking.

I think that the general introduction of the motor-lorry type of lime and fertiliser distributor would reduce the labour of spreading by at least 80 per cent., while the same might be said in regard to the sowing of ridged crops in favour of the introduction of the New Zealand ridger.

Economy

Lastly, on the question of economy of purchased materials, there can be little doubt that the use of the combine drill and the ridger would save 60 per cent. or more of the fertiliser by comparison with broadcast sowing, and this should mean a saving of very large sums annually to British farmers. Better methods of sowing land down to pasture could economise on the quantity of seed necessary, while better strains of grasses and clovers now available, and better management of pastures, could economise considerably on the provision of supplementary stock foods.

There has probably never before been a time when the farmer was so ready as at present to accept revolutionary changes in his naturally conservative outlook. He is now convinced that the agricultural scientist has something to offer him, and he is prepared to do his part in bridging the gap formerly said to exist between science and practice.

I feel that now is the time to 'cash in' on the accumulation of scientific knowledge in all branches applicable to agriculture."

Don't

neglect internal parasites in poultry. Full information is available in the Department's free bulletin No. 19.

Government stock seeds are the product of much care on the part of the Grasslands Division of the Plant Research Bureau, and of the Department of Agriculture. The original work is done by the Grasslands Division, which selects the material from which the nucleus seeds are obtained. Every plant in the selection has to be examined before it can be saved for seed. The nucleus is then taken over by the Department of Agriculture for multiplication under careful scrutiny.

Government Stock Seeds

By

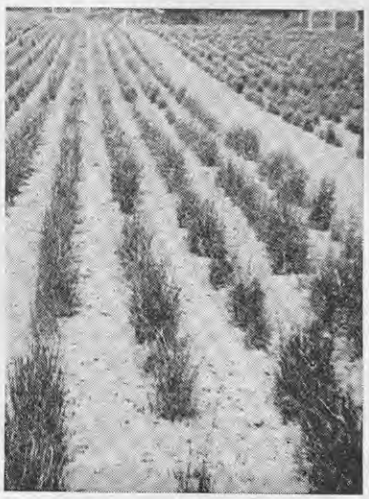
J. A. S. MILLER,
Instructor in Agriculture,
Wellington.

AS the many farmers who have applied for Government Stock seeds this season have by now realised, it has been impossible to supply every grower with the seed he desired.

This is regretted but it gives some indication of the growing popularity of Government Stock seeds; it also shows that the demand far exceeds the supply, particularly so in the case of perennial ryegrass and Montgomery red clover. There are two main reasons for this shortage. The amount of nucleus seed produced is small so that the contract areas from which Government Stock seed is obtained are not large, while seasonal conditions play a considerable part in determining the resultant crop. The other reason is that farmers have created an artificial demand by reason of their orders for these seeds not having been filled in past seasons.

Important Points

Apart from the usual attention given to the preparation of the seed bed for the sowing of grasses and clovers, consideration should be given to the following points:



The initial stage in the production of 'Government stock seeds,' the growing of special plants in order to select the best types.

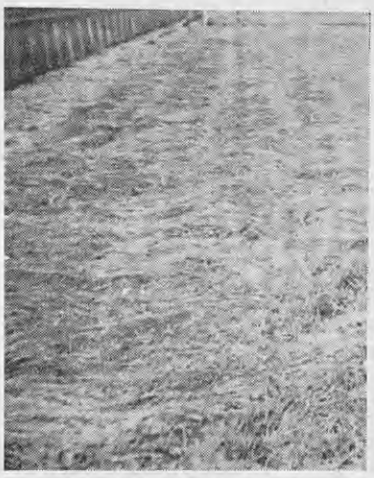
Inspection of a nucleus area of perennial ryegrass prior to harvest.

1. **Perennial Ryegrass:** It is the aim of every grower to produce Pedigree seed when he sows an area down with Government Stock seed and there is one main impurity which prevents an area from reaching this standard—Italian ryegrass. It is, therefore, undesirable to sow Government Stock perennial ryegrass on an area which has previously been in Italian ryegrass. Old stack bottoms should be avoided when drilling, especially if there has been Italian ryegrass in the stack. A clean drill or seed sower is essential as even a trace of Italian ryegrass seed may cause the area to be degraded or even rejected.

Many farmers apply for both perennial ryegrass and white clover for sowing in the same area but this practice is not recommended as it does not lead to the most effective utilisation of the seed available, and it is the maximum production of seed which is required.

2. **White Clover:** As this is a specialy selected strain of white clover, it is undesirable to have it sown on an area in which there is much volunteer white clover. Certain districts are noted for this volunteer growth and Government Seed stock is, therefore, not recommended for these districts. Suckling clover is a weed which is troublesome and may cause the white clover seed to be rejected on the purity test. Hence, every endeavour should be made to sow on an area relatively free from this weed. The remarks which apply to the sowing of white clover with perennial ryegrass also apply here though it may be advantageous to sow some Italian ryegrass with the white clover. Several farmers have been allotted both white clover and Italian ryegrass for this purpose, the former to be harvested in the first season and the latter in subsequent seasons.

3. **Cocksfoot:** This is a specially-selected leafy variety of cocksfoot evolved by Canterbury Agricultural College and is a decided improvement



The nucleus area cut and ready for threshing.

Ag. F. 95.

New Zealand Department of Agriculture.
FIELDS DIVISION.

New Zealand *Perennial Ryegrass.* Certified Government Stock Seed.

KEEP THIS SLIP AS EVIDENCE.

If you intend to make application for the inspection and certification of the area sown with this seed, you must retain all these insert slips, and forward them with your application to the Agricultural Instructor in your district. No other seed of the same species should be mixed with this "Government Stock Seed" for seed-production.

Harvested from registered area No H.B/B-4

Purity and germination certification accompanying this seed is No 178/H.B.

The amount of seed in this container is approximately 7 *bus.* ~~lb.~~

By Authority. R. B. Yeoman.

Director of the Fields Division.

[OVER.

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The insert slip included in every sack of Government Stock Seed.

on any existing natural variety. The worst impurity of cocksfoot (apart from other cocksfoot varieties) is ryegrass, and it is very desirable to have the soil entirely free from this grass before sowing the cocksfoot. Odd plants of ryegrass which may appear in the resultant crop should be removed by hand, or, at least, prevented from seeding with the cocksfoot. Cleanliness of the sowing apparatus is essential as it requires very little ryegrass to cause the cocksfoot seed to be degraded from the Pedigree class.

4. **Montgomery Red Clover:** Government Stock Montgomery red clover has been selected as a high-producing and long-lived strain and it is desirable that it should remain so. Hence the presence of broad red clover or cowgrass is a state of affairs to be avoided at all costs, as a trace of this impurity may result in the degrading or the rejection of the area. Similarly it is undesirable to sow an area of Montgomery red clover adjacent to or near an area of broad red as the chances of cross-fertilisation are very great and the seed produced from such a crop would be of doubtful type.

5. **Italian ryegrass:** This is the last of the Government Stock seeds to come on the market and its utility has not yet been realised to the full. The remarks which apply to perennial ryegrass apply equally here. Perennial ryegrass is an impurity to be avoided and a rigorous field inspection is made to determine the amount present. A mere trace is allowed so the farmer should make every endeavour to control this variety. It is advisable to leave a strip round the fence-line when harvesting in order to avoid the possible inclusion of perennial ryegrass which is usually to be found growing in this situation.

A Bad Practice

Government Stock seeds should be sown absolutely without adulteration with inferior strains. Farmers who have received less Government Stock seeds than they ordered may be tempted to increase the amount of material by mixing in a proportion of seed of a lower class such as Pedigree or even Mother. This is definitely not a practice to be considered by any man who wishes to produce the best seed.

A nucleus area of white clover in full flower.

Harvesting Machinery

The machinery used in harvesting should be as clean as possible. Threshing mills, in particular, should be thoroughly cleaned as these are a frequent source of impurities in the sample. Machine dressing should be carried out by a reliable firm in order to safeguard the final purity and also to get the greatest quantity of clean seed out of the line, for it is the clean seed which brings in the returns.

Government Stock seeds are valuable and the products therefrom are valuable. Why waste them through faulty husbandry? Your local Instructor in Agriculture is always available to help you with your problems. Use him.

The sealing tag attached to every sack of Government Stock Seed.

LIQUID MANURE ON GUMLAND

Spectacular Response Obtained by Northland Farmer Through Topdressing With Shed Washings

Speedy and convenient motorised distribution is a main feature of Mr. Browne's layout.

By—

P. S. SYME,
Instructor in Agriculture,
Warkworth.

ALTHOUGH he is a firm believer in the value of topdressing, observation and experience have convinced Mr. H. B. Browne, Wellsford, that artificial fertilisers fall far short of the genuine article. The shoemaker believes there is nothing like leather, and Mr. Browne is satisfied that there is no perfect substitute for farmyard manure.

Actuated by this belief, and further impelled by the shortage of fertiliser, Mr. Browne decided to follow the lead of Taranaki farmers, and to utilise the shed washings for topdressing.

Fortunately for the success of the project, the shed is situated on steeply sloping ground, and by excavating the face of the bank it was found possible to run the washings direct into a distributing tank. This avoided the need for a holding sump or a pumping outfit, and greatly reduced overhead costs.

The Distributor

Since, in the absence of a collecting sump, the success of the system would largely depend on having a convenient and speedy distributor which could be used every day regardless of the weather, Mr. Browne decided to employ motor traction. Fortunately, an old truck was already available, and the only outlay involved was the provision of a specially made 200 gallon tank fitted with an agitator, and made of heavy gauge iron. This tank was fitted to the chassis of the truck as illustrated, and has sufficient capacity to deal with one day's washings. Fitted with double rear tyres and chains, the outfit is both speedy and efficient.

Although much of the farm is undulating to steep, and the soil is heavy clay, distributing the load has at no time proved difficult. Even in wet weather, the allocations being so arranged that easy fields are topdressed when the going conditions are bad, while the steeper country is treated only when the ground is reasonably dry.

Mr. Browne's farm comprises 103 acres in grass and carries about 60 cows. The system has been in operation for about a year, so that Mr. Browne is now in a position to assess its practical value.

The work of excavating the approach to the shed and fitting the distributing tank was done by Mr. Browne himself, and the only cash outlay involved was £50 for the tank.

Annual Value

The liquid manure to be obtained each year from the herd of 60 cows,

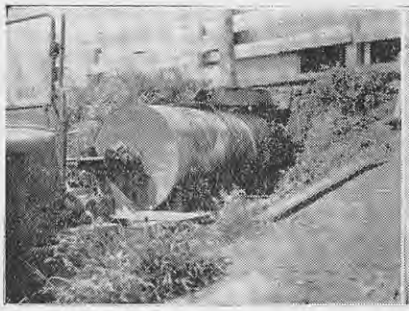


Fig. 1.—Showing how the distributing tank is filled up direct from the shed. Note agitator mechanism in front of tank.

Fig. 2.—Showing how agitator is driven from sprocket on front wheel. Mr. Browne considers an efficient agitator is an indispensable item of the equipment.

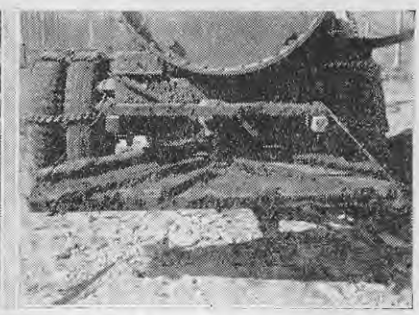


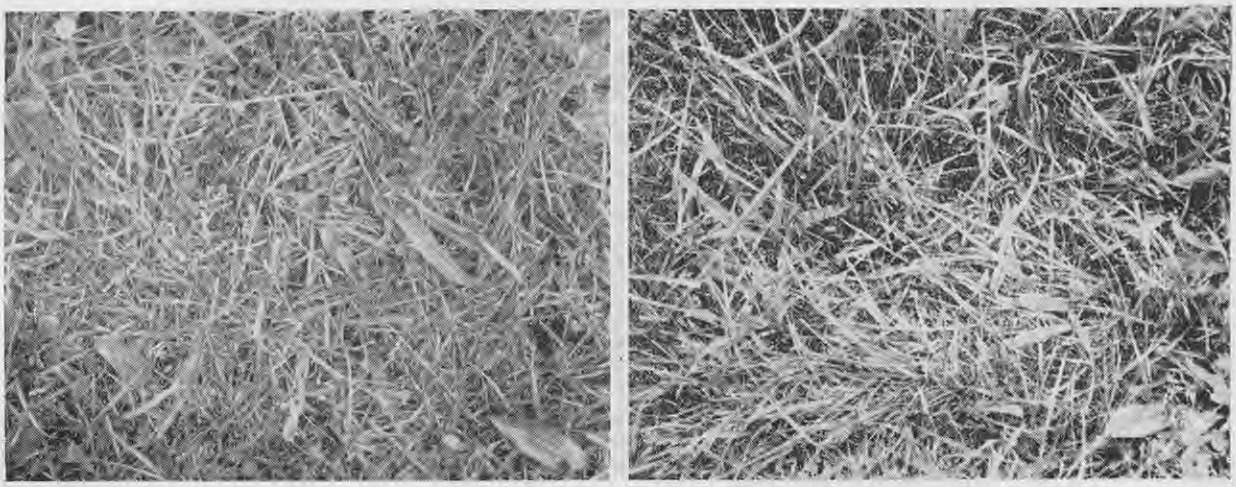
Fig. 3.—Rear end view showing simple home-made distributor board. This has proved highly efficient in practice.

translated into its "artificial" equivalents would approximate 12 cwt. sulphate of ammonia, 12 cwt. potash salts, 5 cwt. superphosphate, 5 cwt. lime, and would be worth about £22.

Allowing for interest, depreciation, and distribution charges, this obviously leaves little margin for expensive plant, and if regarded purely on the basis of analysis and price, the use of liquid manure compared with artificial fertilisers would barely pay its way. Mr. Browne, however, is convinced that chemical analysis is not a fair basis of comparison. Experience has clearly shown him that liquid manure is much more efficient than artificial fertilisers, and possesses special virtues of its own which greatly enhance its value. Moreover, artificial fertilisers are unobtainable at present beyond allocation quotas, regardless of price.

Spectacular Responses

That there is much to be said for Mr. Browne's contention is readily proved by an inspection of his pastures. Judged on the basis of analysis one would certainly expect an appreciable response from shed washings. In actual fact, however, the response can best be described as spectacular, and must be seen to be properly appreciated. Even with a quick-acting phosphatic fertiliser like superphosphate the response is apt to be relatively slow, and improvement in the grass elements tends to await the improvement in the clovers. With liquid



Liquid manure is very quick in action. These two photographs were taken on the same day, the pasture on the right having been treated about 14 days previously.

manure on the other hand, the response is almost immediate, as shown by the accompanying photographs taken only fourteen days after treatment. The ryegrass has made quite remarkable growth in the interval, and there has been practically no time lag after application.

An inspection of the grass following treatment might suggest that the growth would be unpalatable to stock. Admittedly this might be true if given an overdose, but applied at the rate of a 200-gallon tankful to an area of about 14 chains by 6 feet, it has been found that in showery weather stock will graze the treated area the following day after application. In this connection, however, Mr. Browne attaches great importance to the fitting of an efficient agitator to insure an even flow of uniformly blended washings. Without this, excessive fouling of the grass is apt to occur, so that patches are neglected by stock, and become very rank and unsightly.

First Year's Operation

Summing up his experience of the first year of operation, and considering the system as applied to his own farm, Mr. Browne is highly satisfied with his investment, and can think of little to alter.

Although the cost of the motorised outfit together with the benzine used may at first sight appear to be high, it is pointed out that these are the only costs, and considering the resulting speed and convenience of distribution, it may possibly in the long run prove cheaper than a horse-drawn conveyance.

Daily Distribution

When the project was first considered, it was pointed out that in the absence of a collecting tank, the distributing of the manure would prove an irksome daily chore, and moreover, one which would present some difficulty in wet weather. Thanks to Mr. Browne's foresight in providing a really speedy and efficient spreader, this daily distribution has presented no difficulty, and has made no heavy demands on time, involving on an average only about 15 minutes each day.

While it is claimed that, apart from its greater convenience, a holding tank improves the value of the manure by permitting time for a "ripening" process, Mr. Browne considers that this is more than offset by the increased costs, and anyway the results he is obtaining could hardly be bettered.

Winter Growth

Whether it is preferable to treat 20 acres twice each year, or about 40 acres once, can be determined only by experience, and the reaction of the grazing stock. Much will probably depend on the degree of fertility, and the existing pasture sward. Wherever the treatment has been applied, the response has been impressive, particular benefit resulting where the sward was

extremely poor. Normally, prolonged heavy topdressing over a period of years is needed to build up a pasture on this class of land, and liquid manure seems to offer a promising short cut in this direction. It was also found that treated pastures gave noticeably better winter growth, a factor of considerable importance to the health of stock at a time when natural green feed is at a premium.

No More Waste

Considered on his experience to date, Mr. Browne is emphatically of the opinion, that the use of liquid manure is both practicable and profitable, so long as proper care is taken to keep the overhead charges within reasonable limits. So far as he is concerned, the practice has come to stay, and even if artificial fertilisers were once more freely available, he would never again tolerate the wastage of this valuable natural fertiliser.

CHARACTERISTICS OF SERPENTINE SUPER

This article outlines the chemical and physical characteristics of serpentine superphosphate, and its practical value as a fertiliser in terms of practical farming.

—By—

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Supervisor of Serpentine Development,
Wellington.

IN view of certain criticisms levelled at the use of serpentine with superphosphate, it may be mentioned at once what serpentine super is **not.** For instance, it is definitely **not** merely ordinary superphosphate diluted with a soft rock, added as a "make-weight" and thereby involving uneconomic use of labour and transport.

When properly ground and mixed with super, under suitable conditions, serpentine imparts to super important desirable chemical and physical properties, and adds as well, essential plant nutrients to those already contained in straight super. This means that speaking generally, serpentine super is a more efficient fertiliser, weight for weight than normal superphosphate, and, as Mr. Cockayne has stated, it increases the effective fertiliser ration of the farmers by 33⅓ per cent., so playing an important role in increased farm production, an essential part of the Dominion's war effort.

What is Serpentine

Serpentine is a mineral containing mostly magnesia and silica, as well as certain important trace elements, some of these likely to be of possible value in plant and animal nutrition. Of these, cobalt is of special interest. Serpentine is found in abundance in New Zealand, but unfortunately not in deposits alongside the railway. This largely accounts for its higher cost per ton than lime, so many deposits of which are adjacent to rail. Incidentally, the name serpentine is given this mineral because the rock often has the appearance of a snake's skin, being of a mottled greeny blue colour.

Manufacture

The serpentine rock is ground to a fine powder at the superphosphate works, and one part by weight of this material is mixed with three parts of hot moist superphosphate and the mixture allowed to chemically react and mature in piles. Only slight setting takes place, and, after the serpentine super is dressed and bagged, it remains thereafter in a free running condition.

The main features of the chemical reaction are that the water soluble phosphoric acid in the super is changed mainly into a magnesium phosphate, a "reverted" type of phosphate, by the magnesia in the serpentine. Some magnesia also becomes water soluble and is available for plant use. The silica portion of the serpentine becomes colloidal silica. There is an increase in availability of some of the other elements contained in small amounts in serpentine, i.e., iron.

The net result of the chemical reactions is that serpentine super, unlike ordinary super, is a non-acid fertiliser, the magnesia of the serpentine acting in this connection as does lime.

It may be mentioned that it requires several hundredweights of lime in the soil to neutralise the acid condition of one ton of ordinary super, and this is one of the main reasons why liming is so important, especially on acid soil types where superphosphate is applied.

Use of Lime

Whilst in the use of the serpentine super, there is no drain on the lime in the soil to neutralise acid in this fertiliser, it must not be taken that the use of serpentine super will obviate the use of lime. On acid soils the use of lime is still necessary, but in areas so distant from rail or lime supplies as to make its application impossible, the use of a neutral fertiliser such as serpentine super is advantageous. It means too, that there is no chemical injury to bags, a common fault with superphosphate, and in these days of bag scarcity and with higher priced bags, this is quite an important feature of this new fertiliser.

Again, the mixture does not cake or set hard as does super so the laborious job of breaking up lumps prior to sowing the fertiliser is obviated. Farmers find that serpentine super is easy to sow, either by drill or by hand. The physical attributes of this new fertiliser will be at once obvious to all farmers. The chemical properties, as indicated in crop or pasture growth can only be appreciated after its use.

Chemical Properties

As already mentioned, the magnesia in serpentine (there is approximately 35 per cent.) reacts with the water soluble phosphoric acid in super to make

a magnesium phosphate. Scientific research has demonstrated that this is a particularly useful type of phosphate for farm use. It is what is called a "reverted" phosphate, and this type is less liable to be "fixed" or "locked up" by certain soil chemicals with the beneficial result that more of the applied reverted phosphate is available for growing plants, and in turn more goes to the animals or humans consuming such plants than is the case with superphosphate.

The whole question of soil phosphate fixation is a complicated chemical problem which it would take many pages to discuss, but, in essence, it is this. When water soluble phosphoric acid, as in super, is applied to the soil, it combines with some base or bases in the soil. These bases from the standpoint of phosphate recovery by plants may be good or bad. In the good category are calcium and magnesium; in the bad, iron and alumina. Discussing the bad bases first. Iron and alumina phosphates, formed by the combination of iron and alumina with water soluble phosphoric acid, are very little, if at all, available for growing plants. So it is said that iron and alumina "fix" or "lock up" the phosphates.

On the other hand, when the water soluble phosphoric acid combines with calcium or magnesium in the soils, plants can much more readily secure their phosphate needs from either calcium or magnesium phosphate than from the iron and alumina phosphates. Further, the recovery from magnesium phosphate is, according to overseas authorities, better than from calcium phosphate.

Now, iron and alumina are most active in acid soils, so, when lime is applied, some of their phosphate fixing powers are lessened. This is one of the most important functions of liming soils and of particular value where super is the phosphatic fertiliser used.

When water soluble phosphoric acid is applied to soil, it can therefore combine with one or more of the good or the bad bases, and over large areas of New Zealand, our soils contain a good proportion of the undesirable bases—iron and alumina.

In order therefore to ensure that the form of phosphate applied is of the most desirable type, it is reasonable to suggest that it is worth while to add a good base to the phosphoric acid before this is applied to the soil. This is just what is done by adding serpentine to super at the fertiliser works. The phosphoric acid is "reverted" with magnesia and this greatly minimises it being "perverted" by iron and alumina in the soil.

Of course, lime can be used also to revert the phosphate but it is considered better to use serpentine rather than lime in the works, applying lime as such in suitable quantities, depending on soil and other conditions.

Magnesia as a Plant Nutrient

As mentioned, some of the magnesia of the serpentine becomes water soluble and so is available as a plant food.

Our New Zealand soil surveys are now indicating that over wide areas the magnesium content of the soil is getting low, possibly dangerously so in some areas. It should be realised that magnesium is a base that leaches out of soils, and is utilised by plants and animals much like calcium, and that up to the time of using serpentine super, very little magnesia had been applied in artificial manures to our soils.

Magnesia is a very important nutrient for plants and animals, and time may show that one of the most important attributes of serpentine super is its water-soluble magnesium content.

Fortunately, the silica content of serpentine is in a form that allows a chemical reaction with super to the end that colloidal silica is formed. The presence of colloidal silica in serpen-

tine super further helps the uptake of phosphate by plants, and so enhances the fertiliser value of this material.

"Trace" Elements

As well as magnesia and silica, serpentine contains small percentages of what are called "trace" elements, some of which have a possible value in plant and animal nutrition. Cobalt, nickel, iron, zinc, manganese occur in serpentine.

Cobalt is the important mineral for "bush sick" areas, but there is not sufficient in the usual per acre dressings of serpentine super to enable the fertiliser to supply a sufficient dressing of cobalt, as is the case with cobaltised serpentine super. However, the repeated annual dressings of even small quantities of desirable "trace" elements are likely in time to have some value.

This point also may be made. The chemical analyses of serpentine super somewhat approximates that of a mixture half and half of superphosphate and basic slag, and observations of pasture experiments suggests that the field results of serpentine super and the super-slag mixtures have much in common. Time alone will determine whether these preliminary observations are borne out over several years' trials. If they do, grassland farmers in the wetter area of New Zealand will have a fertiliser equalling one which experiments and experience have shown in the past to be excellent, i.e., super and slag, half and half.

It may be pointed out, too, that as each farmer receives his fertiliser quota, he should appreciate the fact that this is one-third greater because of the advent of serpentine super; a very important consideration when his ration is about one-third of his requirements some two years ago.

Whilst all the evidence points to serpentine super being a first-class fertiliser, it is of necessity, now being applied at rates much less per acre than in pre-ration years, and, in any comparison of results under present conditions with these when several times the amount of fertiliser was applied per acre, this should be borne in mind.

In concluding this section on the chemical aspects of serpentine super, it will be realised by farmers that the addition of serpentine to super in the approved manner gives the new mixture a character tending definitely to increase its fertiliser value when used in crops and pastures over wide areas of this Dominion. This also, is associated with very desirable physical properties, no rotting of bags and no setting of the fertiliser in the bags.

In a large number of official trials carried out by the Department of Agriculture over the past three years, it has been shown that when soils have been asked the question, "How good is serpentine super compared with super or reverted super, or super and lime?" a favourable answer has been obtained.

Generally speaking, 1 cwt. of serpentine super is at least as efficient as 1 cwt. of straight super, and on many areas it is better, and this, fortunately, where fertilisers are needed most. As a fertiliser for farm crops, it has given good results and on cruciferous crops, turnips, swedes and rape, serpentine super not only gives good crop yields but there is no germination injury as is the case with straight super.

So on crops and on grassland serpentine super can be used with confidence by New Zealand farmers.

Careless Handling of Pigs

Concern is felt in many quarters at the prevalence of bruises and weals on various parts of the skin of pigs. Farmers, dealers and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of otherwise prime porker or baconer carcasses. Much can be done by a little more care and patience, the use of a proper yard and loading race, and the absolute prohibition of rough handling, stock whips and sticks.

All engaged in the handling of pigs should obtain a copy of the Department's free bulletin (No. 175) on this subject.

Lambing Estimates for 1942

Greatest Number of Ewes on Record And Highest Lambing Percentage

Contributed by the LIVESTOCK DIVISION.

FOR the first time in the history of the Dominion, the lambing percentages have exceeded 90 per cent. for three years in succession, and this year's estimate of 91.43 is the highest yet recorded. The estimate is not as accurate as in previous years, the number of breeding ewes being based on the 1941 figures, as no figures for 1942 are available.

During the last five years the South Island returns have been consistently higher than those from the North Island, and this year the percentage for the South Island is the highest on record, while the North Island estimates show that a high lambing percentage has been recorded there also.

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland District.			
Mangonui	33,111	81.90	27,118
Whangaroa	13,662	87.20	11,913
Bay of Islands	60,793	85.00	51,674
Hokianga	54,527	82.55	45,012
Whangarei	100,347	81.48	81,762
Otamatea	75,754	84.26	63,830
Hobson	69,958	82.02	57,380
Rodney	82,007	77.60	63,637
Great Barrier	7,169	70.10	5,025
Waitemata	67,146	85.40	57,343
Eden	2,314	89.07	2,061
Manukau	61,023	91.00	55,531
Franklin	96,399	94.00	90,615
Coromandel	39,416	73.51	28,975
Thames	10,114	86.01	8,699
Hauraki Plains	12,775	88.48	11,303
Ohinemuri	10,953	93.08	10,195
Waikato	134,971	94.43	127,453
Raglan	343,133	90.46	310,398
Waipa	154,784	94.74	146,642
Piako	98,411	100.03	98,441
Matamata	183,427	100.67	184,656
Rotorua	67,887	91.00	61,777
Taupo	19,571	103.00	20,158
Taumarunui	90,680	95.95	87,007
Kawhia	56,996	85.25	48,589
Otorohanga	118,599	89.65	106,324
Waitomo	300,472	94.00	282,444
Ohura	105,365	93.97	99,011
Kaitieke	57,802	80.23	46,375
Tauranga	92,872	95.00	88,228
Whakatane	40,409	84.40	34,105
Opotiki	52,626	83.40	43,890
Totals	2,715,473	90.50	2,457,571
East Coast-Hawke's Bay District.			
Matakaoa	63,379	73.47	46,564
Waiapu	252,799	79.86	201,885
Uawa	127,970	82.47	105,536
Cook	443,179	85.51	378,962
Waikohu	368,102	80.55	296,506
Wairoa	410,897	82.00	336,935
Hawkes Bay	929,939	86.00	799,747
Waipawa	392,574	95.00	372,945
Waipukurau	128,147	95.00	121,739
Patangata	499,491	90.00	449,541
Weber	53,259	86.00	45,802
Dannevirke	269,467	100.00	269,467
Woodville	80,378	88.00	70,732
Pahiatua	157,724	93.00	146,683
Akitio	160,172	92.00	147,358
Totals	4,337,477	87.38	3,790,402
West Coast-Wellington District.			
Clifton	71,377	90.31	64,460
Taranaki	18,404	104.24	19,184
Inglewood	37,675	96.02	36,175
Egmont	21,029	102.32	21,516
Stratford	80,134	92.00	73,723
Whangamomona	47,378	86.70	41,076
Eltham	50,297	94.77	47,666
Hawera	75,613	93.48	70,683
Waimate West	5,684	101.31	5,758
Patea	200,278	96.20	192,667
Waitotara	134,955	90.80	122,539
Waimarino	169,112	92.00	155,583

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
West Coast-Wellington District—Contd.			
Wanganui	261,680	86.60	226,614
Rangitikei	948,933	95.70	908,128
Oroua	203,784	103.25	210,406
Kairanga	109,377	101.18	110,667
Kiwitea	229,073	94.00	215,328
Pohangina	117,795	94.00	110,727
Manawatu	146,150	102.87	150,344
Horowhenua	116,009	94.97	110,173
Hutt	72,390	85.00	61,531
Makara	44,515	90.00	40,063
Featherston	315,698	86.80	274,025
Wairarapa South	162,098	86.80	140,701
Masterton	295,884	82.50	244,104
Castlepoint	96,452	82.60	79,669
Eketahuna	138,514	80.00	110,811
Mauriceville	45,146	93.50	42,211
Totals	4,215,434	92.19	3,886,532
Marlborough-Nelson-Westland District.			
Waimea	168,128	77	129,459
Takaka	26,558	78	20,715
Collingwood	13,199	83	10,955
Buller	2,487	93	2,313
Inangahua	13,534	109	14,752
Murchison	32,565	98	31,914
Grey	24,764	108	26,745
Westland	36,066	111	40,033
Sounds	101,456	72	73,048
Marlborough	195,771	84	164,448
Awatere	205,875	88	181,170
Totals	820,403	84.78	695,552
Canterbury-Kaikoura District.			
Kaikoura	112,418	79	88,810
Amuri	228,670	76	173,789
Cheviot	145,070	94	136,365
Waipara	283,603	92	260,914
Ashley	63,146	95	59,988
Kowai	66,359	102	67,686
Oxford	71,258	87	61,994
Rangiora	33,220	107	35,545
Eyre	49,569	103	51,056
Tawera	51,924	75	38,943
Malvern	111,652	99	110,535
Paparua	29,946	104	31,143
Waimairi	4,193	102	4,276
Heathcote	10,333	100	10,333
Akaroa	86,275	106	91,451
Mt. Herbert	40,410	107	43,238
Wairewa	71,456	122	87,176
Halswell	13,298	95	12,633
Springs	26,206	109	28,564
Ellesmere	78,337	104	81,470
Selwyn	144,544	82	118,526
Ashburton	647,761	99	641,283
Geraldine	231,694	86.65	200,762
Levels	144,414	117	168,964
Mackenzie	304,723	77	234,636
Waimate	431,309	96	414,056
Chatham Islands	41,003	73	29,932
Totals	3,522,791	93.22	3,284,068

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Otago-Southland District.			
Waitaki	416,955	84.0	350,242
Maniototo	249,853	81.1	202,631
Vincent	254,222	82.5	209,733
Waihemo	94,422	80.0	75,537
Waikouaiti	65,433	98.8	64,648
Taieri	164,635	84.5	139,116
Peninsula	15,698	106.5	16,718
Clutha	385,263	98.0	377,558
Tuapeka	323,179	97.5	315,099
Bruce	213,059	92.0	196,014
Lake	133,333	78.0	103,999
Southland	1,541,199	106.1	1,635,212
Wallace	560,210	91.4	512,032
Stewart Island	1,894	80.0	1,515
Totals	4,419,355	95.03	4,200,054

Note: The breeding ewe figures are those taken out in 1941.

District Estimates.

The following table gives the estimates of the current (1942) season's lambing for the several sheep districts:—

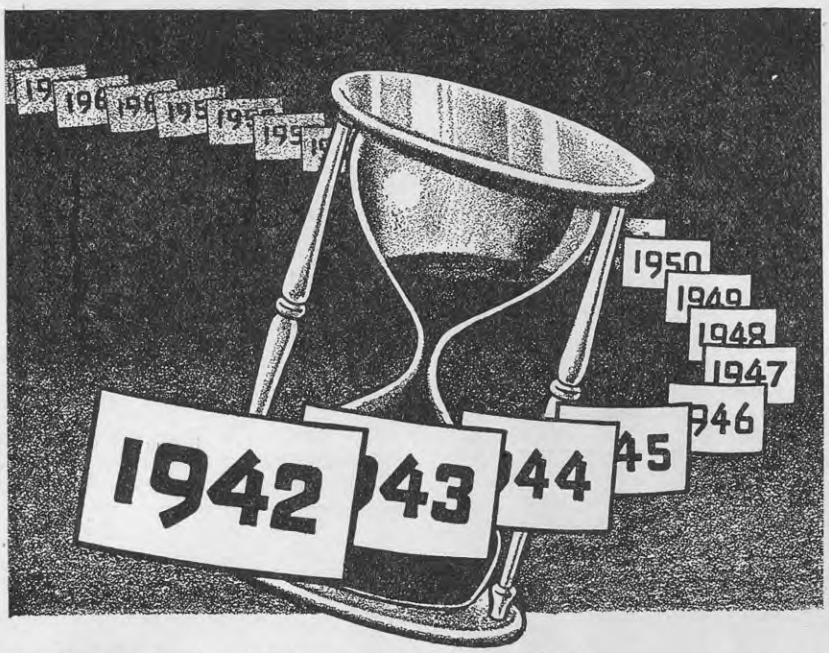
District.	Number of Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland	2,715,473	90.50	2,457,571
East Coast-Hawke's Bay	4,337,477	87.38	3,790,402
West Coast-Wellington	4,215,434	92.19	3,886,532
Marlborough-Nelson-Westland	820,403	84.78	695,552
Canterbury-Kaikoura	3,522,791	93.22	3,284,068
Otago-Southland	4,419,355	95.03	4,200,054
Dominion	20,030,933	91.43	18,314,179

Dominion Totals

The following table shows the estimated lambing for the North and South Islands for the previous five years, together with the actual number of lambs tailed:—

Year.	Number of Breeding Ewes	Estimated Percentage of Lambs.	Estimated Number of Lambs.	Actual No. of Lambs Tailed.
North Island.				
1942	11,268,384	89.95	10,134,505	—
1941	11,268,384	90.74	10,224,786	10,593,291
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
South Island.				
1942	8,762,549	93.34	8,179,674	—
1941	8,762,549	91.60	8,026,076	7,929,999
1940	8,809,973	91.69	8,078,518	8,037,123
1939	9,070,497	86.29	7,826,601	7,752,922
1938	8,928,037	90.10	8,044,540	7,914,594
1937	8,761,689	91.35	8,003,668	7,939,418
Dominion.				
1942	20,030,933	91.43	18,314,179	—
1941	20,030,933	91.11	18,250,862	18,523,290
1940	19,727,657	90.21	17,796,006	18,385,772
1939	19,960,299	85.26	17,017,395	17,229,569
1938	19,663,866	84.64	16,645,165	16,948,979
1937	19,332,077	88.71	17,149,517	17,340,914

Manuring Sensibly!



TIME Tells Its Story with BETTER NON-ACID MANURES

- Many soils of high-rainfall parts of New Zealand lack Lime and contain large quantities of Iron and Alumina (clay), which rob the farmer of about four-fifths of every ton of water-soluble Phosphates spread on these soils; a Basic Slag contains, among other minerals, large quantities of a non-acid chemical compound known as Calcium-Silico- Phosphate which, it is claimed, has the power of unlocking these dormant minerals from the soil. The phosphates of a Basic Slag cannot be locked up by soils because they are already combined in a form easily digested by the root acids as they need them.
- Over 70% of the ash of grass, wood or other organic matter is silica; this is the main reason why humus and compost manures produce such extraordinary growth in plants and trees; properly oxidised Basic Slags, too, contain large quantities of valuable silica—in a form that is SOLUBLE in the natural acids of plants and soil.
- This is the reason why, in the high rainfall districts of 30 inches or more, Basic Slags—even those of low phosphate content—give good results.

HESKETT SLAG

Made in New Zealand for New Zealand soils.

Finely ground and packed 18 bags to the ton, it is delivered f.o.r. Huntly, Waikato. Obtainable from merchants and Dairy Companies or from the Chief Distributors:

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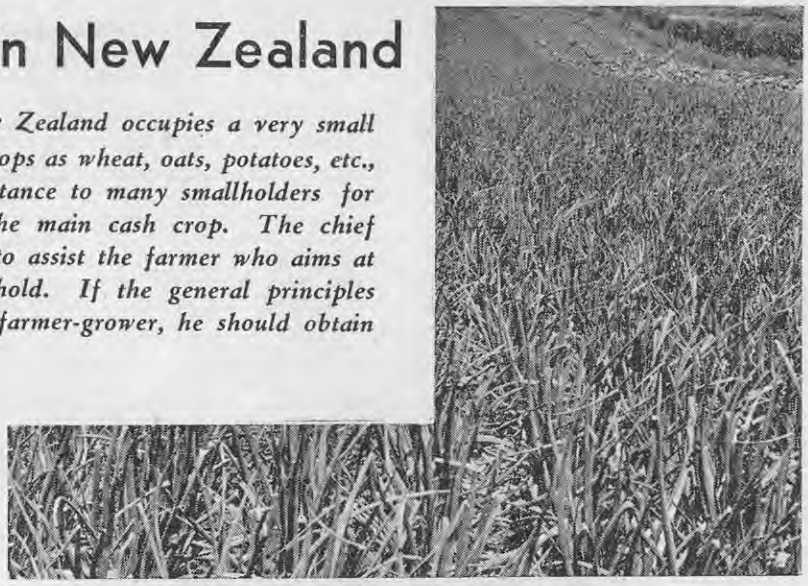
Onion Growing in New Zealand



Although onion growing in New Zealand occupies a very small acreage when compared with such crops as wheat, oats, potatoes, etc., the industry is of paramount importance to many smallholders for whom onion production provides the main cash crop. The chief purpose of this article however, is to assist the farmer who aims at growing onions for his own household. If the general principles outlined are adhered to by the farmer-grower, he should obtain satisfactory results.

—By—

A. V. ALLO, Instructor in Agriculture, Whangarei.

ONIONS in New Zealand have always been grown principally for the local market, although at various times small shipments have been sent overseas. The main districts devoted to this crop are Pukekohe in the North Island, and, in the South Island, areas contiguous to Christchurch, particularly Marshlands and Halswell. Small areas are grown in the other centres, while nearly every amateur gardener has his onion patch.

Soil Types

Onions can be grown successfully on several types of soil, but it is preferable that the ground is free working. A good silty, volcanic or peaty loam, river flat soil, pumice or sandy loam may all be suitable; the latter type is considered to produce the best keepers with the brightest skin. It is essential that all onion ground be well drained, sweet, and in good heart. Other things being equal, onions grow best on a sunny slope with a northerly aspect.

The onion plant is very delicate, and will not stand extremes of wetness or drought. As it takes 6 to 7 months to mature, and is growing during the wettest and driest periods of the year, the quality of a crop depends to a large extent on the weather conditions during growth. In a wet season the bulbs are inclined to be soft, and of large size with many thick necks, and will not keep well. On the other hand, if the season be dry, crops are lighter and bulbs smaller than usual. The ideal climate is a gentle spring with fair rainfall, a fair summer rainfall until mid-January (with no humid weather), and no extremely hot summer days, and then a warm dry autumn.

Onion growing is mostly confined to small holders, and where it is the main cash crop, it is usually given the most favourable place in the rotation, which may be onions, carrots, cabbage, potatoes, onions. On the other hand, there are many growers who grow onions on the same ground year after year with no ill effects, provided the soil fertility is maintained.

The ground should be well drained. Consolidation should be good, while the final seed-bed must be firm, friable, moist, and free of weeds. All preparatory cultivation should have this object in view. On no account should seed be sown when the ground is wet, and sticky, and sowing on hurriedly-worked soil should be avoided.

Fertilisers

Although not gross feeders, onions require a plentiful supply of plant food if the maximum yield is to be obtained. The soil needs a good supply of organic material which may be obtained by ploughing in well rotted stable manure

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or a soiling crop such as oats. In these days of fertiliser rationing it is difficult to make any hard and fast recommendations regarding the use of artificial fertilisers, but it is quite safe to say that the maximum amount of fertiliser obtainable under the fertiliser restrictions should be applied. Onion growers vary in their opinions regarding the value of lime, but many experienced growers claim that lime improves the onions in hardness and quality.

Methods of applying fertilisers vary somewhat. They may be broadcasted on the area prior to sowing and lightly worked in, or they may be drilled in with the seed.

Varieties to Grow

Of recent years a considerable amount of investigational work has been carried out in New Zealand in an attempt to determine the most suitable varieties of onions to grow. The most desirable characteristics of an onion are (a) high yielding ability; (b) good keeping quality, (c) good cooking quality, (d) uniformity of type, size, and shape, (e) disease resistance, (f) a skin that is neither too coarse nor too thin.

These characteristics are self-explanatory. As regards size, the onions most favoured by the housewife are those that average four or five to the pound. If bulbs are too large the keeping quality deteriorates, while if bulbs are too small, there is too much wastage in peeling.

In the early days of onion production Brown Spanish was the chief variety grown, but the crops were usually very light (often only five to six tons per acre). This variety is also susceptible to mildew, and as a cooker is not commonly popular, as it is hard to cook and dark in colour. Varieties such as Brown Globe, Deptford, Golden Globe, Ailsa Craig, etc., have been grown for many years, but none are suitable for keeping until September or October. Some South Island growers have a strain of onion that appears to be a cross between the Brown Spanish and Brown or Golden Globe, and this strain is a fair keeper under favourable circumstances.

The Australian Brown was introduced in 1928, and proved a good keeper, but its cropping power was very moderate and it soon went out of favour.

The Straw Spanish has been grown for many years in the Pukekohe district. It is a flat topped onion, somewhat the colour of grain straw. It resists mildew, is a high yielder, thin-skinned, and a good cooker. It is, however, not a good keeper. Of recent years, an improvement in the Straw

Spanish has been brought about by selection, and the Pukekohe Longkeeper is the outcome. It yields a shade less than Straw Spanish, but is of an excellent keeping quality. Various growers in the Pukekohe district have further improved the Longkeeper strain, which is now by far the most popular variety in the country. The value of this strain has been particularly marked in the South Island, where there has been a keen demand for the Longkeeper seed.

A variety popular in the South Island for sowing in the autumn and harvesting in early January is the Giant Rocca, which has large bulbs of poor keeping quality.

In Canterbury, autumn sown onions are sown in March and April, being harvested in December and January. Spring-sown onions, the main crop, are sown in August and September and are harvested in March and April. In the North Island seed is sown about five to six weeks earlier in the spring than in the South. Two types of crop are grown (a) transplants, and (b) seedlings.

Transplants

The seed is sown ¾ in. deep in rows one foot apart, at the rate of one ounce per chain, in late March and April. Each 5 lb. of seed sown in this manner will provide sufficient plants to plant out one acre. In July, or even as late as September, the plants are wheelhoed out of their beds. The plants are topped and tailed with shears for ease of handling and transplanted in rows one foot apart and spaced 3 to 4 inches in the rows. The transplanter holds a bundle of plants in one hand, and with the other presses the roots of each plant in the soil with the thumb, allowing the plants to lie over on one side. Plants may also be carried in a bag slung in front of the planter, who is then able to use both hands for planting.

The plants soon strike and in a few days are upright. Before planting, the rows are marked out by pulling a rake-like, wooden implement, with five teeth each one foot from its neighbour, over the area to be planted. Transplanting is far more common in the North than in the South Island.

Seedlings

The seedling crop is sown from July to September, the earlier date being commoner in the North Island. The rate of seeding is from 3 lb. to 5 lb. per acre and the seed is sown either by hand or with a drill in rows 12 to 15 inches apart. The rate of seeding depends on the lateness of the spring (if sowing is held up by rain it is advisable to allow a slightly heavier seeding), on the variety, and on the germination percentage of the seed. A large bulbed variety, e.g., Giant Rocca, would have a lighter seeding than a smaller bulbed type such as Longkeeper. If the germination of the seed is less than 85 per cent. the rate of seeding should be increased. When the seed is sown the drills should be shallow.

The seedling crop is usually later than the transplant in coming to maturity, and gives a slightly lower yield, but this may be offset by the saving in labour, and the production of an onion that is a better keeper.

In a crop planted by the seedling method, there is usually no thinning, and the bulbs just push each other out of the rows. This procedure is quite satisfactory, with most of the bulbs reaching good size, while there is a good demand for the smaller sized bulbs as picklers. If so desired, however, they can be thinned to 3 to 4 inches apart.

After-cultivation

The surface of the ground should be kept open and free from weeds. The soil may be hoed with a hand hoe, or wheel hoe, although, if the latter be used, a certain amount of hand weeding along the drills is required. Hoeing should not be too deep, just sufficiently so to cut the weeds. As the onion roots soon traverse the space between the rows it is a mistake to intercultivate deeply, and when the bulbs are well formed intercultivation ceases. As the yield of a crop depends to a large extent on the care and attention the

farmer devotes to after-cultivation, it is essential that the ground should be kept as free from weeds as is possible.

Harvesting

Onions are ready for harvesting six to seven months after sowing. In the case of autumn sown onions maturing in January, and the earliest maturing bulbs of the transplanted crop, the bulbs may be lifted, and topped when green, and used immediately. This is not the general practice, however, and in nearly all cases the onions are allowed to ripen fully before pulling.

When the bulbs are fully formed and the tops yellow, they may be bent over, care being taken only to bruise the leaves, and not break them, as otherwise new leaves will start to form, and the bulbs become useless for keeping.

If the autumn be very warm and dry it is not necessary to bend over the tops. When the tops are dry, or nearly so, the bulbs are pulled and placed into windrows, three or four rows comprising one windrow. They are left to lie in the paddock five to ten days, depending on the weather. When the tops are dry they are cut off with shears about ½ in. from the bulb. If rain intervenes the onions are turned until dry. When clipped the onions are roughly graded according to size and quality. Yields vary considerably, but 12 to 16 tons per acre is considered a good crop.

If onions are to be stored, drying must be thorough. They may be stored loose in sheds, in sacks or crates, or in clamps under trees covered with straw or a tarpaulin.

Answer to Correspondent

Sowing of Swedes

"M.W.H." (Whakaangiangi):—

I know it is against all laws to mix turinp seed with super, but, can swede seed be mixed with serpentine superphosphate and sown through the drill, and does serpentine superphosphate flow faster than super in the drill?

FIELDS DIVISION:—

Numerous field trials have shown that serpentine superphosphate can be mixed with swede seed for sowing through the drill with little or no harmful effect on the germination. Compared with superphosphate, the serpentine super has given very much better germination. With regard to the question of the relative rate of sowing compared with super, generally the serpentine superphosphate is in a better physical condition and runs more freely, about four hundredweight being sown with the setting to give three hundredweight of super.

Pig Industry Broadcasts

UNDER the auspices of the District Pig Councils concerned broadcasts will be delivered in February as follows:—

1YA, Auckland.—February 18, 7.15 p.m., "Care of Young Pigs after Weaning," by H. H. Preston, Supervisor, Northland District Pig Council.

4YA, Dunedin.—February 8, 7.15 p.m., "Concrete for Piggeries," by the Supervisor, Otago and Southland District Pig Council.

2YH, Napier.—February 9, 7.30 p.m., "Housing and Sanitation," by I. H. Owtram, Supervisor, Tairawhiti District Pig Council.

2ZA, Palmerston North.—February 16, 8.30 p.m., "Avoiding Losses in Pig Production," by H. H. Marsdon, Supervisor, Wellington District Pig Council.

LITTER PRODUCTION

(Continued.)

Treatment of the Sow.—It is nearly impossible to define this since every man has his own ideals of looking after animals. Further, sows, like every other animal are subject to the accidents of time, and the consequences of the circumstances under which they live. They may suffer attacks of indigestion and other internal disorders, rheumatism, colds, and chills that just seem to happen in spite of the very best treatment they may receive. Any one of these things may be sufficient to cause a sow to reduce the number of living foetuses.

There are, as well, a further number of man-made causes which can produce the same effects, and it is with these that the owner is most concerned. Thus, irregular feeding, sudden changes in quality or quantity of feed given, absence of water for 24 hours, exposure to excessive sunlight or to inclement or extremely variable weather, damp quarters, maltreatment by the owner, or anything else that may be classed as poor treatment may cause a reduction in the number of live foetuses.

Maintain Sow's Weight

Sows that lose weight during the gestation period cannot do this, and at the same time store body weight in the form of a litter that is perfectly normal and thrifty. Litters from sows which lose weight, either grow slowly after being born, or if the sow improves and has plenty of milk, and the litter grows rapidly, sudden and unexpected deaths occur with symptoms similar to those associated with pulpy kidney in lambs. It has been said that mineral starvation is a prime cause of poor litters. It can be, but insufficient food or unsuitable treatment when the food is adequate are more usual causes of small and weakly litters. It is most important to see that the sow is sufficiently well fed so as not to lose condition during the gestation period.

Contributed by the Livestock Division.

Deaths After Farrowing

It is at this stage that the greatest obvious losses occur. In almost every country these have been measured from time to time, and the average loss during the first three days amounts to from 20 to 30 per cent. of pigs born. By preventing this loss we could increase the efficiency of sows, and most of this improvement would be profit.

In the past, the use of farrowing rails has been recommended, and these are very widely used. Since the losses continue to occur it would almost seem that the recommendation is not sound. When one considers the circumstances, that the little pigs are unaware of the danger of being overlain, that they are slow to move, and that initially they do not know that safety lies in getting behind the farrowing rail, it almost seems that farrowing rails are not the solution of the difficulty.

The use of short straw or sawdust for the sow's bed is also recommended in order to facilitate the escape of the little pigs from danger. The fact remains, however, that if the little pig had the vitality of a weaner he still may not escape the disaster because he does not know where to go. The dead pig gets no second chance of escape. Short straw, however, may have some advantages later, in that it prevents the young pigs from hiding in it, and so obviates the possibility of their being walked on by the sow.

Keep Sows Fit

The more rational approach to the problem seems to be by way of the sow. It is a common experience that the greatest loss occurs with old sows, and with sows that are over fat. Here are the clues to sow treatment: don't let sows get overfat prior to farrowing. Sows on grass in spring tend to get overfat, and in order to keep them right it seems necessary to bring them into the farrowing pen three weeks or more before farrowing, and there to feed them so as to keep them in thrifty but not too fat condition. This procedure achieves the second desideratum in that the sows have time to get used to their new quarters, and should have time to settle down. Sows are often brought in just a few days before farrowing; their food is changed, their activities are curtailed, the temperature, amount of sunlight, condition of their bed, and every physical circumstance is changed. If the sow is temperamental, and resents confinement, this upset is added to all the

others, any one of which is sufficient to prove her undoing at this critical stage. As a rule the older the sow, and higher she is in condition the longer should be the period allowed for settling down.

If the sow is not too fat, and is happy in her surroundings she has every opportunity of finishing up with a maximum number of the offspring that are born. Every progressive farmer makes the utmost use of labour-saving devices. From the condition and circumstances of the sow, one could almost predict the outcome of farrowing, wherever the sow farrowed. English practice recommends placing the little pigs out of harm's way in a hay box as soon as they are born. This entails the attendance of the owner during farrowing, but if such attendance meant the saving of two to three pigs per litter, the time spent would be well repaid. If, however, attention is paid to all the other details, the sow may safely be left to herself at farrowing time.

Nutrition

Feed the sow. Pigs are made before they are born. Size, condition, vitality of piglets, all depend on feeding, as also does the milking quality of the sow.

Special care must be taken in feeding the brood sow if she is to do her best. As has already been pointed out many of the disasters which take place before and after farrowing may be traced to improper feeding.

Just before and after farrowing special attention must be paid to the condition of the sow's bowels. If necessary reduce the feed just before the litter is due (particularly maiden sows) as a precaution against milk fever or swollen udder.

If possible do not let the sow have any feed immediately before farrowing. So long as she is not hungry, she will be the better without food; plenty of water is, however, a necessity. Much harm can be done both to the sow and the litter by overfeeding at this critical period. A bran mash and a little molasses will be all that is required for the first day.

Don't give the sow full rations until her pigs are a week old. The appearance of the sow's udder, the size of her litter, and the condition of the whole family should be one's guide. As the pigs grow the sow must be given all the food she will clean up readily, for with a big litter the strain on her is heavy, and she must be able to make plenty of milk. Avoid sudden changes of food, as this upsets her pigs, if not the sow herself.

Sows Eating Litter

This is often a source of loss, again attributed to a variety of causes. Some say that it occurs where the mineral or protein content of the sow's ration has been low, and that it can be prevented by attention to those matters, or by smearing the young with kerosene or other offensive smelling material. Others attribute it to the sow being irritated by the sharp canine teeth of some of the piglets.

While these may all be causes of this perversion, the considered viewpoint of McLinden is that the sow ate her litter in self-defence. Where sows have experienced unkind treatment at the hands of their attendant, or where they are upset by surroundings to which they are unaccustomed, they exercise their deeply ingrained maternal instinct, and consume their litter knowing that the piglets are incapable of protecting themselves, and fearing that they may be the victim of a direr fate. Wild sows exhibit this characteristic to a greater extent than the domestic animal.

Cobalt Deficiency in Sheep and Cattle

As the result of investigations into the prevention of bush sickness by the use of cobalt, it is now possible to recommend to farmers in the districts concerned, methods by which they can economically prevent the incidence of the disease. These recommendations are made jointly by the Department of Agriculture and the Cawthron Institute, and are available in a bulletin issued free by the Department.

The Linen Flax Crop

Left.—Linen flax crop on good rolling country.

Right.—A well grown crop is easy to pull and easy to handle.

The life of the linen flax plant is comparatively short, ranging generally from 90 to 120 days according to the season and district, from the time of sowing until pulling. It is, therefore, essential that every factor, including soil type, selection of suitable paddocks, and proper and adequate cultivation be taken into consideration, and put into effect, to ensure that conditions are favourable for the unhindered development of the crop.

— By —
W. FAITHFUL,
Fields Instructor, Gore.

UNLIKE most other farm crops, which, in the case of hay or forage crops are grown for leaf, or for grain in cereal crops, or bulbs in turnips, the linen flax crop is grown to produce **FIBRE.**

A further point to remember is that in this crop, perhaps more than in any other, the quality of the finished product is influenced by good husbandry; high quality flax will not be produced on poor, badly farmed land, but quite good flax can be, and has been produced on comparatively poor land which has been well farmed. Let there be no misunderstanding, linen flax does not like low fertility, even although it will grow on comparatively low fertility land, but, if good quality of fibre is the goal, as it should be, then the place for the crop is on the soil type indicated later in this article, and where the land is well farmed.

The next point for consideration is that the flax crop must be given every facility for uninterrupted growth. Climatic conditions play an important part here, but much can be done by proper preparatory cultivation, particularly taking into account the previous history of the particular paddock. High quality flax must be uniform in length and in the thickness of the straw, therefore, the condition of the seed bed is of considerable importance, and the quantity and type of fertiliser used must be right. The colour of the straw is an important indicator of quality, and here again the previous history of the paddock, and the fertiliser used, and the condition of the seed bed are all of paramount importance.

All the foregoing is in relation to fibre quality. Having now some conception of the points governing the production of quality flax, consideration can be given to the various phases of agricultural operations which will have a definite bearing on the resultant crop.

Soil Type

The best soil type for linen flax is a reasonably free silt loam, such as is found in most of the easy rolling country in the Tapanui and Gore factory districts. This type of soil is generally retentive of moisture and can be expected to produce good flax, practically irrespective of the season. On the lighter land there is a distinct element of risk, and shingly land may usually be considered unsuitable owing to its proneness to dry out during the flax-growing period. (Flax must have adequate moisture to the roots.)

Selection of Paddock

Several very important matters must be considered here. The paddock should preferably have a gentle slope towards the North East, it should be well drained, and should not be marred by any sharp changes in contour. "Back lying" paddocks are not suitable as they are generally more exposed to the south and south-west winds, the depth of soil is less than in paddocks with a northerly aspect, and a further disadvantage of the southerly aspect is that the mean soil temperature is lower owing to the shorter period of subjection to the sun (flax requires heat as well as moisture).

Size of Paddock.—This will usually be in relation to the cropping programme of the farm, a good axiom is "A smaller area of good-quality flax is preferable to a large area of inferior crop," and it should be remembered that stooking and stacking of the crop will have to be undertaken, stack bottoms will need to be prepared, and the stacks either thatched or well covered.

Shelter.—This is desirable, but should be provided by the slope of the paddock rather than by a hedge or tall trees. If the latter are present, the crop within the zone of influence will

"lodge," and will generally be unsuitable for fibre, and incapable of being pulled.

Drainage.—If it is intended to grow flax on rolling country having a tight clay sub-soil, the area should be mole drained; on flats where drainage is bad, and where the top soil tends to become waterlogged, the growing of flax should not be considered. On flats where there are areas of shingle on the surface, the behaviour of previous crops in such paddocks should be taken into consideration, as it is quite possible that if the sowing is done early, and all other factors are equal, quite a good crop may be grown, particularly in a wet season.

Previous History of Paddock.—This is an important factor and is very closely linked with cultivation. The best flax may be expected on land which has been ploughed out of **good lea.** Unfortunately most of the lea land put under the plough is "run out," i.e., a rather tough old sward very deficient in clover. One of the essential requirements of flax is to have a steady supply of nitrogen (not to be secured from an application of either organic or inorganic artificial nitrogenous fertilisers). The obvious and necessary alternative is to break lea which is not deficient in clovers. Paddocks in which a brassica crop (such as turnips, kale, or rape) has been grown in the previous season may be used (some of the best crops have been grown on turnip land), but if this is done, particular attention must be given to proper and thorough cultivation. Stubble land may be used, but generally this land should be strong, as the flax following grain will be a factor in minimising the risk of the crop lodging on this type of land. As a usual thing, flax should not follow grain on medium fertility land.

Cultivation

Important points to remember:—

1. Flax seed is comparatively small, therefore, the seed bed must be fine and firm.

2. Flax does not like competition with weeds, particularly in its early stages of growth, and furthermore weeds such as docks, fathen, Californian thistles, and willowweed, are not appreciated in the crop at time of pulling, or during the subsequent processing.

Lea land should be ploughed not later than mid-June. The digger may be used, but it should not be set to plough too deep, just sufficient to turn the furrow over nicely. Late ploughing of lea is to be avoided, but, if unavoidable, the position will not be improved by ploughing a wide furrow to "get over the ground quickly." There is a great difference between just "getting the ground turned over" and "ploughing."

The land requires to get the full benefit from frosts and the pulverising action of the weather. Paddocks must be thoroughly worked, full use should be made of the grubber as well as the discs. If green turf is brought to the surface, it probably means that the ploughing was too late, but clods are better on the surface where they can be dealt with than left untouched below, and are likely to be an obstacle in the development of a satisfactory root system. Full use should be also made of the clod crusher and tine harrows, and the final operation before sowing is rolling to ensure a firm seed bed, and even depth of drilling.

The drilling should be done reasonably shallow. If possible use old coulters after drilling, cover by use of the chain harrows, or if considered necessary, the tine harrows may be used for this job. If there is danger of packing the soil too tightly, or any risk of increasing growth of yarr (particularly on turnip land) the roller should not be used after sowing.

Turnip Land.—The earliest fed off breaks should be used. The land should be well disced before ploughing, deep ploughing is not desirable. This land should be thoroughly worked, but it is not advisable to have it too fine, as very finely-worked land will increase the incidence of yarr.

Stubble Land.—Plough as soon as possible and bury the stubble, and thoroughly work before sowing.

Sowing

The object when sowing linen flax is to ensure an even distribution of plants over the whole paddock, as the gauge or thickness of the straw will

A well prepared seed bed.

be governed to a great extent by the regular spacing of the individual plants. There are three alternatives:

1. 7-inch drills, i.e., through every coulter of the drill.

2. Cross drilling, i.e., half the total quantity of seed and fertiliser drilled one way and then crossed with the other half.

3. Broadcasting.

The 7-inch drills will be found the most satisfactory under ordinary farming conditions, giving a comparatively even seeding in the drills. Cross drilling results in uneven gauge in the straw, owing to the density of plants at each intersection. Broadcasting should be undertaken only on strong land that has been very thoroughly worked; provided these two essential qualifications are present the broadcasting of the seed has much to recommend it, inasmuch as there is a comparatively even distribution of seed over any given area of the land, whereas the distribution of seed in 7-inch drills is confined to the coulter runs. Also in cross drilling the distribution is such that there is a heavy concentration of seed at each intersection of the coulter runs, and only a 50 per cent. seeding in the drills between the intersections.

The result of this method of drilling is that the straw at the intersections is fine, frequently quite spindly, while the straw between the intersections is comparatively coarse. This unevenness in gauge is not a feature of good-quality flax. Although, by these comparisons, the broadcasting appears to be the best, the conditions justifying sowing broadcast are so very infrequently encountered that farmers are recommended to use the 7-inch drilling method. The flax seed is sown through the "wheat feed" or "fine" side of the grain box.

The rate of seeding is between 70 lb. per acre on light land and up to 120 lb. per acre on heavy land. On most of the medium land about 84 lb. to 90 lb. per acre is a sufficient seeding. Other factors being equal, quality can be influenced by seeding rate; a heavy seeding will control length and gauge of straw on heavy land, where a light seeding would be disastrous.

Fertiliser

At present the fertiliser ration for this crop is superphosphate at the rate of 1½ cwt. per acre or its equivalent, and judging by results there does not appear to be any necessity for increasing the quantity of phosphatic fertiliser. There is no advantage to the linen flax from an application of lime immediately prior to sowing; in fact, in one area a marked decrease in yield resulted from this practice.

Harvesting

The careful handling of this crop during pulling, stooking, and stacking is important. A standing crop of about 28 to 30 inches over-all length can be well handled by the pulling machines. But difficulties are experienced in making good even butted sheaves in tall crops, particularly if these crops are lodged; growers may, however, minimise the faults in such crops if a little extra time is taken to straighten out the sheaves when stooking and stacking. A good, thick stack-bottom should be provided, preferably of brush and straw, stacks should be as large as possible; a good standard size for "square" stack bottoms is 30 ft. by 15 ft. All stacks should be well sprung to the eave, thereby leaving only the extreme root ends exposed to any weathering.

Whether the stacks be square or round, or long or short in the head, they should be extremely well covered, preferably thatched. No matter how well the head is built to "shed water" it is not good enough for flax as this material must be insulated from weathering. Much good flax has been spoilt in the past owing to the butts of the sheaves being exposed to the weather, so the final advice to the grower of linen flax is "Be sure to thoroughly cover your stacks to prevent weathering."

Don't

permit ashes from wood fires to be exposed to rain. These contain valuable potash which will be leached into the soil.

HEAT STORAGE OF ONIONS

REPORT ON TRIAL

The approximate average annual loss of onions during harvesting and storage is estimated to be 1000 tons. The losses which were borne by the grower, retailer and consumer during the past season would probably be more than double this quantity. In an endeavour to assist in establishing improvements in the drying or curing of onions in bulk, directly following their harvesting, the Department of Agriculture is investigating a system of grading onions for long storage and heat curing, and thereby minimising losses and maintaining a continuity of market supplies during the season.

Above—
Samples of Turbott onions held in heat storage from July 3 to December 18, when this photograph was taken.

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

THE economic value of the Dominion's onion production will be more fully appreciated when it is realised that 1100 acres are planted with onions yearly, and the average estimated production is about nine tons per acre, a total of about 10,000 tons.

The main areas of production are North Auckland, 500 acres producing 4800 tons; Canterbury, 400 acres producing 4000 tons; these two areas yielding 8800 tons.

The average price obtained for onions in normal times is in the vicinity of £10 per ton; but under the present emergency conditions where importation of onions is restricted, realisations have increased considerably.

Except in the north, the 1942 season was generally unfavourable to the production of onions of good keeping quality, and rots developed during and following harvesting. This condition resulted in the crop being marketed comparatively early in the season. Many growers experienced exceptionally heavy losses during storage, and the markets were practically without supplies for the last three months of the season.

It is estimated that one-third of the production of the main producing areas is required to supply the markets during the last three months of the year. With a view to assisting producers to develop an improvement in storage conditions which should extend the storage period and enable them to supply the full market requirements throughout the year, the Department of Agriculture, with the co-operation of Messrs. A. D. and D. G. McFadden, onion growers, of Marshlands, is conducting a commercial experiment with the use of heat, and air circulation for the curing and storage of onions.

Results of Trial

The results of this season's trial have proved—

1. The selection of onions for long-period storage is of vital importance to

Specially designed onion storage crate made of *pinus insignis* and used in the heat storage trials.

their successful keeping, and to the conservation and regulating the marketing of supplies. The best keeping variety grown in New Zealand is the Pukekohe Longkeeper raised by John Turbott; but only sound lines of this variety should be selected for long storage purposes. The other varieties, and grades should be placed in the market according to their condition and keeping quality.

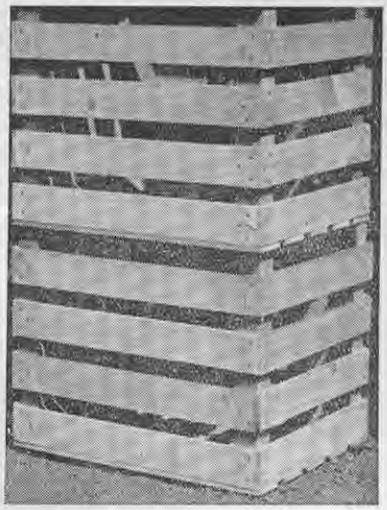
2. Heat storage, and the use of an electric heating and air circulating system installed in an insulated chamber have proved to be practical, and economical for thoroughly drying the skins, and stem-end tissues of onions. Under these conditions drying or curing is brought about by the relationship between temperature and relative humidity, and the wide optimum temperature range, as compared with the narrow optimum humidity range.

3. To assist the drying or curing, and storage of onions, a properly designed system of air distribution is essential, together with facilities which will provide for the ventilation of the storage chamber.

The Storage Chamber

The storage chamber, having 3024 cubic feet of storage space, and a capacity of 24 tons of onions was erected in one end of Mr. A. D. McFadden's ordinary onion storage shed, and was ready for storage on July 3. An illustrated description of the experimental chamber and a statement setting out the objects of the trial were published in the September, 1942, issue of the "Journal of Agriculture."

As the onions available for the trial had been held in ordinary storage for approximately three months, much experimental work dealing with the state of the maturity of onions for successful heat curing, and storage could not be undertaken. In addition the season was too far advanced when the experimental chamber was ready for storage, to determine to what extent the development of stem-end rot can be controlled by forced drying or curing directly after onions are harvested. This work will, therefore, form an important part of the trials at the commencement of the coming harvesting season.



Method of stacking crates in the heat storage chamber.

Examination During Storage

A heat storage trial was commenced on July 3, 1942. The onions were examined on September 15, and November 20, and replaced in the chamber for a further period of storage. The results of these two examinations are as follows:—

The temperature of the experimental chamber was controlled thermostatically at 72deg. to 76deg. F., and the relative humidity at 70 per cent., after the humidity control equipment had been installed and put into working order early in November.

FIRST EXAMINATION, SEPTEMBER 15, 1942.

Weight of onions (in lb.) before storage on July 3	4,272¼
Weight before sorting on September 15	3,928
Weight after sorting on September 15	3,418½
Original number of onions	26,861
Number of sound remaining onions after sorting on September 15	23,119
Number of sprouts	1,087
Number of rots	1,106
Number of root growth	56
Number of seconds*	728
Total number of onions rejected on September 15	3,742
Total weight loss after sorting	853¾

SECOND EXAMINATION, NOVEMBER 20, 1942.

Weight (in lb.) on replacing in chamber on September 15	3,418½
Weight before sorting on November 21	3,102
Weight after sorting on November 21	2,896
Number of onions before sorting	23,119
Number of sound onions after sorting on November 20	21,400
Number of sprouts	1,362
Number of rots	161
Number of root growth	68
Number of seconds*	128
Total onions rejected	1,719
Total weight loss lb.	522¼

* Onions not properly matured which had dried out or shrivelled during storage.

TOTAL LOSS AT BOTH EXAMINATIONS.

Original number of onions,	Total remaining sound onions, November 20.	Total onions rejected.	Original weight, July 3.	Weight after sorting, November 20.	Total loss weight (lb.)	Total seconds or saleable onions included in total onions rejected.
26,860	21,400	5,460	4,272¼	2,896	1,376¼	1,621

TABLES SHOWING VALUE OF CAREFUL SORTING BEFORE STORAGE.

The sorting was carried out before the onions were placed in storage in July, and the following tables show the losses in the two sections when re-sorted during the first examination on September 15th.

Section 1: Average method of sorting onions.

Section 2: A careful method of sorting for storage.

Section 1: Average method of sorting.

No. of onions when placed in storage in July.	No. of sound onions following sorting in September.	Total defective onions lost.	Deterioration from			
			Sprouts.	Rots.	Root growth.	Seconds.
11,781	9,059	2,722	660	1,143	111	808
Section 2: Careful method of sorting.						
11,580	9,871	1, 709	404	585	12	708
Differences in losses between Sections 1 and 2		1,013	256	558	99	100

A summary of this table shows that in Section 1, where average sorting method was aplied, the loss of onions from deterioration during storage was 1013 onions more than in Section 2, in which a greater number of defective onions had been detected and rejected when they were more carefully sorted for storage.

Storage Conditions

The onions held for the trial were stored as follows:—

(a) In the usual type of onion cental bags stacked three bags high.

(b) In the cental bags placed in a timber rack to remove weight from the onions.

(c) In a specially designed onion storage crate with dimensions 20in x 16in x 14in.

Methods (b) and (c) gave good results; but in (a), where the bags were stacked one on top of the other, the onions, particularly in the lower two bags, became compressed so that the air circulating in the chamber did not penetrate into the centre of the bags. Diseased onions in the centre of these bags did not dry out properly, as in the other two methods of storage, and caused the surrounding onions to develop root growth.

Since the conditions for harvesting last season were unsatisfactory, it was impossible to obtain a perfectly sound line of onions suitable for storage. A careful selection was made from the lines available, but many onions were infected with incipient stages of disease, and these could not be detected during sorting.

In (b) and (c) methods of storage, sprouting, root growth, and decay appeared to develop only in unsound onions.

The trial therefore indicates that with heat storage, sound onions can be kept over until the next season's onions appear on the market. In the next trial it is hoped to obtain conclusive proof of this indication.

Summary

The results of the two examinations shows that from 26,800 onions placed in the experimental chamber in July, 21,400 of these were still in excellent marketable condition on November 20. The weight lost during storage and sorting was practically all due to the faulty onions rejected at both examinations. These onions had dried out, and this accounted for almost all of the moisture and weight loss. The seconds, totalling 1621 onions from the two examinations, are included in the total onions rejected. These seconds were fit for sale.

The cost of erecting the experimental chamber, and installing the equipment was in the vicinity of £200. The cost of electric power for maintaining the required storage condition was 4s per ton per month, based on a full chamber, or 32s per ton for eight months' storage.

Arrangements for a further trial during the coming season are now under consideration.

The Effect of Closed Air Admission Holes on the Health of the Udder of Dairy Cows

— By —

C. S. M. HOPKIRK, T. PALMER-JONES, and W. G. WHITTLESTON, Animal Research Station, Wallaceville.

DURING previous experiments carried out on the station herd of dairy-cows (Hopkirk and Palmer-Jones, 1942) it was noted that clinical mastitis seemed to develop following blockage of the air admission hole of the claw. It was decided therefore that two bails in the milking shed should be allotted to two groups of eight cows each for the 1941/42 season, the one group being milked with open air admission holes, and the other with no air admission to the claw. As in the previous season's work, the vacuum was stepped up by increasing from 10in. through 15in. to 19in. From August 18, 1941, to September 15, 1941, the herd was accumulating and the cows as they calved were milked at 10in. vacuum. On September 26 the herd was divided into the two groups decided upon, taking into consideration prior history and the state of the quarters, and was kept at 10in. vacuum until October 13. On this date the vacuum was increased to 15in. and kept there until January 4, 1942. From this date till May 27, 1942, the herd was milked at a vacuum of 19in.

A weekly examination of the herd was carried out to observe the bacterial flora present, and the quarters were also classified by leucocyte assessment as described in the previous paper. Quarters in class A are free from mastitis, those in class C are affected with clinical or sub-clinical mastitis, while class B are an intermediate group. The results are summarised in the table, which shows the percentage of quarters in each group which fell into the various classes during successive periods of the experiment. Although there is a tendency for the quarters in class C in the open hole group to increase towards the end of the experiment, there is a steady and much greater increase in the class C quarters in the closed hole group. Very little clinical mastitis occurred in either group, but as class C quarters show a marked tendency to become clinical, it may be concluded that closed air admission holes, especially when milking at high vacuum, predispose towards the development of mastitis. Dairy-farmers are therefore advised to inspect air admission holes regularly and to clear them from obstructions when they are found to be closed.

PERCENTAGE CLASSIFICATION OF QUARTERS BY LEUCOCYTE ASSESSMENT.

Open Holes.

	Prior to Experiment.	10 in.	15 in.	15 in.	19 in.	19 in.
	18/8/41 to 15/9/41.	22/9/41 to 13/10/41.	20/10/41 to 27/11/41.	4/12/41 to 5/1/42.	12/1/42 to 16/3/42.	23/3/42 to 27/5/42.
A.	67.0	57.7	50.9	47.2	40.0	21.9
B.	25.0	25.0	34.8	38.3	40.9	50.7
C.	8.0	17.3	14.3	14.5	19.1	27.4

Closed Holes.

A.	68.2	56.1	45.3	39.6	23.3	5.6
B.	20.7	20.2	17.9	32.6	30.8	33.1
C.	11.1	23.7	36.8	27.8	45.9	61.3

Reference: Hopkirk, C. S. M., and Palmer-Jones, T. "Mastitis in dairy cows. Bacteriological and leucocytic survey of the laboratory herd through four seasons." N.Z. J. Science and Tech. in press.

Manures

are vital to the success of your garden crop. A free bulletin on "Manures and Manuring for Garden Crops" may be obtained from the Department of Agriculture.

A. V. ALLO, Instructor in Agriculture, Whangarei, discusses

Pasture Establishment in the Western Bay of Plenty

ONE of the first things that attracts the attention of the visitor to the Bay of Plenty is the suitability of the country for grassland farming. Under the conditions prevailing in the Bay, pastures yield very freely, and, from the relatively small amount of cropping carried on it is quite obvious that this fact is generally appreciated by the farming community.

The climate is ideal. Ample rainfall, mild weather conditions, a relative freedom from cold winds and sharp frosts, all go to encourage a prolific grass growth. The soil, varying from light pumice loams to peaty silts, is readily responsive to phosphatic fertilisers and even the poorest soils will give good returns if adequately topdressed.

Nevertheless, there is room for improvement in the quality of many of the pastures in the Bay. Quite a few are poor and weedy, lack clover and ryegrass, and in quality are inferior to what the soil is capable of maintaining. Such conditions may be due to faulty preparation of the seed bed, the use of poor quality seeds, lack of topdressing or to several other factors which will be discussed later. The intention of this article is to collate the experience both of the Department of Agriculture and the farming community as a whole, with the aim of offering a guide whereby the quality of the pastures in the Bay can be improved and the production of butterfat increased.

It is fully appreciated that the shortage of fertiliser has greatly increased the problem of pasture maintenance and improvement, and that all farming operations are, of necessity, limited by this shortage. Nevertheless, it is felt that the basic principles outlined in this article could be adhered to with profit, even though it is impossible to give the pasture as heavy a topdressing as it would normally receive.

The Seed Bed

First essential is the preparation of the seed bed on virgin land, from which vegetative growth has been removed. Cultivation of the ground must be thorough and early spring ploughing to a depth of 5 inches is strongly recommended. If the land is skim-ploughed a month or two prior to deep-ploughing, so much the better. It should then be left to lie fallow until January, thus encouraging aeration and bacterial activity. Early in January roll the ground on the furrow. This will help to destroy air pockets and to compact the soil. Then give the paddock a thorough discing, at least two double cuts. By doing this, clods are worked to the surface and the finer soil falls below, while at the same time moisture is conserved. Discing must be deep if a satisfactory job is to be done. After discing, several strokes with the tine harrows will break up any clods, and, at the same time, help to level down the surface. Then comes one of the most important operations of all—the final consolidation of the seed bed. A thorough rolling just prior to sowing the seed will amply repay the farmer for his time and work. If no roller be available, a mob of sheep or dry cattle, driven several times over the paddock, will do much useful work in helping to consolidate the soil.

On the light soils of the Bay, it is difficult to obtain thorough consolidation, and many instances of poor pasture establishment are directly attributable to faulty work in this connection. Two or three strokes of the roller just prior to sowing down the pasture will go a long way towards giving that consolidated seed bed which is so desirable. It must be emphasised, however, that rolling alone will not suffice, but that every operation from ploughing onwards is aiming at giving a well-formed seed bed, so all work must be done thoroughly and well.

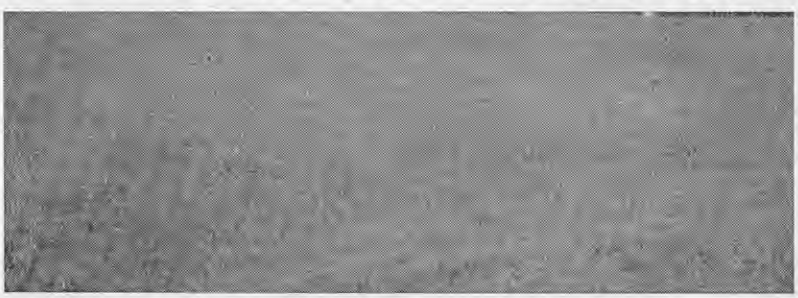
When renewing an old pasture the procedure is only slightly different.

Weed infestation in a paddock sown with uncertified seeds.

Usually it is desirable to take a crop or two before the land is put back into grass. Ploughing should take place early in winter, and the land worked down in the spring for either roots or maize. After the crop is harvested, allow the land to lie until the spring before skim ploughing. Then leave it until January when it should be deep ploughed, rolled disced, harrowed, and again rolled before sowing.

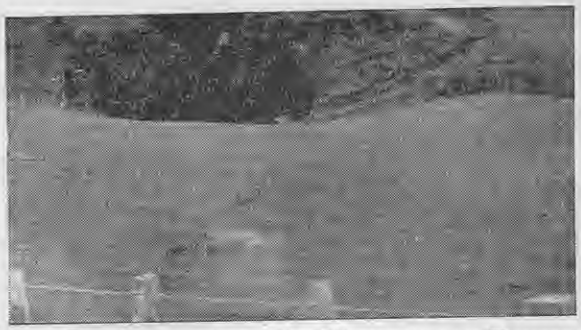
Time of Sowing

The seed bed should be prepared and ready for sowing some time between the beginning of February and the middle of March, depending on the weather. If the seed is sown much later than the middle of March, clover establishment is usually very poor, while the young ryegrass will be subject to frostlift during the winter. The seed should be sown on a rolled sur-



Twelve months old pasture sown in certified seed.

Five year old pasture, sown in cheap seed and never top-dressed. Now a mass of weeds.



A good quality sward on light hill country near Tauranga. Sown down in certified seed over five years ago.

face, covered with the brush harrows, and given a final rolling.

Seed Mixture

Perennial ryegrass, white clover and paspalum or cocksfoot, according to the class of country, should form the basis of the seed mixture. Paspalum may be sown almost anywhere, while cocksfoot should be favoured on the lighter hill country. On the light soils of the Bay of Plenty, as on all other types of soil, satisfactory clover establishment is essential to the success of the pasture. There are farmers who do not include white clover in their seed mixture, as they say that it will eventually come into the sward of its own account. However, the entry of such volunteer clover is usually slow, and, in the meantime, the ryegrass will have suffered severely owing to deficiency of nitrogen. White clover should always be included in the seed mixture.

Paspalum is certainly a grass of great value. Some farmers are afraid that it will get out of hand, and assume such dominance in a sward that all other species will be subdued, or even choked right out. Under a proper system of grazing management, however, and with adequate topdressing and use of the mower for topping when necessary, paspalum can be controlled quite well. The wealth of feed that it will produce during the summer and early autumn periods, when ryegrass and white clover are relatively dormant, make it a grass of great value, and it should certainly be included in at least a few fields on every farm.

Cocksfoot is also of value, particularly on the higher country, and is worthy of inclusion in the general seed mixture. It will produce good seed later in the season than ryegrass, and when a sward is properly managed this plant can be a very valuable constituent of the pasture. Timothy is a grass also worthy of consideration. It is greedily eaten by stock, so that it does not always show up in a pasture, but it is surprising how prominent this grass becomes in fields closed for hay crops. Where paspalum is not favoured, timothy should certainly be sown

on the peaty silts, while even on the lighter country some farmers include one or two pounds per acre in the seed mixture. Crested dogstail is also sown fairly extensively, and its value as a bottom grass makes it worthy of inclusion in the pasture mixture.

A satisfactory seeding should comprise most of the above pasture species, and the standard mixtures, given below, should be varied to suit local conditions.

	Light Country.	Better Quality Lands.
Certified perennial ryegrass	20	to 25 lb. per acre
Certified white clover	2	2 lb. ,,
Certified cocksfoot	12	to 8 lb. ,,
Timothy	1	2 lb. ,,
Red clover	3	3 lb. ,,
Crested dogstail	2	0 lb. ,,
	40	40 lb. ,,

When paspalum is desired, it should be included at the rate of 6-8 lb. per acre. It is preferable to use Australian hand-shaken seed, rather than seed produced in New Zealand, which usually has a very poor germination.

Quality of seed used is of paramount importance. There has been a great deal of so-called cheap seed sown in the Bay, but such seed is not satisfactory.

In every district there are farmers who have sown down paddocks in this "cheap" 4½d per pound seed and in no case has a satisfactory sward resulted. Certified seed, obtained from a reputable merchant, should always be sown. The extra initial cost of such seed will be repaid by the increased production during the first year, and will provide a permanent asset instead of an increasing liability. This point cannot be stressed too much—a farmer cannot expect to get a high quality pasture unless he sows high quality seeds.

Another point of importance is the rate of seeding per acre. Many farmers sow a good deal less than the standard mixture recommended by the Department of Agriculture. Farmers who sow such light seedings usually justify their action on the ground that they cannot afford a full 40 lb. per acre seeding, plus adequate fertilisers. From observations extending through the western end of the Bay, many of the seedings appear far too light, resulting in an open sward which takes a long time to reach full production. Moreover, with the risk from ragwort infestation, light seedings are very dangerous. It would be better to handle only half the area, as experience shows that the **TOTAL** feed produced from a given weight of seed is greater when sown at the full rate, than when it is skimped in order to cover a larger area. As a rule, more feed would be produced from four acres sown at the rate of 40lb. per acre than would be obtained from eight acres seeded at the rate of 20lb. per acre.

Farm Shelter

Good farm shelter is a necessity rather than a luxury, as is shown by the fact that close attention has been paid to this point on practically every farm in New Zealand which shows an outstanding herd average.

Best results are obtained if the provision of shelter is planned ahead and useful suggestions are contained in Bulletin No. 182, "Farm Shelter," by P. S. Syme, Instructor in Agriculture, Warkworth. A free copy of this bulletin may be obtained from the Department of Agriculture, P.O. Box 3004, Wellington.

Manuring New Sown Pastures

Phosphates are essential in the Bay. In experiments conducted by the Fields Division and covering the whole of the Western Bay of Plenty, it has been shown that serpentine super will give results at least as satisfactory, and often superior to any other form of phosphatic fertiliser. On virgin land, where humus is low, it is a good practice to apply blood and bone as well as the inorganic phosphate, to provide a source of nitrogen for the young grass until the clovers are established. It is appreciated that it is a very difficult matter to obtain blood and bone these days, but, when it is available it could be used to advantage.

Summary

Generally speaking, improvement in pasture quality throughout the Western Bay of Plenty provides ample scope for the farming community. While it must be admitted that there is a considerable acreage that will compare favourably in quality with the best in other high-producing districts, the general average does not reach a high standard of excellence. A fairly high acreage, in fact, is quite inferior in quality.

Insofar as the better pastures are concerned, sound management coupled with topdressing as far as the ration permits will help to maintain a satisfactory position. With regard to the lower quality swards, however, improvement can be most economically secured by renewing such pastures.

The practice of oversowing poor swards with better grasses and clovers has given some outstanding results (see N.Z. "Journal of Agriculture" Vol. 62, page 437) and could be adopted with success on many farms.

To summarise, it should be remembered when sowing down pasture in the Western Bay of Plenty, that the following points are of considerable importance, and determine the degree of success that will be attained:—

1. Thorough, early preparation of the seed bed, in which consolidation should not be overlooked.

2. Early autumn sowing of a suitable and adequate seed mixture in which certified seed is used.

3. Provision of all available fertiliser for pasture establishment. In this connection phosphates are essential, with serpentine super giving good results.

Answer to Correspondent

Crops for Feeding Sheep.

"SUBSCRIBER" (NELSON):—

For further sheep feed after a crop of turnips, would you recommend Japanese millet, or perhaps chou moellier? Would a dressing of crushed carbonate of lime be an advantage to the crop? Does a crop of oats and vetches sown during February give much feeding during the winter?

FIELDS DIVISION:—

Generally, it is wise in the interests of disease prevention not to follow a cruciferous crop with another member of the same family. Rape, chou moellier, kale, turnips, and swedes are best sown after pasture or some non-cruciferous crop. Accordingly, Japanese millet might well follow in your rotation after winter-fed turnips or swedes, and if sown in November or, at the latest, mid-December, it should be ready for first grazing about eight to ten weeks later. Chou moellier is not so suitable for supplementary sheep forage as is rape.

Crops of the cruciferous family are all strongly responsive to lime, and do best if drilled with reverted super at 2-3cwt. per acre, or, better still, a 50:50 mixture of super and crushed lime which has been turned and mixed some days previously. A general predressing of one ton of carbonate of lime per acre would also be beneficial in your locality.

Oats and vetches if early autumn sown (March-April) on suitable land usually provide good winter grazing, but on heavy ground subject to pugging they may be most disappointing.

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Veterinary Notes for the Farmer

The Skin of Cattle

The condition of the skin is an important guide to the state of health of an animal, and it is also liable to become affected by certain diseases. Although it is the most obvious part of a beast, it frequently escapes a careful examination. It is not only in local diseases that the skin may be affected. It may show changes when the internal organs are involved, if the animal is feverish, and so on. The purpose of this article is to give the farmer a few hints with regard to the skin in health and disease.

WHEN cattle are in good condition, the hair should be glossy, and lie smoothly. The winter coat should be shed in the spring, and should not be retained during the summer months. Delay in casting the coat may indicate nutritional disturbances. By means of the hair, of course, body heat is maintained and prevented from being dispersed too soon.

"Hair Streams"

While on the subject of hair, it might be well to refer to the direction of the "hair streams" on the buttocks of cattle as an indication of milk production, as this is a question often asked. The "escutcheon" is formed by the hair growing upwards and downwards and forming a "crest" at the line of junction. This extends to the udder, and is shield-shaped. Guenon of France stated that a large "shield" betokened a good milker, and also investigated the relationship of the various forms and shapes of the escutcheon to the production capacity of a number of animals. Nowadays little importance is attached to this feature.

Shedding of the hair is of course a seasonal occurrence, but in some cases of chronic disease the hairs tend to become loose, and may be easily pulled or rubbed out. A loss of hair over a large part of the body is known as alopecia, or baldness, and sometimes follows recovery of an animal from a severe disease. When the hair falls out, and the skin is scabby or thickened, there is an actual skin disease present, a matter which we will consider later.

Cattle usually sweat freely on the muzzle, which therefore should be moist. Sweating has been observed on the general surface of the body, but this does not take place to the same extent as in the horse. A decrease in sweat secretion, with a dry muzzle, occurs in certain feverish conditions.

Pliable and Elastic

The skin of a healthy animal feels pliable and elastic, and is freely movable. If a fold of skin is drawn out between the fingers, it should rapidly return to its former position when released. The skin is kept supple by a greasy secretion formed in the sebacious glands, which are distributed over the surface of the body. This material also gives a gloss to the coat, and prevents the penetration of rain, thus saving undue loss of heat.

When the animal is out of condition, or emaciated from a wasting disease such as tuberculosis, the skin feels tough and leathery. The skin may adhere to the underlying parts, and cannot easily be pulled into a fold; hence the expression "hide-bound." The hair will probably be filled with dandruff, which consists of skin scales, fat, salts, and a large amount of silica and dirt. The amount of fat is variable, according to the diet.

Swellings

It is also important to recognise the presence of swellings under the skin. Sometimes a soft, dropsical swelling may be detected, due to an abnormal accumulation of serum in the connective tissues underlying the skin, this serum, of course, having transuded from the blood. This is often due to congestion of the veins, the free passage of the blood being interrupted. In such cases, the swelling appears in the under portions of the body, especially the brisket, chest, and abdomen. This condition is found in heart troubles in particular, especially in the not uncommon cases where a foreign body, such as a length of wire, has been swallowed, and has penetrated the stomach wall, and pierced the membranous sac enclosing the heart. These swellings may also occur in cases of abnormal changes in the blood, or in heavy worm infections. Swellings may also occur as a result of local injuries. In such cases the swellings are usually accompanied by pain and increased warmth, and may later be succeeded by abscess formation.

Sometimes accumulations of air or gas may occur under the skin. Such swellings crackle on being pressed. Air may enter through a wound in the skin. Gas may be formed in such rapidly maturing infectious diseases as blackleg and *Haemhorrhagic Septicaemia.*

Colour of Skin

The colour of the skin should also be noted in white-coated animals, in places where there is no hair to hide the skin. The skin becomes bluish-red when the blood is heavily charged with carbon dioxide gas, such as occurs in heart disease, lung congestion, and severe choking. Yellow discoloration may be due to jaundice. The white portions of the skin in cattle are liable to photo-sensitisation or sunburn, the

skin being pre-sensitised to light by the animal eating certain substances. Facial eczema is included under this heading.

The skin is affected in ergot-poisoning in cattle. A cow fed with ergot at the Wallaceville Animal Research Station developed symptoms in thirteen days following heavy dosage. Lameness developed, and sensation was lost in the fetlock region, and the skin in that part became dry and hard. There was a sharp line of demarcation at the fetlocks of both hind limbs. Above the line, the skin was healthy; below it was cyanosed and necrosis was commencing.

At times a chain of small hard lumps may be observed in the skin of cows' legs. These may contain yellow matter, and owners are often apprehensive in case they should prove to be tubercular in origin. In most cases they give no reaction to the tuberculin test, and are generally considered to be local skin infections due to a soil organism that gains entry through small abrasions in the skin.

Dermatitis is a term meaning inflammation of the deeper layers of the skin. It frequently develops on the limbs of cattle that are compelled to wade through mud or manure. It may also affect the udder and teats. Treatment consists of cleaning and drying the affected parts, and applying anti-septic protectives such as zinc ointment.

Skin Parasites

The skin, like other parts of the body, may be attacked by parasites. In the winter, when the coat is long, it is liable to be infested by lice. They resemble tiny white specks moving in the hair, and being blood-suckers they cause loss of condition. They can be easily disposed of by using the emulsion described in the New Zealand "Journal of Agriculture," June, 1940. Dissolve 1 lb. soap in 1 gallon of boiling water and stir in ½ pint of kerosene. Mix thoroughly and make up to four gallons by the addition of cold water. Apply with a brush when cold, and repeat twice after intervals of three days.

Mites may burrow into the skin, causing the condition known as mange. Some mites enter the hair roots, and this is known as Follicular mange. This affects the hides, and it is not till the leather-making process has reached a fairly advanced stage that the pittings caused by the parasites can be seen. Where the disease can be recognised, treatment consists in the application of a mixture of kerosene and derris root. In what is known as Sarcoptic mange the mites burrow into the skin itself. Severe itching occurs round the eyes, face, and neck, and later hairless spots covered with small eruptions appear. After a few weeks the skin becomes wrinkled in thick folds. If taken in time, it is readily cured by scrubbing with hot soap and water, and applying a sulphur dressing.

Another type of parasite is a fungus that lodges around the hair roots, the hairs become brittle and break off, and the skin becomes thickened and wrinkled. The lesions caused are round and sharply circumscribed, hence it is popularly known as ringworm. It occurs chiefly in young cattle in the regions of the ears and eyes. The skin

should be thoroughly washed with a warm soda solution, and the scabs removed. Then apply tincture of iodine with a stiff brush, and repeat the treatment on two more occasions at intervals of five days.

Ticks are creatures related to spiders and scorpions, and in some countries are the means by which a number of serious diseases are spread. Fortunately, the New Zealand species is not pathogenic, and is readily controlled by suitable dipping.

It is hoped that these brief remarks will indicate to stock-owners the value of a careful routine examination of the skins of stock, and of the varied information that can be deduced from such an examination.

—*R. E. ALEXANDER, M.R.C.V.S., Veterinarian, Gisborne.*

Answers to Correspondents

Lice on Horses

"G.McR." (PIRONGIA):—

Can you tell me of a cure for lice on horses? Something to give immediate relief is desired as the horse is in low condition and won't "pick up."

LIVESTOCK DIVISION:—

The treatment recommended for the eradication of lice on horses consists of an application of the following mixture:—1lb. of soft soap is dissolved in a gallon of boiling water, then slowly add half a pint of kerosene, the mixture being well stirred while the kerosene is being added, so as to form an emulsion. Dilute this mixture by the addition of water so that the resulting quantity totals four gallons.

Dress the body of the animal, using a brush for the application. If it is necessary to do the entire body surface, about one quarter should be dressed daily. This remedy is effective in destroying lice, but in order to secure the best results it is necessary to repeat the dressing within seven days, so as to kill any lice which may have hatched out from eggs remaining in the horse's coat at the time of the first application.

Eye Trouble in Horse

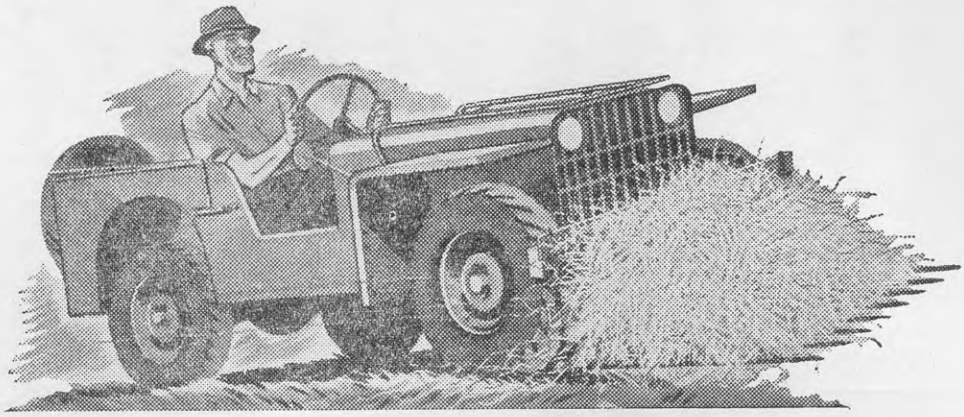
"N.K." (ALEXANDRA):—

Please advise what I should use in the treatment of a horse's eye. At present the eye is very badly swollen in the bottom corner with proud flesh, and has a slight discharge, although the swelling has not become worse during the last month or so. The swelling is sufficient to force the eye out of position, thus affecting the vision.

Unfortunately I am unable to state whether it is a growth or whether the eye has been injured, as I have not had the care of the horse all the time, so cannot tell how or when the trouble started.

LIVESTOCK DIVISION:—

From the description it appears that the horse is suffering from either an infection of the eye or a growth is developing on the membrane at the corner of the eye. Without seeing the horse it would be impossible to determine which, but I should advise treatment with 7½ per cent. Argyrol. This can be obtained from any chemist and can be instilled into the eye with an eye dropper, a few drops night and morning. This should clear up any infection. If the trouble turns out to be a growth it will need to be surgically removed.



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Farm Practice and Management

Tarweed In Pastures

A PROFUSION of any weed in cultivated land or in old pasture usually calls for little comment. Its presence can readily be explained as due to bad management or to some special condition of soil or climate, and far from being mysterious, its appearance under existing conditions is only to be expected.

When a weed, whose presence was not even suspected, however, suddenly appears in virgin land ploughed out of native teatree and sown in grass, one is to be pardoned from expressing surprise, and, where the weed is in such profusion as to almost smother the pasture, there is even cause for alarm. Such is a very common experience with tarweed in many districts. Its sudden origin, like its equally sudden disappearance is something of a mystery.

Specimen of tarweed. The plant grows from 6 inches to 12 inches in height and is easily identified by the stalkless yellow flowers on the upper part of the stem, and the fact that the whole plant is distinctly sticky to the touch.

[H. Drake, photograph.

Various explanations have been given to account for this phenomenon. It is sometimes suggested that the tarweed was present as an impurity in the seed. This, however, appears extremely unlikely, as the plants are far too numerous and commonly appear even where the best quality machine-dressed seed was used. The more plausible explanation, and the one given by old settlers, is that the country was at one time sown in grass with the tarweed as an impurity. As the land reverted back to teatree, the tarweed was suppressed along with the grass. The seeds, however, remained in the ground dormant and owing to their inherent longevity were still sufficiently viable to produce a vigorous germination when the land was broken up and conditions again became suitable. If this explanation is correct, it is evident that such seeds can live in the ground for very long periods indeed.

Showing tarweed infestation in a young pasture. The land was ploughed from teatree scrub in which no trace of tarweed was present, sown down in the autumn and photo taken early in the following summer.

The same area exactly one year later. Note how the tarweed has completely disappeared. The land was broken out of scrub as shown over fence.

The disappearance of tarweed from a pasture is more easily explained. This plant likes loose soil conditions and cannot compete with a vigorous growth of grasses and clovers, particularly where consolidation is promoted by heavy stocking. Although at first sight the prolific smother of tarweed in a young pasture may be very alarming, under good management little trouble is likely to be experienced after the first year.

—P. S. SYME, Instructor in Agriculture, Warkworth.

Frost Warnings

IN the interests of national security the broadcasting of weather reports was, in 1940, suspended for the duration of the war. However, for the benefit of farmers, market gardeners, fruitgrowers, and other members of the public apprehensive of danger to crops by frost visitations, facilities have been made available whereby frost warnings can be obtained by enquiry from the telephone exchange at more than 100 post offices throughout the Dominion. If the district forecast gives any indication of frosts which may damage the crops, then the necessary precautions can be taken.

While these forecasts are published in the majority of evening newspapers, it is considered that the addition of this telephone advice service will be appreciated in many districts.

Information regarding the particular post offices operating this service can be obtained from any postmaster.

Consolidation Versus Aeration

THERE is one aspect of cultivation which is given much prominence in nearly all articles on cultivation written nowadays, and which could easily be misapplied, viz., consolidation. There are parts of New Zealand, and also certain periods of the year when consolidation should be stressed, but the young and inexperienced farmer is apt to gain an altogether wrong impression of this aspect of cultivation, especially in Otago and Southland.

If the soil is thoroughly cultivated, then under normal conditions consolidation will invariably take place in spite of all efforts to prevent it. The point is how to arrive at a thorough state of cultivation. It is doubtful if too much reliance is not being placed on the disc harrows as a means of obtaining a fine seed bed. It is quite true that the disc harrows are useful in the early stages of preparing the seed bed, but once a fair tilth has been obtained a better seed bed would almost certainly result by using a cultivator.

Modern Methods

Our modern methods of cultivation, using the tractor and disc harrows, are tending to drift from one of the main principles of cultivation, which is aeration of the soil. Prior to the advent of the tractor one of the most difficult problems of cultivation was to eliminate air pockets formed by ploughing, and it became common to emphasise the necessity for consolidation when what should have been emphasised was the necessity for thorough cultivation.

In the early days when shallow ploughing gave good results there was no difficulty in this respect, but once the top soil had become exhausted, farmers found it necessary to plough deeper, not only to bring up fresh soil, but also to break the pan formed by continued shallow ploughing. This deep ploughing brought in its train the problem of the necessity of eliminating the air pockets, and often this was attempted by consolidation instead of by more, and deeper cultivation. It should be remembered that if deep ploughing is practised then deep cultivation must follow if maximum results are to be obtained.

The advent of the tractor seemed to present a solution of the problem of

eliminating these air pockets. Here was unlimited, or almost unlimited power, and consolidation could be gained by using bigger and heavier implements, and by giving the land an extra discing. All this could be accomplished in much less time than by horses. Ploughing could be done later, and when cultivation was commenced it was finished in a very short time; in fact in such a short time that one could almost say it was done in one operation. But did not this speed eliminate the very important factor of aeration

Thorough Cultivation

A new phraseology was adopted. It became the practice to speak of working a paddock down instead of working it up. Even the plough was used to bring about consolidation. Recently a splendid paddock of rolling country was seen being ploughed by a swamp plough. The reason given was that it was hoped the deep flat ploughing would bury the yarr seed which was very bad in this paddock. Little if any aeration can possibly take place in this paddock unless a cultivator is used, and the cultivation is spread over a period. In all probability it will be double disced a couple of times in the space of a day or two, and then turnips will likely be sown the next day. It is not intended to infer that consolidation is not necessary, but the point to be emphasised is that consolidation will take place of its own accord if the cultivation is thorough.

Does the question of aeration not open up a big field of inquiry? In the past the control of plant disease such as club-root and dry rot was attempted by treating the seed, and by the use of chemical fertilisers, much in the same manner as our bodily ailments are treated with patent medicines. Just as it would be wiser to return to a better way of living, so in regard to plant diseases it would be advantageous to return to better cultivation, and aeration of soil.

Take care of the cultivation and consolidation will take care of itself.

—H. K. EDIE, Assistant Fields Instructor, Gore.

Internal Parasites

The annual mortality amongst hoggets from internal parasites is increasing from year to year, and on some properties is assuming enormous proportions. Similarly, losses amongst calves are proportionately high. Important information on this problem is available in the Department's bulletin, "Internal Parasites of Sheep and Calves, and Their Treatment."

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the months, May to November, 1942, have been compiled by the Livestock Division:—

District.	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Pigs
North Island.						
Meat-export Slaughterhouses—						
Auckland	132,342	569,327	55,408	30,215	170,552	101,166
Poverty Bay-Hawkes Bay	33,682	55,386	71,358	42,593	405,694	9,920
Taranaki-Manawatu	60,934	204,989	19,007	13,426	155,303	52,956
Wairarapa-Wellington	26,409	22,069	36,829	16,272	123,826	11,065
Totals	253,367	851,771	182,602	102,506	855,375	175,107
Abattoirs	77,174	23,302	362,715	162,562	39,357	68,991
North Island Totals	330,541	874,973	545,317	265,068	894,732	244,098
South Island.						
Meat-export Slaughterhouses—						
Nelson-Marlborough	1,354	10,723	7,516	5,239	38,983	2,979
Canterbury-Westland	7,728	34,084	105,515	75,560	294,310	14,176
Otago-Southland	8,044	37,912	61,474	49,633	516,034	3,382
Totals	17,126	82,719	174,505	130,432	849,327	20,537
Abattoirs	58,710	13,306	272,328	139,972	33,220	26,618
South Island Totals	75,836	96,025	446,833	270,404	882,547	47,155
Dominion.						
Meat-expt. Slaughterhouses	270,493	934,490	357,107	232,938	1,704,702	195,644
Abattoirs	135,884	36,508	635,043	302,534	72,577	95,609
Grand Totals	406,377	970,998	992,150	535,472	1,777,279	291,253
Same Period, 1941— Meat-export Slaughterhouses and Abattoirs	305,999	989,607	958,085	552,681	2,001,134	361,467
Same Period, 1940— Meat-export Slaughterhouses and Abattoirs	346,814	987,520	1,162,688	711,816	1,619,582	334,525

Slaughterings of Pigs

The 71,455 pigs slaughtered at meat-export slaughterhouses and abattoirs during the month of November, 1942, were distributed in weight ranges approximately as follows:—

Up to 60 lb.	170
61 to 120 lb.	18,358
121 to 160 lb.	32,273
161 to 180 lb.	13,230
Over 180 lb.	4,233
Sundries	3,191

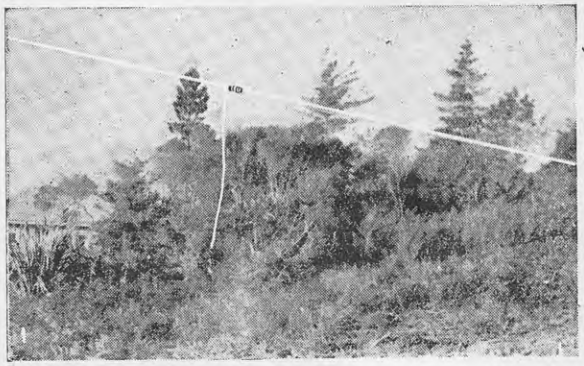
The grading of porkers was 93 per cent. of 1st quality, 7 per cent. of 2nd quality; and that of baconers was 75 per cent. of Prime 1's, 19 per cent. of Prime 2's, and 6 per cent. of 2nd quality.

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

121 to 160 lb.	81%, 15%, 4% of P1's, P2's and 2nds respectively.
161 to 180 lb.	61%, 29%, 10% of P1's, P2's and 2nds respectively.

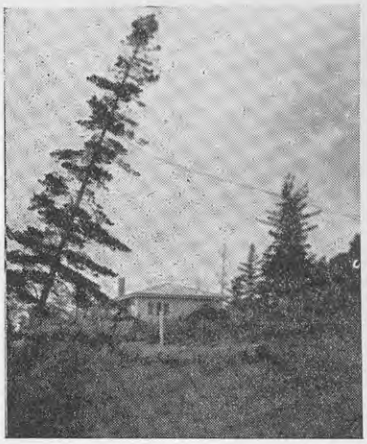
Clearing Trees the Easy Way

ANYONE who has tried digging out a tree stump knows just how arduous and exasperating this job can be. Although the main roots may be easily severed, the deeper tap roots are invariably difficult to get at and inevitably there comes a time when, though every root within sight seems to have been cut, the stump still stubbornly refuses to be shifted. The tensile strength of roots is surprisingly high, and even a minor one can provide a stubborn anchor unless considerable leverage is available.



A rope or wire cable is attached well up the tree to provide sufficient leverage. A length of rope, one end of which is attached to the base of a conveniently placed tree, is then led through a pulley on the end of the wire cable. This provides the necessary leverage.

When the job can be tackled before the tree is felled, extraction, as shown in the accompanying illustrations, presents no difficulty. Using the tremendous leverage which the tree itself provides and supplementing this with the increased strain provided by a pulley block, the work of extraction is relatively simple and can be done with a minimum use of axe and spade.



A haul on the pulley and the job is done.

This method is particularly useful when clearing trees in restricted areas as in gardens, since the tree can be laid even against its natural lean, and the risk of damaging adjacent buildings or power lines is reduced to vanishing point.

—P. S. SYME, Instructor in Agriculture, Warkworth.

In the Orchard and Vineyard

Orchard Notes

Seasonal Work in the Orchard

SOME fruitgrowers make the mistake of finishing their spraying season too early and are confronted with such troubles as late infection of black spot, late codling moth stings, leaf roller damage, and brown rot infection of the maturing fruit.

Stone fruits should be sprayed with lime sulphur 1-200 plus colloidal sulphur (25 per cent.) 4 lb. per 100 gallons to within ten days of harvesting to give added protection against brown rot. Lead arsenate sprays should be continued on apples and pears until January for early varieties and March for late varieties.

Where Bordeaux mixture 1-2-50 is being used on apples as a protection against ripe spot and bitter rot, do not overlook the addition of a spreader such as casein, as mentioned in last month's notes, to minimise spray blotchiness.

Miscellaneous Work

Every endeavour should be made to raise and plough under some form of green crop each year. Sowing should be done during January. If dry hot weather is experienced at time of sowing, better germination will be secured if the seed is drilled in rather than broadcast and harrowed. When the growing green crop is approximately two to three inches high, the harrows should be run through it to give a final loosening to the surface of the soil.

Any budding to be done should be carried out this coming month. Approximately ten days after the budding is completed, the buds should be examined. Where any have died there is still time to do further budding for replacements.

Packing Shed and Equipment

Before grading and packing operations commence the sizing machine should be thoroughly cleaned, adjusted and tested. Packing benches should be repaired where necessary, and nailing presses be put in good order. A day or two spent on this work before the season commences will obviate many breakdowns, and minor holdups when packing is in progress which cause staffs to be rendered idle.

Fruit cases should be made up as soon as possible, and stacked to dry. Second-hand cases should be cleaned, and repaired. Orchard picking boxes should be repaired and sterilised to rid them of any spores of fungal rots. Fruit cases may be satisfactorily sterilised by dipping and spraying, using any of the following three solutions—Shirlan W.2, 1-15; formalin 1-50; or lime sulphur 1-20.

The provision of adequate light in the packing shed, especially over the grading table, is of vital importance to the satisfactory handling of the crop. Overhead light is the ideal as no shadows are thrown, and every effort should be made to provide this system of lighting, even if only for the grading table. High, wide windows are the next best provision. To prevent glare or the heat of the sun striking the fruit the window should receive a coating of whitewash on the inside. Lighting will be considerably improved by whitewashing the interior of the packing shed. If the walls and roof are brushed down, and two coats of whitewash sprayed on, the extent of extra lighting obtained through reflection is surprising. A satisfactory whitewash can be made with strong salty water and sufficient hydrated lime to bring the mixture to a consistency of thin cream.

The foregoing recommendation is worthy of the serious attention of growers whose sheds are poorly lighted.

Harvesting

Points in the harvesting of pip fruits may be summarised as:—

1. Make at least two pickings. The larger, more mature, and best coloured fruits should be harvested at the first picking, leaving the balance to improve in size, maturity, and colour.

2. Avoid the careless removal of fruits as careless picking frequently results in the stalk being pulled from the fruit, or in the pulling of the whole spur.

3. Much bruising of fruit occurs in the picking bag, through being overfull, or being carried partially full by the picker from tree to tree, or up and down picking ladders. If the bag cannot be filled at one or two trees, empty it rather than walk around several trees filling it.

4. Do not overfill the picking boxes. When filled, stack the boxes in the shade of the trees ready for prompt dispatch to the packing shed.

—R. G. I. HAMILTON, District Supervisor, Horticulture Division, Auckland.

Citrus Notes

Plant Nutrition

(Continued.)

Zinc

Chemical Symbol: Zn.

Occurrence in Nature: Zinc rarely occurs free but in a combined form as the carbonate (calamine) and sulphide (zinc blende).

Function: Zinc plays a prophylactic and catalytic role. Plants need 1oz. available zinc per acre. Most of the zinc in a soil is not available.

Recommendations: In the absence of zinc, diseases such as walnut yellow, apple rosette and little leaf of stone fruits occurs. Zinc is probably the most widespread deficiency of citrus and is known as 'mottle leaf" in California. The symptoms are a tendency to produce narrow and pointed leaves. In immature leaves, the area between the veins is usually a lighter green in colour. In mild cases of zinc deficiency the symptoms appear on occasional weak twigs and particularly on shoots produced at other than the regular growth period. The remainder of the foliage seems normal. Zinc deficiency is most severe when copper is also deficient and occurs in trees growing on the more alkaline soils, i.e., pH over 6. Zinc deficiency is unlikely to be prevalent in New Zealand citrus soils.

Copper

Chemical Symbol: Cu.

Occurrence in Nature: Copper occurs in the metallic form and also as the oxide, sulphide, and carbonate.

Recommendations: Copper also is prophylactic. Very small quantities of combined copper greatly stimulate plant growth—especially on reclaimed soils such as the Florida everglades. Copper salts, in more than a trace, are toxic to all plants. Its absence results in the twigs turning reddish brown and fruits being similarly discoloured. Copper deficiency is unlikely to occur in New Zealand where copper as bluestone (copper sulphate) is regularly applied with hydrated lime as Bordeaux mixture 3-4-50.

Silicon

Chemical Symbol: Si.

Occurrence in Nature: Silicon does not occur free but as the oxide silica (quartz being free crystalline silica) and combined as numerous mineral silicates—felspars, clays, etc.

Recommendations: Silicon causes increased phosphate assimilation. In certain plants the impregnation of the epidermal cell walls with silicon renders them immune from the attacks of fungi and certain animals. Silicon is applied as a by-product in basic slag which contains 3 per cent. to 13 per cent. silica.

Aluminium

Chemical Symbol: Al.

Occurrence in Nature: Aluminium does not occur free but is present in numerous compounds such as oxides and hydroxides (bauxite). Felspars and clays are complex silicates of aluminium with other bases.

Recommendations: Aluminium is present as the aluminium ions in soil solution. Excess of these ions is a powerful contributing factor to the toxicity of so-called "acid" soils. Aluminium is applied as a by-product in basic slag which contains up to 3.7 per cent. aluminium oxide.

Chlorine

Chemical Symbol: Cl.

Occurrence in Nature: Chlorine occurs only in the combined state, almost entirely as chlorides of such metals as sodium, potassium, magnesium which constitutes the main part of the dissolved matter in sea water. The evaporation of inland seas has lead to the formation of thick beds of these salts, chiefly rock salt (sodium chloride), sylvine, carnallite, etc.

Function: Chlorine probably occurs in all plants but apparently is not essential, and exists as ions in the cell sap.

Sodium

Chemical Symbol: Na.

Occurrence in Nature: Sodium occurs in the form of salts which are widespread. They are found in the sea as sodium chloride, in many old salt beds as Chile saltpetre, sodium nitrate, and as a constituent of many rocks and minerals.

Function: Sodium is always present in plant ash. It is not considered essential but may replace potassium to a limited extent.

Conclusion

The first nine elements mentioned in these notes (carbon, hydrogen, oxygen, calcium, nitrogen, phosphorus, potassium, sulphur and magnesium) are major elements essential to citrus trees and can be added in fairly large quantities the transition between beneficial and harmful effects being very gradual. With the remaining nine minor elements there is a sharp line of demarcation, and although the addition of small quantities as a dressing or in a spray may be beneficial, large quantities may show sudden and serious harmful effects. These elements should therefore be tested with caution on a few trees, and the effects observed compared with untreated similar neighbouring trees.

Plant nutrition is closely related to soil fertility and is not a matter simply of abundant supplies of nitrogen, phosphorus and potassium. It consists in the favourable operation of a number of factors and a close study of all of these must be made, especially water conditions. Farmyard manure is the oldest of manures and modern science has not made it obsolete. It makes the difference between exhaustive and conservative soil farming. It should not be judged simply by its nitrogen, phosphorus and potassium content. Of equal value is its use in maintaining the organic matter status and hence the structure of the soil and increased biological activity.

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

Cool Storage Notes

Harvesting of the Pear Crop

AN important factor in the harvesting of pears is the choice of the picking time. Pears should be harvested when fully matured yet firm, carefully handled, and immediately placed in cool storage, in order to ensure that they can be held in the best possible condition up to the point of marketing, and that the ripened product will then be attractive and fully flavoured. When pears are gathered too early the flavour and attractiveness of the fruits in the eyes of the consumer will be seriously affected. When picked too late the maturity of the fruits will be unsatisfactory for their successful cool storage, transportation and marketing.

Points to be kept in mind when harvesting:

1. Pears should be carefully handled to prevent injury from rots which may develop during storage.

2. Avoid any delays after picking and before storage that may occur from (a) shortage of labour; (b) transport difficulties or week-end losses of time after picking and before storage.

3. The attractive presentation of pears on the market free from bruising and blemishes is of the utmost importance, and has the effect of improving or reducing values accordingly.

A method of dealing with pears which provides for their cooling loose in boxes immediately after harvesting has much to recommend it. The pears are placed in cool storage in a more uniform state of maturity, and held in this condition until required for marketing, when they are graded, and fruits of similar maturity are packed in the same cases.

When stacking cases of pears in cool-storage, they should be so stacked as to provide plenty of air space around the cases, in order that the air circulating in the chambers can quickly remove the heat from the stacked fruit.

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

Concrete

has many uses on the farm. Instruction in the mixing of concrete and guidance as to its use is contained in "Concrete on the Farm" (bulletin 184) issue free by the Department of Agriculture.

Guide for the Home Garden

Seed Production in the Home Garden

APPREHENSION concerning a probable shortage of vegetable seed or increased prices for seeds which may be available, may induce many home gardeners to attempt to produce, and save seed from plants grown by them in their own garden. While efforts in this direction can at all times be commended, the results obtained may not always come up to expectations—may, indeed, have serious and undesirable repercussions with regard to the quantity, and quality of the crops grown from the seed so produced.

From the numerous inquiries received and acknowledged concerning the production, and saving of vegetable seeds, it seems evident that some hints, and recommendations in these notes on this important phase of home gardening may be timely.

Seed production, whether for private use or commercially, at all times carries with it definite responsibilities, not only to the producer of the seed, but to those who may consume the vegetables produced from the seed saved.

Annual Production

The opinion is generally held that it is necessary to produce every year fresh seed of each variety of vegetable which may be grown in the garden. This, however, is not so, as the profitable life of vegetable seeds varies from one to ten years, and even longer, according to the variety. Tests recently carried out by Edgar W. Pritchard, Dip. Econ., Agricultural Botanist, South Australia, showed that, in the eighth year after harvesting, peas (Greenfeast) gave 67 per cent. germination, and tomato seed from the tenth to the thirteenth year inclusive gave 60 per cent., 65 per cent., 43 per cent. and 58 per cent. germination respectively. All varieties of beans were good up to the sixth and seventh year, varying from 85 and 90 per cent. in the former, and 36 per cent. to 70 per cent. in the latter year. Profitable cabbage germination varied from two to four years, rock melons up to twelve years, turnips and lettuce to three years, and radish to seven years.

It will be realised from the foregoing results, that annual production of the vegetable seeds required in the garden is not only unnecessary, but inadvisable, because of the ever present possibility of cross-fertilisation. Briefly, it may be stated that tomatoes, peas, beans, and lettuce, although self-pollinated, may cross, but not to any appreciable extent. Cucurbits (marrows, pumpkins, etc.), carrots, parsnips and celery are self-fertile, but often cross-pollinate. Naturally cross-pollinated varieties are asparagus, beet, onions, radish, spinach, and all members of the cabbage family.

Unless precautionary measures are adopted in any attempt to produce vegetable seed, only those varieties which do not naturally cross-pollinate should be selected. During the flowering period varieties which cross-pollinate should be protected by having the entire plant completely enclosed by some light covering material such as scrim.

Plant Selection

Plants selected for seed production should conform in the highest degree to the desirable characteristics of the variety to which they belong. Trueness to type, early maturity, healthy vigorous growth, productive capacity, and freedom from disease are necessary in plant selection.

Seeds to Produce

Tomato, sweet corn, pepper, lettuce, and parsnip seed may be produced, also peas and beans, but plants of these varieties should be selected with particular care in order to prevent the subsequent spread of diseases. Beets, carrots, and onions are stored during winter, and planted early the following spring. Cabbage, cauliflower, borecole, etc., require such special knowledge, and particular skill that production of seeds of these varieties by the home gardener cannot be recommended. The risk of cross-fertilisation is too great.

Mass Selection

To obtain best results, and to maintain distinct and desirable characteristics in any vegetable variety, it is not advisable to choose tomatoes, peppers, etc., from those which may have been picked because they were becoming ripe, and looked well. Special plants should be selected, and marked so that only the best specimens of fruit from the best plants may be secured for seed production.

Maturity and Harvesting

Climatic conditions will, in many instances, be a deciding factor in vegetable seed production. Excessive wet conditions with high humidity during autumn will tend to prevent ripening. Good rainfall during spring, reasonably moist conditions in summer, and a dry autumn are ideal conditions for vegetable seed production. Unless weather such as that indicated can be depended on, efforts to produce one's own seed may end in failure.

Storage

Seed, when harvested, must be properly stored. Containers which are reasonably air-tight should be used. Kept otherwise, rats, mice or other destructive agents may render the bulk of the seed useless. Seed well grown, and properly cured will retain its vitality within the limits of ordinary temperature variations.

Commercial seed production is, today, a vast and highly specialised industry. Engaged in it are plant breeders, expert seed growers, and specialists in several branches of agricultural science, and it is not too much to assume that, apart from seed production, the scientist and the grower are recognising how much they have in common, and to what extent the world's food supply depends on their joint collaboration and combined efforts.

Tomatoes

February is the month which usually calls for special attention to autumn

What To Do In The Garden Next Month

Summary of Operations During February

SUCCESSIONAL SOWINGS.

Peas (dwarf), lettuce (sow in the row and thin out), turnips (Model White).

OTHER SOWINGS.

Spinach, endive (for winter use), carrots (Earlykrop, Early Shorthorn), cabbage (Flower of Spring for spring use).

CROPS IN SEASON.

(The month in brackets represents the month in which the seed may be sown).

Cucumbers (Sept.), lettuce (June), sweet corn (spring, after frost danger), tomatoes—outside grown (late Aug.-Sept.), radish (spring and summer).

Green Crops.—Peas (June, July and early spring), silver beet (early spring and early autumn), beans (late Oct. and Nov.).

Gourds.—Marrows, pumpkins and squash (Oct. and Nov., earlier in frost-free areas).

Root Crops.—Beetroot and carrots (almost all the year round), parsnips (early spring to early autumn), onions (late March-early April), salsify (early spring), turnips (except winter months).

and winter maturing crops. Tomato plants which have been properly grown will have attained a height of from 2ft. to over 3ft. according to variety, time of planting and growing conditions. If the plants have been set too close or if other crops tend to overcrowd them, adequate air circulation will be prevented, and this may be responsible for the start of trouble from blight. The danger may be minimised by the removal of leaves immediately below the bottom truss of fruit. These leaves, however, should be removed by cutting with a sharp knife, not by breaking them off. The latter method will leave a rough wound through which harmful bacteria may enter the plant. Removal of this heavy foliage will make easier spraying of the plant stem with a combination spray containing arsenate of lead. As has been previously stated complete spray coverage of the plant is the only safeguard against attacks of blight.

During February a sharp look-out should be kept for maturing fruit. As soon as the tomatoes begin to colour they should be picked. At this time of the year blackbirds and thrushes are particularly active in tomato beds, and considerable damage may be done by these birds unless the ripening fruit is removed.

Cabbage

As it is not desirable to leave unoccupied any part of the garden in which a profitable crop may be grown, a few late, well-grown Savoy cabbage plants—Omega variety—may still be set out. Under good growing conditions, and with judicious manuring, and watering, combined with adequate protection from the usual garden pests, the plants will make good growth before the advent of cold weather which will restrict development.

Gourds

Marrows, pumpkins, etc.: Unless it is intended to store the balance of the crop remaining on the vines, the mature fruits should be removed and used as convenient. This will induce better growth of immature gourds which will ultimately be saved for storage and winter use. The tips of all the vines should be removed to prevent the plant from becoming exhausted in useless foliage production. Applications of liquid manure, preferably made from animal excreta, will at all times be beneficial to any of the gourd family. It should be applied after watering or after rain.

Potatoes

When the crop reaches maturity it is advisable to remove it as early as possible, and the tubers placed in storage. This is specially desirable in locations which may be subject to exceptionally moist conditions. Removal of the crop will serve the double purpose of preventing second growth which results in a certain amount of deterioration of the tubers, and will permit that part of the garden occupied by the crop to be turned over. Removal of matured crops is a necessary part of garden hygiene. Even if no immediate vegetable cropping on the same area is contemplated, seed of a green crop can be sown and later dug in.

Brassicas

That eternal vigilance which is reputed to be the price of liberty is also the price which, if paid, will secure the autumn and winter green vegetable crops for winter use. February, and early March are usually the worst months for these crops. Periods of warm, dry weather induce attacks by plant pests, and make necessary the use of insecticides in either spray or dust form. Nicotine sulphate, arsenate of lead and derris used according to directions usually printed on containers will be effective in protecting the plants. Hoeing—always shallow—should be frequent to maintain a soil mulch, and assist the conservation of moisture. During dry spells of weather regular and copious supplies of water should be applied to make good the loss through transpiration.

Celery

Celery plants should receive plenty of water, and occasional applications of liquid manure. If being grown in trenches, the sides should be maintained at a height which will ensure proper blanching. Beds will require boards arranged along the sides to blanch the plants. In warm districts a late planting may still be made, which, if it does not mature as dessert quality, will invariably be of value for other domestic requirements.

Swedes should be properly thinned out and kept free from seeds. Cultivation in this crop should be particularly shallow, and the top growth sprayed for aphides.

Leeks, too, will require heavy watering, but the soil must be well drained. Liquid manuring is of special value to this crop.

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

Seasonal Work for Beekeepers

Honey Production and Harvesting

WHILE honey may be divided into groups or grades according to the floral sources, an important consideration is its physical form for marketing purposes. Honey is marketed in the original comb in which it is produced, and as such is known as section comb honey and also in a liquid or granulated form known as extracted honey.

In whatever form the beekeeper desires to market this product, the bees must first store the honey in a comb entirely of their own making, or in a comb built on a wax base comb foundation.

To secure a good surplus of honey as indicated in last month's notes, it is necessary to establish in each hive a strong colony with a population of seventy thousand or more bees, and keep them working without swarming. Because of the tendency to swarm under certain conditions, the majority of beekeepers throughout the Dominion prefer to produce extracted honey when swarming can be controlled by giving the bees plenty of room, whereas to produce sections successfully, more or less cramped conditions are necessary.

Section Comb Honey

In section comb honey production, a good quality product is dependent upon a well-finished comb which is not easy to obtain under the varying conditions in which the bees may have to work. The beekeeper is also faced with the problem of enticing the bees into the small compartments known as sections, in the centre of which is fixed a piece of thin super comb foundation. These sections are usually 4¼ in. x 4¼ in. or may be 4 in. x 5 in. and the bees often refuse to work in them owing to the restricted space, and very often because conditions are not right for wax secretion where only small clusters of bees can congregate. Consequently, the brood nest becomes overcrowded, and swarming eventually results, which means a loss in honey production. There is also the problem of knowing exactly how much room each colony requires, so that all sections of honey are well filled and completely capped over with wax at the close of the honey flow.

Early Removal

For the best results, and to prevent travel stains, sections should be removed from the hive immediately the combs are completely capped over by the bees. These may be replaced with empties so long as honey flow continues. The wood work of each section should be scraped clean of all propolis and stains, and sections should be wrapped in cellophane or some suitable paper to keep them free from dust, and avoid the absorption of moisture. Travel-stained combs or sections with a soiled appearance do not sell well in any circumstances.

Extracted Honey

In the production of honey for extraction from the bee combs the beekeeper must follow a somewhat different procedure after the main honey flow begins. Plenty of room should be provided by supplying each colony, slightly ahead of requirements, with supers containing full depth drawn combs or frames fitted with comb foundations, the size of which resemble closely natural combs built by bees in a wild state.

When drawn combs from the previous season are supplied to the bees there is less work and larger crops on the average are produced. Also when a medium or poor season is experienced some surplus honey is secured, whereas no section comb honey could be properly finished by the bees under these conditions. In all locations therefore where seasons vary considerably and medium crops only are secured the beekeeper should concentrate on the production of extracted honey.

Harvesting

Beekeepers in many parts of New Zealand will now be busy harvesting early surplus crops of honey, and will require to use the most economical and labour-saving methods for the removal of full combs of honey from the hives. While several methods are used, including brushing and shaking the combs free of bees, the most popular and economical method is by means of an escape board fitted with a double exit "Porter" bee-escape. This appliance, which can be readily made by the beekeeper, is especially valuable during the late summer and autumn months, and will be illustrated in next month's issue.

The main points to observe when harvesting crops of honey are:—

Do not remove supers from the hives during the main honey flow until the combs of honey are at least 90 per cent. capped over by the bees.

Do not remove honey during wet weather and avoid extracting or storing honey in open tanks under damp conditions.

Securely cover all combs in transit from the hives to the extracting room.

To obtain best results—extract all honey as soon as possible after removal from the hives.

Cleanse well with boiling water and thoroughly dry all honey house appliances before use.

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

Lucerne

is a forage crop of such outstanding merits over a wide range of conditions that it should be used more freely in New Zealand farming than is the present case. Write to the Department of Agriculture for a copy of bulletin 155, "Lucerne on the Farm."

Notes for the Poultry Farmer

Management of Pullets up to Laying Stage

—By—
W. L. JOURDAIN,
Poultry Instructor, Dunedin.

IT is the care and attention which pullets receive up to the laying stage, apart from the inherited qualities of health, stamina, and production capability, that will make them into good laying machines. They are egg-producing machines, and, as everyone knows, machines which are working continuously must be given careful attention at all times.

No matter how good the breeding stock may have been, the quality of the subsequent pullets will depend on the rearing during the growing stage. Time and again it has been noticed that although the chicks have been purchased from reliable breeders the matured birds have been of poor quality, and often the breeding stock is blamed, whereas the fault rests with the rearer of those birds. It is obvious that good stock cannot be reared from poor breeders, but it is possible to rear poor stock from good breeders. In some cases this may be due to lack of knowledge, and it is with this in view that the following points are emphasised.

Housing

It is necessary that good housing should be provided throughout the life of the birds. Any house used must be free from cracks in the back or side walls, well-ventilated, and have a good floor. Cracks in the walls, as well as bad ventilation, are often the cause of colds in a flock. As the young stock grow older, they need more and more fresh air, and it is this point which a great number of poultry-keepers either forget or ignore. Whereas they themselves make sure they do not live or sleep in stuffy quarters, they keep their stock in conditions which somewhat resemble a hot-house, and it is only natural that as a consequence the stock may be lacking in stamina.

Ventilation is, of course, controlled by climate to a large extent, but this fact need not prevent the poultry-keeper from having his house well ventilated. The space between the top plate and the purlin on the back wall should be open, except for wire-netting. If the prevailing wind is from the south, it is quite an easy job to baffle the opening, and thus prevent any wind blowing directly on to the birds. If possible, the front of the house should be open for three feet from the roof downwards. In the event of the prevailing wind being from that direction, it should be possible to shelter the front without interfering with the ventilation. If the house is built with the roof sloping from the back to the front, and carried out beyond the front wall for two feet, this will keep out most of the weather.

The best floor is concrete, but many poultry-keepers still use only a dirt floor. While the least desirable type of floor, providing it is kept dry it will probably be satisfactory until such time as some disease is experienced. The control of disease on a dirt floor is a particularly difficult problem.

Perching

Pullets should be perched soon after they are six weeks of age. It is advisable to use perches which are 3 inches to 4 inches in width, to prevent, as far as possible, breast-bones becoming bent.

Overcrowding

The majority of poultry-keepers find no difficulty in rearing a few pullets, but it is a different problem when it comes to rearing a large flock. The failure is then generally caused by overcrowding. A few birds well reared will give better returns than a larger number which have lacked proper attention. When pullets have reached the age of six weeks they will invariably do better if kept in flocks not exceeding one hundred, irrespective of the size of the house provided.

Cleanliness

This is another point which should receive every attention, since the cleaner the house and surroundings are kept, the better the chance of rearing strong, and healthy stock. A damp or wet floor is an ideal place for certain disease germs to multiply, and therefore every endeavour should be made to keep the floor dry. Although some poultry-keepers manage to escape trouble for long periods where their birds live under dirty conditions, once disease occurs losses are greater, and control more difficult to effect as compared with well-managed and clean farms.

Feeding

It is difficult, and practically impossible, after the first few days, to overfeed young growing stock. They should be given as much food as they will eat without waste, for no matter how much food they are given they will not put on fat. However, do not allow food of any description to lie about the floor, as birds picking up such food may be eating something which will upset them, possibly because the food has become sour.

The food fed to young growing stock should be nourishing but not forcing, and therefore very little animal protein in the form of meat, meat-meal, or milk is required after about eight weeks of age until the commencement of laying. No matter what method of feeding is adopted, the food must be good in every way, as it is the food and not the method which counts. Do not make the mistake of buying cheap, poor quality food, as this is a policy of being "penny-wise and pound-foolish."

The feeding of poultry has been fully discussed in the "Journal of Agriculture" during the past year, and in consequence it is only necessary to refer to a good mixture for growing stock from eight weeks up to the laying stage.

Mash: 34 lb. pollard.
20 lb. wheat-meal.
25 lb. bran.
15 lb. maize-meal.
2 lb. dried milk.
2 lb. meat-meal.
2 lb. mineral mixture.
—
100 lb.

Grain: 60 lb. wheat.
20 lb. hulled oats.
20 lb. kibbled maize.
—
100 lb.

The mineral mixture may consist of one pound of fine salt and one pound of either steamed bone-flour or oyster shell dust. If the birds are found to be maturing too quickly, it is advisable to eliminate the milk and the meat-meal entirely.

One of the most important foods for young growing stock is green-food, as this supplies many of the minerals and vitamins required for good growth. It should be fed liberally, and in a young succulent condition. Silver beet, spinach, chou moellier, cabbage, lettuce, young green oats, lucerne, watercress are all suitable for this purpose.

Health

The birds should be watched closely at all times so that any change in health may be attended to immediately, and if possible checked before it goes too far. Generally it is through either ignorance in not being able to identify the trouble or carelessness in not obtaining help that diseases are allowed to get a hold. If prompt corrective measures were applied immediately, the spread of disease among poultry in the Dominion would be considerably lessened.

Apart from disease, the birds should be watched for body lice, which cause irritation, and loss of body condition. The best remedy is full strength nicotine sulphate applied in a small trickle along the centre of the perches just before roosting time. The heat of the bird's body releases poisonous fumes which kill the lice. Any eggs present, are unaffected, and it is necessary, therefore, to repeat the process after an interval of ten to fourteen days, in order to kill off the lice which have hatched out since the first treatment. It is advisable to wipe off any dust from the perches before applying the nicotine sulphate, as dust will cause the liquid to run off the perches.

Red mites which may be found during the day in cracks in the wood or under perches where they rest on their supports, also lower both the health and condition of the birds by suckling their blood at night. These may be destroyed with a blow lamp, or by painting infected places with a mixture of two-thirds creosote and one-third paraffin. It may be found that more than one application is necessary, and this point must receive particular attention during the warm summer months. If this is done about once every two months during the summer and every three months during the autumn and winter, it is unlikely that there will be any trouble with these parasites.

Pullets will also do better and be in a better condition to commence the laying season if they are de-wormed about a month before they commence to lay. It is a good plan to treat all the birds regardless of whether they appear to have worms or not. The birds are dosed with nicotine sulphate after they have been starved for 24 hours. The nicotine sulphate is added to a wet mash at the rate of one fluid ounce for every 100 birds, together with half a pound of Epsom salts. The salts should be dissolved in the water used to mix the mash, and then the nicotine sulphate poured into the water, and the whole agitated, and tipped straight into the mash and mixed up. If the water is not agitated the nicotine sulphate will float on the top and cause an uneven distribution. When feeding this mash, use only one-quarter of the usual quantity fed, and place it in troughs of sufficient length to allow all the birds to feed at once. Do not be alarmed if the birds appear to be knocked out after eating the mash, as nicotine sulphate is a powerful drug. Complete recovery occurs shortly after dosing, and no losses need be anticipated. Do not give any other food until all of this special mash has been eaten.

Note.—Be careful when using nicotine sulphate, as it is a deadly poison, and death will follow an over-dose.

Grading and Culling

In many instances people do not cull their pullets, either because they cannot be bothered or because they think that a pullet, no matter what she is like, is a good layer. On every farm, no matter how good the management, or how experienced the manager, there are always culls among the pullets, and in cases of poor management these might be as high, or higher than 200 in every 1000 pullets reared. Only birds of good constitution are profitable, and any that are stunted in growth or are deformed in any way should be culled. Strong, healthy Leghorn pullets have bright yellow legs and beaks before coming into lay, while their general appearance is bright and alert. Those with pale legs, and an anaemic appearance are lacking in constitution, and are unlikely to make profitable layers, and should therefore be culled. Stunted or weedy birds are a menace to the rest of the flock, as they are generally the first to start an epidemic such as colds or worms.

Throughout the growing stage, pullets should be continually graded and culled. This is a safeguard against outbreaks of disease, and a flock of unevenly-grown pullets at the beginning of a new laying season.

Free Range

Young stock may be reared intensively with satisfactory results, but much depends upon the birds receiving an ample supply of green-food. It is a fact, however, that those raised on free range, or with access to good grass-runs, invariably make the best birds, not only in appearance but in stamina as well. Even under these conditions additional green-food should be supplied. A satisfactory method is to place the birds in small colony houses which can be moved whenever it is considered necessary, or whenever a fresh batch of pullets are put into them. These houses should be built to accommodate not more than 100 pullets at six to eight weeks of age, and should be large enough to house them until it is necessary to shift them to their permanent laying quarters. Close watch should be kept on these birds, as overcrowding often occurs as they get older, and increase in size. This is a common fault, and one that does much harm to pullets every year.

Federation of Young Farmers' Clubs

Meeting of Dominion Executive Committee

A MEETING of the Dominion Executive Committee was held in the Railway Conference Hall, Wellington, on November 18th. Those in attendance were Messrs. D. S. Ross (Dominion President), in the chair, T. E. Streeter (chairman, Canterbury Council), S. G. Avery (chairman, Wellington Council), H. L. Chisnall, J. Barclay, and A. D. Talbot (delegates, Canterbury Council), W. F. McLaren, McGregor Donald, and B. J. Collerton (delegates, Wellington Council), J. H. Bremner and A. P. O'Shea (N.Z. Farmers' Union), A. C. Morton (Massey College), and S. Freeman (Dominion Organising Secretary). Apologies included those from Messrs. R. J. Reid, Dunedin (Dominion Vic-President), R. B. Tennent, and C. H. Schwass (Department of Agriculture), A. Walter (Auckland Council), A. C. Cameron, S. R. Whyte, Maitland Clark, A. S. Trotter, and G. C. Grocott (Otago-Southland Council). Mr. Grocott had intended to be present, but was held up through inability to secure steamer accommodation.

The chairman, Mr. Ross, in welcoming delegates, expressed gratification at the attendance; considering the difficulties prevailing at the present time the representation was definitely encouraging. He particularly welcomed Mr. Talbot, formerly chairman of the Canterbury Council, who was in Air Force uniform and on leave. He stressed the need for all units of the organisation to hold as regular meetings as possible in order to sustain interest.

Analysis of Clubs

A report presented by the Organising Secretary pointed out some of the difficulties connected with the maintaining of the organisation and the carrying on of individual clubs. The responsibilities of District Committees, and the need for the enrolment of younger members was stressed; clubs carrying on were only active by virtue of the fact that they had recruited from the "under-eighteens." A detailed list of clubs functioning in individual districts was submitted, giving figures relative also to clubs disbanded or in recess. An analysis revealed the following figures for Council areas:

Auckland, 16 active, 38 in recess; Wellington, 20 active, 61 in recess; Canterbury, 21 active, 20 in recess; Otago-Southland, 13 active, 23 in recess. Total, 70 active, 142 in recess.

Considering everything, this could be counted as reasonably satisfactory, the figures indicating a slight increase over those given at the annual general meeting. Of the clubs listed, eleven were only partly active, but could be considered as functioning, even though they were holding irregular meetings. as they were keeping in touch with the organisation and making every effort to carry on.

The chairman, in commenting on the report, expressed the opinion that, taking into consideration the number of members in the armed forces and the essential work being carried out by many others, the position could be regarded as distinctly encouraging, particularly as it indicated that interest in the movement was, in most districts, being maintained. North Auckland could be excused for its lapse, as the effects of military control and operations had been felt there probably more than in any other area in the Dominion; he was, however, disappointed with the position in the Waikato and Taranaki, which districts should be among the strongest in New Zealand so far as Y.F.C. activities were concerned.

In moving the adoption of the report, Mr. Bremner congratulated the Federation on its position; no other organisation within the Dominion had suffered to the same extent through its ranks being depleted by war. The position was, on the whole, good, as there was every indication that a nucleus would be left, after the war, with which to rebuild a strong organisation.

"Leadership"

A report brought down by the sub-committee set up at the Annual General Meeting covering the remit dealing with "Leadership" was read and discussed. The sub-committee was thanked for its efforts in compiling such a useful and comprehensive report, and it was decided that copies should be circulated among members of the Executive Committee, and discussed at the next meeting, when it was hoped that the members of the sub-committees responsible would be in attendance. A motion was also carried instructing the secretary to communicate with Dr. Beeby, Director of Education, suggesting the incorporation in the education syllabus of some such course as "Citizenship,"

it being realised that this is one of the most valuable and important subjects that can be taught in schools.

Policy

The matter of policy was discussed at length. The chairman intimated that the Federation's policy had been framed from time to time to meet altered circumstances, and he could see no reason under present conditions to diverge from the policy laid down at the annual general meeting. A motion was carried reaffirming the Federation's policy as laid down at the annual general meeting.

Y.F.C. Pamphlet

The Y.F.C. pamphlet, instructions regarding the preparation of which had been given at the annual general meeting, was read for consideration. The following motion was carried: "That the pamphlet as submitted to the meeting be paragraphed, with appropriate sub-headings, and printed for distribution to high school teachers and others, and that a dodger be prepared and distributed to school pupils; the matter of preparation, printing costs, and distribution to be left in the hands of the secretary, in collaboration with Mr. S. A. La Roche, of the Canterbury Council."

Competitions

The matter of national competitions was discussed and it was decided that an essay competition should be held, in both senior and junior classes. A motion was carried as follows: "That the subject of the essay for national competition be **'Citizenship** and the part that can be played by the young farmer'; the length of the essay not to count in judging, but the material to be of not less than one thousand words; the closing date to be August 31, 1943."

Resolutions Passed

Other resolutions passed included the following: "That future series of the Y.F.C. Roll of Honour should be headed so as to indicate that the Roll applies to all members serving with the armed forces"; "That, owing to the uncertain economic position obtaining at the present time, further consideration of a Y.F.C. Land Settlement Scheme be deferred until the next Dominion Executive Committee Meeting, and that the Land Settlement subcommittee be asked to acquaint that meeting with the latest steps taken by the Government in respect of land settlement"; "That, having regard to the approval given by the Federation to the formation of clubs in secondary schools, and recognising the value of such clubs at the present time, and appreciating the need to enrol new members from fourteen to eighteen years of age, a request be issued to all councils and district committees urging that every endeavour should be made to put this policy into practice."

The venue of the next annual general meeting of the Federation came up for discussion; Mr. Morton, referring to the fact that it would be held in Palmerston North, asked if consideration could be given to the meeting taking place at Massey College. On behalf of the college he offered the hospitality and facilities available. Appreciation was expressed to Mr. Morton and to the college. Mr. Avery (chairman, Wellington Council), in thanking Mr. Morton, stated that the offer would be put before the next meeting of the Wellington Council, which body would be responsible for the local arrangements for the annual general meeting.

It was decided that the next meeting of the Dominion Executive Committee would be held in Christchurch during the first week in April, if possible.

Canterbury Y.F.C. Council Meeting

A MEETING of the Canterbury Council was held in Christchurch on November 17. Those present included Messrs. T. E. Streeter (chairman), H. G. Stephens, L. W. McCaskill, H. L. Chisnall, R. S. France, J. Barclay, S. Watson, and R. Whiteman. Messrs. D. S. Ross (Dominion President) and S. Freeman (Organising Secretary) were present by invitation. The meeting was a very representative one. Reports indicated that in the Canterbury Council area, out of the original 41 clubs in existence before the war, 21 were still active; as there appeared to be reasonably strong clubs still functioning in each of the six main districts, the position was considered, under existing circumstances, to be quite satisfactory.

The Dominion President, Mr. Ross, in an address, stated that he was gratified to see such a good representation at the meeting. While fully aware of the difficulties confronting the organisation, he appealed to delegates to exert every effort to maintain the existing clubs, and reminded them of the immense value of the movement, both from the educational standpoint and from the point of view of leadership.

The organisation had demonstrated, so far, its ability to carry on in spite of the war; clubs generally would, doubtless, suffer further depletion of membership, but this should call for greater effort and sacrifice on the part of those left. The necessity to enrol new members was apparent. He pointed out that there would shortly be numbers of lads leaving secondary schools, who would be choosing farming as a calling; every Y.F.C. member should realise his responsibility and endeavour to assist these schoolboys who have their lives before them. He considered that club work could be made more attractive; field days could still be held and lectures and demonstrations encouraged.

There was also the definite promise to members overseas to carry on with the organisation. The Federation had laid down a policy, but it had to be planned locally to suit the requirements of individual districts. The District Committees could assist materially; so long as they were functioning, so long would the movement prosper. These committees should meet regularly, work out a definite policy, and put it into effect.

Mr. Ross reminded members that this was his second term of office; he would particularly like to see the movement in a healthy condition, ready to hand over to a new Dominion President at the end of the Federation year, more especially as there was a likelihood of the incoming President being selected from amongst the active members. He suggested that perhaps in the New Year it might be possible for the chairman of the Canterbury Council and some of the delegates to make a tour of the district committees with a view to stimulating interest. He was encouraged and inspired by the meeting and the attitude of those present, and appealed to them to use every effort to maintain the movement, so as to give a good account of their stewardship when their comrades returned from

Concrete on the Farm

Although concrete has been used for hundreds of years as a building material, its application to farming is of comparatively recent origin. Its use in the construction of floors, tanks, silos, troughs, fence-posts, paths, buildings, pipes, field drains, etc., is well recognised and there are few farmers who have not at some time laid down a path or constructed a trough in concrete.

The advantages of concrete lie in the fact that it is relatively cheap to use, easy to prepare, and, once placed, is there for years.

Valuable information on the mixing of concrete and its practical uses on the farm is available in the **free** illustrated bulletin "Concrete on the Farm," obtainable from the Department of Agriculture, Wellington.

overseas. The chairman thanked Mr. Ross for his address and referred particularly to the matter of the recruiting of boys from 14 to 18 years of age stating that this matter would be brought up for discussion at a later stage of the meeting.

The business of the meeting included the following: writing off unpaid affiliation fees owing by unfinancial clubs now in recess; calling of nominations for the Lincoln College Old Students' Association Scholarship; formation of a Women's Auxiliary by the Scargill-Omihi Club; enrolment of members between 14 and 18 years of age. In regard to the latter, many constructive suggestions were made, and remits were framed for presentation at the Dominion Executive Committee meeting in Wellington the following day. It was considered that the formation of clubs in secondary schools should be very definitely encouraged, and that steps should be taken to contact lads in rural areas leaving school, with the idea of interesting them in local clubs. It was tentatively decided to hold the next meeting of the council immediately prior to the next Dominion Executive Committee meeting.

Bay of Plenty Y.F.C.

By A. F. WALTER, Paengaroa Y.F.C.

Debating Competition.

INTER-CLUB debating competitions have been a feature of Y.F.C activities in the Bay of Plenty since 1937, when the combined clubs purchased the Debating Shield. The district committees conduct the preliminary contests between the clubs in their respective areas, culminating in the final contest between the leading Eastern and Western club teams.

To determine the Western Bay representative club team this year, Te Puke competed with Paengaroa, the subject for the debate being "That Agriculture offers as good an Opportunity to Young Men as does other Employment." The Te Puke team took the negative. After a lively encounter in which some quite eloquent speeches were made, the adjudicator, Mr. R. S. McDonald, awarded the decision to the Te Puke team, Pat Nichol (leader), Ken Petch, and Lou Ashe; the Paengaroa team was led by Gordon Spratt, with Doug Ross, and Ian Spratt as supporting speakers.

This win brought Te Puke against Waimana in the struggle for the coveted shield, which took place in the Waimana Hall. The Waimana team, H. C. White (leader), R. T. While, and R. McDonald, took the affirmative of the debate "That the Marketing of Primary Produce should be Producer-Controlled." The Te Puke team, P. Nichol (leader), Don Caldwell, and L. Ashe, supporting the negative, won the contest. Mr. Hubbard, Headmaster of the Whakatane District High School, kindly adjudicated. At the conclusion of the contest Mr. D. S. Ross, Y.F.C. Dominion President, presented the shield.

Worthy of mention was the high standard of debating skill and technique evident throughout, and the ability of the speakers to drive home their facts. Capacity audiences were provided, both at the Paengaroa and Waimana Halls, by the older members of the farming community and the general public.

Previous holders of the Bay of Plenty Debating Shield:

1937—Kati Kati, runner-up Te Puke.

1938-39—Waimana, runner-up, Paengaroa.

1940—Waimana, runner-up Omokoroa

1941-42—Te Puke, runner-up Waimana.

Stock-Judging for Wright, Stephenson Cup

EVERY year representative teams from the Eastern and Western Bay of Plenty meet to compete in a stock-judging contest for the Wright, Stephenson Challenge Cup. This year the event was held on Mr. T. W. Wardlaw's "Greenmeadows" property. Mr. Wardlaw being a well-known breeder of high quality stock, the activity was looked forward to with more than usual interest.

The competing teams were as follows: Eastern Bay, D. Woolfield (leader), R. McDonald, and B. Hughes; Western Bay, Cliff Riddell (Leader), Jack Gulliver, and Sam McDowell. In this event each team fills in one card only, the judging being the joint effort of all members of the team. On this occasion pedigree Jersey heifers were paraded. Both teams placed the heifers in correct order, giving very excellent reasons and faults, and it was only after a considerable time spent in close scrutiny of the cards that the judge, Mr. J. S. Rae, awarded the decision to the Eastern Bay team. Mr. R. Fleming, a Jersey breeder of Waimana, gave an instructive demonstration on the points of judging, and there was a competition amongst individual club members for medals presented by local farmers.

Included amongst the competitors were some members of the Whakatane District High School Young Farmers' Club.

Western Bay of Plenty Y.F.C.

By A. F. WALTER, Paengaroa Y.F.C.

Stock-Judging Competitions

THE art of selecting and judging stock is definitely encouraged amongst the members of Young Farmers' clubs. To this end a field day is held annually in the Western Bay of Plenty, at which members from the various clubs gather to compete in the dairy cattle, sheep and pig classes. This year's competitions were held at a field day on Mr. G. R. Spratt's farm, Paengaroa, members being present from the Te Puna, Tauranga, Te Puke, Paengaroa and Pukehina clubs. For the purpose of judging the usual Auckland Council judging-cards were used, animals (marked A, B, C and D) to be placed in order of merit, reasons, and faults to be given. One hour was allowed for the completion of the cards in the three classes—dairy heifers, breeding ewes, and baconer pigs, and an extra class for allotting the points of a ewe. The pedigree Jersey heifers

were paraded for a short time so that competitors could make comparisons.

At the expiration of the time limit the cards were collected and Mr. G. F. D. Watson, who judged the dairy heifer class, announced his placings, and gave a short demonstration; he was followed by Mr. G. P. Spratt, judge of the sheep class, and Mr. Norman Carter, judge of the pig class. Interest then centred on the announcing of the place-winners in the three chief classes. The club whose members secured the highest aggregate of points was to hold the Gulliver Cup for the year; this cup was presented by Mr. J. A. V. Gulliver, and was awarded on this year's performance to the Paengaroa club.

Ensilage Competition for Doidge Cup

OWING to prevailing conditions it was not possible to judge all the entries received; on this account at the last meeting of the Western Bay of Plenty District Committee it was resolved that the Doidge Cup competition be deferred this year. A trophy is to be presented to the winner of those judged.

Results: Bruce Gordon (last year's winner), Pukehina, 89 points; P. Nichol, Te Puke, 85 points; P. Voltz, Paengaroa, 82 points; M. D. Steel, Paengaroa, 77 points; J. Gulliver, Paengaroa, 75 points; S. McDowell, Paengaroa, 69 points.

Reports on Club Activities

SOUTH OTAGO.

Warepa.—Applications for Lincoln College Old Boys' Scholarship discussed. Tentative arrangements made for a butchering demonstration. Lecture by Mr. Hayhurst, Veterinarian, on "The Castration of Horses"; after questions put by members, a discussion followed on "Ailments of Farm Animals, and the Treatment Usually Applied." There were nine members in attendance.

CHRISTCHURCH.

Ellesmere.—General business. Address by the Rev. L. McMaster on "Aspects of Life as it Affects the Young Man of Today." Nine members present.

NORTH CANTERBURY.

Scargill-Omihi.—Arrangements for next meeting. Decided that club send Christmas greetings by cable to members overseas. Lecture by Mr. J. W. Earl on "Farm Pastures and the Harvesting of White Clover for Seed."

NELSON.

Murchison.—The club held a practice dog-trial on November 21; this activity was such a great success that it has been decided to hold a trial on a proper scale after Christmas.

WAIRARAPA.

Carterton.—Arrangements made for several club members to give talks on topics of their own choosing at the December meeting. Lecture by Mr. N. Lamont, Department of Agriculture, on "Serpentine Super" and "Vegetable Culture." Nineteen members present out of a membership of twenty-two.

MANAWATU.

Bunnythorpe.—The secretary reported that the entries in the potato competition totalled twelve, nine entries being from club members. It was decided to donate a points prize in the root-crop section at the forthcoming local Women's Institute Show. Informative address by Mr. Sparrow, of the Bunnythorpe Sub-Station, on "The General Construction and Establishment of the Hydro-Electric Power Schemes of New Zealand." At the previous meeting arrangements were made for club members to visit the Seed Testing Station in Palmerston North. The rules and conditions for the proposed potato competition were laid down, being as follows: Minimum area to be ¼ acre, and entries to be invited not only from club members but from farmers in the local Primary Production District area. The idea of extending the competition was so that the observations of the results of growing potatoes by the various methods employed by farmers would cover as many plots as possible. A talk was given by Mr. L. Williamson on "Seeds." At both of these meetings there was an attendance of eleven members out of a total membership of fourteen.

Rongotea.—Letter to be sent to Mr. W. Croucher thanking him for his most interesting series of broadcast talks in the Y.F.C. Session at 2ZA, entitled "Farming Through the Years." An invitation to the W.D.F.U. Birthday meeting was accepted with thanks. Decided that the club would go into temporary recess during the busy season and meet again in February. Mr. J. Gloyn gave a very interesting lecture entitled "The Circulation of the Blood." The speaker demonstrated by means of the blackboard and coloured chalks the action of the heart and the circulatory system of the blood stream. The meeting decided to recommend Mr. Gloyn to kindred clubs as a speaker on this particular subject. There were twelve members present out of a club membership of twenty.

BAY OF PLENTY.

Paengaroa.—Club dance to be held during December. Lantern lecture by Mr. J. R. Murray, Department of Agriculture, on "The Development of Pumice Lands. Attendance of twenty-five members out of a total of thirty-five. Four new members were enrolled. The Western Bay of Plenty District Committee held a successful meeting at which forty-two members and delegates were present.

Te Puna.—General business. One new member enrolled. An effort to be made to collect rubber and raise club funds.

WARKWORTH.

Kaukapakapa.—Two new members enrolled, bringing the club membership up to forty-one. Interesting and informative lantern lecture by Mr. J. M. Smith, Fields Superintendent, Department of Agriculture, entitled "Life in the Chatham Islands." The speaker, who had visited the Chatham Islands some years ago, gave members some very interesting facts about farming in the island and transport to the mainland. Thirty-two members were present.

Health Notes for the Farm

The Undulant Fever Menace

Contributed by the
DEPARTMENT OF HEALTH

TOWNSFOLK these days do not hear very much about undulant fever, but in the country districts, particularly the dairy-farming areas, it is a constant menace to human health.

Undulant fever is an unpleasant and very debilitating disease. It belongs to the list of diseases that are transmitted from animals to man, and in its way it is unique—because the same produces a different result in cattle from what it does in man. In cattle it is responsible for the unhappy and costly prevalence of contagious abortion, and in humans it produces the fever, which, in the United States alone, is said to affect 12,000,000 people.

It took research workers a lot of hard and concentrated work to find out the dual nature of the *brucellosis* germ, and it was a woman—Miss Alice Evans, of Washington—who discovered that the Bruce microbe (which causes undulant, or Malta fever in humans) was the same as the Bang microbe, which causes sterility in dairy herds.

A Simple Remedy

Having found this out, and having found out also that the source of infection for humans was the raw milk of the diseased cows, the next course was fairly simple. It was—treat the raw milk. And that is where pasteurisation of milk has once again proved its value in guarding human beings against the invasion of contagious disease.

As Miss Evans herself put it: "If there were no other reason for milk pasteurisation, it would appear to be folly to drink raw milk containing the Bang organism." The growing use of pasteurised milk in the populated areas has resulted in the virtual elimination of undulant fever in these areas, though a recent isolated case in a North Island town was traceable to the use of unpasteurised milk.

In the towns, only those who drink the raw milk are running any risk of contracting undulant fever. In the rural areas it is liable to break out at any time among people who handle cattle, pigs or goats, and who are careless about their personal cleanliness. And of course the general practice in country districts of consuming the milk in an untreated state obviously leads to a greater spread of infection.

Anyone who lives in the country and drinks untreated milk from an infected cow is liable to come down with fever and vague pains. He may feel fine every morning, but in the afternoon his temperature rises, and he gradually loses strength. This may keep up for a long period. Symptoms range all the way from mild backaches to bone and nerve infections, and heart disease. Scarcely an organ in the body is safe from infection.

Similar to Influenza

At the outset undulant fever in man is hard to distinguish from influenza. Characteristic symptoms are general malaise, headache, muscular pains, and high temperature. Profuse sweating and constipation are also symptoms. Sometimes the bout passes, and the patient congratulates himself on having thrown off an attack of influenza. On the other hand it may recur, and it has been known to drag on for weeks, and months, and even years. In fact, it is from this habit of producing wavelike accessions of fever that it gets its name—undulant.

The only really comforting feature of the disease is that preventive action is simple. That is, drink only pasteurised milk. In most populated areas this is now possible. The treatment of milk on the farm, and in those households that do not use pasteurised milk, presents no difficulty. It is simply a matter of heating the milk to 155 deg. Fahr., stirring constantly; then set the pan at once in cold water, and keep stirring the milk until it is cool. At that temperature the bacteria cannot live.

There are people who say that the food value of milk is appreciably lessened by pasteurisation. This has absolutely no basis in fact, and the enormous increase in the consumption of pasteurised milk is abundant proof of the widespread switch away from this view. Undulant fever merely provides another argument to prove to doubters the great value of pasteurisation in the prevention of disease.

Don't

neglect early spring cabbage plants. For slugs and snails use burnt lime freely. It is best applied in the evening.

THE Good Neighbour

BY MARY

From Me To You

IN my cutting book I have a piece by an unknown author, which I have been wanting to share with you for a long while.

"A modern wise man was once asked if he believed in luck. Here is his answer, and it is worth cutting out and pasting in your hat!

Do I believe in luck? I should say I do! I have watched the successful careers of too many lucky men to doubt its existence and its efficacy.

You see some fellow reach out and grab an opportunity that the other fellow standing around had not realised was there. Having grabbed it, he hangs on to it with a grip that makes the jaws of a bulldog seem like a fairy touch. He calls into play his breadth of vision. He sees the possibilities of the situation, and has the ambition to desire them, and the courage to tackle them. He intensifies his strong points, bolsters his weak ones, cultivates those personal qualities that cause other men to trust him and to co-operate with him. He sows the seeds of sunshine, of good cheer, of optimism, of unstinted kindness, he gives freely of what he has, both spiritual and physical things.

He thinks a little straighter, works a little harder, and a little longer; travels on his nerve and his enthusiasm; he gives such service as his best efforts permit, keeps his head cool, his feet warm, his mind busy. He doesn't worry over trifles. Plans his work ahead, then sticks to it—rain or shine. He talks and acts like a winner, for he knows in time he will be one."

"And then LUCK does all the rest!"

There, did you enjoy it? I knew you would. Luck is all very well, but it needs a lot of help from ourselves to bolster it up into being of practical use to us. Don't envy those folks you always think of as being lucky—study them closely, and find out for yourself just why they are lucky. It is not a fluke—it is usually hard work and solid application to the job in hand that has made them successful in whatever they have undertaken to do. And determination—that's a quality that counts where luck is concerned. The man or woman who possesses a dogged determination to succeed is the one who usually succeeds in the long run.

Now that we are well into the New Year, could I ask one thing of you? It's not a very big request—but with a lot of people it has become a habit that causes untold worry. And worry is the greatest enemy to success that I have met. Here it is: Don't cross your bridges until you come to them. It is an old saying with a wealth of truth in it. How many of you spend endless hours worrying over troubles and events which never come to pass? Now own up—I am sure that every one must confess that at some time or another they have committed this fault.

You don't get anywhere by worrying over events before they come to pass—instead you weaken your powers of resistance so that often if the worst does come to pass you are not fit enough to face events with a sane mind and clear head. So paste it in your hat, along with the cutting about luck, and I am sure you will not regret adopting it as your New Year motto: Don't cross your bridges until you come to them.

Mary

Tea is Rationed

I THINK we are all feeling the pinch a little now that tea has been rationed for quite a number of months, and here are one or two hints I have found useful in making my ration of tea go further.

This recipe for tea essence is a good one, provided the folk take sugar in their tea. Put a teaspoon of sugar with every ½ lb. of tea. Five minutes before the tea is required have the teapot hot, and put two heaped dessertspoonfuls of strong tea into it, and cover with a breakfast cup full of boiling water. Let it stand about three minutes, and then pour the liquid into a small glass bottle and cover. Then fill the teapot up with boiling water again, and it will do for three or four cups. You may use the essence whenever you want to make a single cup of tea, for being very strong it may be used as coffee essence—put into a cup the same amount of essence as of milk, and fill with boiling water.

In canteens this method is used extensively. Bring the required quantity of water to the boil, then add the tea. Try half a pound of tea to four pints of water, or 2 oz. tea to half a pint of water. Just bring to the boil again, and add a little cold water, allow to stand for five minutes, and then strain gently and bottle. Leave the bottle uncorked, and use as required by adding boiling water.

Ever warmed your tea before you use it? Roll it out on a sheet of paper with a rolling pin, being careful not to roll it to dust, place on an oven tray, and put in a warm oven for ten minutes. This brings out the full flavour of the tea, and makes it go twice as far as normally. The oven must not be too warm, and don't replace the tea in the caddy until it is quite cold.

Try these hints out, and see if your tea lasts any longer next month.

RECIPES FOR PRESERVING FRUITS and VEGETABLES

GENERAL DIRECTIONS
for Water Bath Method or Oven Method.

1. Select fresh sound fruit without bruises or marks and not too ripe.
2. Wash fruit and drain thoroughly, or wipe clean, using a damp cloth.
3. Prepare by removing skin, stones or cores, as required. Top and tail gooseberries. Remove stalks from all berries. Peel and halve pears, quinces and apples, and remove cores.
4. Test jars and lids, and use new rubber rings each year. This is important; old rings have lost their elasticity.
5. Put old jars and lids into moderate oven to heat through thoroughly.
6. Sterilise new jars and lids. **To Sterilise.**—Cover jars first with cold water. Bring slowly to boiling point. Boil for fifteen minutes. Allow jars to cool in the water.
7. Grade the fruit and vegetables as regards firmness and size. Naturally, large fruit will take longer to cook than smaller fruit of the same variety. Uniformity helps to secure an even distribution of heat throughout the jar, and improves the appearance of the finished product.

Fruits may be packed into either cold or hot jars or bottles. When using cold jars use cold water or syrup. For hot jars use boiling water or boiling syrup.

Always pack fruit into the jars as tightly as possible, because when cooked the fruit shrinks. Do not bruise the fruit.

Completely cover fruit with water or syrup, and to within half an inch of top of jar to allow for expansion of air and to prevent liquid boiling over. Place rubber rings into position and see that they rest quite flat. Place lid on and screw lightly. If using bottles with glass tops and clamps, place rubber ring into position; do not tighten clamps.

FOR OVEN METHOD.

Place several thicknesses of paper on to scone tray or oven tray. Place jars on top of this; allow a little space between each jar. Place tray on grid shelf fourth or fifth ledge from top of oven. Allow fruit, etc., to remain in oven at desired degree or number till fruit has changed colour and syrup just reaches boiling point, and liquid begins to ooze out of jar.

TO SEAL JARS.

At the end of the cooking period, as each jar is removed, stand it on a board or a thickness of paper, or a thick dry cloth. Immediately screw cap down tightly—as tightly as possible. This is important; as no air must reach the sterilised product. Do not attempt to screw lids down when jars are cold—this may break the seal.

TO TEST JAR.

Stand jars right way up till perfectly cold, then turn jars upside down. If any leakage, seal is not perfect. Look for cause and re-sterilise for one-third of the time, or use product right away.

STORAGE—IMPORTANT!

Store in cool, dry place, **not** in cupboards high in kitchen.
Important Points.—Sound, fresh products and perfect sealing of jars.

TO STERILISE FRUIT AND VEGETABLES.

Water Bath Method.—Any large pan will do.
Must be deep enough so that the boiling water comes to within one inch of top of jar. A tight-fitting lid is necessary and a stand or rack (perforated) placed at bottom of pan to prevent the fierce heat from penetrating to the bottles and jars. The copper will do if preserving a large bath of bottles.

Prepare fruit or vegetables. Pack and partly seal jars. (See general directions). Use very hot water in pan if using hot jars and liquid. Cold water if using cold jars and cold liquid.

Place jars on stand. Have water one inch below top of jars. Bring water gradually to boiling point. Boil briskly for time required. Lift out each bottle and seal immediately. See directions to seal.

To sterilise is to cook food so that the action of any bacteria is killed.

Proportions of Syrup for Fruits:—
Thin Syrup—1 cup sugar to 2 to 3 cups water.
Medium Syrup—1 cup sugar to 2 cups water.
Thick Syrup—1 cup sugar to 1 cup water.
Very Rich Syrup—2 cups sugar to 1 cup water.

In each case boil sugar and water together till sugar has dissolved. Stir occasionally. Strain syrup through a piece of butter muslin to remove any foreign matter. Syrup may be used either boiling or allowed to get cold.

TIME FOR OVEN BOTTLING (FRUIT).

Heat oven for 15 minutes, regulo turned to No. 1 (260 deg.) Champion Cooker; No. ½ (260 deg.) New World Cooker. Very moderate oven.

Berried fruits will take from 20 to 30 minutes—raspberries, blackberries, cape gooseberries, currants, black and red, loganberries, gooseberries, strawberries, etc.

All other fruits approximately 50 to 60 minutes. Appearance—till syrup nearly reaches boiling point and begins to ooze out of the bottles.

To obtain 180 deg., turn regulo to No. 1, Champion, and to No. ½, New World, then turn the oven tap on half. Allow a longer time for fruit at this degree.

VEGETABLES.—Time for Water Bath or Steriliser.

Beans and Peas.—Three hours. Have water boiling in the steriliser or water bath the whole of the time. If desired, sterilise for 1½ hours; allow to get cold, then in 24 to 48 hours sterilise again for another 1½ hours.

Asparagus, Mushrooms, Sweet Corn.—Three hours, or sterilise twice—1½ hours each time.

Carrots, Beetroot, Cauliflower.—2 to 2½ hours, or sterilise twice.

Carrots and Beetroot (very young).—Wash and retain one inch of stem. Boil for 15 minutes. Rub skins off under running water. Pack whole or in halves, or in slices. Cover with slightly salted water and sterilise as for beans. Time—2 to 2½ hours.

1.—PRESERVING OF PEACHES & NECTARINES, ETC.

Select firm fruit just beginning to ripen. All fruits have a much richer flavour if preserved with the skins left on, but the rough furry skin on peaches is very objectionable to some folk.

Peel peaches, if desired, or remove skins by placing into steamer and steaming till skins will slip off easily. Time about 7 minutes. Leave whole, cut into halves and remove stones, or cut fruit into slices, as desired.

Place rubber rings into position. Pack peaches into heated jars, pour heated syrup over to within half an inch from top of jar, then immediately screw lid on very lightly. Place bottles into water bath or into the oven. Cook until

syrup nearly reaches boiling point, and begins to ooze out of bottle. Time about 50 to 60 minutes. 212 deg. (boiling point), when using water bath.

260 deg. in oven (very moderate oven).

When fruit is ready lift out each bottle and stand on piece of wood or thick cloth. Screw down each jar immediately it has been removed from oven. Screw very tightly (important). Test to see if sealed. Turn bottle upside down, should any moisture ooze out, cap is not screwed enough.

APRICOTS. Oven Method.

Heat oven for 15 minutes with Regulo at No. 1 for Champion Cooker, and ½ for New World. Select firm fruit, rather on the unripe side, just when the apricots begin to change colour, for best results. Wipe with damp cloth. Cut into halves, leaving the stones in a proportion of the halves. Pack very tightly into either hot or cold jars. Place rubber rings into position. Fill jars with syrup (medium) to within half an inch from top of jar. Hot syrup for hot jars. Cold syrup for cold jars. Screw lids on slackly. Place several thicknesses of paper on top of scone tray. Place bottles on paper. Place tray on fourth or fifth ledge from top of oven. Sterilise (cook) with regulo at above number. Time about one hour for quart bottles; half to three-quarters for pint bottles, till skins of apricots just begin to break.

Remove one bottle at a time from oven and screw lid down immediately. Make sure bottles are absolutely air-tight.

Note.—When cold should apricots rise to the top of the bottle, stand bottles upside down for several days, then place bottles on their sides for several days.

PRESERVING FRUIT—Every Variety.

Simplest Method of All.—With this method more fruit and less syrup can be packed into jars. Make a syrup using two cups of water to each cup of sugar; or a syrup as desired.

Place jars and caps into oven to heat thoroughly. Prepare fruit. Whole, halved, or into slices. Peeled or unpeeled, cored or stoned.

Bring syrup to boiling point. Drop the fruit in. Cook gently till fruit is just soft and clear. Lift fruit carefully into jars, using ladle or cup. Make certain that syrup overflows bottle (important), and seal each bottle immediately it has been filled. Make sure cap is tightly screwed down, and **do not** rescrew when fruit is cold. This may break the seal.

When preserving a large quantity, more sugar and more water in proportions required may be added to the fruit syrup left in pan, brought again to boiling point and more fruit added.

When all fruit has been preserved, syrup left over may be sealed into beer or pickle bottles. Useful for sauces, jellies, drinks and winter time desserts.

Note.—Use corks or caps to exclude air.

PRESERVING VEGETABLES (Hints).

Satisfactory results in preserving vegetables will be assured by—

Using fresh, sound, young firm products. Preserving the product while it is fresh.

Putting each jar into the water bath (processing vessel), as soon as packed.

Sterilising the products twice at required temperature and time.

Completely sealing each jar immediately it has been taken from the water bath. The sealing of the jar is most important.

Grading the vegetables is important, too, especially with peas, as old peas will take much longer to sterilise. The younger the vegetable the better the result. Never preserve peas when changing colour. Dry the peas at that stage.

Proportion of salt to water for vegetables is 1 dessert-spoon to 1 tablespoon of salt to each four breakfast cups of water (1 quart). To suit individual taste.

3.—BOTTLING OF BEANS.

Scarlet Runners, French or Butter Beans.

Select young tender beans. Wash beans and dry thoroughly, or wipe beans with damp cloth. Remove strings, if any. Prepare ready for table use. Cut thinly, thickly, or into fine shreds. Plunge beans into pan of fast boiling water; lid on pan. Boil for 10 minutes. Drain beans. Place rubber ring into position. Pack heated jar with beans. Fill jars with slightly salted boiling water to within half inch of top of jar. Place screw top into position and just screw lightly. As each jar is ready place into the hot water bath.

Sterilise for 1½ hours. Remove each jar and screw top down immediately jar has been taken out. Make sure cap has been screwed down tightly. Let stand for 24 to 48 hours, then re-sterilise again for 1 to 1½ hours. This time do not unscrew lids. Have water in bath cold to start with. Bring water gradually to boiling point and boil briskly for 1 to 1½ hours.

4.—PRESERVING OF PEAS.

This is the hardest vegetable to bottle, and it cannot be definitely stated that satisfactory results will always be obtained. The following, however, has been found very satisfactory. Wash pods, but not peas. Shell peas. Select freshly gathered peas, if possible. Grade. Place peas into pan and just cover with boiling water. Boil gently for 5 to 10 minutes, lid on pan as if for immediate use (no soda). Strain and fill the bottles. Tap the bottles on the table and fill up to the neck.

Cover peas with boiling salted water. Place rings and caps into position. Sterilise in water bath for 1½ hours. Take out and seal each jar immediately. Let stand for 24 to 48 hours and re-sterilise for 1½ hours. Have water in bath boiling throughout the whole process. Read bean recipe.

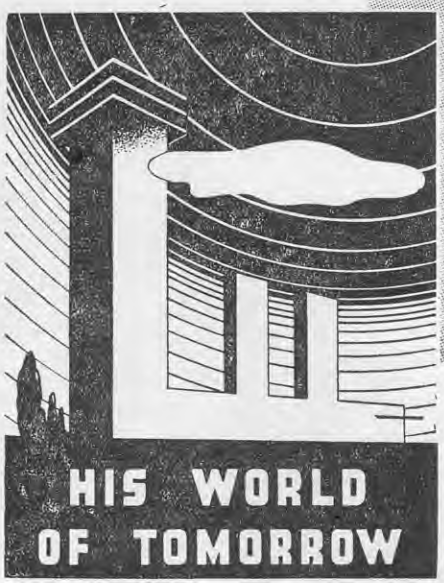
Note.—Sterilise for 3 hours on end, if desired. At end of first hour remove bottles and screw lids down tightly and return bottles to pan.

Sugar and lemon juice or vinegar may be used in the proportions of 1 teaspoon of sugar and 1 dessertspoon lemon juice to each 2 cups of liquid. Add to salted water.

5.—EASY HOME METHOD—PLUM JAM.

Ingredients.—3 lbs. plums; very firm plums. 3 breakfast-cups of water. 5 breakfastcups of sugar.

Method.—Put fruit and water in pan and cook till plums are soft; then add sugar and boil swiftly till a little tried sets firmly. (Remove stones as they rise to surface.) Remove from stove; allow to cool a little, then bottle, cover, label and store in a cool, dark place.



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6.—RASPBERRY JAM.

Ingredients.—9 lbs. raspberries. 9 lbs. sugar.

Method.—Place raspberries into well buttered preserving pan, bring slowly to the boil and stir till they are mushy and no lumps. Add heated sugar and bring quickly to boil; boil hard for five minutes, stirring all the time. Remove from stove and stir occasionally, till partly set, then bottle, cover.

7.—BOTTLED RASPBERRIES.—Ready for Dessert.

Select raspberries which are fresh and dry; wash and leave to drain. **Method.**—Fill hot jars with raspberries, shaking the jars in order to obtain a full pack. Make a syrup of 3 breakfastcups of sugar to 2 breakfastcups of water. Pour the boiling syrup over the berries till jars are full. Adjust rubber and lid lightly, and place in oven 270 deg. F. for 20-30 minutes. Then seal.

8.—PEACHES AND NECTARINES.

Wash and dry peaches carefully, then place over steamer for 7 minutes for blanching; remove skins and pack firmly in bottles; cover with boiling syrup, adjust rubber and lids lightly, and place in oven 180 deg. F. for one hour, then seal tightly.

9.—PEARS.

Peel the fruit with a sharp knife, cut in halves or if very large, cut into quarters. It is advisable also to take out a little of the hard core. Drop the peeled pears into slightly salted water until ready to fill the jars. This saves discoloration. Pack the fruit as closely as possible into bottles and cover with syrup (1 cup sugar to 3 cups water). Adjust rubber and lid lightly. Place in steriliser and bring slowly up to 200 degrees, then allow temperature to fall to 180 degrees, and maintain as near as possible for 2½ hours.

If desired, can be done in oven 260 deg. F. for 1-1¼ hours.

10.—APPLES.

Peel the apples, core and slice them, and pack as closely as possible in the bottles. Fill the bottles with syrup and adjust rubber ring, and screw lid lightly. Put in steriliser and bring to 160 degrees, and maintain as near as possible for 2½ hours.

11.—TOMATO PUREE.

Wash and dry tomatoes thoroughly; place on oven slides and cook till very soft and skins shrivel. Remove from oven. Press through a wire sieve until only skins and seeds remain. Bring pulp to boil and bottle immediately in previously heated bottles. Fill to overflowing and screw tightly.

12.—BOTTLED TOMATO JUICE.

For the best product, select tomatoes which are ripe and of good colour. Wash thoroughly. Cut up coarsely and simmer gently until very tender. Strain. Add salt to taste, bring to boiling point and turn into sterilised jars, to fill within a half-inch of the top. Adjust new rubber jar rings, dipped in boiling water; add sterilised covers and tighten the seal. If using screw-top jars, loosen seal a half-turn—release the second spring, if using jars whieh seal with a spring. Place on rack in a deep pan of water which is at the same temperature as the jars; be sure that water comes up to one inch from top of jar, and not touching each other. Bring to boil and boil for 5 to 8 minutes. When processing is complete, remove from pan and tighten seal. If preferred, processing may be done in a very slow oven, 260 deg.—Regulo No. 1 for Champion Cooker, and No. ½ for New World—allow 40 minutes of oven-processing.

13.—PRESERVING OF WHOLE TOMATOES.

Select firm and not too ripe. Prick tomatoes, using a sharp fork. Place tomatoes on a flat tray. Cook in a moderate oven until tomatoes are just soft. Lift carefully into well heated jars. Pour slightly salted boiling water into jars to fill jars to overflowing. Seal each jar immediately. Test seal when tomatoes are cold.

Another Simple Method for Tomatoes.—Grade and select firm tomatoes, prick with fork. Place into jars, pour boiling salted water to within half an inch of top of jar. Adjust rings and caps. Sterilise in oven with Regulo at No. 1 Champion Cooker; No. ½ for New World Cooker. Time 40 minutes to 1 hour, till skin just cracks. Seal each jar immediately.

WARNING

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Mary's "At Home"

HERE is how I solved my problem of amusing the kiddies when they are tired of their toys, and getting a little bit cross. I put them into their bathing suits, provided, of course, that the day is warm, equip them with an old paint brush and a bucket of water, and let them "paint the house." They just love doing this, and many a time they have painted the house twice in a day! Try it next time you want something for them to do.—**Pigtails, Wellington.**

I HAD a surprise this week when a parcel of fine sturdy tomato plants arrived unexpectedly from one of my sisters, and now that frosts have abated if not gone for good I'll have a great time growing these plants in fervent hopes for a bumper crop this coming autumn, for we all must needs "grow for Victory," apart from the good derived from our very own gardens. These succulent green peas, tender carrots, etc., all have a thrill of their own. I do love to hear of those city folk who with only a patch of ground available that is no larger than my kitchen in some cases are valiantly growing a little succession of crops. Not for them the acres of potatoes we can put in, but even that short row followed by another has pride of place. May I conclude by quoting a vegetable catalogue? "'Tis only when we have tended them that vegetables have things to tell us," and "A mass of flowers in a quiet garden is like a tonic to hearts that have grown tired."—**Roundabout, King Country.**

JUST finished reading "Wuthering Heights," by Emily Bronte, and how I have enjoyed it! Did you see the film, Mary? I did, and enjoyed it immensely, but the enjoyment of the film had nothing on the enjoyment of reading such a fine book. I just buried my head in it from start to finish, and nothing was done until I had read the last page. It is amazing to me that one who led a life as sheltered as Emily Bronte could have ever conceived a story so gripping and so realistic as this. When Emily Bronte died she was only thirty, and it makes me wonder what genius her pen would have produced had she lived for some years longer. I am not going to tell you the story of the book, for I hope you will be able to procure a copy to read for yourself—if you have not already done so, Mary—I can recommend it to you, and I am sure you will not be disappointed.—**Shortbread, Waikato.**

I HAVE been experimenting with flower decorations, and although my garden is only a humble one, and has not a great variety of flowers, I have surprised myself at the results I have obtained from flower decorations. In one corner of my room I have a flat copper dish filled with nasturtiums, and although the sun is not shining, my room is full of sunshine. I have found copper dishes of the greatest help in flower decorations. On the small table beside my bed I have a basket of pink geraniums—do you remember the old-fashioned sort that climb all over seaside cottages? My basket is a low one with a tall handle, and the flowers I arranged in a shallow bowl. They would not stand up at first, so I put a layer of sand in the bottom of the bowl, and they did anything I wished them to do! Now they are climbing gracefully round the tall handle of my basket, and looking a picture. All my jugs take turns at becoming vases, and what fascinating arrangements can be made as the seasons pass—pink japonica in my black

jug in the spring, roses in my crystal water jug in the summer, chrysanthemums in my brown jug in autumn, and back to my black jug for winter, filled with shining scarlet of holly berries.—**A.S.C., Carterton.**

HOW I enjoyed reading of your holiday at the Sounds. There is so much beauty in the country if we have but eyes to see and ears to hear the birdsongs, the ripple of the streams, animals on the prowl. Reading of your holiday made me have a mental one too, for I love the things you enjoyed so much. I am sure you would feel the benefit of it, and feel fit and fresh for your work. I live amongst much beauty: green valleys, bush clad slopes, rivers famous for their fishing, white roads winding here and there always luring one forth to go adventuring along them; such trees that "only God can make"; the gay singing of birds; away in the distance majestic mountains with their ever-changing hues; plains dotted with trees and homesteads.

Life is very busy these war days, but it is good to "stand and stare." What lots we would miss if we did not. "Beauty is beauty only when it speaks to us."

I have a birthday book with Tennyson verses in it for each day, Betty G., and I still get names in it because each years brings fresh ones.

Biddi-Jan, I just know how much you must enjoy rummaging. I have letters (always do keep the most interesting ones) cuttings of prose and poetry, a drawer full of fancy work (not finished), music, patterns, and I hardly ever sew, but I do love looking at them. Perhaps there may come a day when things will not have such a hold, maybe it will happen when I have done all the things I have set out to do.

Well, Mary, I must close, wishing you and our Good Neighbours all the best for 1943.—**Peggy, Pleasant Point.**

When scrambling eggs, add a dessertspoonful of breadcrumbs to each egg—this makes the mixture go a lot further.

* * *

Whipped cream will go further, be much lighter, and have a distinctive flavour if two egg whites are beaten separately and added to each pint of cream when whipping.

* * *

New potatoes can be scraped much easier in salted water than fresh water.

"What is the Effect of Radio Serials on the Minds of Our Children?"

I FOUND it most interesting reading your views on this subject, and most of you had commonsense ideas to put forward. In the finish I came to the conclusion that, as in all things, with careful guidance there was enough good in radio serials to counteract any evil, and as entertainment is scarce for so many of you in the remote country districts, I think the verdict was in favour of them, provided of course that they were carefully chosen, and not of the very dramatic type. "Tiggetty Boo," of Kati Kati, has set her ideas out very clearly, and to her is awarded the first prize, while second prize goes to Mrs. C. Spedding, of Christchurch.

First Prize:

INDISCRIMINATE listening-in to the radio, like the reading of any kind of books available, is not in my opinion a good thing for any child. Children have such pliable, plastic minds, full of the searching eagerness to learn, easily influenced, moulded, and so easily marred. We can't expect them to differentiate between what is good and what is not when it comes to retaining anything mentally. For the absorbing minds of children are apt to accept so much they hear, or read, or see, as sober facts, and to be influenced thereby. So that, when considering the influence of radio serials that so often end up on a note of excitement, we must remember that unless they are carefully chosen, little minds can be adversely affected by them. It is important also to consider the type of child we are dealing with—the mind of a sensitive and highly-strung child for instance can develop a taste for constant excitement or morbid fear by being able to listen to programmes that, though most unsuitable for them, would have a much lesser effect on a more phlegmatic nature. Yet, because of such effects it is not wise to altogether deny a child something that other children are generally allowed to enjoy, for such an attitude may cause rebellion. I think, taking a middle course, and allowing children to listen in to the fresher, cleaner, and more wholesome type of serial suitable for their ages, a wise parent can direct and advise their choice, and so the children can be entertained. The thing we most need to guard against with radio serials is over-stimulation of a feeling for constant excitement, a state of being keyed up to a pitch over a story, and allowing this to become an obsession. It is wise to teach children not to become too absorbed, or to lose their perspective in the importance of such serials. Sooner or later they will probably want to listen in, so how can we expect our young folk to retain a well balanced view unless they are taught good listening, as well as good reading, or anything else?

Children need the guidance of a wise and sympathetic elder. Given supervision in radio serials I feel they derive much pleasure and little harmful effects, so long as they listen in moderation. Sophisticated grown-up serials, fantastic, murderous, or gangster types of serials should be taboo. Little people with vivid imaginations, sensitive, highly impressionable ones should be carefully looked after in this regard. They can so easily develop fears that stay with them without our realising the cause. Treat the children as intelligent, responsive human beings, don't over indulge, don't use too much restraint, and they can learn so much from the radio that the effect must be good.—**Tiggetty Boo, Kati Kati.**

Second Prize:

ARE the children of to-day influenced by radio? Probably no more than by films, or the books they read, but certainly the influence is there. There is no doubt that radio has a fascination for the average child, but why cannot we direct their interests in the correct channels? Certainly there are one or two serials that really do contribute to the education of the child, but when there are so many great works on our bookshelves waiting to be dramatised for every child, why should third-rate entertainment be put across? Most of the programmes are clean entertainment, but they stop there. They teach our children nothing of advantage at the same time. Radio is a great medium for advancing the intellect of the child to-day—let us not waste it.

Then there is that menace—the "thriller." Too many of these are put on before the average child's bedtime. Most of them are degenerate, far-fetched efforts, surely not put across for a reasonably intelligent adult of today. And then, do we need more horror these days when we switch on the radio? We do not! We want a rest from it all, or if we must have thrills, there are plenty of true, stark facts without the ravings of perverted imaginations.

Give us please, the dramatization of living and lasting works, well acted,

and put across, and so raise the standard of radio serial entertainment.—**G. Spedding, Christchurch.**

I MUST admit the serials have their points, the main one being that they kill time most entertainingly, but I have a grudge against too much of such for the small fry because they do not let them be children for long enough. They make them so eager for more such amusement that they lose interest in small things, and too many catch phrases get so abused in everyday life that one sickens of the source entirely. Children are very adaptable, and everything learnt in the young age sticks for ever in little minds. Always eager for fun, anything that makes them laugh is one hundred per cent., but too much of this unadulterated kill-time gets them nowhere, and I really think the class of wares put over for the children needs much better attention by the authors. But can we ever please all?

—Mrs. Vee, Hamilton.

LISTEN to the children—hear that different phrase, that dashing new slang? Last night's radio serial featured them probably. The radio has in my opinion a deep effect on the child's mind, and therefore parents should not let them hear all the mixtures that are put over the air. Ghosts and murders are no good, and are the wrong things to imprint on young minds; let them hear the brighter war serials if you like, the ones where they can hero worship the Air Force, the Navy, the Army. War cannot be kept away from them, and the radio usually has a number of war serials which are harmless. Unfortunately "gang" serials are upsetting in speech and moral, so keep clear. Generally though, I think radio has a lasting influence on the child's mind, and provided parents keep a check on the programmes, the radio should prove a great benefit.

M., Feilding.

SAYS Judy to Punch: "Hurry up with that cow, or we will be late for the serial to-night. I want to be back at the house by 5.30." So, working with added zest, they hustle along with their chores and for that day at least they are on time. The serials they follow definitely give them something to think about, and as we seldom go to pictures, and have never had the opportunity of taking them to a suitable children's play, it gives them variety, apart from definite thrilling entertainment. So much for the "early on the programme" serials. I am definitely against those coming late in the evening for children to sit up and listen to, very often hours after they should be in bed, and very often, too, of a nature far too excitable for children to go to bed on. These late serials should not be allowed by parents until a certain age is reached, or their hearty, healthy offspring may develop into nervous and highly-strung individuals.—**Roundabout, King Country.**

Competitions

January

This competition, which closes on February 15th, is bound to bring back happy remembrances of days now gone—do you remember the subject was "Holiday Memories"? I am looking forward to sharing your happiest holidays with all of you.

February

With victory as our ultimate and only object, what a wealth of co-operation has sprung up between the peoples of the world! It is a heartening sign, this sudden friendship between the peoples of the nations, but remembering that everything worth while begins at home, what are you doing to help your neighbour carry his share of the load today? Perhaps amongst your ways of help there will be an inspiration to others of us, so let us share your ideas.

"LOVE YOUR NEIGHBOUR."

No saying is truer and more important today. Send your entries to me before March 15th, and there are two prizes: First of 10/- and second of 5/-.

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

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