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Britain Has Been Promised An Extra 10,000 Tons of Bacon

Now Is The Time To Get Extra Stock, Feed And Equipment

— By —
M. J. SCOTT,
Superintendent of the Pig Industry, Wellington.

NEW ZEALAND has promised Great Britain an extra 10,000 tons of bacon for the coming year. Our total production of pork and bacon for the last two years was about 40,000 tons, so that we are now asked to increase our production by one quarter.

This year approximately 360,000 pigs under 120 lb. weight will be killed. By increasing the weight of these pigs by 30lb. each we would produce about half of the increase required for export.

If no increase in these lightweight pigs is made, then an additional 160,000 baconers of 140lb. carcass weight, or 220,000 average pigs, are required. This means the progeny of 16,000 to 22,000 more sows, and this increase in sow numbers means that the figures should be restored to the level of January, 1939.

It is impossible to say what the sow population is at present, but the opinion is generally held that a sufficient number of sows have been retained to provide the extra pigs. Individual farmers will have a better idea of whether or not the position is satisfactory.

THE OBJECTIVE

It will be more than satisfactory if every farmer accepts the ideal of producing a baconer for every cow milked for butter and one for every two cows milked for cheese, at the same time taking immediate steps to provide the equipment, stock and feed necessary to do so. This would give us 80,000 tons of pigs, and would make the 10,000 tons increase just a milestone on the road of progress.

Pigs cannot be produced without feed additional to dairy by-products. These products are just about half the feed required to produce a baconer, and the

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kind and quality of the other half depends very much on the months in which the sows farrow.

A careful study of the following details may help some farmers to obtain a clearer idea of the amounts of feed that are required in different circumstances.

When pigs could be marketed at any weight the months of farrowing were not so very important. At least, that seems to be the case from a careful review of the monthly killings as pork and bacon for several years past. It is evident from this review that December and January farrowings produce mostly pork and the corresponding farrowings in June and July produce mostly bacon. Pigs born in other months are more evenly divided between pork and bacon. Fewer sows farrow in February, May and October than in any other months.

BEST TIME TO FARROW

Now that the objective is bacon production, careful thought given to the question of which are the best times of the year to have sows farrow might ensure the best use of feed on many farms. This urge to consider the question of farrowing dates is directed particularly at those who do not yet realise the advantage they used to take of pork production in fitting their feed supply to pig numbers. Farrowing which suited pork production can easily make the production of bacon difficult.

Generally, no hard and fast rules can be laid down, as many variable and uncertain factors have to be considered. The time the cows come in, the amount of grazing used for pigs, the amount of root crops grown for pigs, when the cows dry off, and the number and weight of baconers sold per sow all influence the month of farrowing. Facilities for keeping pigs in winter are important.

In the discussion which follows the argument is based on:—

(1) One sow producing 12 baconers being kept for every 12 cows milked.
(2) Fairly generous amounts of meal being used.
(3) Some grazing being used.
(4) Some roots being used.
(5) Baconers being sold at carcass weights ranging from 130lb. to 150lb.
(6) At least threequarters of the cows being in milk by the end of August.

JANUARY AND JULY FARROWINGS

A sow which farrows in January and again in July requires for herself and the two litters 12,500lb. of feed, made up of 6,300 gallons of milk, 3,500lb. of meal, 10 tons of roots, and 2 tons of grazing. The peak months of feed requirements are January, February, September, and October; the slack months are March, April, May. Reasonably good stores of 85lb. to 100lb. carcass weight along with the sow are the only pigs wintered.

FEBRUARY AND SEPTEMBER FARROWINGS

Feed requirement for a sow and progeny as above are 12,000lb. of feed, made up of 6,300 gallons of milk, 2,100lb. of grain, 13 tons of roots and four tons of grass. Peak months are October, November, February, March; the slack ones are April, May, June, July. Stores of 65lb. to 80lb. and breeding stock only are wintered.

MARCH AND SEPTEMBER FARROWINGS

Feed requirements for a sow and progeny are 11,900lb. of feed, made up of 6,300 gallons of milk, 2,500lb. of grain, 7 tons of roots and 7 tons of grazing. Peak months are October, November, December, March and April; the slack ones May, June, July and August. Stores of 45lb. to 60lb. are wintered.

APRIL AND OCTOBER FARROWINGS

Feed requirements for a sow and progeny are 11,600lb. of feed, made up of 6,300 gallons of milk, 3,010lb. of grain, 4½ tons of roots, and 6 tons of grazing. Peak months are November, December, April, May; slack ones June, July and August. Weaned pigs are wintered.

MAY AND NOVEMBER FARROWINGS

Feed requirements for a sow and her progeny are 12,700lb. of feed, made up of 6,300 gallons of milk, 2,726lb. of meal, 7 tons of roots, and 6 tons of grazing. Peak months are December, January, May and June; the slack ones, July, August, and February. Baconers are being finished off in June, and weaned pigs are carried for the remaining winter months.

JUNE AND DECEMBER FARROWINGS

Feed requirements for a sow and her progeny are 12,700lb. of feed, made up of 6,300 gallons of milk, 4,500lb. of meal, 7 tons of roots, and 2 tons of grazing. Peak months are December, January, August and September; the slack ones February, March, April and October. Light baconers are carried through the winter.

If this information is set out in a summarised table it will be seen that, with a fixed milk supply, a maximum amount of purchased meal is required when pigs are born in January-July or December-June, and a minimum for pigs born February-August, March-September. A maximum of roots and a minimum of grazing is required for pigs born January-July, February-August, and June-December. Minimum quantities of roots and a maximum of grazing are required for pigs born April-October, May-November, and March-September.

It looks very complicated, but it is worth while geting it sorted up if best use is to be made of the feed available.

For the Economical Prevention of Foot-rot in Your Flock

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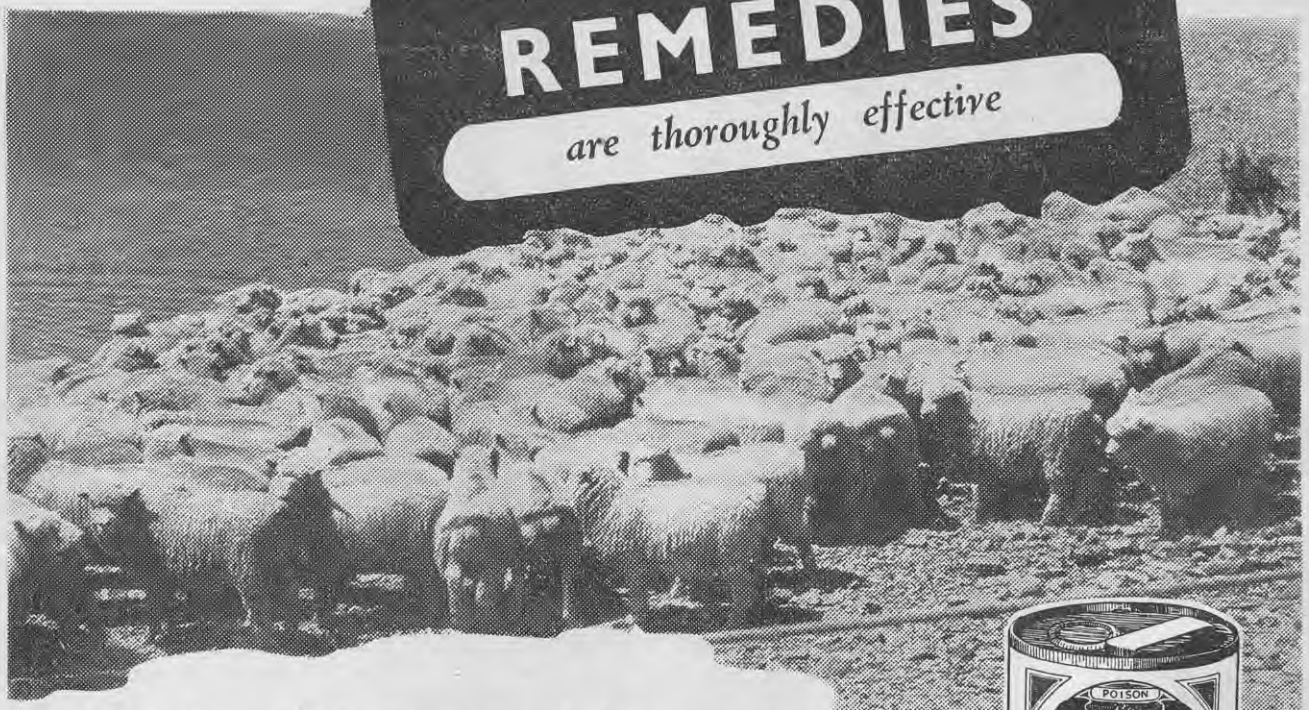
are thoroughly effective



Foot-rot is a disease which has become exceedingly common and may cause considerable financial loss. On farms where it has previously occured preventive measures become a necessity. Cooper's Foot-Rot Liquid per medium of the footbath supplies an efficient method of controlling the disease both before and after it is known to exist on a property. Mixes instantly with cold water and does not make the hoof brittle. For individual treatment of affected sheep a hand-dressing of Cooper's Foot-Rot Ointment is invaluable.

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Sheep Farmers!

Guard Against Sleepy Sickness of Ewes

In a few weeks time lambing will begin in certain parts of New Zealand, and the sheep farmer must guard against ante-partum paralysis of ewes, or "sleepy sickness," as it is sometimes called. This trouble can cause substantial losses in certain years, and the elimination of losses is one of the simplest ways of increasing production—a matter of national as well as individual importance at the present time.

— By —
A. D. M. G. LAING.
Veterinarian, Hastings.

TWIN lamb disease is another name for this trouble, as ewes suffering from it are found to have been carrying twin lambs in the very great majority of cases. The first signs of this disease are noticed from ten to 20 days before the ewe is due to lamb. The animal is dull, off her feed, and tends to keep apart from the rest of the flock.

The earliest noticeable sign is frequently a loss of control over the limbs, manifested by tripping up or crossing the forelegs when driven. Later, she will stand stupidly and be moved only with difficulty. The eyes appear glazed and sightless. The affected animals may also stagger and/or walk in circles. As she gets worse, the ewe gets "down to it," collapsing after walking a few paces if raised to her feet. She may live for several days in this condition, death occurring in a few days after the first signs were noticed.

Results of Post-mortem

If a ewe which has died of this disease is opened up after death she is nearly always found to be carrying twin lambs. The general condition of the body and organs is good, with the noticeable exception of the liver, which is quite abnormal, being enlarged, pale yellow, greasy to the touch, and very easily broken. There is not, in fact, any healthy liver tissue left. Some of the internal body fat may have a patchy, parboiled appearance.

Treatment and, more important still, prevention of any given disease must be based on a proper understanding of what causes that disease. In the ewe the cause is nutritional in the case of *ante-partum paralysis* or "sleepy sickness." That is to say, it is associated with a feed shortage or a lowering in the nutritional value of the feed during the latter part of pregnancy. It is desirable, therefore, to give a very short and necessarily sketchy description of the extremely complicated process by which the sheep converts pasture into flesh and blood, etc.

Digestive Balance

A balanced proportion of the three main food factors, proteins, fats, and carbohydrates, is required. These are all broken down by the digestive juices and action of the liver into simple substances, the waste products

being excreted. These simple substances are carried by the blood fluid to the muscles, and there combine with oxygen absorbed from the lungs, the resulting heat being the energy by which the body lives. A number of minerals—phosphorus, calcium, iodine, etc.—are also essential to life and to the satisfactory working of the processes outlined above.

It must be emphasised that the liver plays a very essential part. When the food intake is in excess of the bodily requirements the surplus is stored as fat. If the daily food is insufficient, then the fat reserves are called into use. The liver is the organ by means of which the body reserves of fat are converted into the simple substances, in which forms alone they can be made use of to support life.

Time Nourishment Is Required

An important fact which must be emphasised is that just as milking cows require so much feed for the maintenance of their bodily requirements and so much more for milk production, in precisely the same way the in-lamb ewe requires so much feed to keep herself and so much more to develop the one, two, or three lambs she is carrying.

The important point, however, is that these lambs do not require nourishment in an evenly-increasing ratio throughout the period of pregnancy. In the case of the ewe, in fact, it may be stated that during the last five weeks before lambing she is called upon to supply half the total growth requirements of the lamb or lambs she is carrying. In other words, if she is carrying twin lambs during that last five weeks the ewe must evolve from her own body roughly growth requirements equal to one lamb.

Strain on Liver

It will readily be appreciated, therefore, that when the feed of a pregnant ewe carrying twin lambs falls off in quantity and/or quality during the last month before lambing, when the requirements of the twin lambs she is carrying are so very high, a very heavy strain indeed is put upon that ewe's liver in converting her body fat into those simple substances that have been mentioned, in which form alone this fat can be made use of.

In the case of *ante-partum paralysis*, what does happen is that these several factors result in the formation of injurious substances. The presence of these injurious poisonous substances causes the characteristic symptoms of the disease and the gradual breakdown of the whole liver, of which the quite abnormal appearance is so characteristic on post-mortem examination.

As the saying goes, "Prevention is better than cure," and of no condition is that more true than *ante-partum paralysis*.

Treatment

Before discussing prevention, let us consider treatment. Nothing can be done once the case is far advanced, as the liver has become useless. In the early stages, however, while there is still a desire for food and the ewe can move about, the administration of up to a ½lb of molasses daily is indi-

cated. Glucose is more expensive, but, perhaps, more easily administered, and it can also be given in the form of a 10 per cent. solution by the rectum as an enema, and must then be at blood heat. The object of the administration of substances such as glucose, molasses, or sugar is that they help the body against the poisonous substances which have been formed, as already outlined, from excessive use being made of body fat.

As constipation is usually present, 1oz to 2oz of Epsom salts, **once only,** at the start of the treatment are of value. Do not repeat the salts. If the ewe lambs, the symptoms will disappear. It is most essential that the ewe under treatment be given the most nourishing and succulent feed available—green barley, young grass, and so on. If these are not available good-quality hay, preferably leguminous, sprinkled with a mixture of one part of molasses to five parts of water, is a fairly good substitute.

Particularly where very early lambing is the practice, accompanied as it occasionally is in certain years by a falling-off in the early spring in the quality and quantity of the pastures, due to climatic conditions, it is advisable that all ewes on such properties should be accumstomed to hay as a reserve feed.

Prevention

In regard to prevention, no deficiency of calcium or any other mineral in the animal body has been diagnosed on this disease. A calcium or lime deficiency does, however, occur in lambing sickness, but that is a different disease. It is not confined almost entirely to ewes bearing twins as is *ante-partum paralysis.*

Prevention is on common-sense lines, that is:—

(1) The management of the ewe flock should be directed towards a slow rise in condition from tupping time to lambing time. If there is likely to be a falling-off in the feed in either quantity or quality it is obvious from what has already been stated that it is much less harmful for it to occur during the first four months than in the last month before lambing. Such a practice will also be beneficial to the ewe's milk flow.

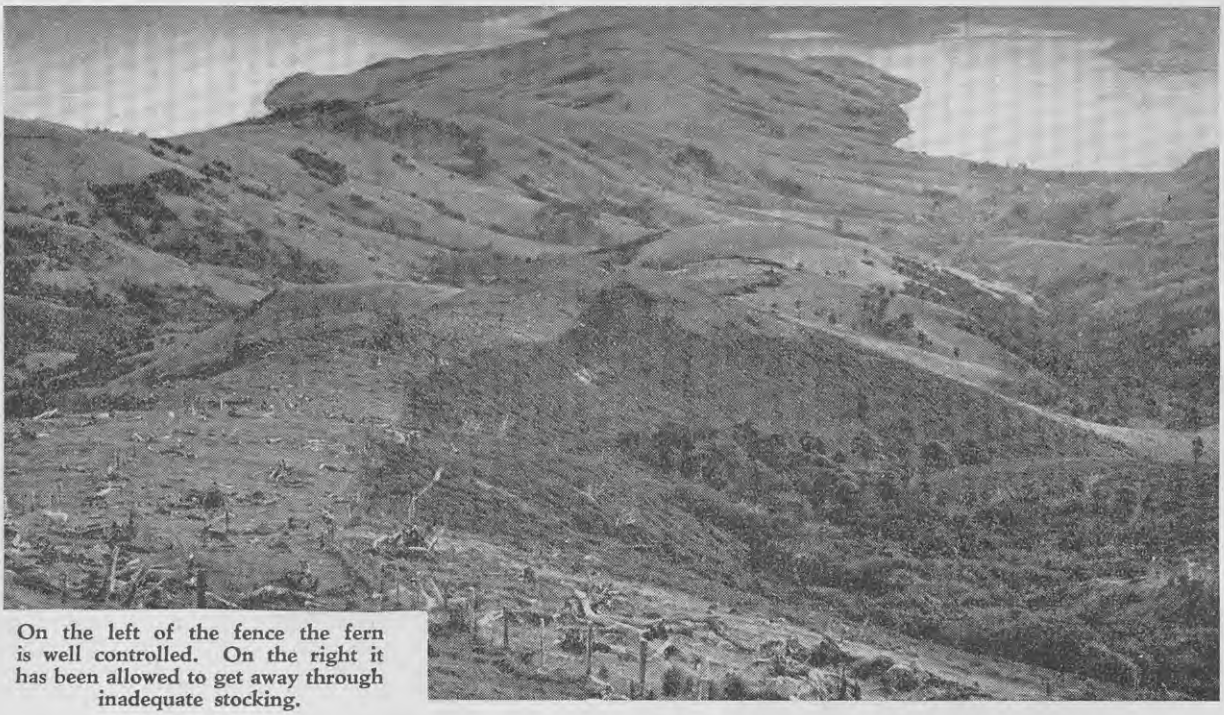
(2) Where paddocks are not top-dressed, a lick composed of equal parts of bone-meal or bone-flour and salt should be made available for the ewes.

(3) If heavy frosts occur during the month before lambing is to begin, or if there is any other factor which tends to lessen the quality of the feed, steps should be taken to supplement it in order to prevent that falling-off in nutrition which is the cause of the disease.

(4) When cases of *ante-partum paralysis* have occurred, or where there is reason to suspect that they may occur, where the flock is in high condition daily exercise appears to be of considerable value. During such movement it is easier to pick out ewes in the very early stage of the disease (that is, loss of control of the limbs as shown by tripping up when driven), and treatment and special feeding when they are picked out then will give good results. A useful plan is to muster the affected flock daily and drive them slowly for half a mile or so to good pasture and back again after one or two hours.

It is, of course, fully appreciated that circumstances on particular properties may make it difficult or impossible to carry out the measures mentioned in their entirety.

It is suggested, however, that, should the climatic and pasture conditions which cause the disease occur during the next few weeks, it will be advisable for the sheep owner to carry them out as far as possible. As another proverb goes, "A penny saved is a penny earned," and a ewe saved, plus twin lambs, is worth a good many pennies.



On the left of the fence the fern is well controlled. On the right it has been allowed to get away through inadequate stocking.

Fern Control With Cattle

Successful Experiment of Banks Peninsula Farmer

J. G. McKAY, Fields Instructor, Christchurch.

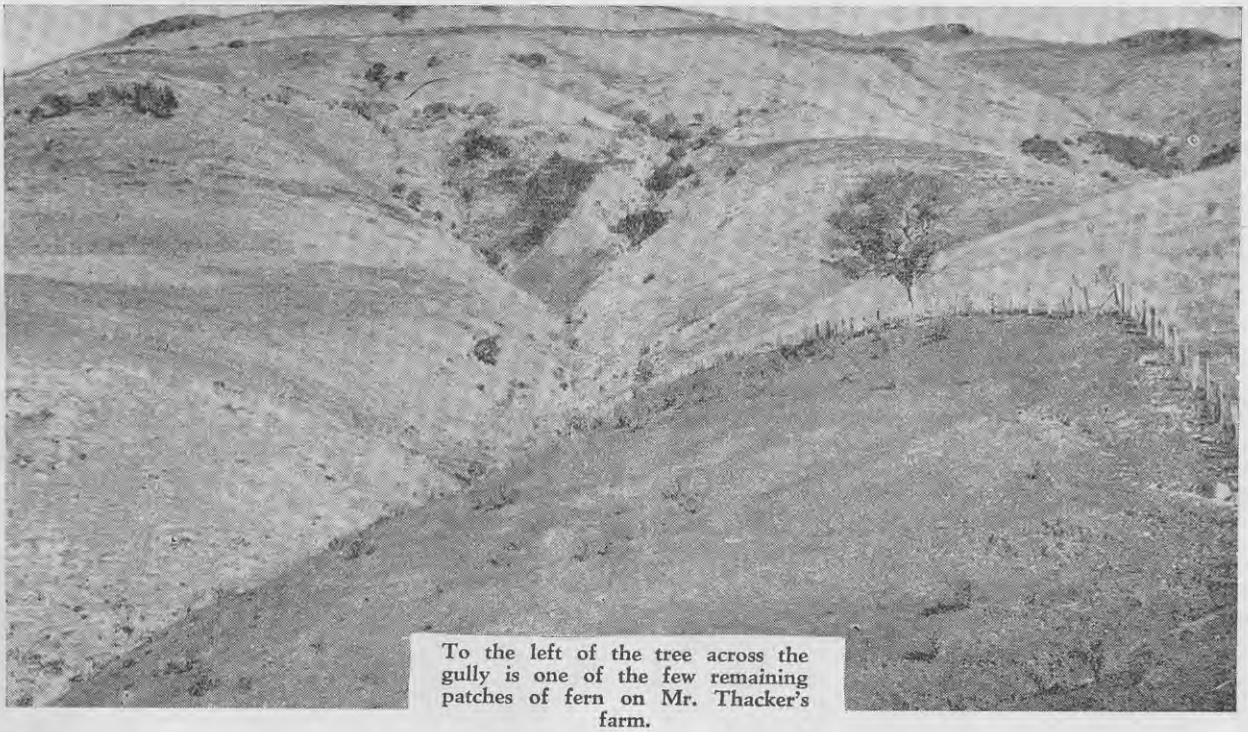
THE USUAL methods adopted to control fern over wide areas in New Zealand consist of burning the fern in autumn, surface sowing where necessary with suitable grasses immediately following burning, and stocking heavily in spring when the new fern fronds are tender and brittle. The fern is practically dormant during the winter, and, generally speaking, the new fronds do not come away until September or October.

The object of heavy stocking is to feed off or break off the young growth rapidly, as once the young frond expands it is far more difficult to deal with than in the curl stage.

The methods employed by a farmer on Banks Peninsula to control fern infestation with cattle are described in this article. Although his farm was at one time badly infested, today it is practically free from fern, and the cattle used have proved a sound commercial proposition.

Cattle v. Sheep

If sheep are used for crushing, stocking should take place before there is any sign of uncurling of the leaf. Fern can be successfully crushed by cattle at a later stage of growth, and this is the principal reason why cattle are generally regarded as the more efficient fern-crushers on land suitable for them. Fern crushing is at times severe on stock, and they should not be left on too long, but good success cannot be achieved by this method unless the area being handled is stocked sufficiently to destroy young growth at the curl stage. For this reason it is a mistake to burn off a larger area of



To the left of the tree across the gully is one of the few remaining patches of fern on Mr. Thacker's farm.

fern in autumn than can be adequately stocked in spring.

The firing of fern followed by insufficient stocking only makes dominance of the fern more pronounced. Apart from this, repeated firing of country which has reverted from good surface-sown pasture to fern must ultimately result in the destruction of the better pasture plants.

Destruction of Plants

When the first heavy growth of fern fronds has been checked by stocking in spring, it is some time before the next growth appears. As soon as fresh growth comes away the area should be restocked, and stocking should be repeated each time fresh growth appears. The underground stems (or rhizomes) of fern carry heavy reserves of plant food. These food reserves are manufactured by the fronds, and it will thus be seen that destruction of the fronds will ultimately result in the death of the plants.

There are two main types of fernlands in New Zealand—natural fern land, that is, land that carried fern before the first Europeans landed in the country, and artificially-induced fernland, or land which became covered in fern after the destruction of the forest.

Fern is said to be one of the stages in the transition to forest and many types of our forest lands after being burnt out and allowed to remain practically unstocked have become infested with fern.

Early records give the original forest area of Banks Peninsula as 134,000 acres and the total area of the Peninsula at 223,000 acres. After the clearing of the bush, mixed grasses including perennial ryegrass and clover, were sown. The first record of cocksfoot being sown was in 1852, and this grass became the chief support of Peninsula farming.

Methods of Control

Certain parts of Banks Peninsula are natural fernlands which have been in fern for a considerable period. Fern has, however, encroached on areas that

did not carry any when the first settlers began clearing the forest and occupying the land as grazing farms. Fern is spreading on some Peninsula farms, while on others it has been kept well in check by systematic methods of stocking.

In this connection the practice adopted by Mr. J. E. Thacker, of O'Kains Bay, to control fern on his property is of interest. Mr. Thacker is farming a property of 1680 acres, typical of much of the cocksfoot country of the Peninsula, where members of his family were among the first settlers. Mr. Thacker states that some thirty years ago about 400 acres of this particular block was badly infested with fern, and today the property is practically free from it.

This almost complete elimination of the fern has been accomplished simply by stocking with cattle in combination with sheep. The fern is not burnt off. Mr. Thacker considers burning unnecessary and harmful to the grass.

System of Stocking

The system of stocking has been to run cattle with sheep. The cattle are stocked at from one beast to four acres to one beast to eight acres, according to the extent of fern on the area being dealt with. Starting off as yearlings the cattle are put on a certain block in the spring when fern is plentiful so that they may reach winter in good condition. These cattle are kept on the same area during winter, it being considered they work better as scavengers and go more readily into the fern-infested places to trample and feed than would cattle strange to the area.

This method is distinct from what is commonly called fern-crushing in that the beasts are not crowded in large numbers on small areas. Naturally the cattle are compelled to get into the fern-infested areas to forage during winter months through lack of feed elsewhere, but they are not unduly punished and come through to spring in good store condition.

Mr. Thacker not only regards stocking with cattle in the way he does as a sound commercial proposition, as ultimately he sends them away fat, but he also considers that cattle are essential to keep the fern in control.

He is a firm believer, however, in stocking with well-bred cattle, preferably bred on the place, and is now breeding his own beasts, using Hereford, Shorthorn, Black Poll crosses of good strains, from which he is getting excellent results.

Financial Aid For Farmers

ATTENTION is drawn to an advertisement appearing in this issue relating to facilities available to farmers for obtaining loans on the security of stock and chattels under the provisions of the Rural Intermediate Credit Act. The administration of the Act has been entrusted to the State Advances Corporation, which invites farmers who are desirous of securing financial assistance for productive purposes to address any inquiries for further information to the nearest office of the Corporation, or to the Office of the Secretary of any Rural Intermediate Credit Association established under the Act.

The War May Mean A Shortage Of Fertilisers

But Your Stock Provide Tons Of Free Manure Waiting To Be Spread With The Harrows

—By—
C. R. TAYLOR,
Fields Instructor, Whakatane.

Under modern wartime conditions shortages inevitably occur in a country so dependent on imported necessities for full production from farms, and it becomes essential to adjust methods to secure the maximum results from available supplies. This is particularly necessary in the case of fertilisers, which have become so important a factor in grassland farming, and one of the immediate adjustments required is to ensure maximum production from supplies now in sight and possibly becoming less in the future.

HOW is this to be achieved? In the first place, refrain from topdressing pastures which do not pay a material dividend for this outlay. All farmers know that certain pastures, say, of the reyegrass-cocksfoot-white clover type, respond well to topdressing, but there are others of a brown-top-vernal character lacking in a fair measure of clover growth which **do not** respond sufficiently to cover the cost of the fertiliser used.

In the latter circumstances it is clearly uneconomic to topdress such pastures at any time, but in time of war it amounts to nothing more or less than criminal waste. Far better would it be for the farmer and the country if such unresponsive pastures were either renovated by severe harrowing and oversown with productive species or else ploughed and resown to permanent pasture or cropped for a period. In no other way can real benefit result from the topdressing applied.

Use of Harrow

Another method of effecting economy in topdressing is by the use of the grass harrow in the regular spreading of animal excreta. Both the urine and solid material contain significant amounts of available plant food in the way of nitrogen, phosphoric acid, and potash, to say nothing of the important trace elements, and when these are evenly distributed at regular intervals over the entire paddock great assistance is rendered to the pasture plants in their efforts to produce growth.

Every farmer knows this to be perfectly true, for has he not observed the phenomenal vigour of plants in the vicinity of dung patches and the areas on which stock have urinated? Surely such observation tells its own story in indicating the vast potentialities for achievements in a wholly costless product. Why not make more

Following a period of grazing, pastures become fouled with the excreta of feeding animals. This material contains valuable fertilising elements, and should be evenly spread over the pasture to allow all plants to avail themselves of a store of this plant food. Neglect in this direction results in a tufty pasture, the rank growth of which is both unpalatable to stock and very unsightly.

use of it, especially at a time like the present?

Great Value of Animal Deposits

If still a little more persuasion is required to make farmers generally realise the great value of the voided products of livestock it may be stated that scientists have estimated that in one ton of cow manure there is phosphoric acid equivalent to 28lb of superphosphate or slag, potassium equal to 25lb of kainit (potash), and nitrogen to the value of 20lb of sulphate of ammonia.

Assuming, therefore, that a mature cattle beast voids 10 tons of material a year, which is a very fair average, and that the average carrying capacity of a farm is, say, two acres to a cow, then the return to the soil per acre of costless plant food in the equivalents mentioned above is as follows:—

Superphosphate	1¼cwt.
Kainit	1⅛cwt.
Sulphate of ammonia ..	1cwt.

Where, on the better-class country, carrying capacity is higher than that referred to, the return of plant food is, of course, also correspondingly greater.

Maintenance of Fertility

In addition to the actual minerals supplied to a soil (superphosphate, potash, and other plant foods) through the conscientious use of the harrow on grassland, it must also be remembered that a huge quantity of humus-forming material is also made available for the maintenance of the soil fertility in the broadest sense. This is vitally important, as humus encourages essential bacteria, retains soil moisture at an optimum level where drainage is satisfactory, and also makes possible the best utilisation of the artificial fertilisers used.

To bring home to farmers more fully the significance of this statement one might mention that the Sahara Desert is a soil from a geological point of view and yet it is sterile, that is, it will grow nothing. Why? Not merely because it is a waterless waste (although moisture is, of course, vital), not merely because it lacks applications of artificial manures (for all the manure of this type in the world

Harrowing of Pastures

Benefits Depend on Type of Harrow Used

MUCH has been printed from time to time in these pages dealing with the very important and controversial question of the treatment of grasslands by Harrowing. In this matter there is a good deal of misapprehension among farmers as to what is and is not correct grassland harrowing. Few pastures need **severe** harrowing. In fact, the reverse, but some harrows sold to-day have a placement and design of the tynes which even if adjusted for the lightest stroke are still far and away too severe for grassland use. The design is such that a distinct groove is left behind each tyne and at times large tufts of good pasture are ripped completely out, making a nice seed bed for weeds. Naturally, a pasture so treated suffers, and farmers start the old outcry about harrowing being detrimental for grassland. The trouble is not with harrowing, but with the type of harrow used, for exhaustive experiments by the Department of Agriculture have proved conclusively that pastures gain great and lasting benefit from proper harrowing.

The Harrow that is proving ideal for use on 95 per cent. of our pastures is the Fertility Harrow. The lightweight job has short knife-edged spring steel teeth which give a clean surface and do everything necessary, from the point of aeration. On the remaining 5 per cent. of pastures which require a good deal of scratching about, this same harrow can be weighted down and the paddock given a double "stroke."

Manure spreading Important with Shortage of Nitrogenous Manures

It is probable that during the War, we shall experience extreme difficulty in obtaining supplies of artificial nitrogen. It is, therefore, more important than ever that full use be made of natural organic nitrogen by the careful spreading of all animal droppings. For this work, the Fertility Harrow has probably the most efficient manure spreading device ever built; it is set behind the tynes and enables the complete job of surface harrowing and manure spreading to be done in one swift operation.

The Fertility Harrows are sufficiently light in draught and the New Zealand distributors, Messrs. Wright, Stephenson & Co. Ltd., announce that in the meantime they are available **AT PRE-WAR PRICES.** Any farmer who is interested, is invited to fill in and mail the coupon below when he will be sent illustrations and further particulars of this harrow.

WRIGHT, STEPHENSON & CO. LTD.,
P.O. Box 16, Auckland.
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Without obligation, please forward further more detailed particulars of your famous Fertility Harrows.

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would not greatly alter the position), *but because of the deficiency of humus and consequent lack of essential bacteria that breaks down humus and mineral matter into available plant food.*

In other words, a soil as the agriculturalist knows it is a *live* thing, whereas a soil such as that of a desert is *dead,* and will remain so until natural or man-created agencies give it life by making possible a sufficiency of moisture, humus, and living organisms.

Essential Practice

Thus it will be seen that, all things considered, the efficient harrowing of pastures—not necessarily of the drastic type—is really a most important and essential practice if farm fertility and productivity is to be maintained or increased.

But to secure the maximum benefit the work requires to be done thoroughly and at the proper time. This involves the *regular* use of the harrow at comparatively short intervals. If the job can be done just before rain, or even during a shower, so much the better, as the pastures are not contaminated for long and the plant food contained in the excreta is made more readily available to the plant.

On no account should dung pats be left for weeks, as by this time they are not only far too hard to distribute evenly, but, worse still, most of their fertilising properties have already leached into the small surrounding area of the soil. This results in over-manuring of some parts of the field and under-manuring of the balance, the latter normally representing the larger portion, as illustrated in Fig. 1. In such circumstances the farmer is definitely the loser, for firstly his pastures suffer, then his stock, and lastly himself.

Fig. 1.

An illustration of the neglect to harrow a pasture after intensive grazing.

Harrows Pay a Dividend

Therefore, resolve to rectify this position by adopting a different outlook towards the dairy cow. Henceforth consider her not only as a butterfat producer, but give her full credit for what she really is—a producer of butterfat, plus 3cwt. or more of a complete fertiliser, plus a great quantity of vital humus.

And do not fail to remember that just as manure stacked up in a shed is of no use to pastures, so also are animal deposits left undistributed. Therefore, use your grass harrows, and use them regularly. They pay a definite dividend, as many a successful farmer knows.

Fig. 2.

Another view of the imperfect harrowing of animal droppings. Some attempt has been made, but the work has not been done thoroughly.

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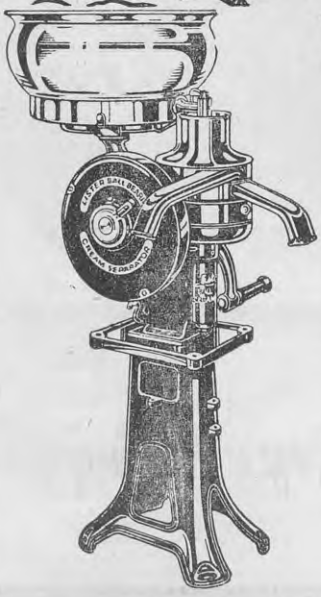

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Testing Milking Machine Accessories

Voluntary Testing Service Set Up To Serve Dairy Industry

By J. F. FILMER,
Acting Director, Animal Research Division.

A Voluntary Testing Service for milking machine accessories is being initiated by the Department of Agriculture at the Wallaceville Animal Research Station. Manufacturers and distributors are invited to avail themselves of this service, for which no charge will be made, and so ensure that accessories sold to dairy farmers are accurate and of a type which will render real service to the dairy industry. Dairy farmers are advised to ask for the Department's report when purchasing accessories.

THE Minister of Agriculture, Hon. W. Lee Martin, recently set up a committee comprised of representatives of the Dairy Board, the Taranaki Federation of Dairies, the Dairy Research Institute, and the Department of Agriculture to supervise generally research work to be conducted by the Department in connection with milking machines. The programme of work which has been initiated falls into two main classes, namely, the study of the effect of milking machines in the production of mastitis, and the study of the milking machine as a unit of dairy equipment, with a view to indicating lines along which some of its component parts may be standardised in the interests of economy and efficiency.

The attention of this committee has been directed to the considerable concern which is being manifested by all associated with the dairy industry at the ever-growing heterogeneous assortment of milking machine accessories which is being submitted by high-power salesmen to bewildered dairy farmers.

Claims for these accessories cover a wide field. There is no doubt that some of them meet very real needs, but there is unfortunately an appreciable minority which are unnecessary and undesirable either because of inaccuracy or inefficiency, and in total this minority represents a considerable financial outlay by the dairy industry for which no corresponding benefit is received.

Testing Service

After considering the various possible means of ameliorating the position, the Milking Machine Investigation Committee recommended to the Minister of Agriculture that a free Voluntary Testing Service for milking-machine accessories should be initiated by the Department. The Minister approved this recommendation, and such a service operating at the Wallaceville Animal Research Station will shortly be available to milking-machine manufacturers and distributors.

The two-fold purpose of this testing service is to enable milking-machine vendors to ensure that their wares are accurate and efficient, and to enable dairy farmers to distinguish between the necessary and reliable accessories and those which are either superfluous, inaccurate, or inefficient.

In the first instance the service will be confined to those accessories whose performance can be measured by physical standards. A list of these will be published in the "Journal of Agriculture" from time to time. The accessories which it is intended to test immediately are enumerated in this article. After testing, a report describing the actual performance of the accessory will be issued to the manufacturer or distributor. There will be no charge for this report, and the vendor may use it in any way he desires, provided it is quoted in its entirety. Purchasers are advised to protect themselves by asking for the

Department's report when buying any of the listed accessories. The following accessories can now be tested.

Vacuum Gauges

Vacuum gauges will be tested to determine whether they are capable of accurately recording vacuums over the range which is generally used in operating milking machines. It must be emphasised that a report indicating the ability of any particular make of gauge to do this does not guarantee that any individual gauge of that make is accurate, either at the time of sale or at any subsequent time. Unfortunately, vacuum gauges are sensitive instruments which can be rendered inaccurate by the rough handling associated with transport.

The Department has seriously considered the advisability of testing all gauges and stamping those which were found to be accurate, but, unfortunately, this would not guarantee their accuracy when received by the dairy farmer. In an article by Mr. Whittleston which appeared in the June issue of this "Journal" a standard mercury gauge was described which is suitable for installing in dairy factories for the purpose of checking vacuum gauges. It is hoped that the dairy factories will provide this service, which will enable the dairy farmers to check their gauges at frequent intervals.

It should be emphasised that new gauges should be checked before they are installed. Some distributors provide this testing service before selling the gauge. Where this is not done, the dairy farmer should make arrangements to have the gauge tested and, if necessary, corrected before it is installed on the milking machine.

Relief Valves

The purpose of the relief valve is to prevent the vacuum rising above the level at which it is decided to operate the plant. To ensure that the desired vacuum is not exceeded, the relief valve should be set so that when no cows are being milked the valve admits air in sufficient quantity to maintain the vacuum at the desired level. During milking the vacuum falls below this level, and if the relief valve is inefficient it may become too low for satisfactory milking.

The efficiency of a relief valve must be considered in relationship to the pump with which it is to work, as a relief valve which is quite efficient with a pump of low air handling capacity may be quite incapable of controlling the vacuum when a more powerful pump is used. Consequently, relief valves will be tested in conjunction with pumps running at capacities corresponding to the various sizes of milking machines commonly used, and the actual fall in vacuum permitted with each of these will be recorded.

Claws and Cups

It has been noted that some types of claws and cups in use restrict the flow of milk in such a way as to impair efficiency. Further, there is a very wide range of air admission. This may vary from none to as much as twelve 1/64in holes. Although air admission helps to maintain a constant vacuum, excessive air admission is undesirable on the scores of increased power costs, thrashing of milk, and introduction of shed taints.

Claws and cups will be tested under a standard vacuum, and the rate of flow of liquid will be measured. The means of air admission and the volume of air flow will be recorded in terms of 1/32in holes.

Milk Elevating Devices

In view of the increasing popularity of machines with low level milk pipes, the need for reliable elevating devices has increased. Their function is to elevate the milk without change in the vacuum in the milk pipe. Testing

milk elevating devices will therefore consist in measuring the change in vacuum between full milk flow and no flow, and the maximum capacity for moving milk will also be measured under specified standard conditions.

Milk Measuring Devices

Milk measuring devices have been provided to enable the production of individual cows to be measured. Obviously they are of no value unless they can attain a reasonable standard of accuracy when applied to different types of milking machines, and are equally accurate with milks of varying butterfat test. Consequently, they will be tested for accuracy under the varying conditions mentioned above.

Vacuum Breaks

The variations in vacuum at the teat cup will be measured by a vacuum recording device and recorded in the form of a graph.

Vacuum Reducing Devices

The variations in vacuum at the teat cup will be recorded before and after the application of the vacuum reducing device.

Other Accessories

The Department is willing to test and report on any accessory whose actual performance is capable of physical measurement.

Applications For Testing

All accessories for testing should be forwarded to the Superintendent, Animal Research Station, Wallaceville, and should be accompanied by a written request that the accessory be tested and a report on its performance issued. This application should be submitted in duplicate, and should include the following particulars:—The name of the manufacturer, the name of the distributing agent for New Zealand, and a full description of the accessory and the claims made for it.

It will be realised that the certificate issued by the Department will refer to the performance of the new accessory as submitted. It is not possible to issue any guarantee as to its continued effective performance under the widely-varying conditions met in milking sheds. In this connection, the Department would be glad to co-operate with dairy farmers and milking-machine distributors in testing accessories which have been in service. This should enable the manufacturers to improve their accessories where this is necessary to ensure a reasonable period of efficient performance under ordinary working conditions.

In conclusion, it must be emphasised that it is not the wish of the Department to persecute milking machine manufacturers and distributors, but rather to assist them to give real service to the dairy farmers, and to this end the co-operation of all concerned, in both the milking machine and the dairy industry, is confidently invited.

An effective rat trap can be made from a kerosene tin. Cut the top away and have about six inches of water in the bottom. Float chaff on the surface of the water so that the rats do not see it, and on the chaff rest the bait, something rather strong, such as a piece of old meat. Lean a plank against the side of the tin so that the rats can climb up to the top of the tin. One drowned rat does not prevent others from jumping in. It is possible to catch quite a number of rats in this way. (Queensland Journal of Agriculture).

"The proof is by Experience"

MR. E. H. SMITH,
a practical farmer of OHARIU VALLEY, JOHNSONVILLE.

upon whose farm tests have been conducted to determine the practical advantages of ELECTRICALLY CHARGED FENCING, (a report on which appears on page 20 in this issue), writes as follows:—

"WE HAVE BEEN USING THE *PREMIER DE LUXE ELECTRIC FENCE CHARGER* WITH SHEEP, HORSES AND CATTLE, INCLUDING A BULL. THE FENCES HAVE BEEN ENTIRELY SATISFACTORY. THE ONLY ANIMALS WHICH WILL GO THROUGH THE "HOT" FENCE ARE THE DOGS AND THEY TAKE GOOD CARE NOT TO BE "STUNG." OUR MOST OUTSTANDING EFFORT WAS TO WEEN NEWLY SHORN CORRIDALE-CROSS LAMBS (AFTER A MORNING'S TRAINING) ON TO RAPE FENCED WITH A PERMANENT 3-WIRE FENCE AND SUBDIVIDED BY A BREAK CONSISTING OF ONE LIVE WIRE AND ONE DEAD WIRE. ONE SIDE ONLY WAS EATEN BARE BEFORE THE LAMBS WERE MOVED, AND NONE PASSED THE PERMANENT FENCE."

The evidence of the field tests on Mr. Smith's farm, and his own practical experience, prove not only the simplicity of installation and unfailing reliability of the PREMIER DE LUXE ELECTRIC FENCE CHARGER, but its great advantages in saving the high costs of fencing and conserving of valuable time, which are very important factors in these days when increased production is vital. THE COMPLETE PREMIER EQUIPMENT COSTS ONLY £12/5/0 AND IS UNCONDITIONALLY GUARANTEED FOR TWELVE MONTHS.

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Electric Fencing

— By the —
FIELDS DIVISION

Survey of Practical Experiences And Possibilities

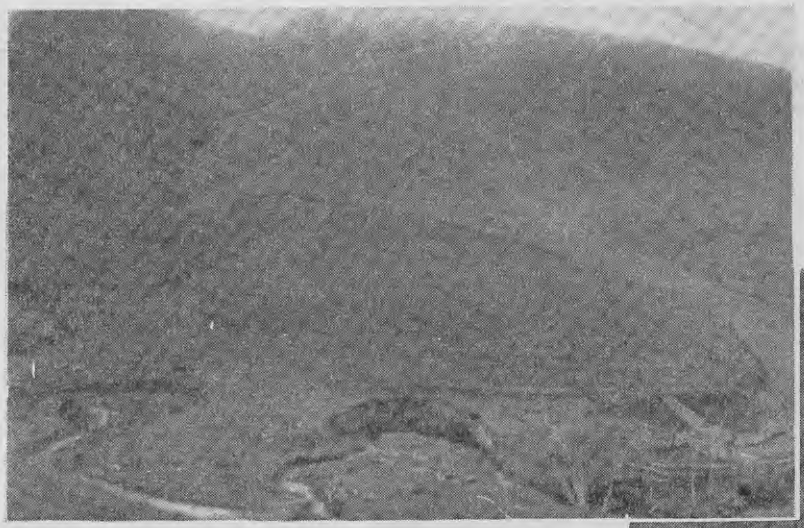
INQUIRIES regarding electric fences are being received by the Fields Division of the Department of Agriculture with increasing frequency. The shortage of fencing wire, the high cost of fencing timber, and labour difficulties have no doubt contributed to the greater interest shown in electric fences, but another factor has been the success achieved by a number of farmers in different districts with this type of fencing.

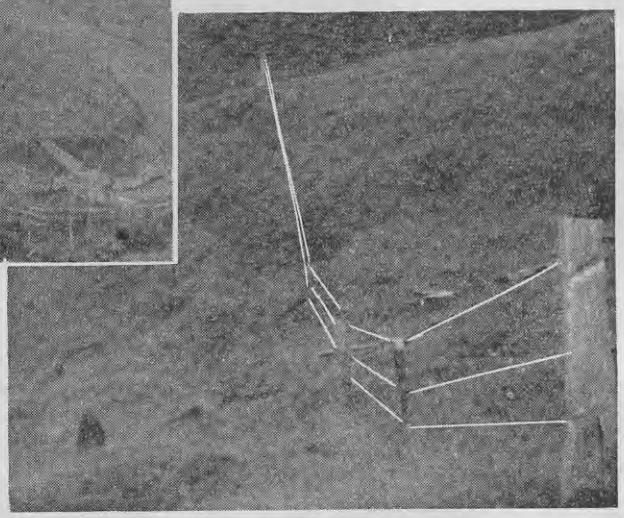
Electric fences have been used on farms in Great Britain and the United States for a number of years, and their general introduction into New Zealand dates from about 1937. At first their use in the Dominion was mostly confined to temporary breaks for root crops and barriers round hay stacks, but gradually their possibilities are being tested for permanent fences, especially on farms requiring subdivision.

In the "Journal of Agriculture" of June, 1939, Mr. C. S. Brook, of Te Kuiti, recounted his experiences in subdividing a block of rugged hill country with permanent electric fences, and extension of the use of these fences has been observed by Instructors in Agriculture in different parts of the country. With the object of giving farmers an idea of both the scope and the limitations of electric fences, a request was made by the Director of the Fields Division to his field officers for data based on the experiences of farmers who had installed electric fences, and this supplement is based on the material which has been forthcoming.

There are still gaps in the knowledge which has been gained, but from time to time it is hoped to give further guidance to farmers based on concrete experiences, which is the best basis for any advice on farm practices.

The Department would welcome accounts by farmers themselves, whether favourable or otherwise, of the results of any experiment or project with electric fences, especially relating to the control of sheep or the subdivision of hill country for either sheep or run cattle.





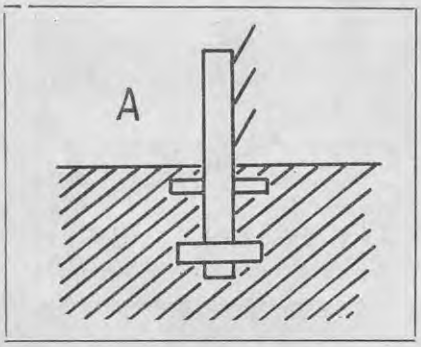
Above: **The type of country being fenced. A field of rape is across the creek.** *Right:* **A three-wire fence over steeply rolling country.**

Hill Country Farmer's Methods

— By —
H. de O. CHAMBERLAIN,
Instructor in Agriculture,
Palmerston North.

AN electric fence is serving Mr. E. H. Smith of Ohariu Valley very well indeed. His installation is run from a wet battery.

One of the most interesting features of Mr. Smith's method of using his fences is the training pen in the sheep yards. This consists of a low two-wire fence across one corner of the yard. The part available to the sheep is quickly grazed bare, and in no time the stock are turning covetous eyes upon the luscious feed on the other side of the electric training fence.



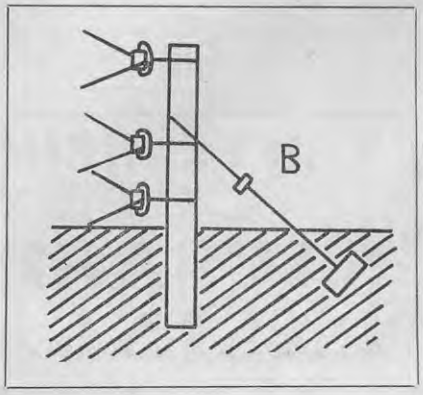
Hopefully, they "make a pass" at it, and then pull up all standing to have a look around to see who hit them. Once again they make the attempt, only to back away with a look of complete bafflement upon their faces. The long green grass can stay long and green as far as they are concerned.

At the end of the day's work the sheep are turned out into the paddocks, and only one attempt at the electrified wire there suffices to remind them that a grass paddock underfoot is worth several on the other side of a fence which apparently hits back.

Time To Train Sheep

Mr. Smith considers that the ideal time to train sheep is just after shearing, when they have lost their wool and are susceptible to shocks.

In selecting the line of the fence, he takes care to avoid wet places, where there will always be rushes growing or very rough faces where the stock allow the grass to get long. If grass or rushes touch the bottom wire there is always the danger of the fence being rendered ineffective in damp weather.

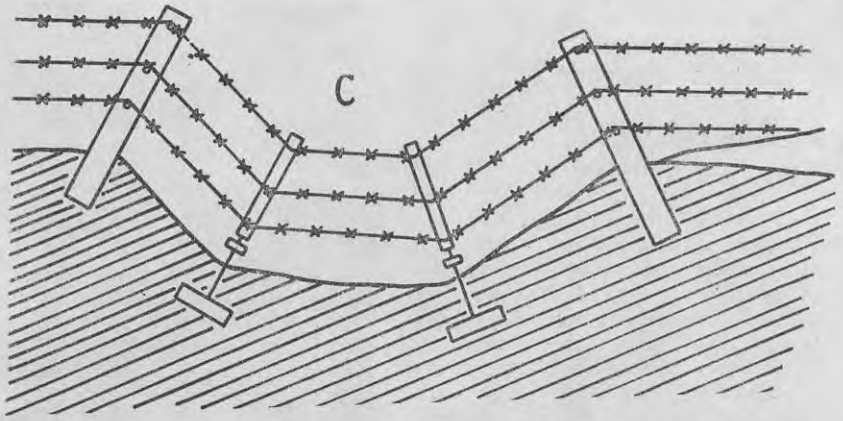


Procedure Advised

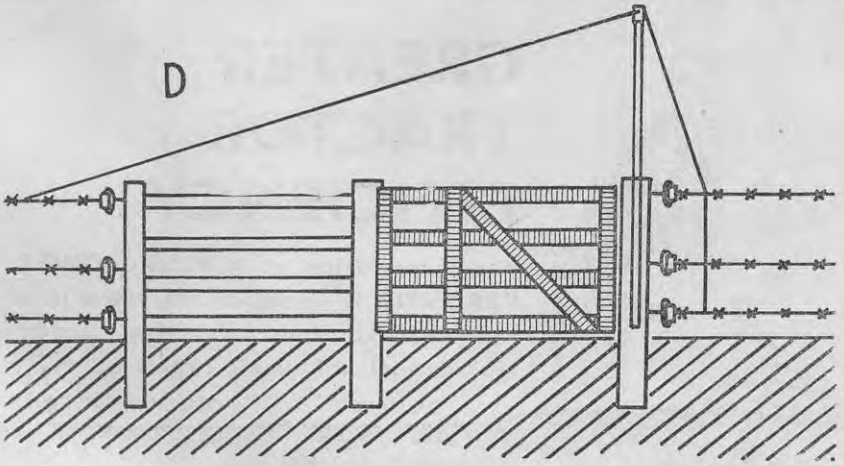
In his own words, the procedure Mr. Smith advises farmers to adopt is as follows:—

"Don't be afraid of steep dips, angles, or steep places. Select a line which will allow you to take as much advantage as possible of the fact that posts may be well spaced out. Some of our posts are as much as 25 yards apart, but I should recommend 12 to 14 yards as a maximum spacing, as the wires tend to sag on longer spans.

"Lay out the following materials:—Strainers where it is intended to swing heavy gates; a set of rails at the head of each gate if considered necessary as explained later; a pole at each gateway; good, solid, wooden posts for ends and angles; light 6ft posts or iron standards in numbers varying from slightly less than two to the chain on flat country to five on extremely broken country; barbed wire as calculated according to grade used; a short batten in each dip; a number of old posts, etc,. for use as bracing and footing material.



"To erect the fence, first put in the end posts which, as already mentioned, need only be good, solid, fencing posts. On firm ground staying is unnecessary, but they should be footed and cross-braced as shown in Fig. A. Sharp angles may be tied with a wire tie or braced like end-posts. A heavy post well rammed is sufficient for a slight angle. In placing an angle post it must be remembered that the wire will run some inches inside the post instead of around it, as in ordinary fencing (Fig. B).



Guide Wire

"Run out a guide wire of No. 14 plain, which is far easier to handle than the barb which is ultimately used. Put in the dips and brows. Instead of footed posts we use a batten swinging on No. 8 wire from a peg buried about 2ft deep directly in the line of the fence (Fig. C). This saves work, and by insulating the No. 8 wire as close to the batten as possible, allows the barb to be stapled to the batten, thereby saving two insulators (8d at current rates). It is not advisable, however, to have more than two of these batten feet together. The remainder of the posts are put in in the usual manner. Suitably drilled iron standards or light wooden posts may be used.

"We use the following three-wire gauge: Bottom wire, 9½in.; middle, 21in.; top, 36in.; but I should think that the two bottom wires should be slightly lower on clean, evenly-grazed flat country, while the bottom wire would probably be better a little higher

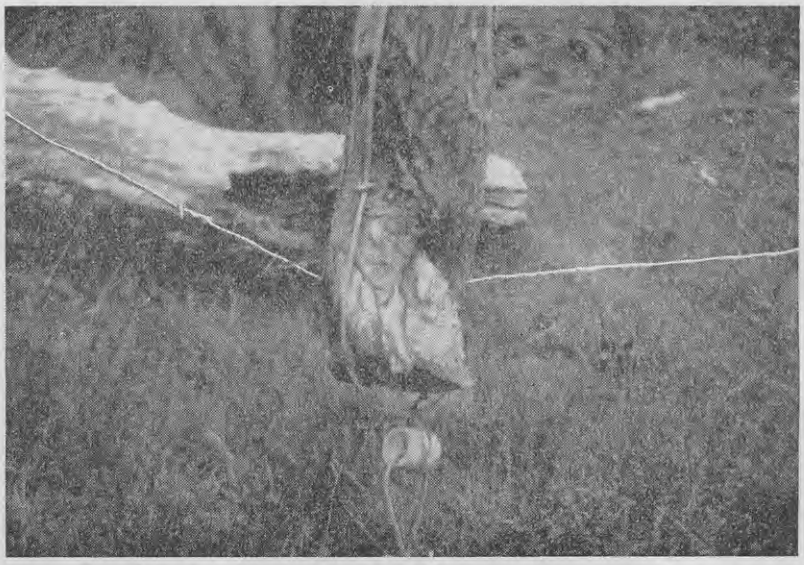
on rough danthonia or bracken country. The gauge should be carefully marked on every post after it is in the ground.

Attaching Insulators

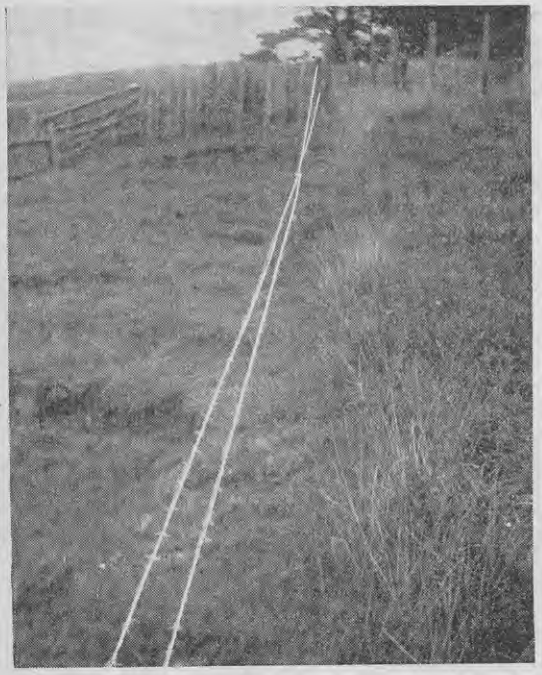
"The insulators may be either nailed with a 4in. nail or screwed on. If iron standards are used the insulators are bolted on. A leather or rubber washer must be put under the head of the nail or screw, and in the case of bolts there must also be a washer between the insulator and the standard. With leather washers it is advisable to punch the holes with a harness punch; otherwise, when the leather dries out the washers will crack and fall off.

"Nailing is quick, but every miss with the hammer means the chance of a broken insulator. The insulators are placed so that the gauge mark for the wire runs above them on brows and below them in dips. The method of attaching insulators at ends and angles is shown in Fig. D.

"We use the special 14-gauge barbed wire done up in 28lb. coils, which are easily run out off a crowbar by one man. It should be thoroughly stretched in the usual way. It merely needs to be taut, and there is no need for excessive straining. The barb is attached to the insulators with 14-gauge tie wire. Anything lighter will cause trouble.



The method of straining down into a creek bed.



Above: Rape fenced off for feeding. Note the rubber insulators. This fence is sufficient to hold sheep and lambs on rape. The bottom wire is "dead." *Right:* The training pen in the sheep-yards.

Construction Of Gates

"Although it is quite possible and very cheap to use an electrified 'Taranaki' gate, we go in for proper timber gates, because we consider that the time saved in riding through justifies the extra cost. The fence current is carried across the gateway on a piece of No. 14 wire, which rises sharply at one end of the gate to the top of a pole, to fall slowly away to a point some distance down the fence (Fig. D). Two poles may be used at the cost of an extra insulator.

"Owing to the extremely flimsy nature of the fence judged as a purely mechanical barrier, stock, particularly sheep, seem to have great difficulty in finding gateways, and will go right past without noticing that their mental hazard has ceased at the gatepost. It is therefore as well to have a set of rails at the head of each gate. This difficulty ceases when the stock have learnt where the gateways are, so that this refinement is by no means essential. It may also save you the unpleasant experience of having your horse put his nose on the live wire while you are latching the gate.

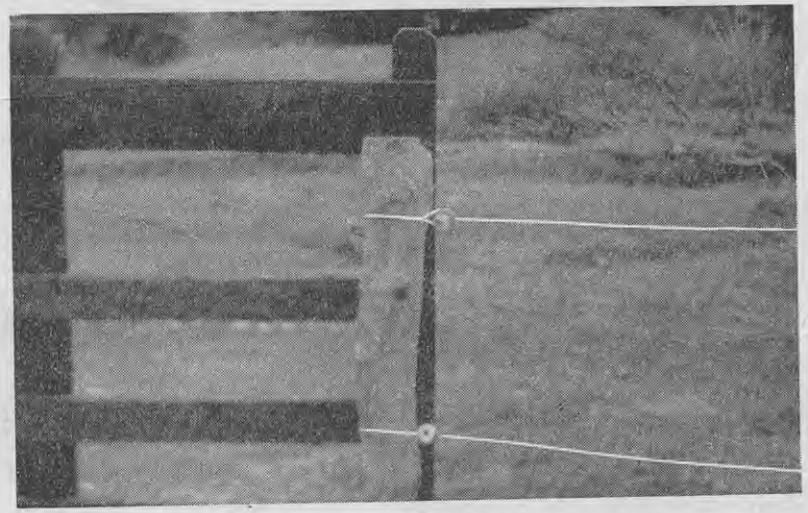
Temporary Fencing

"For temporary fencing, such as rape-breaks, we use light stakes and rubber loops instead of porcelain insulators. Rubber strips which are ideal for the purpose can be obtained from the tyre retread firms. These strips are about an inch wide and several feet long, and it is an easy matter to cut them into 4 to 6in. lengths with an axe. They may also be used for washers for the porcelain insulators.

"The current is carried from the controller to the fence line by means of an overhead system, or, better still, by insulating one wire, preferably a barb on an ordinary fence, and letting the current keep the stock off it too. One barb along the back of a road fence will work wonders in stopping cattle and horses pushing through to the ungrazed road. The wire need only be attached to an insulator on every second or third post.

Causes Of Faults

"Faults in the fence are indicated on the controller, the most common being as follows:—Cracked insulators,



No stay on the gate post.

excessive grass or rushes touching the bottom wire, rubbish blown on to the fence, bark or splinters on the post touching wire, tie wire touching posts.

"When making repairs to a remote part of the fence, simply earth it instead of going back to the controller to turn it off. Experience, although perhaps you will find it rather a 'shocking' experience, will soon teach you when there is a fault on the line or not, obviating the necessity of going backwards and forwards to the controller.

"We have been using fences erected in this manner for some nine months with sheep, horses, and cattle, including a bull, which, although not a confirmed fance-breaker, had no respect for an ordinary fence if he had any real reason to wish to get to the other side. The fences have been entirely satisfactory provided the stock are properly trained.

Importance Of Training

"The importance of training cannot be over-emphasised. The only animals which will go through the 'hot' fence now are the dogs, and they take good care not to be 'stung.' It seems probable that a stray dog with the guilty conscience that such dogs have on strange country would not wait to try the fence again.

"Our most outstanding effort was to wean newly-shorn Corriedale-cross lambs (after a morning's training) on to rape fenced with a permanent 3-wire fence and sub-divided by a break consisting of one live and one dead wire. The bottom wire was left dead because of the fact that it touched the rape in many places. Although one side was eaten bare before the lambs were moved, only three passed the break, which was an easy jump. None passed the permanent fence.

Main Points

"The main points to remember are:—

(1) Buy a reliable controller.

(2) Earth it well.

(3) Don't be slipshod in erecting the fence (a good fence doesn't take long to put up).

(4) Train your stock properly.

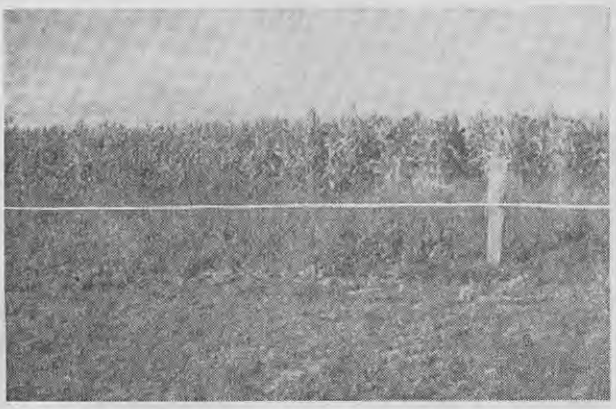
(5) Have your dogs under control when working near the fence."

Cost of Fence

The cost of a three-wire fence has proved to be 15s per chain, made up as follows:—

	£	s.	d.
14 days' labour, at 14s per day	9	16	0
Wire, 8/28lb, rolls No. 14 barb (as made for electric fences)	3	4	0
3 gates	2	10	0
Insulators	1	15	2
Odd wire for ties, etc.	0	10	0
Posts, 60 at 6 per 100 (cut on farm)	3	12	0
Total	21	7	2

It has been found better to use properly constructed wooden gates with a tall post on each side and the wire carried overhead between them.



Left: Protecting the maize crop with an electric fence. *Right:* Protecting a drain and pampas shelter belt.

Experiences on a Dairy Farm

By E. H. ARNOLD, Instructor in Agriculture, Dargaville.

BEFORE dealing with several typical farms selected at random, it is just as well to discuss some general features of the application of electric fencing to an established farm or one in the process of development. The selection of the particular make of outfit is the responsibility of the individual farmer, but it is essential that the "controller" be both efficient and reliable. Most farmers find it satisfactory and convenient for the controller to be placed in the milking shed. Apart from being situated more or less centrally on the farm, the efficiency of the fence can be tested twice a day.

On the average dairy farm the installation of the electric fence does not call for further expenditure in wire and posts. Ample wire is present in existing fences. Three- and four-wire fences can be converted into one-wire electric-fences and the spare wire used for replacing broken-down or erecting new fence lines. A good heavy post does quite well for the end post or strainer, while intermediate posts, usually placed up to a chain apart, need only be strong enough to carry the weight of the wire. In fact, any suitable timber with the equivalent of a 4in. by 2in. cross-section and 4ft. to 4ft. 6in. long proves satisfactory.

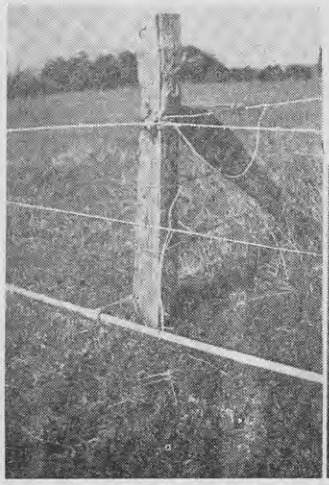
With sapling timber, a larger cross section is necessary, and it is essential that the nails holding the insulators penetrate far enough into the heart timber. Even if soft woods are used —and these rot away in a few years —it is quite a simple and inexpensive matter to replace them where necessary. Treatment with creosote or a good coating of tar makes soft woods last longer.

Stock Must Be Trained

All farmers using the electric fence are equally emphatic that stock must first be trained to respect the fence before it is 100 per cent. reliable. This is usually a simple matter. Farmers have found that after a short period of special training, followed by a week or two with the current turned on, it is quite safe to turn off the power for most of the time, thus reducing battery charges. This, however, is a doubtful saving, as these charges should not exceed 15s per year.

It is very necessary that the fence line be tested frequently to locate short-circuits through the falling of branches and the contact of other vegetation with the wire. Long grass, particularly when wet, will cause a short circuit, but when dry, little or no current is lost. Thus, in summer farmers do not pay much attention to the presence of long grass or fern under the line. During the rainy parts of the year it is necessary to cut this grass back.

Users of the electric fence, when interviewed, without exception are thoroughly satisfied that provided a suitable type is purchased, the erection of the electric fence has reduced construction costs by at least 80 per cent. and in many instances 90 per cent. In addition, maintenance charges prove practically negligible.

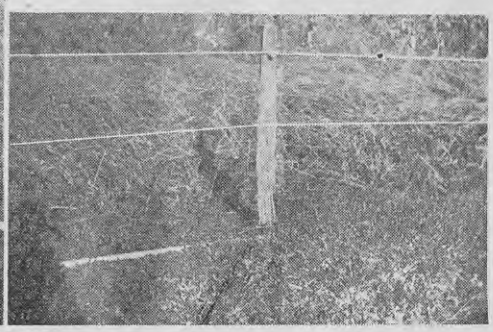


Farm Subdivided

Twelve months ago a farmer in this district purchased a 57 acre dairy farm on which all the fences were in a very bad state of repair. Taking the best of the wire and posts, he was able to repair part of the boundary fence and the road fence efficiently. He then purchased a second-hand but good electric fence controller, which was placed in the separator room. Without the purchase of new wire and posts, all the subdivision fences were converted into electric fences. Most of these consist of one wire, but where the calves are grazed, a second wire is placed between the electric wire and the ground. This lower wire, which does not carry the current, is well grounded by connecting it at convenient points to the water pipes.

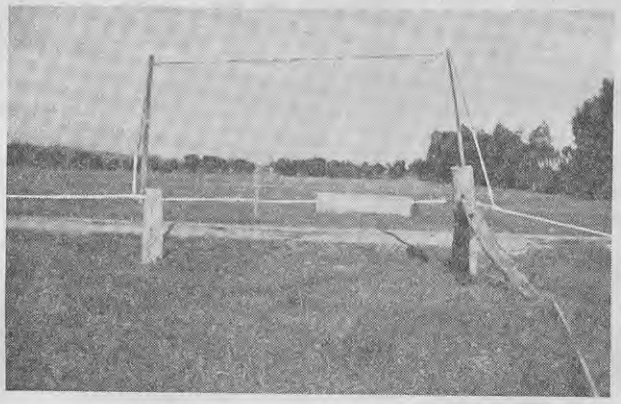
Ordinary fencing battens were found to be too light to hold the special insulator nails, and in place of the nails coach screws with the usual leather washers were used. Wooden gates suffered excessive damage by stock, but their replacement by electrified gates proved satisfactory. It was found necessary, however, to carry an extra electric wire overhead across the gateway in order that the current was not broken when an electric-wire gate was left open. Apart from successfully controlling all classes of dairy stock and horses, the electric fence has been useful for protecting the shelter belts and maize crop.

The calf-proof electric fence.



Educating New Stock

On a partially improved dairy farm, electric fencing has been used extensively with complete success, except



Left: The electric gateway. *Right:* Carrying the electric wire overhead. Note the length of old piping. The insulator is attached with a doubled loop of No. 8 fencing wire split pin-fashion.

in the case of young pigs. When newly purchased stock are brought on to the property they are placed in one end of a paddock temporarily fenced off with the electric fence. The milking herd is placed in the larger portion of the field. One day of this procedure educates the new stock to respect the fence. Since last spring the current has been cut off from most of the fences. Although the cows and calves have grazed right up to, and in some cases under, the fence lines, they have not yet attempted to break through.

At first, however, when the power was turned on recently to a new fence line, some calves got under the wire and into the next field. By clipping the long hair off the necks and backs of the calves, a close contact was made next time the calves attempted to get under the wires, and this practice proved a complete success.

With pigs, he finds that a two-wire electric fence is successful with large pigs and sows, but is definitely emphatic that it is valueless for small pigs.

Pasture Rationing

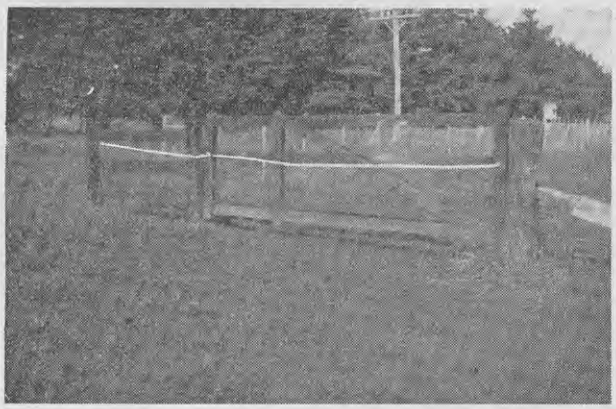
Another farmer has used the fence for dairy stock with success. The erection of temporary electric fences to ration pasture feed has proved entirely satisfactory. Three-inch by two-inch timber, 4ft. to 4ft. 6in. long and pointed at one end, is used for posts. The insulator is placed 4in. to 6in. from the top, and the post is simply driven into place with the maul.

One farmer in this district has used the electric fence extensively for wintering pigs, especially stores, on fern country. Along the existing fence line a single wire is placed six inches from the ground. On the new temporary fence lines two wires are used, one wire six inches from the ground and the other six to ten inches above this. Such fence lines require periodical inspection and lowering if the pigs have rooted deeply under the line.

On Demonstration Farm

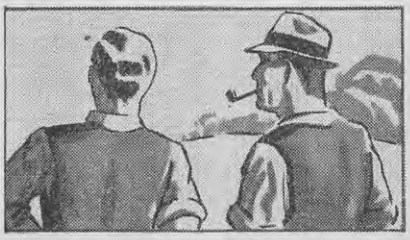
During recent years the Farm Committee of the Dargaville Demonstration Farm has been faced with the renewal of the whole of the fencing on this farm. By last year at least 60 per cent. of this work had been completed on the whole of the drainage system overhauled. Existing drains have been deepened, and new drains dug. Further extensions to the shelter belts have been planned for the coming year. All this work necessitates a considerable expenditure on fencing. In addition, the development of new pasture areas, the growing of maize crops, and the "rationed" grazing of fields call for the erection of temporary fencing.

To continue and complete the work so that production could be maintained and increased, limited funds were available. Consequently, an electric fence outfit was purchased last spring. The first use made of this outfit was to electrify one wire round the bull paddock. The work was done



Left: A wooden gate protected from bulls by an electric wire. *Right:* Using a lead-covered cable to take the electric fence through a culvert under the roadway.

Young Jack showed the Old Timer



OLD-TIMER: *"You know, Jack, if I could subdivide, I'd raise the farm's output by 25 per cent."*

JACK: *"What's stopping you, Dad? Wire?"*

OLD-TIMER: *"Of course. How in the name of fortune can a man fence without wire?"*

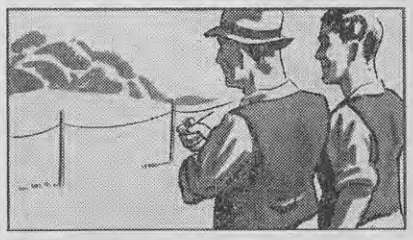
JACK: *"I'll show you. You get me a Prime Electric Fence Controller and I'll get all the wire we need."*

OLD-TIMER: *"Electric Fence? I'll have no more of those new-fangled things here! The last one broke down and cost me a turnip crop."*

JACK: *"That's because you paid a cheap price for a cheap job. Old Fred Smith up the road has a Prime and he's never had a second's trouble. Prime is the best seller because it's the best electric fence controller built."*

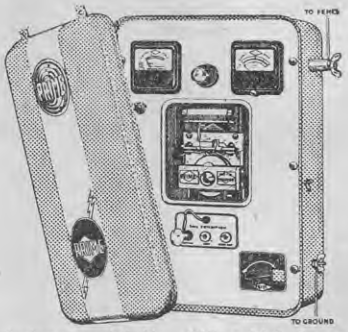
(Two days later.)
OLD-TIMER: *"Well, here's your Prime Electric Fence Controller, but, say, where did you get that wire?"*

JACK: *"Oh, that's a single strand from the new fence on the 40-acre paddock. There's enough here to do all our subdivision electrically."*



JACK: *"Well, there you are, Dad. Not bad, is it?"*

OLD-TIMER: *"Great, son. You beat the wire shortage and you certainly showed an old-timer what a real Electric Fence can do."*



The indoor model No. 660, which is operated from any 6-volt battery. Every possible eventuality is taken care of—adjustment may be made for condition of soil—the condition of the battery is indicated—signal light shows fence O.K.—dustproof cabinet over whole plant, yet everything may be instantly seen.

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ELECTRIC FENCE

THE CONTROLLER WITH FIVE VITAL ADVANTAGES

PRIME MOTO CHOPPER: Moisture proof . . . precision built . . . best quality materials.

PRIME TRANSFORMER: Oversize and perfectly made for a lifetime's service.

PRIME ELECTRIC MAGNETIC IMPULSE with compensator and self-cleaning contacts.

PRIME SOIL CONDITION SWITCH, ensuring perfect uniform performance in all weathers.

PRIME CONTACT POINTS: Highest grade; large nickel silver; no carbonising.

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The Prime Electric Fence is of particular importance to those farmers who are desirous of fencing but cannot obtain supplies of wire. Write for our FREE leaflet which gives you practical details of how you can use wire at present on your fences without lessening their life or their effectiveness. This leaflet is of vital importance to you.

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P.O. Box 16, 35 Albert Street, AUCKLAND.

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Please post me, without obligation, further details of the "Prime" Electric Fence Controller. Also your Free Leaflet on "How to beat the Wire Shortage!"

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JA

in the middle of the mating season, and previously where it was necessary for a man to restaple the wire on the battens and posts every other day, no further work was necessary.

Since then, the electric fence has been used to fence off the maize crop, to protect new drains, and to make new subdivisions. Further, it has proved a simple matter to fence off hay and ensilage stacks. Where the stack is alongside an existing fence line, 20 minutes' work will effectually protect the stack. If the stack was erected in the centre of a field, the connecting electric wire was carried on poles 8ft. high to the stack. This permits free movement of grazing stock under the charged wire.

Electric Gateways

Electric gateways are being used freely. To by-pass the wire overhead, lengths of old piping are used to support the wire. On the electric wire on gateway itself an old claw-tube rubber split down one side and placed on the wire at a convenient position makes an excellent insulator for the hand when opening and closing the gate.

At present field grazing trials are beginning, and further subdivision is necessary. The electric fence allows trial work of this nature to be carried out at the minimum cost. About one-third of the farm is cut off from the remainder of the property by a road. Because of telephone and power lines, it was not possible to carry the electric fence connecting wire overhead. A suitable culvert was available, and use was made of a cheap but efficient lead-covered cable to make the necessary connections. In all, 145 chains of this fencing has been erected.

Within the next six months, the erection of a further 100 chains is proposed. The cost of such fencing is but 10 per cent. of the cost of the erection of the standard 3in. barbed wire fence used on the farm.

Subdivision of Hill Country

By J. W. PALMER, Instructor in Agriculture, Hastings.

RECENTLY I inspected a big area of swedes and chou moellier which has been fenced off with an electric fence for feeding purposes. The fence erected constitutes Waratah standard, one every chain with three plain wires, No. 1 gauge. Care was taken that no stalks would interfere with the fence to cause a short-circuit.

On the enclosed area ewe hoggets were placed, and after a week it was found that only three had got through this fence. It had been the intention of the farmer to erect two plain wires with a middle wire barbed, but as barbed wire was unprocurable, he made the plain wire serve the purpose.

Hay and Grass Seed Paddocks

Last summer I visited a grass seed area, and found that only half the paddock had been closed for seed, the other half being grazed by ewes and lambs with a high stocking of about 10 ewes per acre. Three wires of No 12 gauge were used for the electric fence. Ordinary batons were driven in at 10 yards apart, and it was found that no ewes or lambs entered the grass seed crop that had been closed for seed purposes.

In another instance a paddock was subdivided similarly. Half the area was closed for hay. It was found at first that the fence had been erected a little on the low side and a few of the ewes were hurdling over the top of this wire, but after the wire had been raised to a reasonable height these ewes were prevented from jumping over into the hay crop. It was found that this proved effective and economical for subdivision purposes

On Hill Country

On the estate of E. W. Nairn, Omakere, a paddock at the back of the station of 240 acres has been subdivided by electric fence. Posts were put in approximately a chain apart, while in some instances they were closer to counteract ruggedness of the country. Three barbed wires were erected, the first being approximately 6 inches off the ground, the next 9 to 10 inches above the first, and the top wire about 3 feet 6 inches off the ground. The fence, when being erected, was made so that should the electric fence be unsuccessful, a permanent fence could be erected to the posts al-

ready put in—of course with the addition of other posts.

First, cows and bulls were placed in one paddock, with heifers in the other. It was found that no beasts attempted to get through from one paddock to the other, and in this instance the cattle used were black poll run cattle. Later, 2,000 ewes were placed in the top paddock, and these were held until they were removed into the lower paddock. It was found that no sheep got through this fence.

The manager, Mr. Nation, mentioned that this fence of a mile in length was erected at a cost of £50, as against £250 for a standard eight-wire sheep-proof fence. He is quite confident that the fence, properly erected, and the use of barbed wire is not only economical, but is stock proof. He states that, with the present shortage of fencing wire, any subdivision can be economically carred out by the use of the electric fence.

Its Worth Proved

On a station at Tamumu, owned by Angus Bros., electric fences have been used for the past three years. In the first instance a flat of approximately 35 acres was divided into two, using only two barbed wires. To prove the worth of this fence, 80 cows and 60 calves belonging to Tamumu Station were bought over and left on one paddock. It was first found that the cattle approached the fence, and that on receiving shocks they remained on the opposite side of the paddock away from the electrified fence. Mr. Angus was quite convinced that this would serve as a suitable fence and at very considerably less cost.

At the time of visiting the property he had 1,200 ewes confined on the area of approximately 17½ acres. Only one ewe had got through, and on disturbing her she immediately returned by jumping over the fence. Mr. Angus is subdividing 120 acres into six 20-acre paddocks. This will be used extensively for carrying out rotational grazing for his breeding ewes, and he intends erecting three wires, as he considers that to make an efficient fence, especially sheep-proof, the three wires are essential.

He has also proved that a cold face on a big run can be properly controlled by the use of an electric fence. By the proper control of grazing on these cold faces the sunny slopes are prevented from being grazed too hard and thus reverting to dominant danthonia.

Conclusion

In summarising the efficiency of these fences, I feel quite convinced after seeing those mentioned that they are serviceable and economical, especially at times such as these, when fencing wire is practically unprocurable. The electric fence lends no difficulty in controlling cattle, whether station or dairy cows. It is necessary to educate sheep, but even though this may not be at first carried out, very little difficulty is experienced in confining them to certain boundaries, especially when three wires are used, and more so if they are barbed wire.

Comments from Farmers

By W. L. HARBORD, Fields Instructor, Invercargill.

NUMEROUS farmers who are already using, or have used, an electric fence were asked for their candid views and experience, and, although parts of this article will be found contradictory, it should be borne in mind that the aim is not to praise the fence, but to give the farmer the candid criticisms of practical men who use it, and so let others decide for themselves whether or not there is a place on their farms for this type of fence.

Mr. D. McRae, of Benmore, Dipton, has had considerable experience with the electric fence, and has used it with both cattle and horses. He finds it ideal for a "break" fence for cattle, and states that it is very handy and easily and quickly shifted. On this farm it has been noticed that the fence is of no use during the snow season, as the snow adhering to the wire not only insulates it to the stock, but allows the current to "earth," causing the charge to become considerably weakened.

Experience With Horses

Mr. McRae finds that horses, once having received a "shock," will not trouble a fence further and become easily held, with a great saving on fencing wire, posts, and horse covers. When asked if he found horses at all "wire" or "fence" shy when working, he replied that he had definitely not, and added that any horses with which he has had such experience could be driven up to, and alongside, a fence without trouble.

Another farmer stated that he had no use for the electric fence whatsoever. He bought one to hold a very restive bull, he said, but when roused at all the bull took no notice of the electric shock and went under or over the wire as it suited. This farmer admits, however, that he did not give the fence a very fair trial, but his experience is quoted to show the differing opinions to be heard.

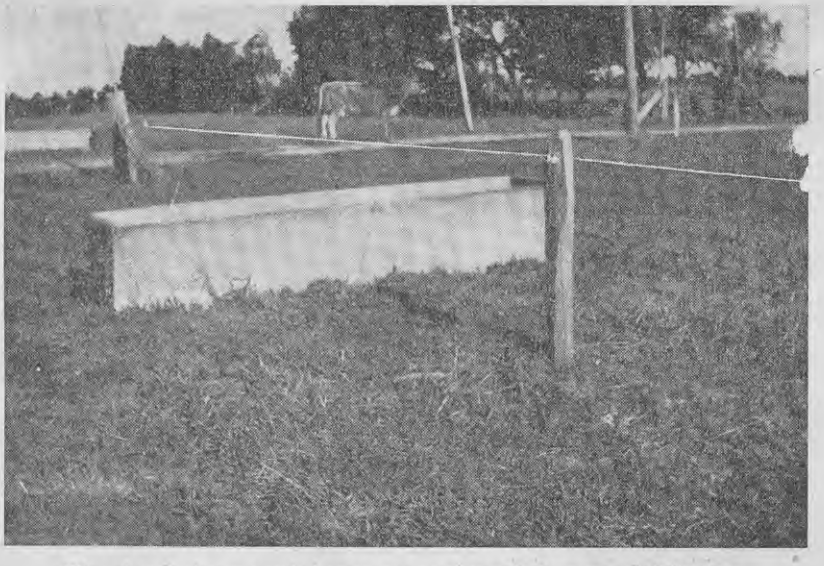
One farmer stated that his bull had been an absolute nuisance about the place before he bought an electric fence. He had never been very certain in which paddock his bull would be found, as it was in the habit of going through or over any fence, no matter how strong or high. After one good shock from the live wire the bull ceased to show any desire to go near, and, although the battery was turned off more often than it was on, the bull was easily held between the months of November to January.

An electric fence line which held stock, which grazed underneath the wire.

A Bull Tamed

One man on a mixed farm near Invercargill related some interesting experiences. He bought a young bull which proved most troublesome from the moment it was turned loose on the farm. When he tried to shift it the bull went through six fences in his effort to evade being driven. It would put its head between the wires of a fence and push until it got through, until by chance it pushed under the wire charged with electricity. The bull took the full shock, and although the wire fell to within ten inches of the ground, it would not attempt to cross or go under it again.

With cows wearing covers, this farmer finds that by clipping the hair along the back of the neck the cows can be kept within the fence. He is of the opinion that barbed wire must be used, because the hair appears to act as an insulator and the barb, by pricking the skin, conveys the shock.



The electric fence carried over a water trough in a new subdivision.

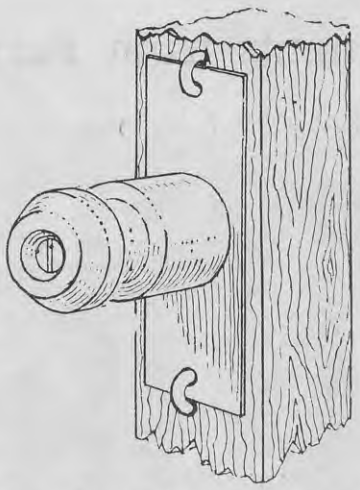
There, again, there are differing opinions, as some farmers say the plain wire is all that is necessary.

When asked about horses and the electric fence, this farmer replied in the same terms as those given by Mr. McRae, but added that his experience showed that the horse had to be educated. All his horses, when receiving their first shock, instead of jumping back, went through or over the fence, but did not trouble it again.

Type of Charges

One man who has had very wide and practical experience of the electric fence stated that he had proved that the type of charge sent along the wire decided greatly the success with which the fence could be used. Some types on the market gave only a single shock represented so, ".—", while others gave a double shock, thus, ".—.".

It was found after several fences had been thoroughly tried that those giving the double charge were by far the most successful. Lambs which would break past a single shock wire could not be tempted to pass the double shock wire, even when starved and tempting fodder was placed just outside the wire.



A rust-proof insulator fence-plate and insulator, which minimises breakages, faulty insulation and loss of power. The plates are fixed by driving a medium-sized fencing staple through each of the end holes. The insulator is then attached by a metal thread screw.

Tried Against Deer

Mr. D. O'Brien, of Lilburne, has tried the electric fence out against deer. Mr. O'Brien is of the opinion that, provided the live fence is being used from the beginning of such times as the deer are likely to visit the paddock, they will be kept down. Contrary to general opinion, it is stated by this farmer that deer will go through a fence more often than over it, and if given a good shock before the feed is enclosed within the fence, they will not bother it afterwards.

One other point which of interest is that it appears that animals are like human beings in their susceptibility to an electric shock. Some animals take no notice of the charge, while others show the fence the greatest respect, and for this reason a farmer may find that he will have to get rid of one animal, or perhaps more, before his fence will be a complete success.

Use As Temporary "Breaks"

By A. STUART, Instructor in Agriculture, Invercargill.

WITH the supply of efficient farm labour steadily diminishing, the farmer must investigate all labour-saving devices. One of these devices which has come into favour is the electric fence.

In Southland electric fences are most in favour for erecting "breaks" for stock while feeding on turnips, swedes, or chou moellier. Stock are on the "break" only for a few hours daily. In cases such as these they have been found most reliable, particularly with cattle.

However, in many herds there will be found at least one cow which is prepared to take the shock and prove troublesome, and it may be necessary to dispose of this animal before satisfactory results are obtained. With cattle, only one wire is required, and it is therefore not advisable to run weaner calves with the herd, for these calves are able to walk underneath the wire and, once through, encourage the bigger beasts to follow.

In the case of sheep two wires are recommended, but results generally have not been so successful as with dairy herds. This is often due to lack of perseverance in the training of the animals. In the first place, a large number of sheep should be confined on a small "break."

Control of Ewes

At the Winton Demonstration Farm a mob of 500 ewes was confined on half an acre of swedes, and only one got through the fence. Wool insulates the shock, and to feel the shock the sheep had to take it on the extremities, either the legs or head. After about three shocks for each animal no further attempts were made to touch the fence, and after the third day the current was turned off.

A curious instance of the intelligence of the manager's dog also came under notice. Last winter the dog received a shock, and this year an ordinary wire-netting "break" on resistant turnips has been erected in the same field, but the dog will not go near this fence, and will go round instead of over it when called.

There is a big diversity of opinion as to the best wire to use in the fence. Barbed wire is recommended by most manufacturers, and may probably be the best for sheep. Where "breaks" have to be shifted, however, the farmer objects to the frequent handling of barbed wire. With cattle, many farmers use the ordinary No. 8 gauge fencing wire, while many use finer wire down to No. 14 gauge.

There is no doubt that, with the prevailing scarcity of wire, both plain and barbed, and the rising costs of wire and posts, farmers will make more and more use of these machines for temporary fencing.

Popular With Dairy Farmers

By E. M. BATES, Instructor in Agriculture, Gisborne.

ELECTRIC fences were introduced into Poverty Bay only about two years ago, and are most popular with the dairy farmers.

The following are several farmers' experiences in the province:—

Mr. T. Preston, Manutuke.—With dairy cows and with steers, one barbed wire for separating grazing areas from hay paddocks or root crops suffices. In the bull paddock one electrified wire at the top of permanent fence is found very effective.

Sheep.—He has not used electric fences for sheep.

Pigs.—He considers electric fence satisfactory for big pigs—porkers, sows, boars—but small pigs intermingle, and electric fences have been rejected for the pigs.

This farmer looks on electric fence as merely a temporary expedient, and is gradually working into permanent subdivisions. He has had trouble with breaks in the small nailed insulators and shorting. Breaks in wires and omission to hook back wire across gateways have caused inconveniences. Four or five rejected telephone dry cells (1 to 1½ volts each) are used.

Mr. H. Cooper, Patutahi.—A dairy farmer who has found the electric fence very effective with dairy cows.

Bull Paddock.—To avoid damage to permanent fence, one barbed wire 3ft. from the ground and 2ft. inside the fence has been erected at the end of the boards attached to the permanent posts.

Grazing paddocks in breaks with dairy herd.—One electric barbed wire is moved across as each break is cleaned up. As a large herd is milked, one wire is used to make a lane on the side of the paddock for convenience in stocking the next break and to avoid puddling and trampling over ground grazed earlier. Earlier breaks are not separated. Cows are on for one hour at a time, and are fed three times a day—immediately after morning and evening milking, and at midday. The farmer has also found the electric fence very useful for feeding off green maize in breaks with the dairy cows.

Protection of hay stacks.—Using four battens or iron standards driven into the ground, one barbed wire gives complete protection, and after several days the current may be turned off where still found effective after a fortnight. Electric fences have cured bad cows from knocking any fences about.

Mr. J. Morrow, Patutahi.—Electric fences are very useful to the dairy farmer, both for dairy stock and grown pigs. This farmer has used them for protecting stacks and for subdivision. He has had very little trouble with shorting. Scotch thistles do not short the wire. One dry battery costing 15s lasted for 10 months, using on-and-off principle. He has approximately 36 chains of barbed wire on short willow posts at height of 3ft. 6in. for dairy stock.

Mr. E. R. Renner, Repongaere.—Electric wire system used for dairy cows, bulls and horses. He considers a two-wire (barbed) electric fence in the bull paddock is better than a seven-wire fence which is liable to be damaged. Actually, the posts in the bull paddock were over 50 yards apart, with the two barbed wires 30in. and 48in. from ground. There was naturally a slight sag in the wires, although these were kept very tight. One barbed wire again was found efficient in keeping dairy cows off root and green crops.

In a race from the milking shed, old rubbers off the milking-machines were utilised for insulation, using two plain wires. Insulation cups in the race

were readily broken off, and the rubber insulators were easily fitted with the wire running through the centre and wired to the posts outside the rubber. When inspected, the rubbers were found to have been in use for two years without replacement.

An electric pricker is used for loading pigs. A loose wire on either side of race is necessary to complete the circuit. This farmer is considering using a switch-board to speed up locations of faults in the system when these occur.

Mr. A. G. Jones, Waingake.—This farmer uses a cheap machine, which he considers is not too reliable. Electric fences have been very satisfactory with cows and bulls.

If a mob of cattle are jammed against fence they will go through. This would not occur with ordinary fence. He considers that barbed wires are required for cattle. On this property iron standards are used exclusively, except for terminal posts and gate posts. No foot or stays are required. The machine is used only in spring and summer.

Mr. G. McPhail, Waingake.—Mr. McPhail has had an electric fence for two years. Battens last about four months. Likes electric fence for quiet stock. Considers excellent for dairy cows. Uses one plain wire. This will keep cows out of maize, crops, etc. One plain wire also used for subdivision. Height of wire about 2ft. 6in. Electric fencing used only in spring and summer.

Sheep.—Uses four plain wires for sheep, which never get through, but does not recommend use for pigs.

Pigs.—Found pigs jumped electric two-wire fence.

Mr. H. Chrisp, Patutahi.—Using an electric fence mainly for pigs; two barbed wires effective for sows unless starved. Not effective for small pigs. In a boar pen has four barbed wires battened every foot to 18in. Posts are about 12ft. apart, and battens resting on bottom wire and stapled. Has found one barbed wire round hay stacks very effective for cattle and horses. Uses only a wet battery, which he considers more economical than dry batteries.

Mr. T. Smith, Mangapapa.—Used two barbed wires with pigs. To educate the pigs, maize cobs were tied to the wires. After two or three attempts pigs would not touch maize. Considers electric fence satisfactory for porkers, slips, sows.

Mrs. Mackie, Ormond.—Used an electric fence to keep pigs out of orchard, but intends to erect permanent fences, as the electric fence has not been reliable. She considered, too, that cocksfoot or anything growing up in fence caused trouble. Three barbed wires were used, but the small pigs went in and out. Could never be sure pigs would not be in the orchard.

Mr. A. H. Wall, Waerenga-o-kuri.—Uses an electric fence for sheep and cattle in feeding-off turnip breaks and in temporary subdivision in hill country. One barbed wire very effective with cattle.

With sheep, barbed wire damages the wool. Has used one barbed wire between two plain wires, but now erecting four plain wires. Used mainly, however, for feeding-off turnip breaks.

Mr. F. Cooper, Waerenga-o-kuri.—Uses only two wires with hoggets when feeding-off turnip breaks, I believe.

Saxby Bros., Cape Runaway.—Have difficulty with fencing streams and gullies with occasional flood waters. Have found electric fences most effective way of control across such areas for cattle and sheep.

On some of the tidal flats north of Karamea, Spartina grass was introduced some years ago. It is now well established on areas covered at high tide and on the adjacent flats, and provides a good picking for cattle over considerable areas which would otherwise be practically devoid of feed.

Barbed Wire Advocated

By A. F. GREENALL, Instructor in Agriculture, Balclutha.

IN the South Otago district there are only about six farmers who are known to have electric fences. These have all purchased machines recently, and therefore their experience is not very great. The majority agree, however, that properly erected and installed electric fences are effective in herding cows, pigs, and horses which are reasonably well behaved. None of the men visited thought that sheep could be controlled, as the wool would prevent good contact.

For pigs, two wires are regarded as necessary, one about six inches from the ground and the other 18 to 21 inches high. Pigs are pushers rather than hurdlers, and consequently high fencing is not generally required. One farmer stated that after an initial period of use with pigs the power was turned off for three weeks before the pigs finally plucked up enough courage to attempt a break, and when they did so they were put back and a week's conditioning proved sufficient to prevent them from approaching the fence for a further period.

With cows, the position is not so clear-cut. At least two wires are required, one to check those which push under, and one to check those which jump. The time and material required to erect such an electric fence are regarded as being the same as that put into the erection of a temporary fence of cyclone wire or barbed wire. However, the electric fence provides an effective check, and perhaps more use would educate the cows to a stage where one wire would be sufficient.

The electric fence has not been generally used for horses, but is said by one or two farmers to be efficient. One farmer stated in conversation that once horses had become afraid of the fence they would experience difficulty in driving the horses up to the fence in operations such as scuffling or ploughing a headland. The general opinion is that a spiked or barbed type of wire is best, and is essential where sheep are being herded by an electric fence.

In a good stand of lucerne in the Ranfurly district there is a strip which has received more surface water, due to seepage from a race, then the remainder of the stand. This strip, due to the moist conditions has become invaded with grasses and weeds to the detriment of the lucerne. This brings to mind the fact that the water requirements of lucerne should be studied from the point of view of:—(a) underground water, (b) surface water, (c) periods when water is most necessary for lucerne to allow of its competition with grasses when under irrigation.

College Cocksfoot (C 23 Strain)

By J. W. CALDER,
Canterbury Agricultural College.

COLLEGE cocksfoot is a pedigree strain bred from a selected plant of Akaroa cocksfoot. It is finer in the leaf, has a denser crain fenning, a denser sward, and is somewhat paler in colour than Akaroa cocksfoot. It was bred for its leaf production, but it produces satisfactory yields of seed. It is extremely palatable, and is persistent under grazing.

Professor Stapledon was the first of the grassland workers of the British Empire to draw attention to the variation which occurred between plants in a population of pasture plants and to the possibilities of breeding improved strains. His investigations opened the door to a new era of pasture improvement throughout the world.

Fig. 1.—Single plants. *Right:* A good plant of College (C23) cocksfoot showing the dense crown of fine leaves. *Left:* A good plant of Certified Akaroa cocksfoot.

Above—

Fig. 2.—Single plant plots. *Right:* A plot of Certified Akaroa cocksfoot. *Left:* A plot of College (C23) cocksfoot, stock seed standard.

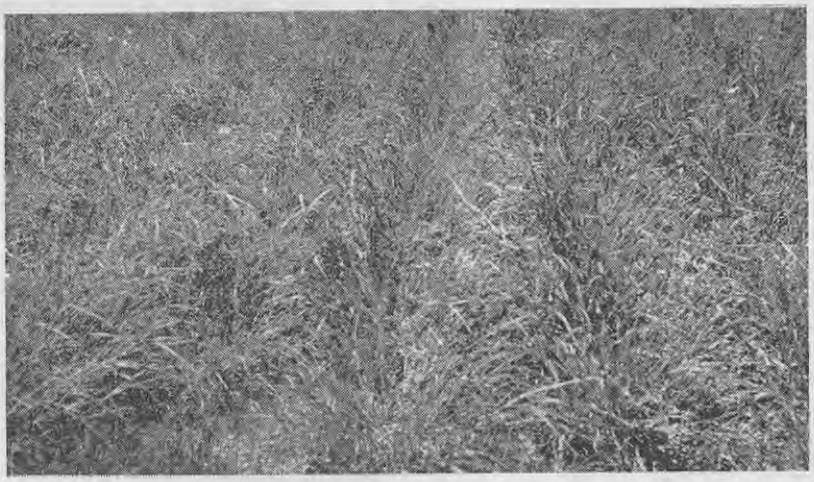
Denmark had already accomplished an objective in their work with pasture plants. They had an established export trade in pasture seeds, and they set out to increase the yield of cocksfoot seed. They did so at the expense of leaf production, and their exported strains were found to be less suitable for pastures than those which were "native" in many importing countries, particularly in New Zealand.

Breeding Methods

The methods which are used in breeding strains of pasture plants are, in principle, not unlike those used in breeding sheep or cattle. In most cases the plants are naturally cross-fertilised, and the purity of type found in such crops as wheat and oats, which are self-fertilised, cannot be expected, even if it were desirable. What is aimed at is a strain in which a high

Below—

Fig. 3.—Seed-sown rows. *Right:* Certified Akaroa cocksfoot. *Left:* College (C23) cocksfoot, stock seed standard.



proportion of the plants possess desirable attributes. These desirable attributes may vary for different conditions, but in general they are those which will increase the grazing production of a field—mainly, leafiness, density of sward, persistency, vigour of growth, freedom from disease, resistance to ravages of pests, and so on.

In the case of cocksfoot, which is normally a cross-fertilising plant, a population of, say, 1000 individual plants grown from 1000 seeds will show a thousand different combinations of these desirable attributes from which a selection of the best plants can be made. This was demonstrated by Dr. F. W. Hilgendorf who, realising the importance of good pastures and appreciating the deficiencies of existing strains, initiated the breeding of improved strains of cocksfoot at Lincoln College.

This selection of good plants forms the beginning of the breeding programme. The value of each selected plant as a parent must then be tested by artificially self-fertilising or crossing with other good plants and then growing the offspring of these plants in progeny plots for study. Those plants which show the capacity to produce good offspring are chosen as parent material for building up a new strain. It was in this way that the strain of College cocksfoot (C23) was developed. In field trials and plot tests it has proved to be an improved pasture type of cocksfoot. It forms a fine, dense sward, and is a high producer.

Differences Shown

The photographs accompanying this article show more clearly than figures from plot trials the differences between the selected strain and Akaroa cocksfoot. In yield trials it has given a yield of herbage per acre at least equal to Akaroa (one trial, plus 3 per cent.; another, plus 10 per cent.; another equal to Akaroa) and a distinct increase in density of herbage, up to plus 15 per cent., as a result of its dense crown of fine leaves. These results are less than one would expect from an examination of single plants, but it is probably associated with the soil fertility level and its influence on the number of vigorous plants in both Akaroa and the selected strain.

It is important to appreciate here that, in the main, production depends on the fertility of the soil, and that

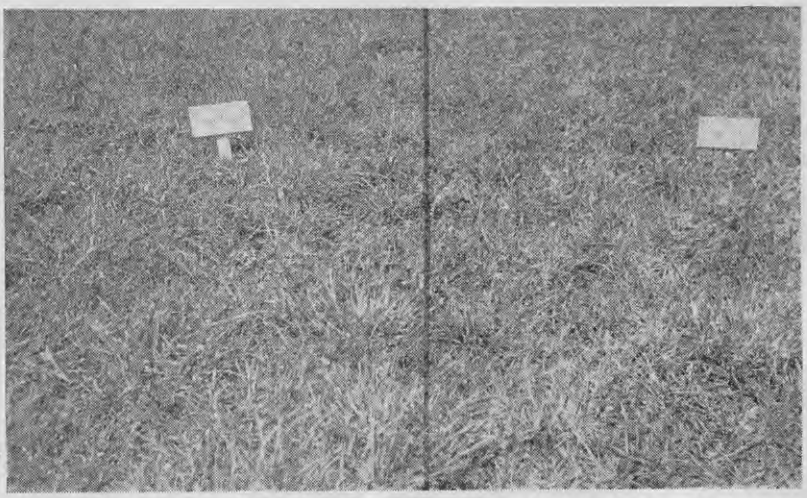


Fig. 4.—Pasture plots. *Right:* College (C23) cocksfoot. *Left:* Certified Akaroa cocksfoot.

when a pasture species has attained a high level of vigour, as is the case with Akaroa cocksfoot, further improvement with that species is likely to be directed towards changes in type suitable for specific purposes rather than a marked increase in production, and this is what has occurred in the new strain.

Improvements

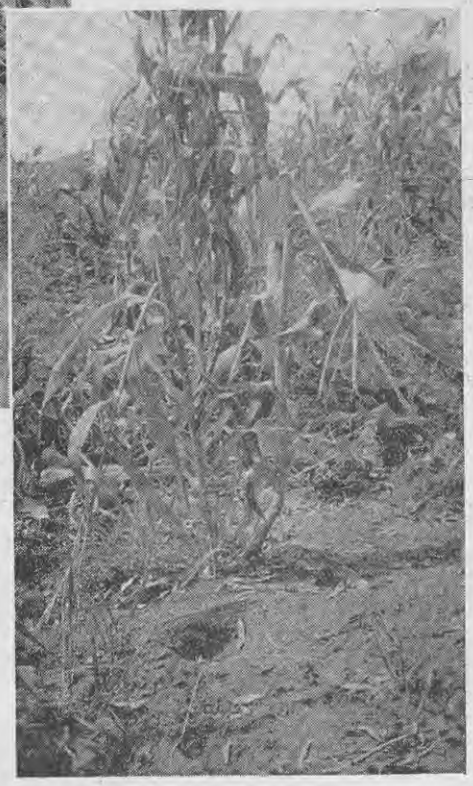
Continued improvement in the strain is being directed towards greater uniformity and density associated with fine dark green leaves and high vigour. As these improvements are effected the strains will be released into the highest grades of the Department of Agriculture's certification scheme.

The selected strain of cocksfoot is available today in the Government stock and pedigree grades. The benefits of any improvements which can be made in this strain will be passed on to farmers through the gradual replacement of the Government stock areas.

Select Your Maize Seed Carefully and Insure Against a Poor Crop

— By —
C. R. TAYLOR,
Fields Instructor, Whakatane

A good, strong maize plant of the Excelsior variety showing the pronounced drooping tendency of the cob while still only half-grown. Ultimately, this cob will point directly to the ground and will suffer little or no damage through water gaining access to the grain while awaiting harvesting.



Another strong plant, showing all the desirable characteristics which should be looked for when selecting maize for seed. Although the cobs are only half-grown, they are already showing a strong tendency to droop over from the stack of the plant. The photograph was taken a few days after the crop had experienced a severe buffeting by storm.

FOR the majority of growers in the maize-producing districts the period embracing the months of late April and May is usually the best time to select seed for the following season's crop, for at this stage the desirable characteristics of maize in general and of specific varieties in particular can generally be seen at their best. Admittedly, it is not the common practice to select seed maize in this way, but as it is well recognised that good crops of other species of plants depend as much upon the use of high-quality seed as any other factor, it is surely not too much to imagine that maize crops, also, are largely influenced by the type of seed sown.

Good varieties and strains of seed are definitely superior to inferior types in the production of crops, pastures, etc., as has been abundantly demonstrated during recent years through the agency of the Government Certification Scheme as applied to potatoes, grasses, and clovers. Before the introduction of this scheme farmers were compelled to purchase seed for their pastures and potato crops more or less blindly and without any guarantee of its trueness to type, yield capabilities, and freedom from disease. The natural

A maize plant of considerably less vigour than those illustrated above, showing evidence of storm damage and late development of cob. It is worthy of note that all three photographs of individual plants were secured almost adjacent to one another, thus illustrating the differences that are evident within the one variety.

outcome of this haphazard method of producing and purchasing seed was not infrequently one of keen disappointment, involving not only a financial loss for one year (as in the case of a potato crop), but much extra expense and loss of valuable time when a pasture has failed to establish or thrive as it normally should.

Uncertainty Removed

Nowadays, however, a great deal of the former uncertainty of seed purchase has been removed by the scientific study of plant characteristics, whereby it has been possible to evolve gradually a system of seed production which definitely insures farmers against the risks of the past.. Such an innovation has naturally meant a great deal to the farmer, in much the same way as the herd-testing scheme has offered him an opportunity of increasing his herd production by "knowing" his cows.

As time goes on, no doubt the certification scheme will be extended to seed of most of the economic species, but in the meantime growers of seed for crops such as maize can do much either to make or to mar their own or other growers' crops by the degree of care given to the selection of seed. It is therefore the duty of the grower to do his utmost to save seed in such a manner as will ensure the best possible return for his outlay and labour; for carelessness will not accomplish this end any more than will the use of a grade bull of doubtful ancestry increase the productiveness of a dairy herd.

Let us remember, therefore, that "like begets like," or, in other words, poor-quality seeds will produce poor-yielding crops.

Points in Selection

In the selection of maize for seed purposes it is customary to pick likely-looking cobs from the crib at the time of shelling. While it is admitted that this practice can, if conscientiously carried out, give very fair results, it is safe to say that it **cannot** produce the **best** results, for when it is selected in this way important details concerning the plant itself cannot be taken into consideration. One might just as well try to assess the virtues of a bunch of calves without seeing or knowing anything of their parentage as to assess the true value of seed maize without any knowledge of the plant that bore it. Consequently, there is only one possible way of saving seed as it should be saved, and that is by selecting from the field and not from the crib.

Many growers will complain that field selection is too laborious, but when one recalls that only from 10lb. to 14lb of seed are required to plant an acre of maize for grain it is surely not too much of an undertaking to gather this comparatively small quantity of seed from the most promising plants when the reward for so doing can be so great.

As an illustration of the possibilities in this direction, it is worth mentioning that over the past ten years the average yield of maize per acre in the Eastern Bay of Plenty (Whakatane and Opotiki Counties) has been a little in excess of 40 bushels, and yet, over the same period and within the same territory, it has not been an uncommon experience to meet numerous growers who have consistently doubled their average yield and more. Surely, such results tell their own tale and point definitely to the possibilities in maize-growing where care and attention have been paid to the essential factors governing the growing of this valuable crop. And not least among these factors has been the careful selection of seed.

Principal Requirements

How, then, should seed be selected? There are two principal requirements which must be satisfied:—

(1) Attention to variety characteristics, and

(2) Attention to strain within the variety.

The first requirement is very important because of the fact that maize crosses readily, and consequently, where two or more varieties are grown in close proximity, it is only a relatively short time before certain definite and desirable variety characteristics are almost obliterated. To save such maize for seed can have disastrous results at times, especially in what might be termed marginal maize-growing districts where, for instance, the average season is just sufficiently long to mature only the early varieties. If, therefore, early and late types are cross-fertilised to the point of, say, practically removing the early characteristics of the early variety, then it is conceivable that no matter by what name this maize is called it will not mature fast enough to save the crop from early frost, etc., and ultimate destruction.

On the other hand, maize growers in districts enjoying a long growing season can well afford to grow varieties which require a longer period in which to mature, as such varieties almost invariably produce the highest yields. If, however, their long-maturing features have been masked by serious crossing with the early types, it is evident that yield is reduced, and once more the grower suffers. Similarly, certain maize varieties are suited to soils of high fertility, while others will produce good crops under less fertile conditions. For these reasons, under this one heading alone severe penalties can easily be the reward of carelessness in seed selection.

Importance Of Strain

Dealing with the second requirement (strain within the variety) it may be pointed out as an illustration that not all cows or pigs within a certain breed are necessarily good because the breed as a whole is generally regarded as an excellent one. In other words, there are good families or strains within that breed, and there are also poor ones. If we concentrate on the good strains we usually achieve success, but if through ignorance or carelessness we work with less efficient strains of the same breed we are rewarded accordingly.

Every farmer knows that this is the case with animals, but it is not so universally appreciated that the same natural laws apply equally to both animal and plant life. Hence, there are good and bad strains of the various varieties of apples, clovers, and maize, etc., and it is only by being able to differentiate between the desirable and undesirable characteristics of each that we can "sift the grain from the chaff" and really select seed of high merit.

How To Select

In selecting maize for seed, therefore, first make certain that the crop is reasonably typical of the variety grown—that is, if the crop is, say, Early Butler, see that both the plant and cob possess the distinctive characertistics of that variety. If satisfied on this point, select only those particular plants which show extreme vigour

of growth and which have their cobs drooping downwards so that the tips distinctly point to the ground. (See Figure 1.)

These two qualifications are most important, as vigour enables the plant to resist disease to the utmost, to withstand in a large measure adverse climatic conditions, such as wind and storms, and to develop heavy yields of grain, while the pronounced droop of the cob, plus good protective coverage, prevents serious wastage of grain through the water gaining access to the cob.

As all maize varieties produce both strong and weak plants—some with their cobs pointing upwards, and others downwards—such caracteristics obviously cannot be associated with particular varieties; rather must they be regarded as strain features, and seed should be selected accordingly. Naturally, crib selection has its limitations, and growers would be well advised to undertake this important task in the field before general plucking.

Disease-free Cobs

In addition to the strain characteristics of plant vigour and cob droop, it is also essential to see that plants and cobs are free from disease and that the cobs are not malformed in any way. The rows of grain should be evenly spaced around the pithy core running the entire length of the cob, and with as little loss of space between the rows as possible. Open-spaced rows mean the loss of several rows of grain per cob, which in turn greatly reduces the crop yield.

Some varieties are offenders in this respect more than others, but, generally speaking, it is nearly always possible to secure a strain which is infinitely better than the average if growers are prepared to spend a little extra time in the selection of their seed. The length of grain is also an important yield factor, and therefore should always be as long as possible consistent with variety characteristics.

In conclusion one may safely say that if maize growers conscientiously selected their seed according to the foregoing recommendations it would not be very long before the general average of yields would be greatly increased, while varieties would be more distinct than they are today.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the month of May, 1940, have been compiled by the Livestock Division:—

District	Catttle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	42,885	5,765	39,433	26,184	61,570	51,221
Poverty Bay - Hawkes Bay	21,019	3,004	82,334	32,107	81,569	4,927
Taranaki-Manawatu ..	25,506	1,224	53,583	31,809	101,825	32,842
Wairarapa-Wellington ..	12,251	895	37,529	20,966	72,868	6,506
Totals	101,661	10,888	212,879	111,066	317,832	95,496
Abattoirs	12,448	4,729	41,512	22,159	4,752	14,208
North Island Totals ..	114,109	15,617	254,391	133,225	322,584	109,704
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlborough ..	210	1	19,269	8,486	34,962	1,841
Canterbury	2,359	1,574	156,652	129,616	241,271	3,845
Otago-Southland	2,734	3	122,598	101,093	409,367	1,070
Totals	5,303	1,578	298,519	239,195	685,600	6,756
Abattoirs	5,559	1,524	24,423	12,450	2,857	4,404
South Island Totals ..	10,862	3,102	322,942	251,645	688,457	11,160
Dominion						
Meat expt. Slaughterhouses	106,964	12,466	511,398	350,261	1,003,432	102,252
Abattoirs	18,007	6,253	65,935	34,609	7,609	18,612
Grand Totals	124,971	18,719	577,333	384,870	1,011,041	120,864
Same Period, 1939— Meat Export Slaughterhouses and Abattoirs ..	87,359	22,070	359,400	190,813	948,418	83,869
Same Period, 1938— Meat Export Slaughterhouses and Abattoirs ..	66,626	11,366	332,619	202,329	824,812	113,645

Slaughterings of Pigs

The 120,864 pigs killed during May were distributed in weight ranges as follows:—

Under 60 lb.	4,795
61-100 lb.	50,540
101-120 lb.	23,609
121-160 lb.	31,148
161-180 lb.	6,069
Over 180 lb.	3,095
Sundries	1,608

The grading of pork is 90 per cent. primes and 10 per cent. second quality, and of bacon 78 per cent., 17 per cent. and 5 per cent. of prime 1's, prime 2's and second quality respectively.

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

101-120 lb.	90%, 6%, 4% of P1, P2 and seconds.
121-160 lb.	74%, 21%, 5% of P1, P2 and seconds.
161-180 lb.	58%, 32%, 10% of P1, P2 and seconds.

Which Is The Best Baconer?

Report For Second Season Of Carcass Quality Scheme For Bacon Pigs

Contributed by the LIVESTOCK DIVISION.

THE carcass quality evaluation scheme for commercial baconer pigs has now been in operation for a second season. As previously reported in the "Journal" for May, 1939, this scheme is operated through the combined efforts of the farmer, the District Pig Councils, the export slaughterhouses, and the Department of Agriculture.

Although the farmer has most to gain by knowing which is the best baconer, he is asked to do less than anyone else in the team, but his assistance is absolutely essential to achieve the ultimate aim of the scheme. He is merely asked to inform the District Council Supervisor when he has pigs being fed into bacon, their breeding, and when they are born. The Supervisor tattoos the pigs, the freezing works staff measures them, and the Department of Agriculture assembles the information and passes it back to the individual farmers, to the pedigree breeders of animals concerned, and to the general public as average values set out below.

"Which is the best baconer?" This question is asked at every meeting where farmers discuss pigs. The answer can be found, if at all, only through this scheme. All baconer pigs are eligible for test, and there is no cost to the farmer, although his interest is indispensable to success. He is asked to get in touch with the District Pig Council Supervisor.

Object of Scheme

The object of the scheme is to find out, first, if there is any breed or cross of pigs that is outstandingly good or bad, and, second, ultimately to find strains within a breed that are above the average. It is obvious that large numbers of every breed and cross must be measured before any decision can be reached, and only by many farmers participating can these large numbers be obtained.

Because individual farmers get little useful information about their own pigs, they are not anxious to have them tattooed. By this attitude they defeat the whole scheme. Farmers are especially asked to get as many baconers as possible tattooed for carcass evaluation, and to keep a record of the date of birth of such pigs and of the way they are bred. If they will do this all the information required can be collected in a couple of seasons.

Points Allotted

In the following table pigs have been arranged into groups according to the breed and quality of the boar, and in four registered purebred classes and four non-registered breed classes. Points have been allotted for: Thickness of fat at shoulder (maximum 20 points), at loin (maximum 12 points), for length of side (maximum 20 points), and for growth rate (maximum 80 points). Points awarded for growth rate are actually 100 times the daily carcass growth rate.

For purposes of comparison last year's scores were: Registered Tamworth (94 pigs), 106 points; unregistered Tamworth (92 pigs), 102 points; large white (32 pigs), 107 points. Because only a few pigs are measured, no significance can be attached to the above scoring, and it is published without comment. At least 1000 pigs of each breed are required to ensure that differences of one point are other than accidental.

Breed of Boar	No. of Pigs	Points for				
		Thickness of fat		Body Length	Growth Rate	Total Points
		Shoulder	Loin			
Registered Tamworth	162	19	12	11	60	102
Unregistered Tamworth ..	182	20	12	10	58	100
Registered Large White ..	52	18	12	10	55	95
Unregistered Large White ..	50	19	11	11	54	95
Registered Berkshire	150	20	12	10	58	100
Unregistered Berkshire ..	84	20	12	10	53	95
Registered Large Black ..	5	19	12	8	51	90
Unregistered Large Black ..	12	20	11	9	56	96

Laying Water Pipes for Stock

T.S.M. (BLENHEIM):—

I have just finished putting drinking water for the stock on to every paddock on my 200-acre farm. An artesian well was sunk, and the water was taken from it to the different paddocks by 1¼in piping. Most of this piping was buried a foot under the surface. The balance of it ran parallel along a fence, and also a ditch about 3ft deep. To save the expense of digging and burying the pipe I just dropped it into the bottom of the ditch. The length of this part is 500 yards. The ditch has water in it most of the year.

Now I am told that this pipe will not last for the same length of time as if it was buried in the soil. The water in the ditch is rather hard, but the artesian water in the pipes is what we call soft. Will the ditch water have any effect on the pipes, and, if so, what effect?

I have been a subscriber to the "Journal" for over 20 years and always look forward to seeing it each month.

FIELDS DIVISION:—

Inquiries have been made from the Public Works Department, which advises that pipes buried in the ground will last longer than if laid in an open ditch under the conditions mentioned in your memorandum, the effect of the hard water in the ditch, of course, tending to cause corrosion.

However, if the pipes were given a good coating of bitumen this would add considerably to their life.

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Treatment of Milk-fever in the Dairy Cow

WITH the approach of the calving season, it appears advisable to record a few notes on the fairly well recognised condition known under the name of milk-fever. This disease of the dairy cow is known under several other names; it is recognised as occurring in ewes, and has also been recorded in the sow.

In the first place, it is necessary for the dairy farmer to be able to recognise the disease and to make a correct diagnosis before attempting any line of treatment. The disease is most frequently seen in the high-producing dairy cow in good condition at calving time. Young heifers are seldom, if ever, affected, and cows in poor condition do not commonly become affected. The disease is seen normally within the first few days after calving. It may be seen a day or two before calving or actually at the time of calving, when parturition may be delayed through the disease supervening.

Symptoms

The symptoms take a rather defined course. The affected cow is restless and rather excited in the early stages, but these symptoms may not be observed if the cow is in the paddock. Gradually an unsteadiness in the hindquarters develops; the animal may knuckle over at the fetlock joints, and eventually goes down. After attempts to rise, the animal gradually lapses into unconsciousness or coma. The animal may be found in the paddock in this condition.

The comatose condition is recognised by the sleepy appearance of the animal and the deep and rather shallow breathing. The reflex action of the eye is absent. The animal may be found with the head turned into the flank or lying flat on the side, when a certain degree of tympany is nearly always present.

Treatment

The treatment of the affected animal which can be most conveniently carried out by the farmer consists mainly of udder inflation. The details in connection with udder inflation may be briefly outlined as follows. It is necessary to strip out each quarter of the udder to remove the milk present. The teats should be washed and cleaned, and only a clean sterilised teat syphon used for introducing the air in the quarters. It is advisable to have the teat syphon boiled each time before use.

Quite effective cheap outfits are available for pumping the air into the quarters, but in the absence of an outfit a teat syphon may be attached to the rubber tubing of an ordinary enema syringe. This is preferable to the use of the bicycle pump and valve so commonly seen. It is almost impossible to prevent the introduction of infection when a bicycle pump is used, and many cases of mastitis from suppurative abscesses to gangrene of the udder have been seen following the use of dirty instruments.

Inflation

Each quarter of the udder requires to be distended with air until a marked distension is apparent to the touch. A partial inflation due to a defective pump frequently results in failure to get the cow on to its feet, or may be responsible for a relapse.

When each quarter has been distended it is common practice to tie a broad band of tape around each teat to prevent the escape of air. This will not injure the teat if the tying is undone at the end of three or four hours. By this time the majority of animals have almost completely recovered consciousness, and some may even be quite normal.

Removal From Danger

If the cow is found lying in a depression or near water or a fence it is advisable to remove the animal from any danger. The animal should be propped up on its brisket by bales of hay or straw. It is advisable to cover the animal and protect it from the weather.

No further treatment is immediately called for, and drenching should not be carried out at this stage. It is very questionable whether any drench will influence the course of recovery, as the basis of treatment is udder inflation. The drenching of an animal in an unconscious condition will most probably result in the drench passing to the lungs, and, although the animal may recover from the milk fever syndrome, it will die in a few days from pneumonia. Hundreds of such cases have been seen and reported.

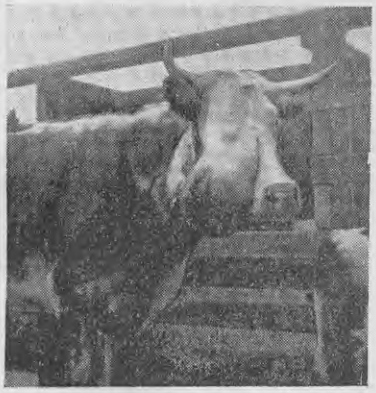
After-treatment

The after-treatment consists of nursing and some attention to the udder. Very little milk will be available for a day or two after the udder inflation; nor is it advisable to strip out the udder unnecessarily. The animal may appear to be constipated, but this is more imaginary than real. It is due to a stasis of the bowels and digestive organs during the period the animal was unconscious. However, at this stage a small dose of salts and molasses may be given without any risk. The trouble is usually overcome by giving a laxative diet for a few days. If attention is paid to detail no losses from milk-fever should be experienced.

If the animal is not affected with the typical type of the disease it is advisable to seek the advice and assistance of a veterinary surgeon.

The application of other methods of treatment for milk-fever, including the use of calcium gluconate injections, is better left in the hands of those more experienced in this line of treatment.

Large Tumour on Face of Steer



THE accompanying photographs show a three-year-old Hereford steer taken from Burnside saleyards during December. The animal was killed at the Dunedin abattoir and the tumour examined and dissected.

No previous history of the case was available, but post-mortem examination disclosed a cancer-like tumour with its centre of origin just anterior to the eye, with the attachment spreading round below and above the bony edge of the eye socket. The main mass of the growth, which weighed about 14lb, hung down the right side of the face, and consisted of a large bulbous portion about the size of a football, attached by a thick stalk to the diffused centre of origin.

The tension on the eyelids had led to almost complete closure of the eye, which was viewed as only a narrow slit behind the attachment of the growth. The skin was continuous over the whole growth except for a point on the lateral surface where an accidental wound had occurred.

On dissecting the tumour from its origin it was found to be firmly attached to the membrane which lines the bones of the face, and appeared to arise from this membrane and from tissue immediately adjacent. Section of the tumour tissue disclosed areas of varying consistency from that of muscular tissue to almost that of tendon; the tissue was very vascular, and numerous blood-filled spaces were scattered throughout. A representative section was taken and forwarded to the laboratory, where histological examination returned a diagnosis of fibroma.

A fibroma is a tumourous growth of tissue known as white fibrous tissue, which is one of the connective or "binding" tissues of the body. It is a benign growth; that is, it does not tend to invade or spread to other parts of the body like the malignant cancerous growths, but exerts ill-effects only by virtue of its size or by pressure on other vital structures.

—B. A. TAYLOR, Veterinarian, Dunedin.

Answers to Correspondents

Cows Eating Pine Needles and Mushrooms

"TOILER" (WHANGAREI):—

As a reader of your "Journal of Agriculture," I must say at times I get quite a bit of useful information therefrom.

My main object in writing is to find out if dry pine needles hurt cows. We

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NAME.....

ADDRESS .....

M.8.27

brought seven cows last May. They had been used to shelter, and when put in a certain paddock would make straight for a patch of pines and eat the dead leaves or needles. Also a brown mushroom that grows only near pine trees. As far as we could see, these do them no harm, but what is your opinion? Perhaps it is some mineral deficiency in the soil, or perhaps it is the turpentine taste that they like.

LIVESTOCK DIVISION:—

The fact of cows eating pine needles and mushrooms may indicate an insufficiency of feed, a mineral deficiency in the feed, or both.

Pine needles are not harmful unless consumed in large quantities, when digestive disturbances may result. The brown mushroom described (*Boletus Luteus*) is not only harmless, but is used as human food in some countries.

A good general lick for cattle may be made up as follows:—Bone-meal or char, 50 parts; salt, 50 parts; limonite, 10-20 parts.

Sores on Pigs

A.E.M. (MORRINSVILLE):—

For some years past in the summer our young pigs have been affected with swellings and sores on the legs and around their jaws. Some of them have had to be destroyed, and though some have recovered, the scar has remained, and this spoils their value. The pigs seem to be healthy enough apart from the sores, which are like abscesses, and eat right into the flesh.

I should be very much obliged if you could tell me what to do for this condition, and, better still, how to prevent it. The sows and young pigs eat plenty of grass. Those being finished are in pens of about one-fifth of an acre, with green grass except round the trough. They are just fed on milk at present.

LIVESTOCK DIVISION:—

These sores or ulcers may be found on any part of the pig's body, and are known as necrotic or spirochaetal ulcers. The infection must be present in your pig sections, and any wound on a pig is liable to become infected.

Common sites for the sores in young pigs are the head, the nose (if rings have been put in), or the jaws, where the original injury may be due to the fighting and biting habits of young pigs on the mother or at the feeding trough. Injuries from barbed wire may cause a wound which later becomes infected with the organisms responsible for the disease. The foot may be infected following injury, and another common site for the formation of the sores is the wound following the castration of young pigs.

The treatment of the sores consists of scrubbing the sores with a stiff brush to remove the outer thick crust or scab. The sore then requires to be dusted lightly with powdered antimony tartrate. This preparation is poisonous, and naturally great care has to be exercised in its use so that none of the powder either gets into the animal's mouth or into its feed trough. Pigs with sores about the mouth are not amenable to treatment, because of the danger of poisoning. The powder, however, is very effective in preventing the spread of a sore and in bringing about complete healing of the ulcer.

The question of prevention of the disease covers an aspect which will mainly be decided by yourself. In the first place, the organisms responsible for the disease are present in your pig sections, probably in the area surrounding the troughs. As a wound is necessary for the organism to gain entrance, all causes of wounds should be eliminated as far as possible. This should cover the young pigs by the removal of the sharp, biting teeth. All barbed wire cuts or other wounds should be dressed with tar.

If the pig sections have been used by pigs for some time it may be necessary to consider a completely new site. If the pig houses are movable, this may be relatively easy. On the other hand, with permanent houses, it is advisable to disinfect the houses and pig troughs thoroughly, and to change the site of the latter to a clean area of the section, applying a good dressing of lime in the immediate vicinity of the troughs. A better method would be the ploughing up of each section as it becomes vacant, liming it and growing a crop of peas or other feed and sowing down again in grass.

All efforts require to be directed to killing out the infection in the pig sections. Of prime importance in this respect is the isolation and early treatment of any pig found to be infected. After the treatment of the infected animals, whichever method of prevention outlined above is considered to be the most practical should be adopted to deal with the pig sections. houses, troughs, and feeding places.

Advisory Service on Veterinary Matters.

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

Farm Practice and Management

Contributed by Officers of the Fields Division

Useful Home-made Saw Bench

BY cutting his own timber out of old logs found on his farm, Mr. W. D. McKay, Makokomiko, has saved many pounds in building a new house. In country recently cleared from bush there is usually a fair percentage of sound logs left after a bush burn. These are usually well seasoned, and, although too short for milling, can often be economically used for private purposes.

Like most farmers, Mr. McKay had a small circular saw which was used for cutting firewood for the kitchen. This saw-bench was improved by the addition of a sliding platform to carry the logs, and has proved very useful for cutting much of the heavier timber used in the construction of his house.

Fig. 1.—The saw bench at work. Note the rough logs on the sledge at the left, and a 10-foot window sill against the fence.

Below—

Fig. 2.—A close-up showing the sliding platform and the 6in. nails regulating the width.

The sliding bench is built of 3in by ½in T. and G. match lining, strengthened with a frame and stays of 3in by 1in timber and mounted on small rollers set on top of the original bench.

With this bench the rough timber is broken down and squared as in larger mills. This bench has been improved to enable straight lengths of timber to be cut from the squared log. Small holes have been bored in the bench at accurately-measured distances from the path of the saw, and 6in. nails placed in these make excellent gauges, which allow several different widths of timber to be cut with little adjustment.

—*W. T. BROWN, Fields Instructor, Taumarunui.*

Extending the Life of Farm Buildings Without Heavy Costs

A JOURNEY through almost any farming district will reveal wooden farm buildings in many stages of repair and disrepair. While good durable timber has been used in erecting a fair proportion of these buildings, many are constructed of poorer and cheaper grades of timber. Much of the disrepair and deterioration can be directly traced to the lack of painting or other treatment of the woodwork.

It may be argued that buildings of cheap inferior timber, so commonly used by the farmer, are only temporary structures. Further, it is sometimes stated that such timber is not worth the expense of painting. But such temporary buildings have the habit of becoming permanent, that is, as long as the timber will last.

Making Woodwork Last

No doubt exists that all woodwork of farm buildings, especially where exposed to the weather, will last considerably longer if preserved by paint or other suitable material. Untreated timber dries out, splits, and opens up under a hot sun, while in wet weather the moisture penetrates deeply, and subsequently the timber quickly rots.

The necessary two or three coats of paint may prove costly, but with farm buildings, where utility counts for more than beauty, substitutes are available. Gates and railings have been successfully treated by coating them thoroughly with used engine oil. Further, used engine oil from the milking motor, tractor or car could no doubt be applied to the exterior woodwork of buildings. Already, clean mineral oil is used as a dressing for the interior woodwork of milking sheds.

Tar Mixture

Tar, the by-product of gas works in the towns throughout the farming districts, is quite reasonable in price. In the past its use has been objectionable because it was necessary to heat the tar to enable it to be brushed over the surface. A more easily applied and suitable dressing consists of a mixture of two-thirds ordinary tar, one-sixth creosote oil, and one-sixth kerosene. Some farmers have used a simple mixture of two-thirds tar and one-third creosote oil with good results.

The oil and kerosene are simply poured into the tar. The mixture is then stirred thoroughly and applied with a wide brush. The addition of the creosote oil and kerosene makes

the tar run more freely, results in deeper penetration into the timber, and does away with the necessity of heating the tar.

The mixture should not be used unless the timber is bare and free from oil paint, as it dries very slowly, and it is essential that there should be no film to stop penetration. Further, it is most essential that the timber be thoroughly seasoned and free of moisture. If the timber is wet when the mixture is applied, rotting will begin inside the timber, although the surface may appear sound. In addition, it must be remembered that such a mixture of tar is unsuitable where the buildings are likely to be painted later with oil paint, as it will prevent the paint from drying and will cause discolouration.

Examples of the value of the simple tar-creosote oil mixture can well be quoted. Pig houses constructed of white pine timber and treated some six years ago are still in good condition. Gates and railings where the surface is rubbed by stock require treating only once in three years, while with the better class of timber a thorough coating resulting in deep penetration will last at least eight years.

—E. H. ARNOLD, Intsructor in Agriculture, Dargaville

Soil Consolidation Is Necessary In The Western Bay of Plenty

ONE of the most common causes of poor pasture establishment in the Western Bay of Plenty is sowing the seed on a poorly consolidated seed bed. No matter how much fertiliser is used or how good the quality of the seed, a greater part of the value may be wasted if the seed bed is loose and unconsolidated.

It is commonly thought that one rolling before sowing the seed is all that is required to give a proper seed bed, but such is often not the case. Many instances of poor pasture establishment can be traced directly to the fact that seed was sown on a surface so loose that one could easily sink in two or three inches. Here, it is quite obvious that one rolling will have very little effect in making the soil compact.

Rolling Not Sufficient

Rolling, in itself, is not sufficient. Every operation from the initial ploughing to the final working should be aimed at producing that firm, fine seed bed so essential on our light pumice soils.

Ploughing should be done early—within reason, the earlier the better. Allow the paddock to lie fallow until a few weeks before sowing the seed. Then roll on the furrow to help fill in any air pockets at the bottom. Give the paddock at least two double cuts and the finer soil tends to move to the bottom of the furrow, thus further helping to fill any air pockets. Discing must be deep to be satisfactory, and discs should be in good condition. An old, worn-out set of discs will do but an indifferent job of work.

After discing, several strokes with the tine harrows will help to break down any surface clods and also give a further measure of consolidation. Finally, give the ground a thorough rolling just before sowing the seed. If no roller is available, driving a mob of sheep or dry stock over the paddock will give comparable results.

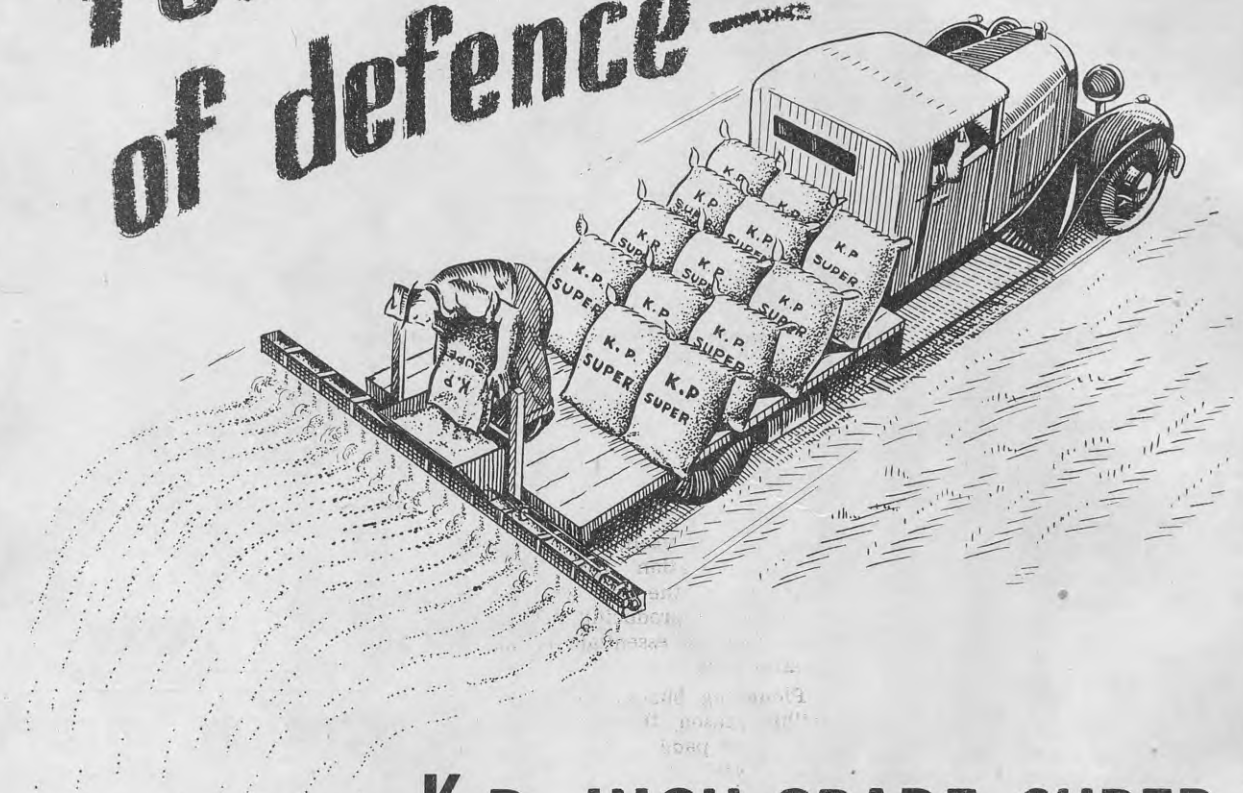
Value for Your Money

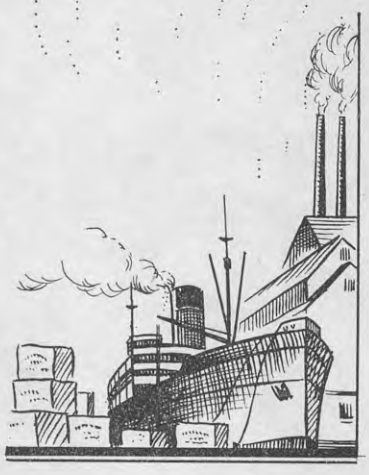
Thus can a firm seed bed be obtained. Whether the seed bed is for grass, lucerne or crops, a consolidated seed bed is essential.

Why spend £3 or £4 per acre on seed and manure, only to lose half the value through sowing on a poor seed bed? If only the land received a more thorough working, one would hear it said less often that it takes four or five years for ryegrass to show up in a new pasture in the Bay of Plenty.

—A. V. ALLO, Instructor in Agriculture, Tauranga.

Your best line of defence——





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See For Yourself

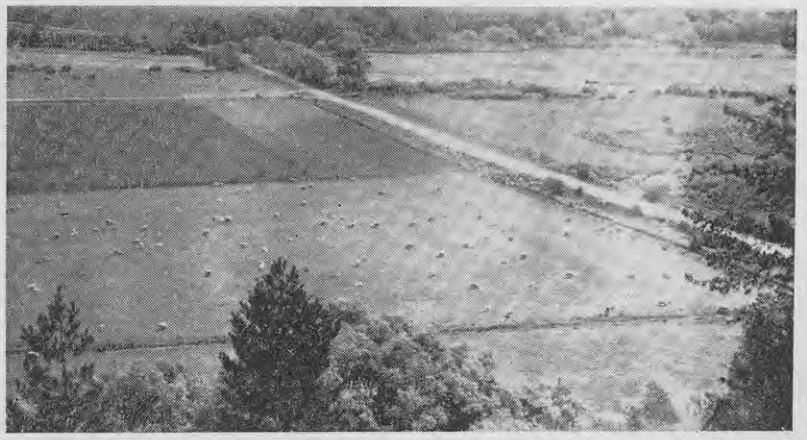
Better Pastures Will Carry More Stock

IN continuation of the series in which some outstanding feature of farming is selected for comment in different sections of the Rangiora district, this article emphasises the value of good pasture. Our attention is being continually drawn to the need for increased production, and by the use of better pastures we can carry more stock, do them better, and so help in the national war effort.

There is no doubt that we can compete successfully with other countries in the production of wool, cheese, butter and meat, but this has been largely due to our favourable climate and soil. Grass, our cheapest food for stock, is too easily produced and is, on the whole, not grown as efficiently as our root and cereal crops. How many farmers devote as much preparatory cultivation to grass when sowing down as they would to a crop of turnips? Very few. And yet the pasture is expected to last three years or more, while the turnip crop is in the ground only six months.

Poverty of Pastures Not Realised

Perhaps it is because a partial failure with a root or cereal crop is easily measured with the eye, while poor pastures are so common that they attract scant attention. Many farmers do not realise just how poor their pastures are until they see what can be done with the aid of certified strains of grasses and clovers together with liming and manuring. In North Canterbury the recently inaugurated pasture competitions are fulfilling a long-felt want in this respect. Interest is being stimulated in grass, our most important crop, and the scope for improvement is just beginning to be realised.



Sheep grazing on strain trial. A view from the top of a hill on the Kaikoura road, Lottery Bridge in the distance.

Trial plots laid down by the Fields Division of the Department of Agriculture are used to demonstrate the good and bad qualities of the different strains of grasses and clovers in various localities. One of these plots in the Waiau district is well worthy of inspection by farmers in the vicinity.

Revealing Trials

Situated on the right-hand side of the road just over the Lottery Bridge on the inland road to Kaikoura, the trial is on the farm of Mr. A. C. Brustad. There are 40 plots sown with the different strains of grasses and clovers. The land was previously in rough swamp, and has been drained, limed, and sown down with superphosphate.

Although the seed was sown as recently as January, 1939, already differences can be clearly seen. For anybody still sceptical of the value of sowing the persistent strains, the opportunity is there, and all they have to do is **see for themselves.**

The latest selections of pedigree ryegrass, white clover, red clover and cocksfoot are included in the plots both on their own and in mixtures. A plan of the plots can be obtained from the owner of the property.

—A. S. NASH, Instructor in Agriculture, Rangiora.

Rejuvenating Root-bound Paspalum

ONE of the most difficult problems in the management of paspalum is the condition known as root-binding. Where paspalum has become root-bound there is a decided falling off in production. This condition is brought about by failure to maintain soil fertility at a fairly high level by supplying plant food in the form of lime and phosphate.

Root-bound paspalum is very slow in responding to manurial treatment, and to make this effective it is necessary to tear open the matted surface roots by surface cultivation or ploughing. The most successful method of rejuvenating root-bound paspalum swards is, where practicable, to plough in narrow furrows as shown in the accompanying illustration.

The ploughing, which should be done in the early autumn, will renew the vitality of the paspalum, and further cultivation will provide a seed-bed so that other grass and clover species can be introduced. This treatment, combined with adequate supplies of suitable fertiliser, will convert a very low-producing sward to a reasonably high-producing one.

This illustration shows how ploughing will rejuvenate root-bound paspalum swards. Note the young growth of paspalum coming through between the furrow slices.

Continued top-dressing and frequent cultivation with disks or penetrating harrows after renovation will prevent a recurrence. Paspalum will stand all the cultivation that can be given it, and this is one of the main methods of keeping it thriving and preventing root-binding. On areas that are difficult to cultivate, top-dressing and winter stocking with heavy cattle will help to prevent this condition.

—E. B. GLANVILLE, Instructor in Agriculture, Whangarei.

Fresh Blood as Manure

S.K. (RAWENE):—

What is the best way to treat fresh blood to make manure? Could it with advantage be mixed with sand, super. or used in the making of humus indore process?

FIELDS DIVISION:—

Commercially, dried blood is prepared by steam-heating, drying, and grinding the collected blood of slaughtered animals. When only small quantities are available, as I presume is so in your case, some farmers have had success by simply distributing the fresh blood over their pastures. A fresh area is treated each time supplies are available, and in time the whole of a field is so dressed.

Fresh blood would not be suitable to mix with superphosphate, and with sand some of the blood would pass through and be lost. It would be quite suitable to use in the making of humus indore process.

A complete clean-up of severe grass grup infestation of a strawberry patch is claimed by a Central Otago grower. In the past large areas of strawberries in this locality have been ploughed in owing to the ravages of this pest. When fertilising the plot in the spring arsenate of lead was mixed with the manure at the rate of 10 lb. per 44 sq. yards. The mixture was scattered on the surface and not worked in. Following this, the land became practically 100 per cent. clean, but to make doubly sure the plants and soil were subsequently sprayed with arsenate of lead 6 lb.-100 gals. No sign of grub damage has been seen since.

The Orchard and Vineyard

Contributed by the Horticulture Division

Orchard Notes

Stocktaking in the Orchard

THERE are times when every person engaged in fruit-growing should take stock. It is poor practice to continue growing fruit year after year without reviewing the various operations of the past season, which could well be done at the close of any fruit season. Here are a few points to give a lead in this stocktaking.

(1) The crop produced.

Could you have produced a heavier crop of fruit? Possibly you could have done so had you given more attention to certain details. Have you been pruning the trees in such a manner and along the lines most suitable to your particular varieties and soil conditions without sacrificing quality for quantity?

(2) Were you satisfied with the quality of the fruit produced?

Perhaps you could have increased the percentage of high-grade fruit if you had cut out more of those crowded fruit spurs when you were pruning. Remember that multiplicity of fruit spurs neither indicates a heavy crop nor high quality of fruit, but often the reverse. Did you thin the crop in such a way as to produce the highest grade fruit? All fruit requires room to grow and develop properly. You may not have given sufficient consideration to the spraying materials you were using, thereby causing a certain amount of injury to the foliage and fruit. The soil conditions may not have been altogether satisfactory for the proper development of the fruit, and you realised when it was too late that you had too great a proportion which only qualified for the lower grades. Try and improve on this.

(3) Were all the pests and diseases controlled as they should have been?

If not, what is the reason? Is it found in any of the following?

(a) Faulty or inadequate spraying equipment.

(b) Incomplete coverage of fruit and foliage.

(c) Trying to get through the work too quickly.

(d) Using spraying materials that have not been certified.

(e) Approaching the trees from the same angle each time when by coming up to them from a different angle may have given better results.

Analyse all these points carefully and see if you are able to make any improvement in disease control. You do not want excess russetting, black spot, codling moth, or any other disease if it can be controlled. It has been done, and you can do it, too.

(4) Have you given any thought as to what it is costing you to produce your fruit? If not, why not?

Consider the following points and act accordingly.

(a) Keep a record of the cost of spraying materials.

(b) The number of days spent on pruning.

(c) The time taken for cultivation, spraying, etc.

(d) The quantity and prices of the various manures used and the time of application.

(e) Any items in connection with running the orchard.

You say there is not sufficient time for this to be done. If you have never tried it you are quite incompetent to say it cannot be done. Try it, and you will be surprised how little time it takes; besides, you will get quite a lot of pleasure out of it. After you have done this for a short time you will begin to analyse the figures recorded and to make investigations to find out how and where you can reduce costs.

(5) Are there any other details which if they had received attention may have improved your position?

What about the following?

(a) Because of weakness in one portion of the shelter belt the gale spoilt a portion of the crop. This could have been prevented had you been more observant previously.

(b) Are there some varieties which are uneconomic? Consider working them over to better and more profitable varieties; it may mean a small temporary loss, but eventually you would receive better returns. Try and correct even the smallest errors or

Seasonal Work

Tree plantings and preparation of the soil.

Push on with the pruning and complete as early as possible; gather up and burn all prunings as they are often a source of disease infection.

Dig around trees where necessary.

Overhaul the spraying outfit.

Spray stone fruit trees for insect pests, using lime sulphur 1 in 15, that is, 1 gallon of lime sulphur to 15 gallons of water.

In August spray all stone fruits with Bordeaux mixture 5-4-50 for the control of the various fungus diseases.

Clean up and attend to all shelter belts, inspect drains.

Clean up packing shed if this has not already been done.

faults and see if it is not worth while. Others have been successful. Why not you?

(6) Have you noticed that in one portion of the orchard the trees were showing unmistakable signs of deterioration?

Perhaps this is caused by one of the following:—

(a) Imperfect drainage.

(b) Existing drains being partly choked.

(c) Unsuitable soil conditions.

All fruit trees resent having wet feet; therefore, every care should be taken to see that sufficient drainage is provided. If already drained, see that drains are not blocked, thereby ceasing to be of any value.

(7) Did you give all the attention to cultivation that was necessary for the complete and proper functioning of the trees during the past season?

You do not believe in ploughing now you have the rotary hoe. This rotary hoe is quite good, but does not fully take the place of the plough in the orchard. Ploughing is necessary at least once each year in either late autumn or early winter for the following reasons:

(a) To provide conditions for taking away excess surface water during periods of heavy rainfall.

(b) To bring up the soil so that it is exposed to the sunlight and air.

(c) To prevent the soil becoming waterlogged, which is likely if it is allowed to lie close and flat all through the winter months.

It is advisable to turn the soil up to the trees before the winter rains set in; remember to plough with or along the slope of the land, otherwise it is not possible to get good conditions for draining excess water away.

(8) Are there any improvements that could be made in the gathering or harvesting of the fruit?

Why pick immature fruit and expect the consumer to buy large quantities? You have possibly done this in the past. Why not try another plan and allow the fruit to reach a greater degree of maturity? You will, of course, be guided by the following:—

(a) Whether for export overseas.

(b) Whether for immediate consumption.

(c) Long cool storage or short storage.

(d) Whether tree-ripened fruit is desired.

All such matters require consideration; however, it is just as easy to do things in the right way as in the wrong. Try and view fruit-growing from two different angles—your own and that of the buyer or consumer. The consumer is the person who eventually determines the price you will get and the quantity you will be able to sell. Try and give him the quality and he will increase his consumption.

(9) What consideration have you given to the manures you have been using in the past? Have the results obtained from their use been quite satisfactory?

All trees require phosphoric acid, nitrogen, and potash, and they also need organic matter, which is the base of all plant life. Some consideration should be given to this, and some means used in order to keep up the supply.

(10) The packing shed in which you have been accustomed to grade and pack the fruit.

Here are a few points for consideration.

(a) Do not be content to continue trying to handle the fruit under cramped conditions.

(b) See that the shed is in a sanitary condition by keeping it clear of decaying and rotten fruit.

(c) Do not use the fruit packing shed to store manures.

(d) Have a reasonable supply of fruit cases ordered and made up before the fruit harvesting season begins. These could be stored in a part of the packing shed if another shed is not available.

The common cry is that fruit-growing will not pay for the many things outlined above. If you have not tried them you are incompetent to speak. There are many who have found that nothing but the best ever pays.

You can get advice from the officers of the Department of Agriculture on all matters relating to the production and preparation of fruit for the market.

I cannot close this brief review on stocktaking without calling your attention to one very important point—"The Foundation." If this is weak, then the structure is hardly likely to stand for any length of time. Do not despise fruit-growing because some have failed to make a success of it; rather, remember that others have been successful. Try to find out the reasons that make for success. What others have done, you can do.

—L. PAYNTER, District Supervisor, Auckland.

Citrus Notes

Have You Considered These Points In Harvesting?

ONCE again the months for harvesting the main crops of citrus fruits have arrived, and upon each individual grower rests the responsibility of so harvesting those fruits that they will have every probability of arriving to the consumer in a sound condition. Think over these points and make sure you are picking correctly.

(1) The Time to Pick.—This depends upon several factors. For sweet oranges and New Zealand grapefruit the chief is palatability. Do not pick too soon, but allow the fruit to ripen on the tree. The lemon, on the other hand, should be picked more to size, that is, an ideal of 2⅛ to 2¼ inches in diameter. If fruit is silver-green or just coloured at this stage of growth it should be picked in order that it may be cured, packed, and retailed in sound condition and of a size desired by the purchasing public. Do not pick too soon after a severe rainstorm, and be particularly careful with wet fruit to avoid the disfigurement of oil spot.

(2) Picking Equipment.—Before starting picking examine your field cases. You will be surprised to see the odd nails or wood splinters which are sure to cause injury. What about the picking bag? Do you empty it frequently, or is it full of "buttons" and small twigs? How long do you place your field cases out in the orchard before picking? Do you allow them to become sodden and then fill them with sound fruit? Do you even sterilise your cases and remove the remnants of rotten fruit? If not, do it this year and check wastage. A solution of formalin, 1 gallon to 100 gallons of water, is recommended. This job should be done in the open, as formalin fumes are apt to have an unpleasant effect on the operator indoors. Are your field cases suitable, or are they too heavy to handle when full of fruit? A case about the size of a bushel is better than a larger case such as an orange box.

(3) How Do You Pick Your Crop?—Do you make two cuts, and is the second one close up to the button, or do you make only one, leaving either a mass of dead and dying twigs in the tree or a stub beyond the button of the fruit which will injure other fruits? At this time of the year thorough picking will improve your trees. Do you climb into your citrus trees? If so, how about injury to the bark and the entry of spores of bark-blotch? Take extra care and wear gum boots or field boots with rubber soles and no protruding nails.

(4) What Do You Put Into Your Field Cases?—Everything? That is a mistake. At every picking certain fruits should be discarded—freaks, split fruit, diseased fruit, and excessively malformed or blemished fruit. Why cart that to your shed and then pay to have it sent to your depot when you know it will only be rejected at the end—an unnecessary expense to you and to everyone else who has to handle it? Bury these reject fruits at the orchard. Do you fill your cases too full? Is not that going to cause injury to other fruits when you stack your cases in your shed or transfer them to the carrier's lorry?

(5) Finally, How Do You Handle Your Cases?—Cases must be lifted and stacked carefully if fruits are to remain sound. Minor abrasions permit the entry of spores of rotting fungi. Do not assist them by the way you handle your fruit.

Shelter

Now is the time to plant shelter trees. Shelter is one of the secrets to success in citrus culture. Is your orchard adequately sheltered, or could it be improved by pines, Lawson's cypress, bamboo, *hakea*, *acmena*, *abelia*, or some other hedge plant or tree which does well in your locality? What about the draught under your line of eucalyptus or pines? How do you expect to grow good citrus fruits free from blemish when that draught is allowed to continue? Plant shelter this winter and notice the result in a few years' time. Citrus culture is a long-term job, and shelter is a long-term necessity.

Liming

Are you going to lime your orchard this winter? It will improve conditions for the lowly plant life of your soil if it is acid, and will thus benefit cover crops and your trees. See that the lime ordered is high in actual calcium carbonate, or if freight is a major problem consider the advisability of applying the lime in the burnt form. If you use superphosphate and your soil is rich in iron or alumina, lime is a necessity.

Make early preparations for spring cultivation so that you may utilise to the full the periods of fine weather durin gthe showery months of July and August.

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

Viticulture

Tannin and Its Uses in New Zealand Wines

THIS article has been written with the object of bringing before the New Zealand wine-maker the facts regarding the use of tannin in New Zealand wines, and of pointing out that the use of this substance in the wines will greatly help the wine-makers to produce a more staple and better product.

The article deals briefly with the normal constituents of wine, the variation of the tannin content from different areas, the use of tannin in wine-making, the value of grape tannin as against other tannins, and how to use tannin.

General

During the last hundred years the research work of a number of scientists has shown us the true meaning of the changes which occur during the fermentation and maturing of wine. As is well known, the quality of the wine depends firstly upon the quality of the grapes from which it is made, and the quality of the grapes is determined by a number of factors, such as climatic conditions, soil and cultivation, treatment of the vines, the variety of the grape, and the degree of ripeness that the grapes reach before picking.

Grape-juice is a complex aqueous solution, and contains a very large number of constituents, the main ones of which are:—(1) Sugar; (2) organic acids; (3) proteins or albuminoids; (4) flavouring substances; (5) Pectin and mucilaginous substances; (6) mineral substances; (7) tannin.

We will consider very briefly what happens to these constituents during the fermentation of the must.

1. Sugar

During fermentation the sugar is split up into approximately equal parts of alcohol and carbon dioxide. Must containing, say, 10 Baume on completion of fermentation will produce approximately 10 per cent. alcohol or 17.5 per cent. of proof spirit.

2. Organic Acids

Although present in only small quantities, malic and tartaric acids are essential constituents of the must. The tartaric acid is in combination to a large extent with potassium, and is partly precipitated during fermentation as potassium acid tartrate.

For a wine to be palatable, its acidity must be in proper ratio to its alcoholic strength and body, and in some cases it may be necessary to raise the acidity of a wine by the addition of citric acid. However, as New Zealand wines have usually an excess of natural acid, it is unlikely that additions would have to be made except in the case of the heavier type of sweet wines.

3. Albuminoids

The must from New Zealand-grown varieties usually contains a large percentage of albuminoids, of which approximately half remains in the wine; the rest is utilised as yeast nourishment, or is precipitated during fermentation. As the yeast cells are largely of a nitrogenous character, a large amount of their decomposed cells spread throughout the fermenting juice, and the amount of albuminous matter becomes much higher than was present originally in the grape itself.

A serious effort should be made on the part of wine-makers to ensure its total elimination from the finished wine, and thus prevent condition troubles. The presence of large amounts of albuminous substances in the young wines also causes to a considerable extent bacterial troubles.

The action of tannin is to precipitate albuminous substances and to cause them to settle in the "lees," which are removed on racking the wine. Wine which contains little or no tannin holds the albuminous matter for a longer period, producing a very detrimental effect on the wine.

The only permanent and satisfactory method of precipitating these substances is by means of tannin. If the wine does not contain sufficient natural tannin it becomes necessary to make up the deficiency by adding the required amount of pure grape tannin.

4. Flavouring

The flavouring substances increase somewhat during fermentation. The fermenting must contains (1) the original flavouring substance, (2) those formed during fermentation, and (3) those produced by different varieties of yeast.

5. The Pectins

Because of the precipitation of potassium acid tartrate during fermentation, the proportion of mineral substances decreases. The amount present in New Zealand wines varies considerably with the different districts, but may be said to be between 0.1 to 0.5 per cent.

6. Tannins

It has long been known that a tannin derived from grapes is one of the constituents of wine. It is known that tannin plays a very important part in wine-making, and that a deficiency of grape tannin in the wine may have very serious consequences for the wine-maker.

The red wines fermented on the skins contain more tannin than the lighter delicate white wines, but, even so, the reds still contain too little tannin for the successful elimination of the albuminous substances.

As tannin assists the yeasts considerably during fermentation, it is advisable to add tannin to the fermenting must at the rate of 8oz per 100 gallons. This tannin added during fermentation is to a large extent used up and precipitated with the lees, and the wine, when fermentation is completed, will still be deficient in tannin, and may require a further addition of from 2oz. to 4oz. per 100 gallons to help deposit the albuminous substances still held in the wine.

Classification Of Tannins

There are a considerable number of different tannins, which are further divided into sub-groups. However, it is not necessary to deal with these different types of tannin, and it will be sufficient if it be clearly understood that when the term "tannin" is used in conjunction with wine and wine-making operations it indicates one specific variety of tannin, namely, oeno-tannin "a natural tannin derived from the vine and its fruit," or, as it is more commonly called in New Zealand, "pure grape tannin."

This tannin does not cause any harshness; on the contrary, its use under certain conditions will reduce the harshness in wine.

One of the virtues of oeno-tannin is that, unlike other tannins, it is not decomposed by fermentation to break up into glucose and gallic acid.

Tannin In Wine-making

As tannin is a natural ingredient of grapes, it follows that in the ordinary process of manufacture the wine will obtain a certain amount of its requirements during fermentation. Because of the climatic conditions ruling in New Zealand, however, the grape itself is very deficient in tannin, and even red grapes, which are kept fermenting on the skins, sometimes for weeks, are still very deficient in tannin.

Of the New Zealand white wines, which should be fermented away from the skins, it can be said that the tannin content is practically nil. It is therefore necessary to add tannin to both the reds and whites during and after fermentation.

Wines from the high rainfall areas have, as stated, a very low tannin content; for such wines grape tannin has proved its superiority. Due to its origin, it adds to the wine the necessary tannin in its best form. Because of its mildness, quite large doses of grape tannin can be added without harm. The proper balancing of the wine with grape tannin is an insurance against the risk of secondary fermentation.

If the whole of the nitrogenous matter is properly eliminated, the food supply for the development of disease bacteria is withdrawn.

Grape tannin also guards against the flattening of wine with age, because it assists in keeping the tartaric acid in solution, a most important point for the wine-maker in New Zealand, where the tendency is for wines to throw out tartar deposits in the cooler weather.

Where a wine is too acid, the addition of tannin will take the "sharpness" off the wine.

In wet and unfavourable years the wine may suffer from general debility, characterised by thinness and absence of stability. In such a year tannin becomes a necessity, as the addition of tannin will immediately act as a filler to the wine, giving it a rounder, fuller character with the impression of greater substance.

In the northern areas of the Dominion a considerable quantity of American East Coast varieties of grapes are grown and used in wine-making. It is in these wines that tannin is so necessary.

Grape tannin is easily soluble, and 1 lb. of tannin can easily be dissolved in 1 gallon of wine or water. The tannin should be added to the wine slowly, and the lot well stirred until complete solution takes place. It can then be poured into the bulk of the wine and the lot roused thoroughly. There are many grades of tannin on the market, but it is essential to remember that only pure grape tannin is suitable for use in wines; to use other types is to court disaster.

For any further information on this subject the reader is invited to call or write to the Vine and Wine Instructor, Department of Agriculture, Private Bag, Auckland, C1, New Zealand.

B. W. LINDEMAN, Vine and Wine Instructor, Te Kauwhata.

Tobacco Notes

Provision of Shelter Belts

ONE of the main causes of severe losses to the tobacco growers of New Zealand in the past has been lack of shelter for their crops. Many fine stands of tobacco have been raised in districts where soil and climatic conditions (apart from prevailing winds) were ideal which, however, have often been ruined before reaching the ripening and harvesting stage through the failure to provide protection against damage likely to be caused by high winds.

Many growers in districts where tobacco is now well established have minimised this risk considerably by planting permanent shelter belts.

Two of the most suitable and quick-growing varieties of wind breaks to plant for this purpose, particularly in the Nelson districts are Lombardy poplar (*Populus fastigiata*), and acacia (*Abizzia lophantha*).

To obtain the best protection from the minimum of shelter belts, a tobacco plantation should be divided into sections of approximately five acres, and the borders of each section, as well as the boundaries of the plantation, planted with the permanent shelter most suitable to the district.

If poplar is decided upon as a windbreak, either young seedling trees or cuttings can be planted in single rows 2ft. apart. Where the variety of wattle mentioned above is selected, it should be sown or planted in two rows (staggered), 3ft. between plants or seed and 4ft. between rows. Before being sown, wattle seed should be steeped for at least five minutes in boiling water.

The advantage of using Lombardy poplar for a windbreak for tobacco lands is the tree's habit of drawing its food supply from the subsoil, using little or no organic matter from the surface soil, so that planting can be done to within a few feet of the break.

Where it is not possible to divide a plantation into small enough sections for the permanent shelter to give full protection to the tobacco crop, the most exposed areas of the block should be sown a month to six weeks in advance of the planting season with maize breaks. These breaks should be sown 3ft. wide, one break to every seven or eight rows of tobacco. The maize should be sown by hand or drilled in at intervals of 3in., with one foot between the rows.

If fertilised, cultivated, and given proper attention, these maize breaks should produce a crop which, when harvested and sold at the end of the tobacco season, would pay for the cost of their production.

—U. A. YELDHAM, Department of Agriculture, Wellington.

Cool Storage Notes

Critical Time Approaching

THE critical time in the life of fruit being held in cool storage is now approaching, as by the end of July defects in fruit will rapidly become apparent. Breakdown tendencies in apples from constitutional causes, such as bitter pit, water core, and mouldy core, will require detection at an early stage to avoid losses.

Samples of the fruits from different lines of the various varieties of apples now being held should be cut in order to detect any sign of breakdown tendency or loss of condition and quality.

Largely because of the shortage of cool storage space during the export season to meet the requirements of fruit intended for long storage, unavoidable delays in getting some of this fruit into cool storage will in all probability have the effect of shortening the life of the fruit. This will necessitate a constant inspection for signs of deterioration from causes such as fungal rotting, flesh collapse, and external and internal discolouration, or other signs which indicate that the fruit is reaching the end of its useful cool storage life.

Lines of pears held should be thoroughly examined, as advancing maturity caused by delays in the fruit reaching cool storage, or unfavourable cool storage temperatures, will very quickly develop into serious losses if this fruit is held for a longer period than will allow it to reach the consumer in good condition.

When pears have been slowly maturing during cool storage, mould and rots will develop quickly.

—A. POWELL, Cool Storage Officer, Wellington.

The Home Garden

Vegetables, Small Fruits and Flowers

Points in Growing Asparagus

F. SYDENHAM, Assistant Horticulturist, Wellington.

ASPARAGUS is not difficult to grow. A suitable soil is required, full sunlight is necessary, and the winter should be sufficiently cold to ensure entire dormancy of the plants for several months. If careful attention is paid to both establishment and maintenance of the crop, profitable production should be obtained for 20 years or more.

Asparagus is not as yet subject to disease in New Zealand, and the production is only slightly affected by unfavourable climatic conditions. An unseasonable frost or a hailstorm may damage one day's crop of shoots, but the ability of the plant to develop more is not impaired.

Establishment

Soil

Maximum production of asparagus shoots is obtained on deep, fertile, sandy loam or peaty loam soils. Heavier classes of soil may be used, but before the crop can be grown satisfactorily in such soils, they must be made more friable by the admixture of horse manure, compost or rotted strawy material, and a generous application of lime should be given.

The site used should be well drained or capable of being drained so that the water table can be kept at least 4ft. from the surface of the ground. On low-lying soils that are inclined to be wet the planting of the crop in raised beds may be practised. The effectiveness of this method, however, will depend on how near to the surface water lies during the winter.

Preparation Of Ground

Those who contemplate planting this spring will, no doubt, have prepared the ground thoroughly in the autumn.

Seasonal Don'ts

Don't

let similar crops follow one another in the same piece of ground. It is advisable to rotate the crops. In this way the diseases peculiar to the different crops will be reduced, and the plant foods of the soil and of the artificial manures applied will, under crop rotation be utilised with greater economy. The work is simplified if crops which have similar requirements are grown together. A suitable four-year rotation is as follows:—First year: roots (trenching and no farm manure). Second year: surface crops, such as lettuce, peas, spinach (digging and inclusion of farm manure). Third year: potatoes (digging and inclusion of farm manure if the land is not very fertile). Fourth year: cruciferous crops, cabbages, swedes, etc. (digging and inclusion of farm manure and lime).

Don't

plant seeds in ground that is wet and sticky. The seeds should be sown only when the ground is in loose, friable condition. An article on the planting of seeds was given last month.

The ground should be trenched and farm manure or compost incorporated in the lower levels.

During the preparation all perennial weeds, especially twitch grasses, should be eradicated completely.

In small areas it is frequently an advantage to enrich the ground with farm manure, but on larger areas this may not be possible, and a cover crop should be dug under several weeks before planting.

As the crop is not tolerant of acid conditions, a dressing of ground limestone at the rate of at least ½ lb. to the square yard should be applied after trenching the land.

Raising of Plants

Asparagus plants are not difficult to raise from seed sown in September and October when the ground has warmed sufficiently to ensure the best conditions for germinating and establishment. It should be sown very thinly, and covered with 1 to 2 inches of soil. The seedlings should appear in two to three weeks, and should then be thinned out so that they stand singly 4 in. apart.

Planting

August and September are the best months to plant. Only those one-year-old plants which show well-developed crowns, each with a number of prominent buds, should be planted. Every care should be taken while handling not to allow the roots to dry out.

Experimental work in England and America has shown that well-grown, one-year-old plants are more productive than two- or three-year-old plants.

Planting Distances.—The commercial practice is to plant 18 in. apart in rows of 6 ft. apart. In home gardens this space can seldom be allowed, and planting in double rows spacing the plants 18 in. apart each way is recommended. Where more than two rows are required, a space of 6 ft. should be allowed between the double rows.

Depth of Planting.—The crowns should be set 8 in. below what will be the final level of the ground. So that this may be accomplished and the crowns not covered immediately with this depth of soil, they should be

What To Do In The Garden Next Month

Summary of Operations During August

VEGETABLE SECTION.

SOWINGS UNDER GLASS.

Celery, celeriac, capsicums, cucumbers, egg plant, melons marrows tomatoes (for outdoor crop). Set kumara roots for shoot production.

SUCCESSIONAL SOWINGS.

Turnips, lettuce, spring onions, radish, spinach (round seeded).

OTHER SOWINGS.

Peas: A sowing of the four varieties W. F. Massey, Greenfeast, Onward and Alderman (tall) will mature in the order given, and should provide peas from Oct. to end of Dec.

Broad beans, globe beetroot, cabbage (spring varieties), carrots (shorthorn varieties), cauliflower, onions (to develop without transplanting), pickling onions (Early Barletta and Silver Skin; sow thickly in wide drills at about 50 seeds per foot), parsnip (Oxheart should provide roots in Dec.). The main crop planting of parsnips should be delayed until Oct.

SEEDLINGS TO TRANSPLANT AND PLANTS TO SET

Spring Cabbage, lettuce, onion, early potatoes (Arran Banner), shallots (complete planting this month).

PERENNIAL CROPS.

Asparagus transplant seedlings (1-yr. plants are the most suitable). (See article in these notes). Rhubarb, set crowns.

CROPS IN SEASON.

The month in brackets represents the month of sowing the seed.

Salads.—Endive (Mar.), celery (Sept.).

Greens.—Brussels sprouts (Sept.), borecole, broccoli, cauliflower, savoy cabbage, silver beet (all in Oct.), spring cabbage (Feb.), spinach (Mar.),

Roots in the Ground.—Artichokes (Oct. tubers), beetroot (Mar. in warm districts), celeriac (Sept.), carrots (Feb.-Mar. shorthorns), leeks (Oct.), parsnips (Oct. and Dec.), salsify (Oct.), swedes (Feb.).

CROPS IN STORE.

Beetroot, carrots, kumaras onions potatoes, pumpkin and shallots.

GENERAL WORK.

Lift the balance of roots as they show signs of regrowth and store them in a cool situation.

Cultivate land to destroy weeds and to produce seed bed conditions. If the ground was well prepared in the autumn a shallow cultivation only is necessary.

Dig under any cover crop four to six weeks before sowing further crops.

Earth up May-planted potatoes.

SMALL FRUITS SECTION

See paragraph "The Manuring of Small Fruits" in these notes.

Strawberries.—In cold district, such as Otago, plant during the last week of August.

Raspberries, Loganberries, etc.–At bud movement apply Bordeaux mixture 5-4-50 for control of cane wilt and leaf spot.

Cape Gooseberries.—Sow seed under glass if not sown in July.

FLOWER SECTION.

Plant tender shrubs and those that do not transplant readily.

Break up and replant herbaceous perennials if this was not done in the autumn. Gerberas, however, should not be taken up until October.

Make early planting of gladioli bulbs, but save some for October to January planting to produce a succession of bloom.

Continue the sowing of seeds of annuals to produce plants for planting out later in the spring. Prick the plants out into boxes as they become large enough to handle.

Set dahlia tubers for shoot production prior to taking cuttings.

Take cuttings of chrysanthemums.

GLASSHOUSE SECTION.

Plant tomato seedlings in the unheated house. If the ground was thoroughly flooded several weeks before planting, additional water should not be required for about two months.

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planted in trenches. It is advisable to make a mound in the bottom of the trench and to set the crown on this mound and spread the roots outwards. A covering of 2 in. to 3 in. of soil is then sufficient until strong growth has appeared, when the soil may be levelled off completely.

Manures to use before Planting.—A dressing of artificial manure should be applied to the trenches before planting and mixed with the soil. A small amount of farm manure, if available, may be applied at the same time. A suitable mixture of artificial fertiliser to use is four parts superphosphate, four parts blood and bone, one part sulphate of ammonia, and one part muriate of potash. This should be applied at the rate of 4 oz. to 9 ft. of the row.

Treatment After Planting

Keep the hoe moving to destroy all small weeds. During this operation a small amount of soil will be pushed into the trenches, but until the shoots are well above ground they should not be filled in.

During the first year of establishment one or two dressings of nitrate of soda or sulphate of ammonia should be applied to the rows after the plants have appeared above ground. For each application ½ oz. to 9 feet of row is sufficient. Thereafter, the ground should be cultivated to destroy weeds and to conserve moisture.

Management

At all stages the ground should be kept free of weeds, especially the perennial weeds and twitch grasses, which are responsible for many failures with the crop. Because of the deep rooting system it is unnecessary to apply water, even during dry weather.

Period of Cutting

The shoots appear from the middle of September onwards. These shoots should not be cut from the plantings which have been down for only one year, but should be allowed to develop. In the second year they may be cut for a fortnight. This short period of cutting is said to strengthen the crown and is advised as the result of recent American experimental work. With this cutting in the second year, that made during the third year should be restricted to four weeks. After this the cutting season may be extended to eight weeks. The cutting should be continued for the full period, provided only strong shoots are produced. When any weakening is evident it is advisable to shorten the season or to cut only the strong shoots.

Manuring

During the establishment of asparagus artificial fertilisers should be applied at about the time that growth begins in the spring in the one-year-old plantation, and after the cutting season in the second, third, and subsequent years. In the first and second years, because of the relatively undeveloped root system, the manure should be concentrated along the rows. In later years the dressing may be broadcast over the area occupied by the crop.

A suitable mixture for average conditions is four parts superphosphate, muriate of potash applied at the rate four parts blood and bone, one part sulphate of ammonia, and one part of 4 oz. to the square yard. This amount is recommended for both young and old plantations.

The application is made at the time that the shoots are allowed to grow. This ensures their maximum development and the greatest accumulation of reserves in the roots. Adequate reserves are required, as shoots are produced from these and not from what the plant obtains from the ground in the spring.

Salt as a manure has not been found to increase production when potash, which is essential for the production of good shoots, is used. Salt may, however, be applied in generous quantities to the rows to destroy weeds before the shoots appear.

If farm manure is available it should be applied to the rows at the end of the cutting season.

Autumn Treatment

When the foliage shows signs of turning yellow it should be cut and burnt. Care should be taken that it is removed before the berries fall to prevent a crop of unwanted seedlings.

After this operation the surface of the ground should be thoroughly cultivated and a cover crop sown with a small dressing of superphosphate at the rate of 1 oz. to the square yard. This cover crop is then allowed to develop, and should be dug under between the rows about the end of July, taking care not to damage the crowns, or to cut the roots in the operation.

Arbor Day

Arbor Day—the first Wednesday in August—will be observed this year on August 7. On that day hundreds of trees will be planted in all parts of New Zealand, and it is hoped that readers of these notes will help to beautify the towns and countryside by planting even just one tree.

When planting, however, it is well to remember that small trees ultimately become big trees; therefore select a position where the tree will have plenty of room to develop. Your reward will be a tree of beauty.

Manuring of Berry Fruits

AN annual dressing of a complete artificial fertiliser should be applied to all small fruit plantations just before growth begins in the spring. The amount of fertiliser to apply will depend on the type of fruit and the quality of the land.

The following mixture is recommended:—2 parts of blood and bone (or 1 part of sulphate of ammonia), 3 parts of superphosphate, and 1 part of sulphate of potash. This mixture may be applied to all the crops mentioned below.

Except where indicated, the amounts of 5 cwt. to 8 cwt. per acre are generally sufficient in established plantations, and should be broadcast. To freshly-planted areas about half these amounts are sufficient if manure was applied at the time of planting. To these new areas the manure should be concentrated relatively close to the plants to be most effective.

Strawberries.

There are two methods of growing strawberries. In the warmer districts they should be grown as annuals, and in the cooler districts as perennials, where the beds may remain in profitable production for two or three years.

The annual crop should receive two dressings of the mixture, each of approximately 1½ oz. to the square yard, one early in August and the other towards the end of the same month. Combined, these two dressings represent an application of approximately 8 cwt. to the acre, and are in addition to 16 cwt. applied to the land before and during planting in the previous autumn.

The strawberry plants, which are retained for two and three years, require the similar seasonal dressings, but about half the amount given to the annual crop gives profitable returns.

Raspberries and Loganberries.

The dressings to individual plants are:—Raspberries, 2½ oz.; loganberries and boysenberries, 1 lb.

Gooseberries.

Each plant should receive about ½ lb. of the mixture.

Currants.

Both black and red currant bushes should receive about 6 oz. of the complete fertiliser.

Winter Rhubarb

B.T. (Murchison):—

When convenient, could you issue some instructions for growing winter rhubarb, such as a suitable variety, when to plant, and the method of preparing the ground.

Horticulture Division—

For winter rhubarb a deep, rich, light soil sheltered from cold winds is most suitable. After eradicating bad weeds it should be deeply cultivated, turning under 40 tons farm manure and half a ton of bonedust per acre.

During October, sow seeds of Improved Topps Winter in drills 18 inches apart, and thin out the young plants as soon as their type and character are readily recognised. In autumn apply a dressing of 3 cwt. superphosphate, 2 cwt. sulphate potash, and 1 cwt. sulphate ammonia per acre to force the growth of winter pulling.

About the month of August plant out selected roots 2 feet apart and 3 feet between rows in a piece of well-prepared ground, and each autumn apply a generous dressing of manures and fertilisers as may be required.

APIARY NOTES

Contributed by Officers of the Horticulture Division

Precautions in Moving Bees

ALTHOUGH bees may be moved at any time in cases of emergency, the early spring is the best time for this work. Bees may then be moved long distances with safety and minimum of loss, either for the readjustment of apiary sites or the establishment of new apiaries.

Commercial beekeepers usually carry out this operation a little later in the spring, however, when the general disturbance caused by shifting has less effect on the bees and the apiary ground is more firm. Advanced beekeepers now agree that it is not desirable to move hives during the winter rest period or at times far removed from an early honey flow.

Shifting in summer is not desirable because of the strength of the bees, the large amount of brood in the hives, high temperatures, and the fact that the bees should be hard at work on the main crop of honey at this time of the year.

To be shifted long distances, single-storey hives should be reduced to medium strength. They should have no green or new honey in the hives, and should be completely screened with wire gauze either on the top or bottom to provide suitable ventilation. The removal of double-storey hives short distances by road transport in the early spring does not require these precautions.

The hives are merely held together by cleats or crate staples, the tops secured by close-fitting flat lids, sacking cut to size, or wooden mats, and the hive entrance closed with a piece of wire gauze or sacking. In this way the hives may be placed out on their new permanent stands and immediately released. Shifting bees up to twenty miles or more should not take more than one or two hours from the time the bees are secured at the entrance to the time they are released, provided the hives have been properly prepared beforehand and shifting is carried out late in the afternoon or on a dull day when all the bees are at home.

Migratory Beekeeping

With few exceptions, August and September is early enough to move bees in New Zealand, according to location. In the northern portion of the North Island, however, shifting bees on a large scale is a common practice from the middle of June onwards to take advantage of the tea-tree, which begins flowering that month and yields nectar lightly at first until about the middle of August, when great quantities of honey are produced from it. In more southerly districts of the Auckland Province the tea-tree flowers later, and the flow extends to late November and early December.

This shifting of bees in the north to tea-tree areas is done purely for spring feeding purposes, after which they are moved back to clover pasture areas in time to produce a crop of better quality honey. Not only do the hives fill up for their own requirements, but during favourable seasons they also supply large quantities of well-filled, capped combs of honey for removal to other apiaries.

Northern beekeepers would do well to study the conditions in any tea-tree areas within easy distance from their apiaries with a view to securing at low cost a good supply of early spring feed for their bees.

Early each spring in light soil areas further south many hundreds of colonies are transported in single-storey hives during July and August to take advantage of the heath (*Erica gracilis pyramidalis*) which begins to bloom in July and continues to September. The bees are allowed to remain for a week or two according to the weather, and are then moved back to clover pasture lands with enough stores to carry them on comfortably to the main honey flow.

Although migratory beekeeping is not practised to any great extent in this country—as it is in Australia and other parts of the world—beekeepers with apiaries situated in closely-cropped, clean pasture lands do resort to this practice in a modified form.

Apiary Locations

There is no more important question for the beekeeper than location. His future success will depend on the selection of a suitable district where clovers and mixed pasture sources are available, and in territory that is not already stocked with bees. The local Apiary Instructor should be consulted before a decision is made to establish an apiary in strange country, where feed and shelter are the main requirements.

Tea-tree Honey Areas

As previously stated, tea-tree honey areas may be excellent for spring feeding purposes, but they should be strictly avoided in all parts of New Zealand for the establishment of permanent apiary sites for the production of marketable honey.

It is extremely difficult to find suitable markets for this class of honey away from the areas in which it is produced because of its general condition and its thixotropic nature. This condition makes it impossible to extract tea-tree (manuka) honey from the combs by ordinary methods, and when it is separated from the combs it will not strain and holds suspended all air bubbles and foreign matter.

To remove this class of honey from the combs by centrifugal force, it must first be stirred up or agitated. This is done by the use of a pricker pad, which temporarily breaks up or softens the stiff jelly-like or glutinous condition sufficiently to enable it to leave the combs freely, but not sufficient to enable the clearance of foreign matter and air bubbles that enter the honey during extracting operations.

Moderate heating by ordinary methods will not reduce the viscosity or holding condition sufficiently for clarification either by straining or gravitation. In all cases where high temperatures are used to remove this type of honey from the combs or to

facilitate straining, the colour is darkened and the natural flavour destroyed to the point of caramelisation (spoiled honey).

Pressing the combs is also a common practice to separate this honey, but this method is very crude, and drives a great deal of air and small pieces of comb into the honey which remains there. Honey in this condition is definitely below the acceptable standard, as there is no way by which it can be successfully clarified and blended with other honeys of better quality.

People living in more or less isolated areas where tea-tree honey is produced have acquired a taste for it, but on the open market this honey cannot compete on an individual merit basis against good quality honey.

Robbing

At this time of the year—and also later in the spring, during the absence of a honey flow and when the weather is mild—the tendency to rob other colonies may develop among the bees to such proportions that all weak or queenless colonies are completely robbed of all their stores. Further, the majority of the bees in the robbed hives will perish in the struggle.

Conditions favourable to robbing in the spring are brought about by neglect by the beekeeper to winter the bees in proper condition and to take the precautions advised in last month's apiary notes.

Preventive Measures

Preventive measures consist of reducing the size of the entrance of weak colonies and being sure that all cracks and crevices are closed. The examination of the colonies in the early spring should be avoided as much as possible, and no honey combs should be exposed to possible robber bees. Queenless colonies, no matter how strong in bees, seem to be less organised to fight would-be robbers, and are quickly overcome and reduced to starvation point.

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

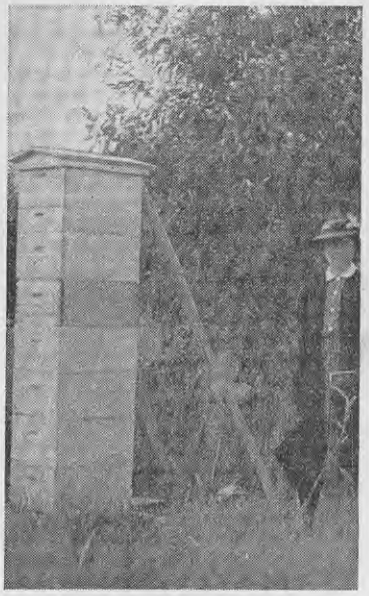
Possibilities of Ruatoria as Honey Producing District

SOME hundreds of tons of good honey are going to waste in the Ruatoria district between Gisborne and Cape Runaway for the want of bees to gather it. It would appear to be a district with wonderful prospects for bee-keepers. It has already established itself as a butter-producing and sheep and cattle district, but its honey-producing capabilities have not yet been fully exploited.

Confining oneself to the main road, one cannot appreciate the wonderful possibilities of the district from a production point of view. In and around Ruatoria there are many roads which lead to numerous fertile valleys where there is a wondrous growth of grasses and clovers. It has possibly one of the finest climates in New Zealand with sufficient rainfall for agricultural purposes.

My first visit was in April, 1939, when an address on bee-keeping was given at Ruatoria. A fair number of interested persons were present and became sufficiently interested to attend a practical demonstration in transferring the bees from old boxes, of which there were a number, to modern frame hives.

There are some 38 registered bee-keepers with 200 colonies of bees in the district. They have formed a Bee-keepers' Association, and have linked up with the New Zealand Bee-keepers' Association. Most of these are now enthusiastic bee-keepers in a small way. Some, however, after seeing the results of the modern methods adopted in bee-keeping, are increasing their colonies with a view to producing honey on a commercial scale.



Mr. W. H. O. Johnson's "Sky-scraper" hive at Ruatoria. The hive is 7½ storeys high, and produced over 200 lb. of first-grade white honey this season.

Among these bee-keepers are a number of Maoris. They are being visited by officials of the local association and are being shown in a practical manner how to properly keep their hives. Some quite remarkable returns have been obtained in the district. One instance may be quoted.

From a hive obtained in October, the secretary of the association, Mr. W. H. O. Johnston, has taken more than 200lb of good white clover honey. This colony is 7½ stories high. Another transferred from an old box in the late spring has now five supers well filled with honey (see photographs).

This association recently held its first field day at Mrs. O. T. Williams's apiary at Titiraukena Station, and, in spite of the showery day, a most interesting meeting was held. From the results obtained, it would be safe to say that this district is capable of producing many tons of first-grade honey.

—G. V. WESTBROOKE, Apiary Instructor, Hastings.

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Prepare for the Breeding Season

NOW that the breeding season is at hand it should be the aim of every poultry-keeper to have everything on the plant connected with breeding operations in perfect order so that this important work may be carried out to the best advantage. It is imperative to ensure that the breeding stock are all in the best of condition. Experience has shown that unless the birds are in a healthy, thriving state trouble will be experienced in both the hatching of eggs and the rearing of the young stock.

Liberal Feeding

Every effort should be made to assist the breeding hens to maintain health and vigour throughout the season. This can be achieved only by liberal feeding of a variety of good, wholesome grains and meals, together with an abundance of young, succulent green foods. Oyster shell and gravel grits should always be available to the birds.

If the birds are inclined to become too fat they should be encouraged to scratch by feeding the grain ration in deep litter. A high percentage of fertile eggs containing virile germs cannot be expected from overfat hens, and profitable stock can be produced only from healthy, active hens.

Chicks are made up of many elements, and it is necessary for the parent stock to have a high proportion of the essential elements in order that the offspring may grow and develop to the best advantage. A good plan is to give the breeding stock a variety of feed in order that the hens may put into the eggs the necessary elements for the production of good healthy chicks.

Keep Houses Sanitary

The person responsible for the welfare of the stock should keep the houses in a sanitary condition and free from vermin. Especially does this apply to red mite. Observations have shown that a bird cannot produce good, strong chicks when its blood is being sucked away nightly by these pests. On farms where the heavy breeds of fowls are kept, hatching operations should begin during July, and should be completed by the second week in September. For light breeds, such as Leghorns, August and September are the most suitable months for hatching operations.

It is advisable to handle the male birds frequently, as they are often too attentive to the hens and do not take sufficient food, with the result that they lose condition, which is often responsible for poor fertility. When it is noticed that the male is losing weight, feed it separately at least once a day.

Poultry Feeding Experiment

FEEDING tests recently concluded at the Department's Poultry Station, Wallaceville, have brought out several useful facts. The most important of these demonstrates the sole object of the test, namely, that a satisfactory egg yield can be secured when huskless oats are fed as a grain diet.

The test was carried out over a period of 44 weeks, which began on April 1, 1939, and concluded on February 2, 1940. One hundred and sixty White Leghorn pullets were utilised in the test, and were divided into groups of 40 and placed into four separate but identical houses.

All birds competing in the test were fed a mash mixture about 7 a.m. At midday they were fed a small quantity of whole oats in the litter as a scratch grain, ½oz. per bird being allowed, and at about 4 p.m. they received their evening meal, which consisted of grains.

Chaffed-up green food was fed once daily after the evening meal. The green food consisted of young green oats, silver beet, and, during the winter months, carrots were also provided. Oyster shell and gravel grits were available to the birds at all times.

The following shows the mash and grain rations fed to each pen of birds:—

PEN 1.
(Hawkesbury College Ration)
Mash.

Pollard	30lb.
Bran	17lb.
Meatmeal	3lb.
Salt	0lb. 11oz.
Total	50lb. 11oz.

Grain.

Wheat	67lb.
Maize	33lb.
Total	100lb.

PEN 2.
(Barley Pen)
Mash.

Pollard	32lb.
Bran	9lb.
Meatmeal	4-8lb.
Total	45-49lb.

Grain.

Barley	100lb.
Total	100lb.

PEN 3.
(Control Pen)
Mash.

Pollard	32lb.
Bran	9lb.
Meatmeal	4-8lb.
Total	45-49lb.

Grain.

Wheat	75lb.
Maize	25lb.
Total	100lb.

PEN 4.
(Huskless Oats Pen)
Mash.

Pollard	32lb.
Bran	9lb.
Meatmeal	4-8lb.
Total	45-49lb.

(Continued on page 71)

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Annual Stock Judging Competitions Of Levin Club

L. EARL, District Secretary, Palmerston North.

THE annual stock judging contests of the Levin Young Farmers' Club were held on May 16 on Mr. Harold J. Lancaster's farm at Fairfield, when members had their most successful field day to date. Some 30 young farmers were present, as well as a number of others associated with the movement, and the wide scope of activities provided much of interest and educative value.

The programme of competitions was one of the largest yet organised by a club, and covered the wide field of primary activity embraced by pigs, sheep, horses, and cattle. Each section was taken separately, and opened with a brief outline by a competent judge of the desirable type characteristics, after which the young farmers were asked to judge three animals and give their placings and the reasons for them. This was followed by the judge stating his placings and indicating the features leading to his decision.

A group at the annual stock-judging contests of the Levin Y.F.C.

Baconer Pigs

The class for the baconer most suitable for export was in charge of Mr. E. P. Nielsen, of Tiakitahuna, who mentioned that while the reverse was the case three years ago, today Great Britain had asked New Zealand breeders to produce as much bacon as possible and not pork. The requirements of the Home market in respect of baconers was for a pig not too heavy, with a fine head, even top, fine bone, good length and good ham. The speaker said that if New Zealand breeders were going to conform with the standards fixed by the English authorities more attention would have to be paid to the length and quality of pigs. Differences of opinion in regard to quality had retarded the industry's progress.

The judging results were:—Mr. C. V. Lewis (165 points), 1; Mr. M. Jepson (160 points), 2; Messrs. H. Marshall and R. Blackburn (135 points each), equal 3.

Fat Lamb Breeding

Mr. J. H. Staples, of Manakau, judged the class for the Southdown ram most suitable for mating with a flock ewe for breeding fat lambs, and also the best flock ewe for that purpose. Mr. Staples said a selection in this instance was made more difficult by the influence of the various types of land used and the fact that different farmers used sheep of different ages. The ewes should not be too thick in the shoulder, and should have good depth in the body and little wool over the head. Alertness, plenty of capacity, and constitution, with the body not too near to the ground and legs not too close were other features to look for. The ram should be distinguished by a short neck, strong and masculine head, thick, and low-set body, with the meat well down to the hock and a tight fleece.

The judging results were:—Mr. V. C. Lewis (160 points), 1; Mr. M. Jepson (145 points), 2; Mr. P. Carter (140 points), 3.

Draught Horses

Mr. V. Bird, of Himatangi, said that in judging draught horses one went first to the head to look for character and a keen eye, followed by a nice crest and shoulder, with the front legs set not too far forward and of hard bone. The ankle should not be too thick, with a clean coronet at the top

of the hoof. The rear legs should have a flat, deep bone, and be well placed without sag. Trotting would give an idea of the horse's feet movements. Particular attention should be paid to the quality of the animal's coat.

The judging results were:—Messrs. P. Carter and V. C. Lewis (160 points each), equal 1; Mr. H. Marshall (145 points), 3.

Dairy Cows

Demonstrating the points of a dairy cow, Mr. R. W. B. Evans, of Levin, said that firstly one looked for good general conformation, followed by constitution, build, length, and fineness and openness of bone. A good dairy cow should have a long neck, well set on to the shoulders, a straight backline, plenty of width between flat hip bones, a well-sprung rib with good capacity in the body, and an udder well caught on to the thighs.

The judging results were:—Mr. H. Marshall (170 points), 1; Mr. B. D. Stewart (135 points), 2; Mr. N. Lewis (115 points), 3.

Acknowledgments

During the afternoon tea interval the club's president, Mr. V. C. Lewis, expressed gratification that so many members had attended the field day, and expressed pleasure at the presence of Mr. R. O. Gloyn, chairman of the Manawatu District Committee, and Mr. L. Earl, Department of Agriculture, who is the movement's district secretary. Mr. Lewis thanked the judges, Messrs. Nielsen, Staples, Bird, and Evans, for their work; Mesdames H. J. Lancaster, D. A. Stewart, V. Lewis, S. Speedy, and J. H. Rolston, and Misses P. Speedy, N. Lewis, and N. Stewart for taking charge of the dispensing of luncheon and afternoon tea; Mr. H. Denton for supervising the competitions; and Mr. and Mrs. Lancaster for making their farm available.

Mr. Lancaster, the club's advisory president, announced that the cup which he had presented for the competitor gaining the most points in all sections had been won by Mr. V. C. Lewis (585 points), with Mr. B. D. Stewart (495 points) second, and Mr. H. Marshall (440 points) third. Mrs. Lancaster presented the cup to Mr. Lewis and congratulated him on his success.

In congratulating the club on the success of its field day, the newly-elected district president, Mr. R. O. Gloyn, said they provided an ideal means of education for the Young Farmer. He mentioned that in the dark days which lay ahead of the Empire the farmers would have to do all they could to increase production.

This club is one of the oldest in the North Island, and the interest it has shown and support it has given in all the Y.F.C. activities has largely responsible for the strength of the movement in the Manawatu.

Wairarapa Stock Judging Contest

N. LAMONT, District Secretary, Wairarapa.

REMARKABLE consistency has been shown by the Masterton Club in its series of successes in the district inter-club stock judging contests. This year the club has scored its fourth successive win in this contest, while on this occasion its B team also occupied second place.

An interesting feature of this annual contest has been the fact that the Masterton Club, although consistent winners in the aggregate, have in no case monopolised the individual and class winners. On the contrary, the club's success has been due to the consistent excellence of every member of the teams, and its performance is all the more praiseworthy on this account.

The members of the winning Masterton A team this year were Messrs. F. Stowell, A. Cruickshank, O. Wyeth, G. Blatchford, W. Ireland, W. Benson, E. Henderson, H. Millar, A. P. Southey, J. S. Mackay, H. Bannister, and D. McLachlan.

The results of the contest in detail are as follow:—

Judging the Clydesdale class at the district inter-club contest. [*N. Lamont, photo,*

Team	Beef Cattle	Clydesdales	Baconer Pigs	Dairy Cows	Romney Sheep	Southdowns	Totals
Masterton A.	214	308	280	162	195	250	1409
Masterton B.	230	165	170	200	242	130	1137
Carterton A.	110	207	285	165	117	180	1064
Martinborough	230	155	60	214	178	220	1057
Carterton B.	120	276	230	149	35	150	960
Alfredton	130	175	130	223	132	160	950
Tinui	90	60	255	93	179	150	827
Greytown	140	80	155	178	131	130	814

CLASS RESULTS (TEAMS).

Beef Cattle.—Masterton B and Martinborough, 230pts., 1; Masterton A, 214pts, 2; Greytown, 140pts, 3.

Clydesdales.—Masterton A, 308pts., 1; Carterton B, 276pts, 2; Carterton A, 207pts, 3.

Baconer Pigs.—Carterton A, 285pts, 1; Masterton A, 280pts., 2; Tinui, 255pts., 3.

Dairy Cows.—Alfredton, 223pts., 1; Martinborough, 214pts., 2; Masterton B, 200pts., 3.

Romney Sheep.—Masterton B, 242 pts., 1; Masterton A, 195pts., 2; Tinui, 179pts., 3.

Southdowns.—Masterton A, 250pts., 1; Martinborough, 220pts., 2; Carterton A, 180pts., 3.

CLASS RESULTS (INDIVIDUALS).

Beef Cattle.—W. Jury, Martinborough, 160pts., 1; F. Stowell, Masterton A, 154pts., 2; C. McKay, Masterton B, 140pts., 3.

Clydesdales.—J. Rose, Carterton B, 176pts., 1; O. Wyeth, Masterton A, 172 pts., 2; J. Milne, Carterton A, 137pts., 3.

Baconer Pigs.—W. Benson, Masterton, 165pts., 1; C. Bliss, Carterton A, 160pts., 2; V. Cripps, Tinui, 145pts., 3.

Dairy Cows.—V. Gates, Greytown, 125pts., 1; W. Campin, Carterton A, 122pts., 2; E. Henderson, Masterton A, 120pts., 3.

Romney Sheep.—N. Wyeth, Masterton B. 135pts.. 1; I. McLaren, Martinborough, 123pts., 2; A. Morrison, Tinui, 122pts., 3.

Southdowns. —M. Hancox, Martinborough, 170pts., 1; D. McLachlan, Masterton A, 140pts., 2; H. Bannister, Masterton A, 110pts., 3.

POULTRY NOTES—(*continued from page 68*)

Grain.

Huskless oats	100lb.
Total	100lb.

The meatmeal content of Pen 1 remained constant throughout the test, whereas that of Pens 2, 3, and 4 varied from 5 per cent. to 10 per cent. (by measure) according to how the birds were laying and the season of the year.

The following table shows the total number of eggs produced by each pen, the cost of foodstuffs consumed, net profit over cost of foodstuffs, average profit per bird, and the cost to produce one dozen eggs.

It will be noted that each of the four pens gave satisfactory results, and the table demonstrates that any one of these feeding rations is suitable from an egg-production point of view. The huskless oats pen (Pen 4) did very well, and it can only be assumed that, provided an adequate and regular supply can be obtained, huskless oats are quite suitable for feeding to poultry.

Pen No.	No. of Birds at Start.	Average No. Birds during Test.	No. of Eggs Produced (Dozens)	Amount Received.	Cost of Foodstuffs.	Nett Profit.	Average Profit per Bird.	Cost to Produce 1 Doz. Eggs.
							s. d.	
1	40	34	398 11-12ths	£35 11 1	£14 4 11	£21 6 2	12 6	8.54d.
2	40	39	440	£38 1 6	£12 12 9	£25 8 9	13 0	6.89d
3	40	38	439 6-12ths	£38 5 11	£14 16 6	£23 9 5	12 4	8.09d.
4	40	36	447 8-12ths	£39 11 9	£14 13 3	£24 18 6	13 10	7.86d.

Field Day at Hanmer State Forest

W. P. BELTON, Hon. Secretary, Amuri Club.

THERE was a good attendance of members at the field day held by the Amuri Young Farmers' Club at the State Forest, Hanmer, on April 27.

A tour through the forest was conducted by Mr. Jolliffe, State Forestry Department, and the party stopped frequently at points of interest, where Mr. Jolliffe gave short addresses as well as answering numerous questions. He pointed out, when inspecting the *insignis* and *ponderosa* pines, that the older part of the forest was planted by prison labour during the period of 1902-13. The trees in those days were planted at a distance of 4ft by 4ft, but this is now considered too close, and trees are planted not less than 6ft by 6ft.

A visit was paid to the new creosoting plant. Mr. Jolliffe explained that the fencing posts and telegraph poles were of larch timber, which, when creosoted, could be expected to last about 15 or 16 years in the ground. By this process there is no doubt that posts will last about seven more years longer than untreated posts, a feature of great value in Canterbury. Before the posts enter the creosote bath they are stripped of their bark and seasoned for some time, after which they are lifted by a gantry crane into a creosote bath, where they soak for seven hours. The posts absorbed up to half a gallon of creosote per cubic foot.

Continuing through the forest, the party inspected a block of larch trees, after which there was an interval for afternoon tea.

A short halt was made to inspect about two acres of Oregon pine plantation, and Mr. Jolliffe explained that these trees are difficult to grow, as they require a considerable amount of natural cover.

At the close of the day Mr. H. D. Bowron, club chairman, thanked Mr. Jolliffe for the interesting day.

Annual Meeting of Federation

THE sixth annual General meeting of the N.Z. Federation of Young Farmers' Clubs will be held in Christchurch on Wednesday, July 24, at 10 a.m., in the Conference Hall, Chamber of Commerce Buildings.

The meeting consists of all members of the four councils. Any other member of the Society is welcome to attend and take part in discussion, but only council members are eliigible tto vote.

There is a considerable amount of business to be put through at the meeting. In addition to the ordinary routine, such as the consideration of the annual report and balance sheet and the election of officers, there are about twenty remits and notices of motion to be dealt with.

A meeting of the Dominion Executive Committee will be held before the annual meeting, and will begin at 9 a.m.

It is hoped to publish a full report of the annual meeting in the Y.F.C. Section in the next issue of the "Journal."

Among the Clubs: Reports on Activities

Western Southland.

Dipton.—Arrangements for club concert. Teams chosen for practice debate. Club members were guests of the Farmers' Union at a lecture and film display arranged by Mr. G. Herron.

Drummond.—A film display was given by the Department of Agriculture, the following being shown:—"Nitrogen," "Seed Dispersal," and "Our Daily Bread."

Lochiel.—General business. Mr. W. R. Harris, Invercargill, spoke on "Winter Feeding." His address was illustrated with the aid of suitable lantern slides.

Thornbury.—General business. An address entitled "Banking Services" was delivered by Mr. C. B. Mathewson, of the National Bank, Riverton.

Wyndham.—Arrangements for field day. A club member appointed to correspond with a Wyndham Young Farmer now on active service. Dr. Ian W. Fraser gave an interesting account of his travels.

Eastern Southland.

Balfour.—General business. Five-minute speeches were given by the following club members:—J. Nicholl, J. Stevens, A. Lamb, and S. Grant.

Crookston.—Mr. Taylor, veterinarian, gave an interesting lecture entitled "Entero-Toxaemia."

Moa Flat.—Talk by Mr. R. Allan on "Whaling in the Antarctic."

Otama.—General. Impromptu speeches given by all members present.

South Otago.

Clinton.—Arrangements made to hold a concert and community sing. Mrs. A. T. Harris, Clinton, spoke on "Farming in Europe."

Lawrence.—Discussed tree-planting scheme with Mr. McKinley, of the Lawrence Domain Board. Talk on "The Centennial Exhibition" by Mr. K. McCaw.

Stirling.—Annual meeting. Officers elected: Advisory president, Mr. H. C. Holgate; chairman, L. G. Bell; secretary, H. R. Holgate.

Warepa.—A lecture entitled "Treatment of Horses and Sheep" was given by Mr. G. McDonald, M.R.C.V.S. At the conclusion of the talk numerous questions were asked, and much useful information was acquired.

Central Otago.

Roxburgh.—Proposed football match with Moa Flat Y.F.C. Mr. G. G. Calder, Department of Agriculture, spoke on "Grass and Grasses."

Upper Clutha.—General business. A talk on "Grasses" was given by Mr. G. G. Calder, Department of Agriculture. At a previous meeting Dr. Douglas gave an address on "Evolution."

Dunedin.

Palmerston South.—General. An address was given by Mr. G. Ross on "Dogs and Dog Trials." At a previously unreported meeting Dr. T. T. Thomas spoke on "How the Soil Was Formed."

West Taieri.—Mr. B. A. Taylor, B.Sc., B.V.Sc., Department of Agriculture, lectured on "Stock Diseases."

North Otago.

Enfield.—Annual meeting. Officers elected: Advisory president, Mr. G. Yuill; chairman, D. S. Anderson; secretary and treasurer, R. McNaughton.

Five Forks.—Annual meeting. Officers elected: Advisory president, Mr. M. Austin; chairman, H. Newson; secretary, I. Meuldrew.

Hampden.—Annual meeting. Officers elected: Advisory president, Mr. W. Gillies; chairman, E. Cleghorn; vice-chairman, A. White; secretary, J. R. Mureatt; treasurer, A. Gillies.

Papakaio.—Annual meeting. Officers elected: Advisory president, Mr. D. Borrie; chairman, J. R. Borrie; secretary, G. C. Hurst; treasurer, R. Aubrey.

Tokarahi.—General business. Mr. T. A. Sellwood, Department of Agriculture, showed films illustrating "How to Increase Production." Annual meeting. Officers elected: President, Mr. M. Milmine; chairman, T. McLean; secretary, A. J. Meikle.

Waitaki-Hilderthorpe. — Annual meeting. Officers elected: Advisory president, Mr. J. B. Chapman; chairman, C. Grocott; secretary and treasurer, B. A. Paton.

South Canterbury.

Albury.—A lecture on "Certification of Crops" was given by Mr. C. C. Leitch, Department of Agriculture. At a previous meeting Mr. A. Smith spoke on "Api-Culture."

Arno.—Business meeting.

Cannington-Cave.—Discussion on land settlement schemes. Lecture entitled "Pig-keeping" by Mr. McIntosh, Department of Agriculture. At a previous meeting talks were given as follows:—"Wheat Growing" (J. Kelynack), "Lincoln College" (J. Gillingham).

Geraldine.—A talk on "First Aid" was given by Dr. L. C. Mail. At a previous meeting a report of a club dance in aid of the Patriotic Fund disclosed a profit of £7 9s 8d. Mr. H. Warner, a club member, spoke on "Club Procedure."

Hunter.—Business meeting.

Maungati.—Mr. E. J. Lukey, Department of Agriculture, spoke on "Supplementary Winter Feeding of Stock."

Milford.—Arrangements for club debate. Mr. Booth, Dairy Instructor, spoke on "The Care and Treatment of Milk."

Pleasant Point.—Donation of £10 to Red Cross Sick and Wounded Fund. Scheme for settlement of Young Farmers on the land was discussed. Mr. C. C. Leitch, Department of Agriculture, spoke on "The Certification of Seeds." At a previous meeting the tree-planting scheme was considered, and a talk was given by Mr. Grant, Department of Agriculture, on "The Dutch East Indies."

Waihaorunga.—Impromptu club debates, 18 members taking part. At previous unreported meetings Mr. Leadbetter, rector of the Waimate High School, gave a very interesting address on "Astronomy." Mr. Scott, Transport Department, spoke on the "Work of a Traffic Inspector."

Mid-Canterbury.

Ashburton.—Tree-planting scheme considered. Mr. G. K. McPherson, Department of Agriculture, gave a talk entitled "Topdressing of Soils."

Hinds.—Tree planting and Lincoln College short course discussed. Arrangements for a debate with Methven Club. Two debates held. In the first, "That it is Necessary to Have a Scientific Education to be a Successful Farmer," Messrs. A. Mackenzie, E. Rhodes, G. Watson took the affirmative, and E. Withell, L. Watson, and D. Chisnall took the negative. The latter team gained the decision. In the second debate, "That Women Should be Allowed in Local Affairs," the affirmative side, J. R. Tait, D. Tait, and R. Ferriman, were the winners. The negative team was represented by R. Watson, I. Tait, and E. Rhodes.

Mayfield.—Debate to be held. A talk entitled "Southdown Sheep" was given by Mr. W. J. Early.

Methven.—Decided to subscribe 10s 6d towards the expenses of every member who intends to take part in the short course of instruction at Lincoln College. Talk by Mr. G. K. McPherson, Department of Agriculture, on "Cultivation of Cruciferous Seeds." Field day attended by 17 members, held at "Homebush Brick Kiln" and Mr. J. Deans's "Homebush." The manager and foreman of the company explained the various processes used in the manufacture of bricks, drain pipes, etc., and the party spent a very instructive hour being shown over the works. The afternoon was spent at "Homebush," where Mr. Deans gave the party a talk on the trees in his native bush and plantations. The party was also shown a fine stand of Montgomery red clover and subterranean clover. The club chairman thanked Mr. Deans for his hospitality and his address.

Christchurch.

Darfield.—Decided to lend the Government £25 free of interest for the duration of the war and six months after. Arrangements for debate with West Melton Club. Three short debates were held. At a previous meeting, Mr. S. Freeman showed a number of films dealing with agricultural subjects, and Flying Officer E. W. Barnett, president of the New Zealand Federation of Young Farmers' Clubs, spoke on "Recruiting as it Affects Young Farmers."

Ellesmere.—Debating team selected. Held mock court in aid of Sick and Wounded Fund. The sum of £25 was raised by this effort. Mr. R. M. Taiaroa gave an account of "Maori Life in Bygone Days."

Springston.—General business. The manager of Massey Harris Co., Ltd., showed the meeting several films on "Machinery." At a previous meeting Mr. Hawkins spoke on "Cream Separation and Alfa-Laval Separators."

North Canterbury.

Amuri.—Field day to be held. Mr. Colin McIntosh, Eyreton, spoke on "Sheep."

Cheviot.—Arrangements for club dance and club debate. Mr. J. Wright gave a lecture on "Fencing." At a previous meeting Mr. W. S. Allan of Cooper, McDougal, and Robertson, Ltd., spoke on "Internal Parasites in Sheep."

Cust.—Mr. A. S. Nash, Department of Agriculture, spoke on "The Utility, Cultivation, and Establishment of Lucerne." At a previous meeting Mr. S. Freeman, Dominion organising secretary, showed films of general agricultural interest.

Hawarden.—Decided to donate £2 2s to Red Cross and also to hold a ball, the proceeds of which are to be used for the same cause. Mr. S. Freeman, Dominion organising secretary, showed a number of films of topical interest, and gave a short talk on The Y.F.C. Movement."

Scargill-Omihi.—Accepted challenge to play a football match against Cheviot Club. Annual ball to be held, and proceeds to be donated to Sick and Wounded Fund. A lecture entitled "Maintenance of Farm Tractors" was given by Mr. J. Buckley, of Gough, Gough, and Hamer, Ltd.

Westland.

Murchison.—General. Debate by club members, the subject being "Horses v. Tractor."

Nelson.

Moutere.—Mr. R. W. Skinner, Department of Agriculture, lectured on "Inspection of Stock." He dealt particularly with the control of hydatids. At a previous meeting Mr. D. Merry, Department of Agriculture, gave an address on "The Purchase of Farm Seeds."

Marlborough.

Flaxbourne.—Arrangements for annual dance. Mr. Cuddon showed several films on "Allis Chalmers Tractors and Headers." At a previous meting Mr. D. Le Souef, Department of Agriculture, spoke on "Tuberculosis in Sheep and Pigs."

Wairarapa.

Alfredton.—Members decided to compete at dog trials. Mr. C. Hay spoke on "How to Train Sheep Dogs."

Carterton.—Decided to give members on active service full membership rights. Profits from club ball to be donated to Patriotic Fund. Tentative arrangements for club birthday party. A lecture entitled "Farm Shelter" was given by Mr. N. Blatchford.

Featherston.—Decided to form a working bee to plant trees under the Centennial Tree-planting Scheme. Half of the profits from the club's annual ball to be donated to the Red Cross Fund. At a previous meeting a debate was held with the Carterton Club, the subject being "That Supplying a Butter Factory is a Better Proposition Than Supplying a Cheese Factory." The Featherston team, consisting of R. J. Pillor, A. Weatherston, and M. Benton, took the affirmative, and the Carterton representatives, B. Brassell, L. Rennall, and M. Knutson the negative. The judge, Mr. Fisher, gave his decision in favour of the Carterton side.

Greytown.—Decided to continue with the tree-planting scheme. An inter-club debate was won by default from Martinborough.

Martinborough.—General business. A talk on "Banking" was given by Mr. Sadd. At a previous meeting a lecture entitled "Farming Law" was given by Mr. H. L. Griffiths.

Manawatu.

Apiti.—Roll of Honour instituted. Final arrangements for the tug-o-war contest to be held. Mr. E. S. Payton spoke on "The South Island Tour."

Bunnythorpe.—Club Roll of Honour started. An address was given by Mr. J. H. Mason on "Land Valuation."

Colyton.—Selection of a seven-a-side team. Arrangements for annual dance. Mr. L. Earl, Department of Agriculture, spoke on "Production and its Relation to War."

Feilding.—Seven-a-side football team selected. Club debating team chosen. "Shelter Belts and Farm Trees" was the subject of a talk given by Mr. Bruce McLeod.

Fitzherbert.—Arrangements for annual dance. Entries for root crop competition received. The club chairman, Mr. J. Woodley, gave an account of the Y.F.C. tour through Canterbury.

Halcombe.—The seven-a-side football tournament, Viles Shield Debate, and Centennial Tree-planting Scheme were all discussed in detail. At a previous meeting a debate was held with the Junior W.D.F.U., the subject being "That a Farm is the Ideal Place to Rear a Family." Club members took the negative side, and secured an easy win.

Kairanga.—Discussed Massey College short courses. Mr. Belgrave gave a talk on "The Setting of Ploughs."

Levin.—Field day held on Mr. H. J. Lancaster's property at Fairfield, Levin. There was an attendance of 41, including ten members of the general public. The club's annual stock judging was held, the following being the results:—Pigs (N. P. Nielson), sheep (J. H. Staples), horses (V. Bird), and cattle (S. Evans).

Opiki.—Team selected to play in seven-a-side tournament. Debating team to be chosen. Mr. H. de O. Chamberlain, Department of Agriculture, spoke on "Agriculture and the War."

Oroua Downs.—Arrangements for debate. Field Day to be held. Mr. Belgrave, of Reid and Gray's, gave an address on "The Setting of Ploughs."

Otaki-Te Horo.—General. Mr. F. S. Elliott gave a resume of the South Island Y.F.C. tour.

Pohangina Valley.—Selected debating team. Speakers during the evening were Mr. A. J. Galpin ("My Observations of Topdressing") and Captain Neilson ("Formation of Mounted Units"). At a previous meeting Mr. Ernest Nielson spoke on "Herd Improvements and the Gire Cycle."

Rongotea.—Selection of debating team. An address was given by Mr. H. A. Bayley, Department of Agriculture, on "Parasitic Infestation in Young Stock."

Shannon.—Mr. H. A. Bayley, Department of Agriculture, spoke on "Parasitic Infestation in Hoggets and Calves."

Tokomaru.—Arrangements for club dance, the proceeds of which are to go to the Sick and Wounded Fund.

Whakarongo.—The Vile Shield Debating team is as follows:—B. Dickson, I. Tabor, and R. Scott. Club debate to be held in July. Mr. Firth spoke on "Activities of Superior Oil Company." At a previous meeting all members on active service were elected as honorary members for the duration.

Wanganui.

Bulls.—Selection of team and subject for debate with the Halcombe Club. Arrangements for annual ball. Tree-planting scheme considered. Mr. Nielson, of the Dairy Council, gave a lecture on "Feeding, Management, Herd Sire Selection, and Genetics."

Marton.—Tree-planting scheme and dairy and sheep farming courses at Massey College discussed. A talk entitled "Wool—its Aspects and Developments" was given by Mr. J. E. Duncan, Department of Agriculture.

Taihape.—Lecture given by Mr. J. E. Duncan, Department of Agriculture. His address was well illustrated with lantern slides.

Waimarino.—Decided to plant 200 trees on the A. and P. Showgrounds as a Centennial Memorial. Debating team to be chosen. Dance to be held, half of the profits to go to the Patriotic Fund. Two teams are being entered in the seven-aside tournament at Palmerston North. The club's football team plays regularly in the local junior competitions, and this year has won all games to date.

Westmere.—Centennial tree-planting scheme. Short courses at Massey College and district debating competitions discussed in detail. Mr. Davies described the different forms of oil erosion in New Zealand and elsewhere.

South Taranaki.

Alton.—Arrangements made to visit Patea freezing works. Invitation to Hawera club to attend a social evening. Talk by Mr. A. Taylor on "Ford Motor Works." A "question and answer" evening held, followed by general discussion.

Eltham.—General. Football team chosen for coming tournament. Mr. Knowles, herd improvement officer, New Plymouth, addressed the meeting on "The History and Value of Herd Recording."

Hawera.—General business. A lecture was given by Mr. A. Leslie on "Lung and Stomach Worms—Their Cause, Prevention, and Means to Take to Destroy Them." At a previous meeting Mr. I. Hayman showed moving pictures of the troops' departure from New Zealand, in addition to other very interesting films.

Central Taranaki.

Cardiff.—Field day held at the Waimate West Demonstration Farm, attended by some 19 persons. Mr. J. E. Davies, Department of Agriculture, assisted by Mr. A. Patterson, lectured on "Farm Pastures, Crops, and Farming in General." A visit was paid to Mr. F. Gamblin's farm.

Midhirst.—Arrangements for club dance. Five-minute speeches by each member; J. L. Hunt and I. S. Harper scored highest points.

Pukengahu.—Decided to enter a team in ten-a-side football tournament to be held in Eltham. Mr. G. A. Blake, Department of Agriculture, spoke on "Pig Husbandry."

Toko.—General. Impromptu speeches were given by the following members:—H. Milne, W. H. Needham, G. Anderson, and H. Ancell. At a previous meeting a talk on "Land Valuation" was given by Mr. T. T. Murray, Toko.

North Taranaki.

Inglewood.—Teams selected for football tournament. A talk entitled "Cleanliness in Production of Milk" was given by Mr. Kristensen, Department of Agriculture. At a previous meeting various members spoke on the subject "What Young Farmers Can do to Help Increase Production.

Karawaka.—It was decided to pay half the fees of two members attending the short courses at Massey College. Euchre and dance to be held. Mr. J. L. Mander, fertiliser company manager, spoke on his "Trip to Nauru Island."

Mangamahoe.—General. Talk by Mr. F. Hunter entitled "Lives and Habits of Bees."

Mangorei.—General. A lecture on "The Grading of Butter" was given by Mr. D. Hull, Department of Agriculture.

Omata.—Annual meeting. Officers elected.

Southern Hawke's Bay.

Ballance.—Teams chosen for stock judging competitions at Dannevirke. Two members are to attend the farming courses at Massey College. Mr. J. A. Walsh lectured on "World Affairs," dealing fully with the present situation.

Woodville.—Massey College farming course discussed. A talk was given by Mr. F. E. Ward, Pahiatua, on "Farming in England and Ireland 20 Years Ago."

Central Hawke's Bay.

Tikokino.—Annual meeting. Officers elected: Advisory president, Mr. A. G. Mowat; chairman, S. J. Rumbal; secretary, R. B. Hughes; treasurer, K. W. Clark.

Waipukurau.—Mr. E. Bruce Levy spoke on "Increased Pasture Production" and illustrated his talk with lantern slides. At a previous meeting Mr. C. G. E. Harker, a solicitor, gave a lecture on "Laws and Acts Which Affect the Present-day Farmer."

Northern Hawke's Bay.

Matapiro.—Field day held on Mr. M. C. Conners's property. There was an attendance of 30. Mr. Conners conducted the party over his farm and explained interesting features. Some of the main points of interest included home-made concrete troughs and hay-making implements, the watering system used on the farm, concrete post-making, hay barn construction, and the method of clearing gorse.

Meanee.—General business included arranging of programme for coming year. A discussion was held on "The Necessity (or otherwise) of Removing the Tops From Mangolds When Storing Them." Mr. J. N. Guthrie explained the method of treatment in the British Isles.

Wairoa.—Return debate with Gisborne Club to be held in Wairoa. Arrangements for third annual farmers' ball. The Y.F.C. to combine with Collie Club and Athletic Football Club in a farewell function for district members of the Third Echelon. Mr. J. M. Taylor described the tour of the Waikato, Rotorua, and Bay of Plenty Areas by the Wairoa dairy farmers' party.

Poverty Bay.

Gisborne.—Challenge accepted for debate with the Wairoa Club. A scheme was outlined whereby the Dominion's production of bacon and pork might be increased. A club dance to be held. Mr. W. R. Pilmer was accorded a hearty vote of thanks for donating a handsome debating cup. Two short talks by club members, "Autumn and Winter Farm Work of Far-reaching Importance" (R. Alley), and "The French Foreign Legion" (R. Muir).

Matawai.—General. District Y.F.C. ball discussed. Massey College Y.F.C. course considered.

Te Kuiti.

Otorohanga.—A send-off to Mr. E. T. Brightwell in the form of a surprise party was given by club members and a presentation made. A recent football match against Kakapuku resulted in a win for Otorohanga by 11 points to 8.

Te Anga Central.—Arrangements for next season's potato-growing competition; 56lb of Government certified seed to be ordered for each grower. The club has decided to keep a Roll of Honour. Mr. K. Montgomery, Department of Agriculture, addressed the meeting on "Bacon Production and the Winter Feeding of Pigs."

Eastern Bay of Plenty.

Edgecumbe.—General business. Discussions took place on subjects of topical interest.

Western Bay of Plenty.

Katikati.—Decided to support the proposal to start a pasture competition in the Bay of Plenty. Members propose to give 1s to the Red Cross at every club meeting. Mr. A. V. Allo, Department of Agriculture, gave a lantern lecture on pasture management.

Paengaroa.—Arrangements for Winter Court at Waikato Show. Practice debate to select team for debate with Tauranga Club.

Pukehina.—Arrangements for club dance. Trees to be planted at Pukehina School as a Centennial Memorial.

Tauranga.—Club dance to be held. A competition for a bed jacket presented to the club by Mrs. Voss realised £4 and was donated to the Patriotic Fund. A lantern lecture on "Farming Conditions in New Zealand" was given by Mr. A. V. Allo, Department of Agriculture.

Tauriko.—General discussion on preparation of a paper for broadcasting.

Te Puna.—General business. Mr. E. Gibson spoke on "The Feeding of Dairy Cows Through the Winter." At a previous meeting Mr. A. V. Allo gave a lanter lecture on "Top-dressing."

Rotorua.

Horo Horo.—Annual meeting. Election of officers. Entries received for Winter Show.

Waikato.

Tauhei.—General. A talk entitled "The Care and Management of Sheep" was given by Mr. G. Smith.

Tahuna.—Decided to give full support to the court at the Winter Show. Badminton to be got under way. A field day to be held.

Te Awamutu.—Football match to be played against Kakepuku Club. Club members read their radio essays to the meeting:—"Mammitis: Its Causes and Controls" (J. Finn); "The Windmill" (W. Daniell); "Afforestation" (L. Clarke); "Increasing Production in the Early Spring" (I. Donaldson); "Footrot in Sheep" (R. Mandeno); "Making the Most of Pasture on a Dairy Farm" (R. Harrison). At a previous meeting a social evening was held. A field day was held on Mr. B. Boswell's property at Pokuru, there being an attendance of 50. Mr. Boswell demonstrated the desirable points in a Clydesdale show horse. Mr. Richardson outlined the points to look for when buying an ordinary utility horse. Mr. Melrose spoke on "Horse Ailments and Their Cures." Mr. Clarke demonstrated on how to break in a horse.

Auckland.

Clevedon.—Mr. D. S. Cook gave an address on "The Art of Impromptu Speaking." At previously unreported meetings the following were speakers:—Mr. Corby, New Zealand Dairy Board ("Increased Production"), Mr. H. Woodyear-Smith ("The Action of Artificial Fertilisers on the Soil"). He also showed the following films to the meeting: "Search for Pasture by Primitive Tribes" and "Manufacture of Superphosphate."

Frankton.—Centennial tree-planting scheme discussed. Proceeds of club dance to go to Sick and Wounded Fund. At the annual meeting the following officers were elected:—Advisory president, Mr. F. Appleby; chairman, A. Franke; secretary-treasurer, R. W. Franke.

Harrisville.—Card party to be held in aid of Patriotic Fund. A talk entitled "Farm Shelter" was given by Mr. Burrows, Pukekohe. At the annual meeting the following officers were elected:—Advisory president, Mr. J. Armstrong; chairman, E. K. Alexander; secretary, G. A. Barrett; treasurer, R. Barnaby.

Hurua.—General business. A talk entitled "The First Principles of Breeding" was given by Mr. K. Richardson. At a previous meeting the same speaker lectured on "How to Conduct Meetings."

Warkworth.

Wellsford.—Mr. P. S. Syme, Department of Agriculture, spoke on "Pampas Grass."

Whangarei.

Kerikeri.—General business. Mr. Marples spoke on "Fertilisation of the Orchard." At the annual meeting the following officers were elected:—Advisory president, Mr. A. Knowles; chairman, R. S. Benner; secretary-treasurer, D. R. Bowden. A talk was also given by Mr. A. Knowles entitled "Quantities and Measurements."

Matarau.—Lectures were given by Messrs. J. Durney and R. Taylor on "Herd Testing."

Maungakaramea.—General business. Mr. H. H. Preston, pig club organiser, addressed the meeting on "Pig Breeding" and "Judging by Tape Measurement."

Maungatapere.—Field day held at Moerewa freezing works. There was an attendance of 67. A demonstration on carcass quality, evaluation, and requirements of the British trade was given by Dr. C. McMeekan, Professor of Animal Husbandry at Canterbury Agricultural College.

Dargaville.

Arapohue.—Mr. E. H. Arnold, Department of Agriculture, lectured on "Fertilisers on the Farm."

Dargaville.—General. A talk entitled "The Conduct of Meetings" was given by Mr. P. W. Hill.

Tangiteroria.—Field day to be held. Arrangements for club dance. Discussion on sports club, and a talk by Mr. J. Hemphill, entitled "Sports."

Kaitaia.

Broadwood.—Lantern lecture by Mr. H. H. Preston on "Conformation and Housing of Pigs." Field day on Mr. John McKenzie's property, at which a pig club was inaugurated. An earlier field day was held on Messrs. James McKenzie's and T. Nash's property. There was an attendance of 30. Demonstrations included "Handling Horses" and "Ploughing," by Mr. J. McKenzie, and "Progress Made on a Small Farms Scheme Property," by Mr. T. Nash.

Kaitaia.—Arrangements for annual ball. Debating team picked for contest with Oruru Club. Lecture by Mr. E. F. Bradley on "Electricity." Members of the Farmers' Union were guests of the evening.

Oruru.—General. Debate held with Kaitaia Club, the subject being "That Surface Cultivation is Superior to Ploughing in the Establishment of Pasture."

Health Notes for the Farm

Contributed by the Department of Health

Beware of the Stealthy Carbon Monoxide Gas

CARBON monoxide is an extremely dangerous gas, and, therefore, attention is drawn to the following measures to combat this hazard of modern life.

There are many occasions on which an escape of gas may accidentally occur in a house. One of the chief dangerous gases which go to the composition of coal gas is carbon monoxide, which has the faculty of being able to combine rapidly with the red colouring of the blood cells (hemoglobin). This prevents the blood carrying its usual supply of oxygen to the tissues, and so rapidly leads to serious symptoms and may end in death.

Another source of carbon monoxide is from the "exhaust" of motor-cars. If, therefore, a motor-car is run in an ill-ventilated or closed garage there may be an undue and dangerous accumulation of the gas, with serious results to the individual present.

Insidious Gas

As carbon monoxide, as compared with other poisonous gases, is colourless, tasteless, and odourless, its presence is not detected, and if the amount present in the air is small its victim generally has no warning that he is exposed to a dangerous poison until it has affected him to so great an extent that he is unable to act. The attack of this gas is always insidious, giving no warning of its presence, but stealthily rendering its victim unconscious.

It is important that every gas water heater and every gas stove be connected to a chimney flue or other vent to the outside air in order that unburned gas may not collect in the room to poison its occupants. Rubber hose and rubber connectors to gas heaters months, permitting the escape of gas frequently rot during the summer through the rotted material when such equipment is brought into use upon the first chilly day. Rubber hose and connectors are also in common use on gas plates. If rubber equipment is not replaced at frequent intervals there is great danger in its use. It is preferable to replace such hazardous material with metal pipes. Loose taps may also be responsible for asphyxiation from this cause.

Gas-burning Appliances

Sometimes valves and by-passes are located at or near the floor line, where they may be accidentally kicked open with the foot or turned open by moving furniture, permitting gas to enter the room. Shallow cooking utensils may easily boil over, spilling their contents and extinguishing the blaze unknown to the occupants of the room. Gas flames turned low are frequently extinguished by a gust of wind. Gas burners which are not properly adjusted may also permit the escape of carbon monoxide.

It should be understood that modern gas appliances, such as ranges with closed tops, accomplish much in preventing carbon monoxide poisoning. Furthermore, all gas appliances, including ranges, water heaters, and gas-heating devices, will give satisfactory results, free from any hazard whatsoever, if they are properly installed and properly operated.

The use of gas appliances in our modern civilisation is as essential as is the use of automobiles; and automobiles, because of careless operating, cause more accidental deaths than does carbon monoxide. The precautions, as outlined here, are issued in an effort to stimulate the exercise of caution, lack of which is responsible for fatalities.

Keep Garage Doors Open

Warnings relative to the danger involved in remaining in a closed garage while an automobile motor is running are issued regularly and often by health officers and safety officials. Nevertheless, deaths from carbon monoxide poisoning due to this cause continue to occur in many countries. Most of such fatalities occur during the cold winter months, when motors are started with greater difficulty and are permitted to idle in the garage while warming up. The average car in a closed garage of average size can, within a few minutes, give off a sufficient quantity of carbon monoxide in the exhaust gases to kill a human being.

Garage doors should be wide open when running an automobile engine inside. It is also inadvisable to drive a car with all windows closed tightly. Any leakage of exhaust into the car, while it may not be sufficient to cause asphyxiation, may cause mental dullness and so affect driving ability.

Resucitation

Pending the arrival of a doctor, the patient should be removed to a good atmosphere, with plenty of fresh air, and artificial respiration should be employed, as in the case of drowning. Prolonged and systematic rubbing of the skin and kneading of the muscles will assist in promoting the circulation of the blood.

The Farm Home and Kitchen

Contributed by the Association for Country Education

Give the Cabbage a Fair Chance

CABBAGE will be our most used green vegetable for the next few weeks. It depends on the cook whether this will be a pleasure or a hardship, and whether we shall be better or worse off nutritionally for every meal we eat that has cabbage in it.

The cook who knows no other way than to serve her cabbage boiled to death commits a threefold crime. First, she makes us grow tired of a wholesome food by her lack of variety in ways of serving it; secondly, she upsets our digestions by so overcooking the vegetable that it decomposes and poisons us; and, thirdly, she robs us because she boils away and pours away practically all the special nourishing factors which only the cabbage could bring to the meal.

"Ring the Changes"

The cook who, on the other hand, "rings the changes" of a variety of dishes, serving her cabbage raw when possible, and at other times always lightly cooked, will always have us asking for more, will stimulate our appetites, improve our digestions, and give us a good part of our daily need of certain extremely valuable protective food substances.

It is well proven that there is a great loss of minerals and vitamins when green vegetables are cooked for a long time, but in the matter of digestibility people may question the superiority of short as opposed to long cooking. This has, however, been more than proved, as the following recent experiment will serve to illustrate.

Effects of Cabbage

There are certain people with whom the eating of cabbage is very frequently followed by such disturbances as belching, gas, unpleasant after-taste, regurgitation, abdominal pain, nausea, headache, etc. In a scientifically-controlled experiment 20 such persons undertook to test the effects of cabbage cooked to different degrees in producing thsee disturbances. The experiment lasted for five days, and on each day care was taken to give the experimentees only very easily-digested food so that nothing else which was eaten could cause any trouble.

For lunch every day they had potatoes, bread, butter, fruit, and a drink, as well as the cabbage to be tested. On the first day the cabbage was served as salad, raw and finely cut up. On the second day, cooked only until tender (12 minutes). On the third day, as salad again, but this time raw and coarsely cut up (¼in. strips). On the fourth day the cabbage was cooked for three-quarters of an hour, and on the fifth day it was cooked for one and a half hours.

The experimentees were asked to record any digestive disturbances which they felt following the luncheon. The results were:—Two were affected by the finely cut up raw cabbage; four by the coarsely cut up raw cabbage; one by the cabbage cooked until tender; five by that cooked for 45 minutes; and 15 by that cooked for 1½ hours. Thus, the longer the cabbage was cooked the more digestive trouble it caused.

So, housewives, take courage! You can safely serve "cole slaw" knowing that raw cabbage **is** digestible; your "last-minute" cooking of cabbage is right, that is, if you want the cabbage to be digestible and nutritious. Take no notice of those who insist that they will be upset unless it is cooked to a pulp.

How to Cook Cabbage

My advice is to cook cabbage like this:—Wash it and shred it fairly finely; have boiling salted water in a saucepan (about one-quarter full); add the cabbage and heat to boiling point quickly, leaving the lid on, but not fitting, until the cabbage is boiling hard. Turn cabbage over in the water, put on lid tightly, and leave it to boil fairly fast for 10 to 20 minutes. Drain off the water and reserve it for soups or gravy, and add butter or other seasoning to the cabbage.

If the cabbage is very old, one should use more water, as there will be more strong-flavoured vegetable acids coming out of the cabbage, and the larger amount of water is necessary to dilute them.

Why waste fuel—destroy food properties—increase indigestibility—and sicken people of a wholesome food, just because tradition says that cabbage must be **boiled**, and boiled to a pulp.

Once the cabbage is cooked it may be served plain and buttered, or with a gravy made from fried bacon, flour, and milk, or as an **au gratin** dish, that is, with a white sauce and grated cheese and breadcrumbs. It may be

Increasing Flavour

If the meat for stews is rolled in flour and browned in a little fat before vegetables and water are added, the stew will have a richer flavour and the meat a more appetising appearance.

. . . . .

A drop or two of vanilla in the breakfast cocoa carries the flavour and often creates new interest in this beverage.

. . . . .

Apple Brown Betty made with wholemeal bread has a "nut-like" flavour not obtained when white bread is used in preparing this dessert. The pudding will be richer in nourishment, too, as wholemeal bread furnishes more iron and Vitamin B than white bread.

cooked with a lump of salt bacon in the water, or it may be boiled in milk instead of water. It may be boiled whole but stuffed, or it may be steamed in a Scandinavian pudding.

So, this winter, let's resolve to ignore tradition and use the knowledge that research has brought us. Thus we shall save fuel, save vitamins and minerals, save digestion, and save our reputations as meal planners—and are not each and all of these surely worth saving?

Here are some attractive ways of serving cabbage:—

CABBAGE SALAD WITH WHIPPED CREAM DRESSING.

3 cups shredded green cabbage
4 tablespoons lemon juice
1½ teaspoons salt
1 teaspoon scraped onion
½ pint cream
12 drops Worcester sauce
A teaspoon sugar
3 tablespoons ground horseradish.

Method.—Put the shredded cabbage in a cold place to become crisp. Whip the cream, add the seasonings, and combine with the cabbage just before serving. If allowed to stand after mixing, the juices are drawn from the cabbage and the dressing becomes too thin. Serve the salad very cold. This is very attractive served in a hollowed-out head of a red or curly green cabbage.

COLE SLAW WITH RAREBIT.

Wash a head of crisp, firm cabbage, cut in quarters, and shred very finely with a sharp knife. Mix thoroughly with salad dressing and serve with the rarebit, which is made as follows:—

1 cup milk
2oz. butter
½ cup tomato puree
¼ teaspoon salt
1½oz. flour
1 egg
3½oz. grated cheese
⅛ teaspoon pepper.

Method.—Prepare a white sauce, using the milk, flour, and butter. Add the tomato juice and egg (beaten). Mix well, and then add the cheese. Continue heating over hot water until cheese is melted. Season with the salt and pepper, and serve on crackers or toast with cole slaw.

BOILED SALAD DRESSING.

Mix together ¼ teaspoonful of salt, 1 teaspoonful mustard, 1½ tablespoonfuls of sugar, pepper, 2 tablespoonfuls flour. Beat slightly one egg or two yolks, and to it add ¾ cupful of milk. Place this in a saucepan standing over hot water and stir constantly while adding gradually ¼ cup of mild vinegar. When the mixture thickens like custard, add 1½ tablespoonfuls of butter or dripping. Stand the saucepan in cold water and beat for a few moments, and then pour into a cold basin.

CABBAGE AND CARROT SALAD.

Use equal parts of grated raw carrots and finely-shredded cabbage. Mix the carrots and cabbage together with salad dressing until well blended. Add ground peanuts if desired. Serve on crisp lettuce.

CABBAGE AND ONION OR CELERY OR APPLE SALAD.

Shred the cabbage and cut the onions or apples into very thin rings, or dice the celery. Season with salt, celery salt, pepper, and paprika. Mix with dressing and serve on a cabbage leaf.

SCALLOPED CABBAGE, SPAGHETTI AND CHEESE.

1½ cups spaghetti broken into small pieces
3 tablespoonfuls butter or other fat
1 teaspoon salt
4 cups shredded cabbage
3 tablespoonfuls flour
2 cups milk
½lb. cheese
1 cup buttered breadcrumbs.

Method.—Cook the spaghetti in boiling salted water for 20 minutes, then drain. Make a sauce of the flour, fat, milk, and salt. Grate the cheese, add to the hot sauce, and stir until melted. Put the cabbage, spaghetti, and sauce in a buttered casserole in layers and cover the top with buttered breadcrumbs. Bake for 20 minutes in a moderate oven.

Hot Milk Drinks for Cold Wintry Days

IT is well known that most of us need more milk in the diet, so let's take it as hot drinks this winter.

COCOA OR CHOCOLATE MILK.

Milk, ¾ cup.
Grated chocolate or cocoa, ½ teaspoon.
Sugar, 1 teaspoon.

Method.—Mix chocolate or cocoa with sugar. Add a little hot water and cook for a few minutes over the fire, then add the milk. Bring to the simmering point and let stand over hot water. Beat with a rotary beater till frothy, and serve immediately.

It saves time if you make a large quantity of the cocoa paste in advance, for then you have merely to heat the milk and stir in the paste. Make the paste by boiling together for three minutes—

1 cup of cocoa.
½ cup of water.
1 cup of sugar.

Stir well during the cooking, then scrape out the paste and store it in a mason jar.

Cocoa contains raw starch so it needs to be boiled. The result is a much more attractive and appetising beverage. A marshmallow or a little whipped cream may be served on top.

Here is a delicious drink for a cold day:—

GINGER MILK.

Milk, 1 cup.
Ground ginger, ¼ teaspoonful.
Golden syrup, ½ tablespoonful.

Method.—Mix the ginger with the syrup. Heat the milk. Pour into ginger and syrup, reheat quickly, and serve at once. Do not mix until the last minute, as otherwise the milk may curdle. (Very warming.)

COFFEE, EGG, AND MILK.

Eggs, 2.
Strained black coffee, ½ cup.
Vanilla, ½ teaspoon.
Sugar, 4 tablespoons.
Milk, 3 cups.

Method.—Beat eggs to a slight froth. Heat milk, coffee, and sugar; add vanilla and stir into beaten eggs and beat with rotary beater. Pour into glasses and serve with a little whipped cream and dust lightly with cinnamon. (Excellent stimulant and food for someone very tired.)

LEMON WHEY.

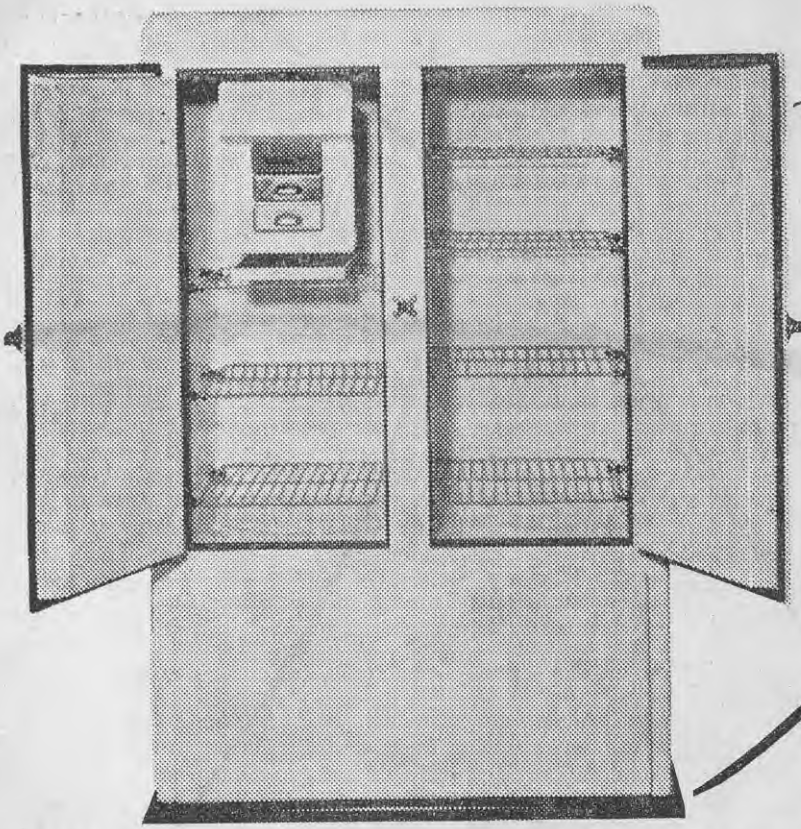
Milk, ½ cup.
Lemon juice, 4 tablespoons.

Method.—Add lemon juice to milk and let stand five minutes. Strain through double thickness of wet cheesecloth. Heat the whey and serve with a slice of lemon and a little sugar. (For the elderly and young children.)

OATMEAL GRUEL.

Sugar, ½ teaspoon.
Water, 1 cup.
Salt, ½ teaspoon.
Oatmeal, 1 tablespoon.

Method.—Boil 30 to 40 minutes; then add cup of sweet milk. Bring to the boil, strain, and serve hot. Sugar may be used as desired. (Good for everyone.)



What can this FRIGIDAIRE do for you in *your* home?

(read below...)

(1) MEAT

You see above a Frigidaire which is specially designed to suit the needs of the modern farm home. Seven shelves provide abundant storage area. Meat may be hung on special meat rail or jointed and placed on shelves. There's enough space here to store a whole sheep.

(2) VEGETABLES

You have to experience the luxury of keeping your vegetables crisp and fresh in a Frigidaire before you appreciate its full worth. The farmer's wife who prepares her salads with lettuce, etc., taken direct from the coolness of Frigidaire, will know that Frigidaire makes better salads—keeps vegetables longer.

(3) MONEY

Frigidaire saves you pounds every year by reducing food spoilage. This particular Frigidaire is not expensive to buy and is by no means expensive to run. Important, too, to the farmer is the fact that Frigidaire is supremely dependable. Other farmers in your district have invested in a Frigidaire. Ask them for particulars and arrange for a demonstration yourself.

(4) HEALTH

Frigidaire makes it possible for you to be sure that ALL your food is completely hygienic. Bacteria cannot live in Frigidaire's low temperature. You can understand that milk, butter, meat, vegetables and other perishables kept fresh in a Frigidaire are safer to give your children than the same perishables kept in other places, open to attacks from flies, household dust, etc.

(5) ENJOYMENT

Your Frigidaire is the key to better meals and to better enjoyment of your "between meal" and supper snacks. With Frigidaire, sliced fruits and food of all kinds can be kept and retain their original delicious flavours. From your Frigidaire you can become host to large parties, storing all that you ever need for home entertaining and home enjoyment.

(6) CONVENIENCE

There is a Frigidaire dealer in every main town in New Zealand—thus you can be sure to get quick service whenever you want it. Frigidaire have provided a special easy payment system for farmers, with low deposits and easy terms. What is more, Frigidaire units are backed by General Motors' Five-Year Guarantee. If you fill in the coupon below, you will be sent full particulars of this Frigidaire specially built for the modern farmer.

FRIGIDAIRE

FRIGIDAIRE, NEW ZEALAND, PETONE.

Dear Sirs—

I am interested in your Frigidaire which is specially built for the farmer. Will you please send me, without obligation, full details by return mail.

NAME .....

ADDRESS .....

.....

Variety in Meat Dishes

REMEMBER always that liver and kidneys, etc., are higher in vitamin value than muscle meats.

CASSEROLED HAM.

Ham (or lean pickled pork), 1lb. (in a thick slice)
Potatoes, 6
Apples (tart), 3
Light brown sugar, 2 teaspoons
Water, ½ cup.

Method.—Soak ham overnight. Cut fat from ham, and cut fat into small cubes. Put these in the bottom of the casserole and the piece of ham on top. Sprinkle the sugar over it. Peel the potatoes, cut the apples in half, remove cores, but leave the skins on. Put the apples and potatoes on top of the ham and add the ½ cup water and cover and cook for at least three hours in a good oven. (Add salt if necessary.)

STUFFED LOIN CHOPS.

Chops
Kidneys
Bacon.

Method.—Choose large chops, and cut away the fat and wipe with damp cloth. Chop up the kidneys and season well. Split the meat of each chop and insert the chopped kidney. Wrap a slice of bacon around and skewer it with a toothpick. Fry or grill in the usual way.

STEWED LIVER.

1lb. liver (lambs or calves)
Salt and pepper to taste
¼lb. spaghetti
2 tablespoons melted dripping
Stock as required
1 peeled onion
A tablespoon red currant jelly
Boiling salted water.

Method.—Remove skin from liver and cut into thin slices. Heat the fat in the bottom of the saucepan and fry slices of liver in it, giving few seconds to each slice. Add stock, sliced onion, salt and pepper, and jelly. Cover and simmer gently for 45 minutes. Meanwhile, boil the spaghetti in the salted water, and when liver is done remove it from the gravy and put in the centre of dish and keep hot. Add spaghetti to the gravy and boil for five minutes. Arrange spaghetti and gravy around the liver. (Rice or other cereal may be used instead of spaghetti.)

STEAK STEWED WITH PICKLED WALNUTS.

2lb. skirt steak
1 large onion
1 cup water
Flour
8 pickled walnuts
¼ cup vinegar
2 tablespoons fat.

Method.—Cut steak into fairly large pieces and flour it well. Fry quickly to brown both sides—remove pieces and also fry the cut-up onions. Return to the saucepan and add 1 cup water. Bruise the walnuts and add them and the vinegar. Simmer for 1 hour or longer. Serve with well-creamed potatoes, or macaroni cooked in the gravy as in "stewed liver" recipe given above.

BAKED RABBIT.

A young rabbit
Pepper and salt
2 slices bacon
½ teaspoonful chopped thyme
1 teacup breadcrumbs
Milk
1 dessertspoonful parsley.

Method.—Joint rabbit, pour boiling water over, add a teaspoonful salt. let stand for one hour. Dry joints with a cloth, place in pie-dish with seasonings, breadcrumbs, and bacon cut in good sized pieces. Cover with milk, put another pie-dish on top, and bake slowly for two hours.

STEWED OXTAIL.

One oxtail
Herbs
6 peppercorns
1 turnip
1oz. flour
1 dessertspoonful chopped parsley
Salt and pepper to taste
2 onions
2 pints of water or stock
1 carrot
1oz. clarified fat
1 blade mace.

Method.—Cut tail into neat joints, remove fat, wipe with a damp cloth. Melt fat in saucepan, and when smoking hot add pieces of tail and fry until brown. Then take out, add sliced onion to fat, and brown well. Pour fat away, return pieces of tail to saucepan, add water or stock and all other ingredients, and simmer gently for three hours.

MUTTON PIE.

2½lb. neck mutton
Small onion
Pepper and salt to taste
1 cup water or stock
2 kidneys
A saltspoon sugar
1 large tablespoonful minced parsley.

Method.—Trim off all the fat and cut up meat and kidneys. Place in pie-dish with seasoning, stock, etc., cover with pastry, cook in oven one hour. Then place on range for one hour to finish off. A little more water may be added if necessary.

"Problem Parents"

TWENTY-FIVE years ago mothers had few food problems other than to provide enough for their families. In those days most children had only one thought when meals were ready—to get their full share of whatever was on the table, with perhaps a second helping before brothers and sisters had emptied the dish.

The extent to which children grew strong and family health was protected depended almost exclusively on quantity and chance; at that time little was known about "the right kind" of food.

In recent years the science of nutrition has advanced so enormously that knowledge of what foods best promote health and growth is available to anyone who is interested. Rapid means of transportation and modern methods of food preservation have almost eliminated "seasons," so that the "right foods" are available any day of the year.

With more knowledge of food values more emphasis has been placed on food for health. With this emphasis there has developed an over-anxiety on the part of many parents to "get the children to eat," and the methods they employ make so-called "problem children" of their offspring. Doubtless, some of these children have a physical difficulty, but all too many of them have difficulties that are only of parent origin.

Eating is a primary instinct, and a normal child will want three meals a day unless he gets more satisfaction in the attention received when urged and coaxed to eat and petted and cajoled by mother because he refuses food. The child is then following another natural instinct—the desire for attention. Parents should train children in such a way as to give them a proper balance in the satisfaction of both instincts.

When children are not so trained, would it not be more appropriate to say that they have "problem parents," rather than to say that the parents have "problem children"?

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