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Linen Flax

An excellent crop of linen flax well above the minimum length for fibre purposes.

THE 1939-40 season was the first in which linen flax was grown on an extensive scale in New Zealand. During the previous three years much experimental and exploratory work was carried out in a large number of South Island districts by officers of the Fields Division, Department of Agriculture, and of the Agronomy Division, Department of Scientific and Industrial Research. Consequently, when the urgent need for fibre became known it

— By —

A. G. ELLIOTT, Crop Experimentalist, and P. B. LYNCH, Assistant Crop Experimentalist, Wellington.

was possible to embark with confidence on the large-scale production of linen flax.

The growing of this crop has met with considerable success, and there is every reason to be pleased with the results obtained under the conditions in which the industry was launched. Nevertheless, it has been evident that better crops could have been produced had we possessed a more complete knowledge of the factors affecting crop growth in the climate and soils of this country. The experience gained last season is therefore of particular importance in view of the greatly increased acreage of linen flax which it is hoped will be grown in the coming year. In order to make full use of this experience the records from more than 900 linen flax areas have been summarised, and this article gives the conclusions which have been drawn.

Method of Analysis

As it has not been possible to obtain figures giving yield of straw or yield of fibre for the great majority of the crops, **height of straw** has been taken as the measure with which to compare them. The height of straw has been found to bear a close relation the yield of fibre, and may therefore be considered a reasonably reliable indication of the value of a crop. The other important feature, **quality of fibre,** cannot be accurately estimated until processing is completed, but estimates of straw quality made at field inspections have been used in the meantime.

Three other factors affecting the value of a crop are weeds, lodging, and

Results of Survey of Crops Grown In 1939-40 Season

disease, and these have been taken into account as far as possible when making the survey. However, comparatively few crops have been rejected on the above grounds, and by far the greater proportion of rejection was due to crops failing to reach the minimum height of straw of 22 in. for crops accepted for fibre. Next season, crops will be accepted on the basis of a minimum effective fibre length, which may correspond to a height of straw of 22 in. in crops showing comparatively little branching, but badly branched crops will need to be taller to produce fibre of a corresponding length.

It must also be appreciated that the conclusions are based on the data obtained from **one season** only, and such conclusions need not necessarily apply in all years. However, the crops were grown in this season under a wide range of climatic conditions from Marlborough to Southland, and consistent differences throughout all linen flax growing districts would probably be significant and applicable in most circumstances.

A close-up of the first pulling machine to operate in New Zealand.

Results of the Survey

(1) Districts

Instructors have a detailed knowledge of suitable districts in the areas under their control, and will arrange the growing of the crop to the best advantage. Details of the relative merits of districts cannot be summarised in an article such as this, and furthermore, much additional experimental work is required to investigate the growing of the crop in districts other than those now accepted as suitable areas. In general, three main factors determine the suitability of a district:—

(a) Its climate.

(b) Its soil.

(c) A sufficiently large area of suitable land within a reasonable radius for the economic functioning of a factory.

(a) Climate.—Preliminary investigations indicate that temperature is not nearly as important as the amount and spread of rainfall or, more exactly, the seasonal variations in soil moisture. The latter factor is also closely linked to soil type. The critical months are October, November, and December, for insufficient moisture at this time invariably leads to stunted crops, which in most cases cannot be harvested for fibre. On the other hand, moist, humid conditions, particularly when the crop is approaching maturity and after harvest, may result in severe loss by disease or prevent the crop from maturing satisfactorily.

(b) Soil.—This must be sufficiently retentive of moisture to maintain good growth, but not too heavy or crops may lodge. In addition, it is difficult to prepare the necessary fine seed-bed on heavy soils. The British Ministry of Agriculture summarise the requirements for the most suitable soil as "land that is clean . . . a medium loam with a stiff subsoil—a good wheat bottom." Freedom from weeds is all-important, and it is useless to attempt to grow flax on "dirty" land.

(2) Method of Sowing

There are many aspects from which to view the problem of the best method of sowing linen flax, but the best practical means is not necessarily the ideal way from the viewpoint of maximum fibre yields and highest quality of fibre.

(a) **Height of Straw.**—It appears that cross-drilled crops may, on the average, be slightly taller than crops drilled one way only. Broadcast crops may have a very slight advantage over those drilled in the latter manner.

(b) **Quality of Straw.**—Cross-drilling tends to give **unevenness** both in height of straw and in diameter of stem, and therefore in quality of fibre. This is particularly undesirable. On the **average,** however, the straw quality of cross-drilled crops is superior to drilled crops, probably because of the smaller amount of branching.

(c) **Sowing.**—Cross-drilling, of course, means going over the ground twice. In addition to the extra cost and greater time taken, the operations involved, which usually include rolling, may over-consolidate those soils which tend to be heavy and lead to "caking" of the surface, with detrimental results to the crop.

When all factors are taken into consideration it would seem that drilling in 7 in. coulters is the only practical method at present. However, the adoption of the Continental system of sowing in 3½ in. drills would probably result in taller crops with a higher fibre yield. Further, the latter method of sowing would probably result in more even-growing crops showing less variation in fibre quality.

(3) Rate of Seeding

(a) **Height of Straw.**—In most districts low seeding rates of 70 lb. per acre or less tend to result in shorter crops, and in some cases the height of straw increases regularly with the higher rates of seeding. This factor appears to assume greater importance in those areas where the crops as a whole have been somewhat poorly grown. In most cases the rate of seeding should be at least 80 lb. per acre, and, generally speaking, rates of the order of 85 to 90 lb. per acre should prove satisfactory.

(b) **Quality of Straw.**—The low rates of seeding in most cases appear to produce crops of inferior straw quality, probably because of the greater amount of branching that a thin stand allows, but no consistent differences are shown apart from this. The rates indicated above should be quite satisfactory from a straw quality viewpoint.

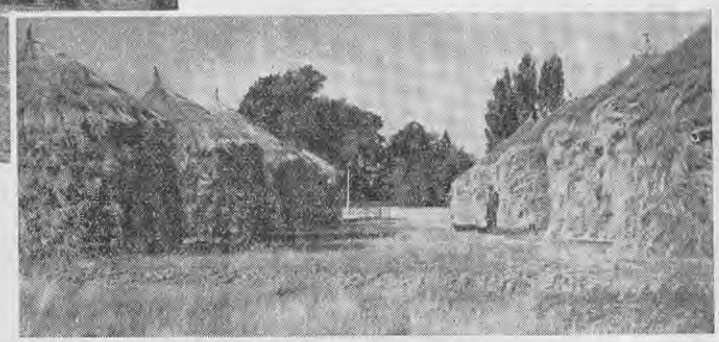
(4) Fertiliser Used

(a) **Height of Straw.**—There is little doubt that higher rates of application of superphosphate or reverted superphosphate have resulted in taller crops than lower rates of these manures. The differences between these two fertilisers when applied at the same rates are in most cases negligible. Increases were also recorded with rates of application above 3 cwt. per acre, but the possibility of affecting germination with high rates of superphosphate in certain seasons should not be overlooked. It would seem, therefore, that linen flax should be sown with 2 cwt. per acre of superphosphate or reverted superphosphate.

(b) **Quality of Straw.**—The effect of additional amounts of phosphatic fertiliser does not appear to affect straw quality as seen in the field, nor are

Left.—A linen flax crop pulled and stooked.

Below.—A linen flax crop in stack and awaiting processing into fibre.



there any consistent differences between superphosphate and reverted superphosphate in this respect. It has not been possible to evaluate the effect that other fertilisers, such as potash manures, may have on quality. Preliminary work on these lines will be undertaken in the coming season.

(5) Previous Crop

(a) Height of Straw.—The best crops are obtained **after grass.** The survey has shown that crops following wheat, oats, or barley are generally not as tall as those after grass, while crops after turnips, swedes, rape, or chou moellier are generally inferior to those after wheat. These differences are particularly marked in some districts, but are evident in all.

(b) Quality of Straw.—There may be a tendency for crops after grass or cereals to be of superior straw quality to those after brassicas. Although the difference is not as marked as the effect of previous crop on height of straw, it strongly supports the recommendation to sow linen flax crops after grass, or, failing that, after cereals.

(6) Date of Sowing

(a) Height of Straw.—In the particular season with which we are concerned, late sowing has in nearly every case given poorer crops. Particularly in those districts where the crops as a whole have been short, November sowings have resulted in markedly shorter stands. In nearly every district early sowings (September or early October) have given superior crops. Generally speaking, late September or early October has been the best sowing time for Canterbury and Marlborough, and early to mid-October for South Otago and Southland.

It is fully realised that this result may not be repeated in another season, and examination of daily rainfall figures indicates that soil moisture may have been a major factor operating to cause the foregoing results. As a general rule, however, one would expect early sown crops to benefit from greater soil moisture reserves built up from winter rains.

(b) Quality of Straw.—There appears to be no consistent difference in the quality of straw of crops sown at various times.

(7) Variety

(a) Height of Straw.—Unfortunately, seed supplies do not allow a choice of varieties for the coming season, but it is interesting to note that Concurrent (which was sown in most of the flax-growing areas last season) gave in South Canterbury consistently taller crops than did the variety J.W.S. Other varieties which have given promising results in special trials are Stormont Cirrus, Liral Prince, and Liral Crown, all of which have been superior to Concurrent in fibre length and yield. Giza Purple has been somewhat similar to Concurrent.

(b) Quality of Straw.—Stormont Cirrus and Liral Prince have been superior to Liral Crown in fibre quality (based on examination of the processed fibre), and all three are better than Concurrent and Giza Purple. On straw quality as based on field inspection, J.W.S. is very similar to Concurrent.

Seed stocks of the promising varieties are being built up at the Agronomy Division, Lincoln, and an experimental programme with these lines is arranged for the coming season. The Young Farmers' Clubs organisation will co-operate in this work, and will also give assistance in other investigations into the growing of linen flax.

SUMMARY OF RECOMMENDATIONS.

(1) Climate.—Good spring and early summer rainfall, as well as reasonably low humidity during harvest are essential.

(2) Soil.—Medium loam; light soils are generally unsuitable.

(3) Sowing.—Drill in 7 in. coulters. Do not sow deeper than ½ to 1 inch.

(4) Rate of Seeding.—85 to 90 lb. per acre.

(5) Manuring.—Sow 2 cwt. per acre of superphosphate or reverted superphosphate.

(6) Place in Rotation.—Sow after grass, or, failing that, after cereals.

(7) Date of Sowing.—Late September or early October in Canterbury and Marlborough, and early to mid-October in South Otago and Southland.

(8) Variety.—For next season's crops, seed supplies are available of one or two varieties only. In variety trials, however, Stormont Cirrus and Liral Prince have shown considerable promise, and seed stocks of these are being multiplied for future distribution.

Conclusion

There are few farmers who do not realise the importance of linen fibre

in wartime economy, and the request that has been made for the maximum production of this material was fulfilled magnificently by the farming community. The crops represented in this survey covered an area of about 13,000 acres; next year it is hoped to grow 25,000 acres of linen flax. In addition to the fact that it is our duty as citizens of the British Commonwealth to produce the maximum quantity of linen fibre it is possible to grow, there is also a possibility that the industry will become stabilised as a permanent and valuable feature of New Zealand's farming economy.

The method of accumulating practical field data as summarised in this article is one of the most rapid means of obtaining results, but it suffers from the limitations of lack of control of the individual crops and the difficulty of securing valid comparisons. It is essential to supplement the work with accurate field trials, and these have been arranged. Next year, it is hoped to publish a summary of the coming season's crops, which will be amplified by results from field trials and data from exploratory work now being carried out in the North Island.

Acknowledgments

The supervision of the growing of the linen flax crop has entailed heavy calls upon field officers, and the Instructors of the Fields Division, Department of Agriculture, are to be complimented on the tremendous amount of detailed work they have undertaken in the season recently ended. Their keenness, efficiency, and willingness to work long hours have contributed in no small measure to the successful growing of linen flax in New Zealand and therefore to the success of the war effort as a whole. Officers of the Agronomy Division, Department of Scientific and Industrial Research, have also assisted in the processing of samples from field trials and have done most valuable work in this connection.

The photographs accompanying this article were taken by Mr. J. H. Claridge, Seed Certification Officer. Mr. Claridge has also indicated the lines of approach which were followed by the survey, and has given much assistance in the work undertaken. Thanks are also due to the Instructors in Agriculture, whose practical knowledge of the crop has been invaluable in a helpful criticism of the survey which they made. The records analysed were collected by Instructors in the course of their crop inspections.

THE Director-General's PAGE

Herd Improvement Plan

TO continue the work carried out during the 1939-40 and 1940-41 seasons, the Government has decided to renew the grant for the New Zealand Dairy Board Herd Improvement Plan for a further season.

The main general purpose of the Herd Improvement Plan is to stabilise, extend, and intensify herd recording work generally, to increase the accuracy of such work, and to provide detailed information for research and investigational work into the production of milk and butterfat.

Consulting Officers have been appointed and attached to each of the Herd Improvement Associations so as to form a practical advisory link between the individual testing members, the Department of Agriculture, and the Herd Improvement organisations. This has resulted in a much more intensive use of herd-recording returns from a feeding and breeding point of view by the testing dairy farmer.

Grants have been made to encourage members to keep their herds under continuous test. Through these herds, with their continuity of records, it is expected that sufficient material will be accumulated to enable a vigorous prosecution of investigation and research into problems connected with milk and butterfat productions.

Sire survey work, with its object of isolating the best breeding strains in the industry, and of encouraging dairy-farmers to retain the best bulls and to weed out the inferior bulls as early as possible, has been greatly extended in the past season. Approximately 500 bulls are now under sire survey.

Herd wastage statistics are being compiled annually from all herds under group test and the results summarised in bulletin form. This enables attention to be concentrated on the most important causes of wastage in their order of importance.

Selected groups of herds under continuous test are being used as the basis for detailed investigation into such problems as the influence of nutrition on production, the influence of nutrition on fertility and the general health of the herd, and the influence of stripping and non-stripping on production, etc. The members in such selected groups have agreed to keep all the detailed information which is being asked for.

These are the main headings under which the disbursements of monies received from the Government and the dairy industry under the Herd Improvement Plan are being made. They serve to summarise a strong, varied, and detailed drive to increase the general efficiency of our herds to the utmost capacity of a well-organised herd recording movement, actively in touch with all its members, and relating their problems and successes to the general background of the industry as a whole. This intensity of effort would not have been possible except for the assistance of both the Government and the industry under the terms of the Herd Improvement Plan.

Linen Flax And The Farmer

FARMERS will note from the preceding article that an added drive for an increased area of linen flax is being made with a view to increasing last year's splendid effort of close on 14,000 acres to 25,000 acres. The terms of the new contract which the Government offers to potential growers of linen flax may at first sight appear somewhat complicated, but they are really quite simple, in that an over-all price of £6 per ton will be paid this year for undeseeded flax straw, and, in addition, substantial bonuses will be paid this year for undeseeded flax straw and, furthermore, substantial bonuses will be paid to those

farmers who produce quality straw and deliver it to the factory in good condition. To the careful grower, this year's contract offers greater inducement for the establishment of larger areas than was the case last year, and it is fully expected that, quite apart from any patriotic motives, farmers will readily respond to the request that more flax should be grown.

The old bogy that flax is an exhausting crop in the soil is, I hope, now dead and buried. Apart from being an excellent preparatory crop for wheat, it is no more exhausting in the soil than any of our cereal crops. The experience of last year clearly shows that where flax is grown in reasonably good soil, particularly in land broken out of grass, good crops result provided climatic conditions are right.

I am satisfied that it is definitely to the farmer's advantage to grow flax as one of his crops in the rotation, and I consider that New Zealand is fortunate in having over a wide area those conditions which are very suitable for flax growing. I am further optimistic enough to believe that this is no mere wartime industry. Provided we give care to the selection of areas suitable for flax growing, and provided further, that every attention is given to producing quality fibre, we should in the post-war period be able to obtain a market for our fibre.

Mechanisation of our methods of harvesting and processing of the crop will result in the reduction of costs of production, and the fact that the factories built by the Government are designed on the most efficient lines should materially assist in ensuring a market for our fibre, which is proving to be of excellent quality.

Besides directly helping the Empire to win this war by supplying Britain with an essential war commodity, farmers should regard the linen crop as a valuable cash asset, and there should be no difficulty in reaching the 25,000 acres aimed at in this year's production programme.

Noxious Weed Control

THE supply of sufficient quantities of sodium chlorate and/or Atlacide for use on ragwort and other noxious weeds has been giving some concern, as indications have pointed to the possibility of supplies from overseas being obtainable in limited quantities only, as Continental sources of supply are no longer available, and the production in Empire countries is not sufficient to meet the demand after safeguarding their own requirements.

Under normal conditions, and assisted by the Government scheme in operation through County Councils, approximately 1000 tons of chlorate weedicides are imported for use each year, but although prospects for even limited quantities are at present more promising than they were a month ago, it is evident that the quantity offering will not be sufficient for normal use, and in addition the overseas price now being quoted is such that importers are naturally reluctant to place orders, as users would hesitate to buy at the price being quoted.

The question of supplies being made available for New Zealand was taken up by the Government some time ago, and as a result some is being released, but this quantity is relatively small, and supplementary supplies from other sources are also likely to be small both because of a shortage and because of the price.

To ensure the utmost good from the supplies that may become available for this work it will be necessary to concentrate on maintaining the position on areas already dealt with rather than to attempt to extend operations, and this procedure is recommended to County Councils and others who may be affected.

The question of the use of other weedicides is not being overlooked.

Emergency Cool Storage

DURING the last six months considerable extensions have been made to cool storage available for meat at various strategic centres. In the aggregate the Government has arranged for approximately two and a half million cubic feet of emergency cool storage to be built, and this is either completed or well under way. The finance involved in this emergency cool storage has been advanced to companies by the Government under terms which represent no hardship to the individual companies who have co-operated in the provision of cool storage. The total sum involved is in the vicinity of £330,000. The completion of this programme will ensure that the meat killed for 1941-42 can be accommodated, provided killings are normal and reasonable shipments are obtained.

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WHEAT UNDER IRRIGATION

The need for maintaining wheat supplies and the fact that little is known regarding the effect of irrigation on this important cash crop necessitated the laying down of the field experiments reviewed. An increased yield of approximately 9 bushels per acre, which at present prices is sufficient to repay the cost of bordering, has been secured. This result from trials completed last season supplies valuable preliminary information.

Diverting the water on to one of the trials.
[Dr. O. H. Frankel, photo

Trials During 1940-41 Show Increased Yields

By

A. G. ELLIOTT,

Crop Experimentalist, Wellington.

THE completion of the irrigation scheme at Levels and other districts in Canterbury will result not only in increased production from pastures, but probably also in some changes in the present farming methods. Among these modifications, that of annual cropping will undoubtedly receive consideration, and in this connection the growing of wheat under irrigation was considered worthy of investigation. In order to maintain present wheat supplies it is essential to know the relation between the difference in yield due to irrigation and the cost of carrying out the necessary work. This is particularly important in the Ashburton area, which produces such a considerable proportion of our present wheat supplies, and where the irrigation scheme to make water available over a large area is now under way.

The investigation was undertaken with the two points of view in mind, namely, the maintenance of wheat production, and the growing of a cash crop as an intermediate step between the breaking up of old pasture and the establishment of new swards on an irrigable area. The field experiments were laid down and completed by officers of the Fields Division of the Department of Agriculture in collaboration with the Director and Plant Geneticist of the Wheat Research Institute.

Description Of Trials

One large-scale variety and manurial experiment and six small demonstration areas on typical soil types were sown after the fields had been border dyked, the cost of the latter work ranging from £1 to £2 per acre. In the more complicated trial the treatments were sown parallel with the borders, while in the smaller ones drilling was across the borders, following what will become standard practice on irrigation land. Unfortunately, it was not possible to harvest the variety and manurial experiment and one of the demonstration areas, but complete information on five trials is presented. The layout of the latter consisted of two areas each approximately 4 chains long, one of which was irrigated and the other left without water, and the comparisons were merely to show the effect of irrigation on the crop.

Details of the trials are as follows:—

Trial on Farm of	Soil Type.	Previous Crop.	Variety of Wheat.	Manure used.	Date Sown.	Date Irrigated.	Date Sampled.	Date Threshed.
J. Brien, Kerrytown ..	Stony silt loam	Grass	Solid Straw Tuscan	1¼cwt. super	11/6/40	1st week Nov.	22/1/41	7/3/41
J. J. Brosnahan, Levels	,,	,,	,,	1 cwt. super	5/6/40	,,	23/1/41	7/3/41
G. Campbell, Kerrytown	Silt loam	,,	Jumbuck	1½cwt. rev. super	13/7/40	,,	22/1/41	7/3/41
D. France, Levels ..	Clay loam	,,	Hunters II.	1 cwt. super	22/5/40	,,	22/1/41	7/3/41
C. E. Kerr, Levels ..	Silt loam	Rape	Solid Straw Tuscan	,,	6/6/40	,,	23/1/41	7/3/41

Good establishment was secured on all trials, and soil moisture determinations were carried out on the large-scale experiment mentioned earlier in this article, while rainfall records for the district were also studied. Observations were taken at intervals by Instructors, and the time of applying water was in accordance with overseas practice, which indicates that a critical period for moisture in the crop occurs at a stage between jointing and heading. As shown in the table above, the water was applied during the first week of November, and three weeks later all reports described a marked increase in growth varying from 3in. to 6in. between the irrigated and non-irrigated borders in each experiment, accompanied by a greener appearance and improved vigour of the areas watered.

Showing the water moving down the borders among the wheat plots.
[Dr. O. H. Frankei, photo.

Yield Data

Harvesting was carried out under the "sampling" technique, which means that the material in the five coulter widths enclosed by the metal sampler 2 feet wide was cut with a sickle, bundled, and four of these samples taken at random down each 2 chains of the area were bulked to form a sample sheaf. The samples from opposite sections in each irrigated and non-irrigated border in each trial were then forwarded to the Wheat Research Institute at Lincoln, where threshing was completed.

Results from each trial are shown in the following table:—

Trial on Farm of	Yields: Bushels per Acre.		
	Non-irrigated border.	Irrigated border.	Difference due to irrigation.
J. Brien, Kerrytown ..	29.0 (28.5)	47.7 (46.7)	+18.7 (+18.2)
J. J. Brosnahan, Levels ..	33.9 (33.3)	40.7 (40.0)	+6.8 (+6.7)
G. Campbell, Kerrytown ..	33.6 (33.0)	40.3 (39.7)	+6.7 (+6.7)
D. France, Levels ..	36.6 (35.8)	44.6 (43.3)	+8.0 (+7.5)
C. E. Kerr, Levels ..	25.1 (24.6)	29.0 (28.5)	+3.9 (+3.9)
Average of all trials ..	31.6 (31.0)	40.5 (39.6)	+8.9 (+8.6)

Irrigation of one of the borders completed.

[Dr. O. H. Frankel, photo.

The difference due to irrigation was statistically significant over all trials, and the yields shown in brackets have been corrected to a standard of 13 per cent. moisture in the grain sample. On present prices for wheat, these trials show that an average increase of 8.6 bushels per acre is sufficient to defray the cost of bordering, and although additional work will be necessary, once the crop is removed and the area ploughed and worked for grassing down, the dykes can be built up relatively cheaply by using discs or a similar implement. It is also seen that the trials now under review have indicated that wheat growing on irrigable land in the districts concerned is payable at present prices.

A large-scale replicated trial containing both spring and autumn-sown varieties and with which different manures will be applied is planned on irrigable land for the coming season. In addition, a number of demonstration areas to investigate the effect of irrigation on wheat will be established and should add to our knowledge of this subject.

Conclusions

The trials completed last season have clearly indicated that under the conditions obtaining an average increase of 8.6 bushels of wheat per acre, which is sufficient to pay for the cost of bordering, was obtained. It is also seen that last season a payable wheat crop was grown on irrigable land at present prices for grain, and also that this cash crop would repay expenses incurred between the time of breaking up old pastures of relatively low production and the establishment of higher production swards to be maintained under irrigation.

Acknowledgments

The thanks of the Fields Division are extended to all farmers who co-operated in the experiments reviewed, and also to officers of the Public Works Department who carried out the soil moisture determinations on the large-scale trials.

Above. — The type of country being cleared.

Right. — Ready for the plough. Note the pile of logs in the adjoining field ready for burning.

By
A. D. MERCER,
Fields Instructor, Greymouth.

Farmer Constructs Clearing Plant for £40

ON the west bank of the Grey River between Greymouth and Blackball lies an area of good river-flat country that was cut over by sawmills and felled some 20 years ago. At present it is a dense mass of gorse eight or nine feet high, covering stumps and logs, some of considerable size, while many dead trunks are still standing. The type of country is illustrated in Fig. 1.

Mr. D. Burt, who is farming in this district, has undertaken the clearing of some of this land, and is very efficiently transforming an unsightly waste into valuable farmland which will eventually be carrying good pasture.

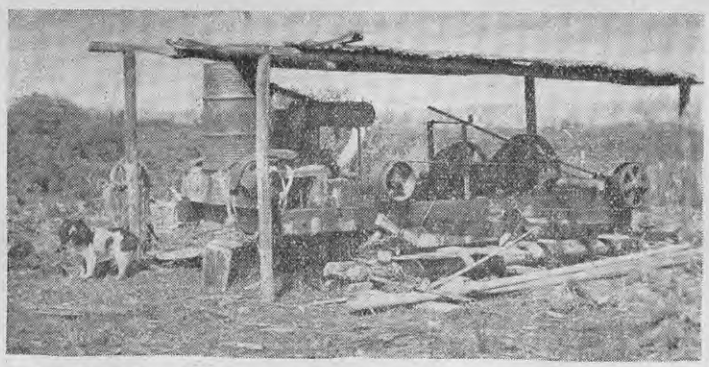
A tractor engine costing £30 and a winch purchased for £10 were mounted on a timber base, attaining both compactness and mobility. With 10 chains of wire rope on the winch (geared 42 to 1) a fair area can be cleared at one set. The first step is the removal of gorse, which is either hand-cut or pulled in clumps by the winch and is disposed of by burning.

The stumps encountered are chiefly beech and rimu. The former are readily pulled, while rimu stumps are first loosened with a few plugs of gelignite. All stumps and logs are stacked in heaps for burning, and as, with this method of stacking, there is no soil among the timber, it can be readily disposed of in this manner. Some of it is hauled over the river bank, and an idea of the size of some of the logs being handled can be gained from the accompanying illustrations.

The work is being carried out by Mr. Burt's son with the help of a boy as spare-time work between milkings at the rate of one acre per month from the original condition of the land to level ploughable country, but during the operations sound beech logs are sawn into lengths and split into laths for the Blackball mine, these laths paying for all fuel and oil used in clearing operations. This land is thus being brought into productive condition at the cost of labour of a man and boy and with a capital outlay of £40.

It would be inadvisable to attempt establishing permanent pasture on this land with the first ploughing. Lime at the rate of 1 ton per acre is the first essential with 2 cwt. of superphosphate. It might be possible with favourable weather conditions to work this land down sufficiently for a temporary pasture of Italian ryegrass and red clover, but the most suitable and profitable crop would probably be an autumn-sown mixture of oats and tares for early spring feed for cows or a spring-sown mixture for ensilage.

The most obvious means of improvement in West Coast farming practice is in the provision of more winter feed. Mr. Burt's achievement is a first step in the right direction.



Above (left). — The plant in position.

Above.—Timber stacked ready for burning.

Lower left. — Some of the logs being handled are of considerable size.

MANGEL SEED SUPPLIES

Arrangements for Local Production

By J. H. CLARIDGE, Seed Certification Officer, Wellington.

WHEN compared with such fodder crops as swedes, turnips and rape, the mangel crop of New Zealand appears relatively insignificant. Nevertheless, there is a section of the farming community to which the mangel constitutes a very important source of supplementary feed. Those farmers, therefore, who among them grow upwards of 10,000 acres of this crop each year have received full consideration in the scheme of seed production launched in New Zealand after the outbreak of war.

Appreciating that the normal procedure in New Zealand provided for a considerable carry-over of seed, it was realised that locally-grown seed would be required for only a portion of the area of mangels to be sown in 1941, but that in all probability this country would be dependent upon its own efforts for the total quantity of seed required in the following year.

Arrangements were made last winter for the transplanting of an area of 30 acres of mangels from which seed would be produced in the succeeding harvest. This, in itself, was a considerable task, remembering that 10 and sometimes 15 tons of bulbs were required for each acre transplanted. In addition, consideration had to be given to the selection of the roots and to the isolation of the areas to eliminate the possibility of cross pollination between varieties. The seed from these areas has been harvested, and is now in process of being machine-dressed preparatory to its distribution throughout the seed trade of New Zealand.

It has not been possible, even if it were desirable, to grow for seed purposes all the varieties known in this country. In this connection a review of mangel variety trials carried out in the past indicates that while highest yields may be expected from the "long red" type, the highest dry matter yield per acre has been returned by the "globe" varieties.

The governing factor in regard to the varieties saved for seed last year, however, was the availability of suitable roots, and as a result seed of the following types was harvested:—

Yellow Globe.
Orange Globe.
Red Intermediate.
Long Red.
Half Sugar.

Most of the seed produced was representative of the globe types, although small quantities of the three latter types were also saved. Mercantile firms throughout the country will shortly be circulated relative to the wholesale distribution of this seed.

In regard to seed for 1942 sowings, arrangements are already in train for the planting out of a considerably increased acreage. Some of the area will be planted with large bulbs, while the balance will be planted with stecklings—plants with relatively small bulb development. For next season's production it is proposed to limit the varieties to be grown to three—Yellow Globe, Orange Globe, and Long Red.

As with other seeds of a similar nature not regularly produced in New Zealand in the past, the production of mangel seed calls for considerable care and attention in the selection of nucleus material for multiplication and also in the actual production of the commercial seed crop.

Provided proper supervision is given, however, there is every reason to believe that seed can be produced in New Zealand equal to the imported material. To meet the present needs, this work is being carried out under the supervision of the Department of Agriculture, and the resultant material will be given official approval for sowing to produce crops for feeding purposes.

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

HORSES—

Sound and Unsound

By
J. MULLINS,
Veterinarian, Hamilton.

IN spite of the vagaries of peace and war, the horse will probably continue to prove a useful and—though to a diminishing extent—essential member of the domestic animal world. True, he has ceased to play the part he once did, but as far as war is concerned, let us be glad that he is no longer the uncomprehending victim of the machinations of the genus "homo." On the roads and farms, also, he seems destined to play a minor role, which is a matter of at least nostalgic regret, as with the passing of the horse, a pillar of the old rural economic and social structure has been removed.

Oil fuel has replaced oats and hay, and we have poisonous exhaust gases and old iron instead of honest horse sweat and useful excreta; with the horse nothing is lost even when dead (excepting the "dead cert."). Further, the "village smithy" for example, no longer finding it remunerative under the chestnut tree, has forsaken it for the "super six." In the racing and hunting fields the horse still has a leading part, although the fact remains that for many racegoers the horses there are really unnecessary; anything else might do as well.

Servant and Friend

Apart from the foregoing, which may be a trifle overdrawn, most will agree that there is a good kick left in the old horse yet, and let us hope he will continue to play a part as man's unquestioning friend and servant. The introduction of the Remounts Subsidy Regulations and the Stallions Act a few years ago would indicate that there is still a place for the horse in New Zealand. These aim at the breeding of a better and sounder type of riding and draught horse, for which there is much room, as is evident throughout the country. It is a pleasure to ride and work a good horse, and he costs no more to keep than the other sort.

Stallions accepted under the above Acts must be free from hereditary unsoundness. This, of course, is most essential. An unsoundness may be taken as any disease or defect likely to interfere with the usefulness of the horse. So custom and law have decreed that any horse suffering from any of the following is unsound:—Roaring, whistling, bone spavin, ring-bone, sidebone, navicular disease, curb, stringhalt, shivering, cataract, all of which are hereditary unsoundness. Stallions must also be free from bog spavin, thoropin and nasal disease, and must not have defective genital organs.

Defects Descried

Most "horsey" men will be conversant with the diseases and defects mentioned, but for those who are not, a brief explanation is given.

Roaring.—The horse makes a harsh roaring sound during inspiration when galloped or otherwise exerted. This is due to paralysis of one or both vocal cords in larynx, and is obviously a serious defect, causing great distress in bad cases.

Whistling.—Whistling is but a less serious form of roaring. (Broken wind is a disease of the lungs.)

3144.

Bone Spavin.—Bone spavin is an inflammation of the bones of the hock joint, which usually results in the irregular formation of new bone, which shows as a hard enlargement on inner surface of joint. It causes serious lameness, but response to rest and treatment is frequently good. A feature of this disease is the great lameness shown on starting off and going on toe, but as the animal warms up lameness tends to disappear.

Ring-bone.—Ring-bone is an inflammation of the surface of the pastern bones, with again the formation of new bone, which frequently forms a ring around pastern; hence "ring-bone." If the new bone impinges on joints, a hopeless lameness ensues.

Side-bone.—Side-bone is a disease of the fore feet due to the replacement of the soft cartilage of the heels with bone. It causes a constriction of the feet, and some degree of lameless frequently follows.

Navicular Disease.—This is an inflammation of the navicular bone, which is a small bone situated within the foot towards the heel. A disease of the fore feet, it results in an incurable lameness.

Curb.—Curb is an inflammation and swelling of a tendon at the back of the hock a few inches below the point. A divergence from the normal straight line is seen. Lameness frequently follows, but rest and treatment usually give good results. Curbs are frequently first "sprung" in predisposed animals when put to jumping.

Stringhalt.—This is characterised by a jerky lifting of one or both hind legs when the animal is made to move. In bad cases the legs may strike the belly. The gait of these animals is unsightly, and militates against good and lasting performance. The cause of this disease is obscure.

Shivering.—Shivering is characterised by a peculiar shivering or trembling of certain muscles in the hind-quarters and tail when the animal is backed or the feet are lifted. The cause here also is obscure. This disease is usually progressive, and may result in the animal becoming useless.

Cataract.—This is a disease of the lens or pupil of the eye. A film grows over its outer surface, making the horse blind.

Other Defects

Weaving, crib-biting, and wind-sucking are also unsoundness, but as they are often difficult to detect in examination, the word of the vendor is asked, which in these cases is sufficient protection.

Splints are bony enlargements below and inside the knee, and unless they impinge on the back tendons, causing lameness, they are of no consequence and do not constitute an unsoundness.

Mention might be made of the synovial conditions known as bog spavin, thoropin and windgalls, which may cause lameness and are difficult to remove. Bog spavin is an inflammation of the synovial membranes of the hock joint, with the formation of excess synovia or joint oil, which results in distension of that area inside the joint but higher up than bone spavin. Thoropin is of a similar nature and is situated above the hock, with distension of the depressions there. Windgalls are inflammation and distension of the synovial sheath through which the tendons pass at back of and just above the fetlock joint.

Special mention might be made of the foot, as "no foot, no horse." The feet should be sufficiently large and open at the heels to prevent constriction of the inner foot. The soles should be concave—that is, off the ground—and not flat or dropped. The horn should be good, and not shelly.

All lame horses are, of course, unsound. A lame horse should never be purchased, however modified the price, in the expectation that it can be cured or on the affirmation of the vendor that "it is nothing." In fact, never buy an unsound horse of any kind if you can raise the price of a sound one, and never, never breed from a sire or dam with a hereditary unsoundness.

In conclusion, see that your horse is symmetrical.

Making Most Efficient Use Of Phosphatic Fertilisers

By
I. L. ELLIOTT,
Supervisor of Fertiliser Supplies, Wellington.

ALTHOUGH it is to be regretted that it has been necessary to restrict the use of fertiliser, there is hardly any real need to remind farmers that the position might well have been much worse. On many farms, however, there will be considerable areas which will not suffer greatly through lack of fertiliser, and once again the point must be emphasised that each farmer must give very careful consideration to the use of the fertiliser he receives as efficiently as possible.

In general the rationing scheme is divided into three sections, the first catering for the supply of superphosphate for topdressing purposes, the second for the supply of phosphatic fertiliser for cropping, and the third for the supply of fertiliser in small quantities such as are required by town dwellers for use in their vegetable gardens. The amount of each order that will ultimately be delivered to the farmer will be determined on the completion of returns of the last two years' usage of phosphatic fertiliser for topdressing purposes. With regard to crops, the amount which will be available for each crop has been set out in the schedule and will be rigidly adhered to, as it is felt that the allowances made are sufficient. It must be realised that these restrictions have become necessary and that all classes of farmers will to some extent be affected, although all crops have been afforded the best possible allocation in the circumstances.

Obtaining the Best Results

In normal times it was realised that, to obtain the best results, fertiliser must be used in its most efficient manner. This is emphasised more than ever now that only restricted supplies are available. Farmers should therefore use the supplies they can obtain only on their best pastures and on those which are, in general, well supplied with clovers. Any other features, such as good grazing technique, which tend to make more efficient use of pasture growth automatically assist in making more efficient use of fertiliser.

On the farm, too, a certain amount may be done to preserve and utilise fully materials which are at present wasted. Particularly is this so on dairy farms, and readers are referred to an article by the Crop Experimentalist, A. G. Elliott, which appeared in the "Journal" for August, 1939, page 113, and to an article in this issue by G. A. Blake. In this connection the following estimate made by the Scottish Department of Agriculture of the value of liquid manure from dairy herds is of interest. According to this authority, the liquid manure from a herd of forty dairy cows would, in twenty-five weeks, be worth £50, or 25s per cow. Three and a half tons of potash salts, 2½ tons of sulphate of ammonia, and half a ton of superphosphate would be necessary to supply the same quantity of plant food as provided by the liquid manure of the forty cows. Just another example of the value of farmyard manure, which is now more often wasted than utilised.

On sheep farms the use of harrows will greatly assist in the efficient distribution of any animal droppings. The farmer would also be well ad-

vised to ensure that the pasture itself is in the best state of growth for the application of the fertiliser. Distribution of fertiliser on paddocks on which much rough, old growth has accumulated will result in much wastage.

Some Fertilisers Not Affected

It has to be stressed that the rationing of phosphatic fertilisers applies only to phosphatic fertilisers as defined on the form which farmers have to return—that is, superphosphate, reverted superphosphate, basic slag, compounded slag, Heskett slag, Seychelles and Walpole guano, Kotkur and K-phos, Nauru phosphate, and any other phosphatic guano or rock phosphate. The term "phosphate" does not include such other organic phosphatic fertilisers as bonedust or blood and bone, nor any of the potash manures, nor purely nitrogenous fertilisers. These materials, together with lime, which are unaffected by rationing, will form a useful basis with which to bulk up supplies of phosphatic fertiliser. Before making up a mixture, however, it would be wise for the farmer, if he feels it necessary, to obtain advice to help him to do this in the best possible way. Where supplies of lime are available cheaply and near the farm, it may be better to consider making the mixture himself rather than having this done at the manufacturers' works or by some mixing agent in order to avoid double railage on the lime. The farmer would be wise, also, to ask for a careful statement of how the price of such a mixture is reached.

An average of all swede and turnip mixtures registered this year indicates that approximately 70 per cent. of the mixtures consist of phosphatic fertiliser as defined above. In the schedule, however, an amount of 1½cwt.. per acre is allowed for turnips and swedes. If a mixture is made up which approximates to the average registered turnip and swede mixture, it will be possible by the use of fertilisers not affected by the rationing to increase this 1½cwt. per acre to 2½cwt. per acre. In other words, the 1½cwt. of phosphatic fertiliser allowed in the schedule is the equivalent of 2½cwt. of the average mixture sold for fertilising roots and forage crops.

Radio Broadcasts

RADIO broadcasts to farmers will be given from 1YA Auckland at 7.15 p.m. on the following dates:—

July 28.—Young Farmers' Club Notes: Mr. J. M. Smith, Fields Superintendent, Hamilton.

August 4.—"Spring Cropping": Mr. H. Woodyear-Smith, Auckland.

August 11.—"Feed Flavour Control in the Bay of Plenty": Mr. A. V. Allo, Instructor in Agriculture, Tauranga.

August 18.—"Brooding of Chickens": Mr. E. C. Jarrett, Poultry Instructor, Auckland.

August 25.—Young Farmers' Club Notes: Secretary of the Auckland Council.

PIG INDUSTRY BROADCASTS.

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

1YA, August 21, 7.15 p.m.—"Elimination of Pig Losses": N. W. Carter, Bay of Plenty District Pig Council.

2YH, Napier, August 14, 7.30 p.m.—"Housing and Equipment": I. Owtram, Tairawhiti District Pig Council (Gisborne).

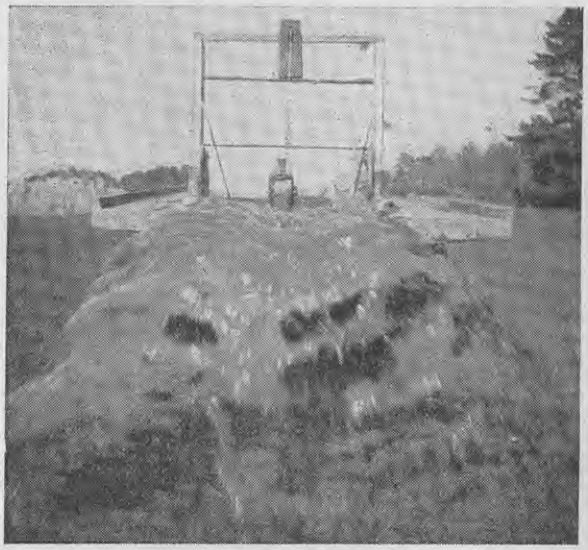
3YA, July 17, 7.15 p.m.—Subject not decided: H. W. McIntosh, Canterbury Pig Council.

4YA, August 11, 7.15 p.m. — "Pig Feeding": N. Macdonald, Otago District Pig Council.

2ZA, Palmerston North, August 19, 8.30 p.m.—"Care of Litters": L. Marsdon, Wellington District Pig Council.

NO QUOTA ON FARMYARD MANURE!

Every dairy farmer has a potential supply of free manure. It has been estimated that about 12 tons of animal manure is produced by the average cow each year, and that, if properly collected and distributed, the droppings of every hundred cows in the milking sheds and yards would provide adequate topdressing for at least 30 acres. With the adoption of a system of liquid manure distribution, dairy farmers can alleviate considerably the present shortage of fertiliser supplies.



The Dairy Herd Is a Valuable Source of Liquid Manure On the Dairy Farm

By
G. A. BLAKE,
Instructor in Agriculture,
Stratford.

ABOUT 12 tons of animal manure in the form of dung and urine is produced by the average dairy cow each year. Of this manure, some 9 tons per cow is deposited in the paddocks, where its value when properly spread by harrows has long been recognised by the practical farmer who is keen on the maintenance of the fertility and production of his farm. The remaining three tons, it is estimated, is deposited in and around the milking shed and yards.

The value of this manure, so often washed away into drains and streams or thrown out into heaps to waste and spoil, was dealt with in an article in the "Journal" for August, 1939, by A. G. Elliott, then Instructor in Agriculture for North Taranaki. In this article, Mr. Elliott summarised the opinion of some 27 farmers who had been making use of the cowshed and yard washings as liquid manure for topdressing pastures and for specially manuring areas intended for crops. Details were also given of the type of apparatus used to collect and distribute the manure.

The present article is intended to stress the fact that, although the use of this animal manure for topdressing and for crops has increased to a remarkable extent in North and Central Taranaki in recent years and

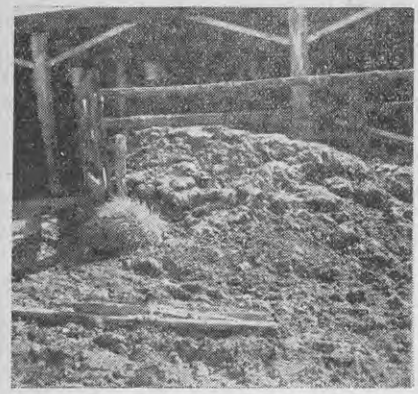


Fig. 1.—When this accumulation of droppings reaches the toprail something will have to be done about it.

Fig. 2.—The type of drain recommended. This takes the washings well away from the shed.

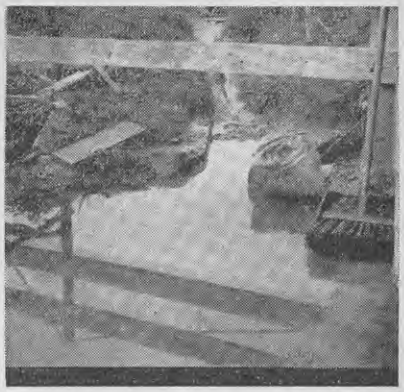


Fig. 3.—The water is held at the head of the drain to soften the droppings.

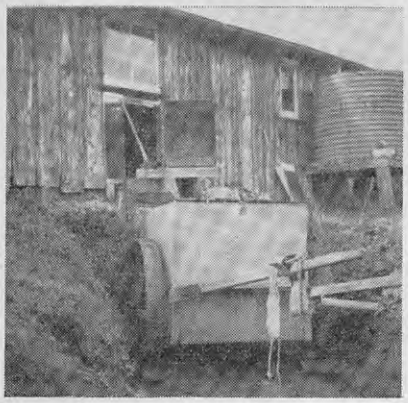


Fig. 4.—A small distributor filled direct from the drain for daily distribution.

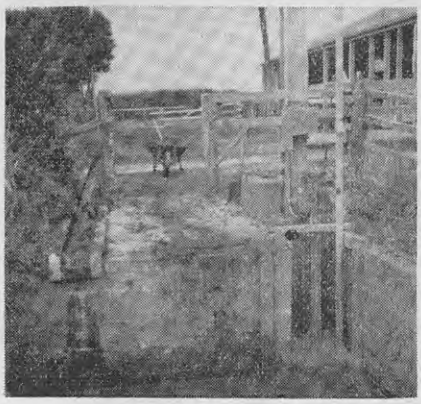


Fig. 5.—An electric pump is used here to lift the manure from the sump to the tank.

Fig. 6.—Taking advantage of the fall to fill the tank direct from the sump.

many farmers are making use of the idea in other dairying districts, there is still going to waste sufficient manure in the form of shed cleanings and washings to topdress adequately many thousands of acres of our pasture lands.

Practical users of the liquid manure which results from the collection of the shed and yard cleanings and the water used for washing down the shed claim that an acre of grass can be topdressed for every three cows milked, and that the acre so topdressed will produce more and better feed than results from the use of 3cwt. to 4cwt. of the usual phosphate fertiliser. In other words, the droppings in the milking shed and yards from every 100 cows, if properly collected and distributed, would provide adequate topdressing for at least 30 acres of the dairy farm lands.

With the present restricted supplies of fertiliser for topdressing and for crops, the value of this manure, hitherto so often wasted, should be considered by every dairy farmer who is anxious about the maintenance of the fertility and production of

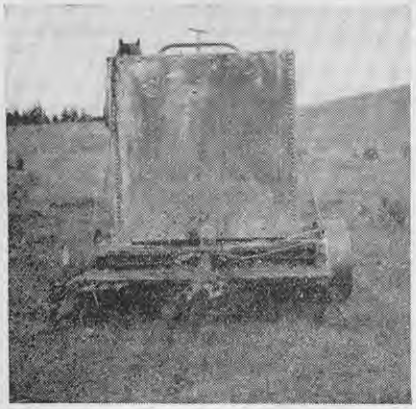


Fig. 7.—A suitable distributor for smaller herds; note the wide, strong wheels to carry 1 ton.

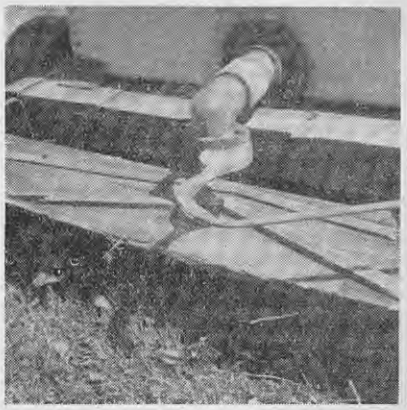


Fig. 8.—The type of spreader used when the tank is on a sledge.

Fig. 9.—A useful spreader for use on a high vehicle. A sheet of iron is bent to give the spread.

his farm. It will not be out of place, therefore, to give in some detail the most practical methods which have been developed by dairy farmers in Taranaki for the easy collection and distribution on to the paddocks of the shed and yard manure.

Collection of The Manure

It has been found that the manure put on the pastures or on to cropping areas in the liquid form so that it will run freely from a tap gives much quicker and better results than where only the rotted and rain-washed solid manure is collected for distribution. Further, the liquid manure, although dilute, can be handled and distributed quicker and easier than the solid manure. There is no shovelling to be done, and there is little or no loss of manurial value. The dung and urine is washed into a drain leading to a sump to hold the cleanings for several days or into a distributor which is emptied every day.

Whether a sump or the distributor is used to collect the material, the drain should be wide enough to take the shed broom, and should have 6in. to 9in. sides at any rate near the entrance to prevent the manure slopping over the edges. Such a drain is illustrated in Fig. 2.

In Fig. 3 the method of softening the solid manure for easy washing down the drain is shown. The water is held at the entrance of the drain until the shed and yard is washed down, and the solid manure breaks down ready to go down the drain. This is of practical importance in the summer time.

It is estimated that about two gallons of water per cow is used to wash down the average shed and yard adjoining, and in this the dung and urine are collected. For 60 cows, then, about 120 to 130 gallons of liquid manure would be produced each day. This is mentioned to give a rough idea only of the capacity of the sump or distributing tank required.

Pumps and Sumps

Wherever possible, the use of a pump to lift the manure from the sump to the distributor should be avoided. Although there are pumps which will handle this manure quite well, they cost money and there is always the possibility of blockage by hair from the cows' tails, by sand or gravel carried into the yards, and so on. However, where the land is flat it is not possible to wash the manure directly into the distributor, and a sump and pump must be used.

Wherever possible use should be made on undulating country of gravity flow to fill and empty the sump or to fill the distributor where no sump

is used. The use of quite a long drain to get the fall from the sump to the distributor or to allow the distributor to stand below the outlet of the drain is advisable. Fig. 4 shows a distributor being filled directly from the drain, while Fig. 5 shows the pump required when a sump is used and the manure cannot be run from the sump to the distributor.

In Fig. 6, on the other hand, the use of a pump is avoided by taking advantage of sufficient fall to let the manure run from the bottom of the sump to the distributor. This is the most satisfactory way of dealing with the manure, because the sump has two very important advantages over direct delivery to the distributor. First, the manure for several days or even weeks can be collected, and second, the collected manure, in which bacteria have been working for some time, gives quicker and better results than the fresh manure from daily distribution. Sumps are either concrete-lined, if below ground, or with 3in. concrete walls and bottom. The avoidance of the use of a pump is also, as already mentioned, well worth providing for.

Distributors

Iron or wooden tanks are used for carrying the liquid manure on to the paddocks. Small containers up to 200 gallons can be mounted on a sledge or konake, which should, however, have wide wheels. A small distributor is shown in Fig. 7.

For handling larger quantities, the horse, lorry, or motor truck with a 400-gallon or larger tank is used.

Distributing The Manure

It must be remembered that this liquid manure is quite dilute, and that to get results heavy applications are required. The usual practice is to fit the tank with a 3in. tap of the dairy factory milk vat type. The tap should be fitted with a lever and arm so that it can be opened and shut quickly from a distance. A spreader board as illustrated in Fig. 8 or a spreader plate as shown in Fig. 9 should be placed about three inches below the tap to give a spread of about 6 feet. A wider spread is not advisable because of the dilution of the manure.

A 400-gallon tank with a 3in. tap can be emptied in about four minutes, and with a 6ft. spread will cover about 14 chains. It takes nine or ten such tank-fulls to do an acre well,

and the effect of a good dressing such as this will last well beyond the year. The effect obtained by the use of this liquid manure collected from the milking shed and yards is immediate and lasting. The growth and density of the pasture is improved, it definitely increases production, and the stock have no objection to grazing freely within a day or so of an application. The paddocks are usually dealt with in strips and seldom as a whole, however, this fact is of little real importaance.

Summary

To sum up, practical experience has shown that the manure from the milking shed and yards has a real and satisfactory value for pasture topdressing or for enriching areas of land intended for such crops as mangolds, carrots, and sugar beet.

The manure is best used in the form of liquid manure. It can be collected in concrete sumps to hold the cleanings for several days, or it can be run direct to the distributor. The distributor consists of a tank on wheels with a large tap to give a heavy and narrow spread to get the necessary concentration.

Finally, if all the manure deposited in and around the milking sheds of New Zealand were distributed as described back on to the grassland from which it comes, about half a million acres of dairying land could be kept satisfactorily topdressed with the addition every few years of some extra phosphatic manure, such as superphosphate or basic slag.

All photographs are by the author.

Answer to Correspondent

Reinforcement for Concrete Fencing Posts

B.W. (CAMBRIDGE):—

Would you please tell me through the "Journal" what is the cheapest form of reinforcement for concrete fencing posts?

FIELDS DIVISION:—

In the absence of ¼in. steel rods for ordinary posts and 3-8in. for strainers, twisted No. 8 fencing wire to measure as near as possible to the above dimensions is quite suitable and is the cheapest reinforcement that can be used. It is suggested that posts reinforced with fencing wire should be allowed a longer period to cure than those reinforced with steel rods, which are usually allowed 30 days.

Two Auckland Farmers Show How

CONCRETE CULVERTS CAN BE MADE ON THE FARM

With a little time, expense and labour, the farmer can construct permanent concrete crossings to bridge open drains or small streams.

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

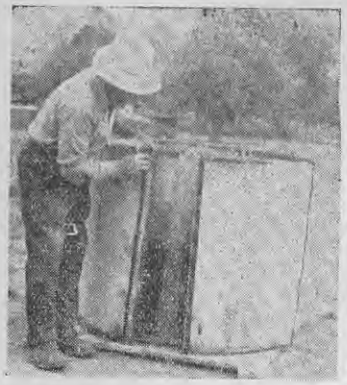
THERE are few farms which do not have at least some open drains or small streams, and on many there are a considerable number over which good permanent crossings are essential for the efficient working of the farm. Every farmer knows to his cost the manifold deficiencies of the common pattern of wooden crossing, and just as concrete is replacing timber in bridge construction on the roads, so are its very real advantages becoming apparent for crossings on the farm.

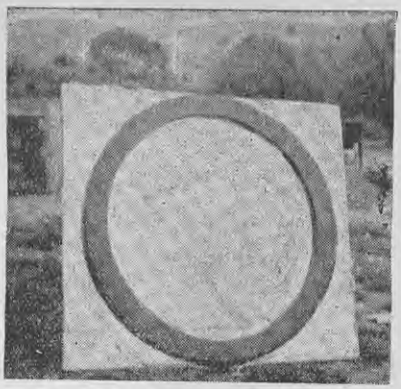
Under ordinary farm conditions, the crossing may be constructed from a number of concrete pipes, or it may take the form of a miniature arched bridge. Both types are easy to construct, and both will carry heavy loads. From the viewpoint of general adaptability and utility, the pipe type is probably best suited for the average farm, and it can be particularly recommended where extensive subdivision entails the provision of a considerable number of water troughs. If a good supply of these home-made pipes are on hand, they can be readily used for culverts or can be easily converted into useful drinking troughs wherever they are required.

The farm owned by Messrs. Barr Bros. at Glorit, like many farms in the North, is intersected by numerous large open drains, and in order to provide safe and convenient access to the various fields, good, wide crossings are necessary. Although improvised wooden crossings had served as a makeshift in the past, frequent trouble and inconvenience resulted when heavy loads of fertiliser had to be transported for topdressing. To avoid further trouble, Messrs. Barr decided that wherever an old crossing was in need of repair or a new one was being constructed the work would in future be done in concrete. They decided, also, that for conditions on their farm the most satisfactory solution would be achieved by some simple method of manufacturing plenty of cheap, standardised concrete pipes of a size which would be generally best suited to their average size of drain.

Mould Described

After some consideration they designed a mould shown in Fig. 1. The mould is constructed of heavy gauge galvanised sheet iron. The ends of the outside mould are fitted with angle irons, which are easily bolted together when erecting the mould. In order to facilitate the detachment of the inner section of the mould, the two ends are





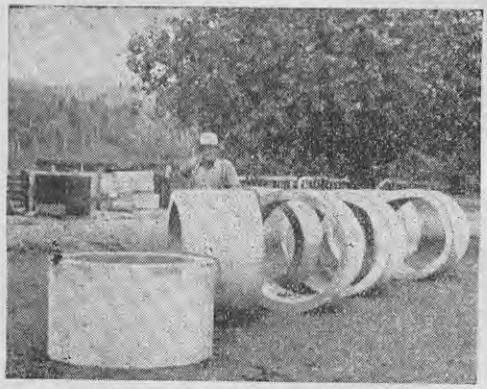
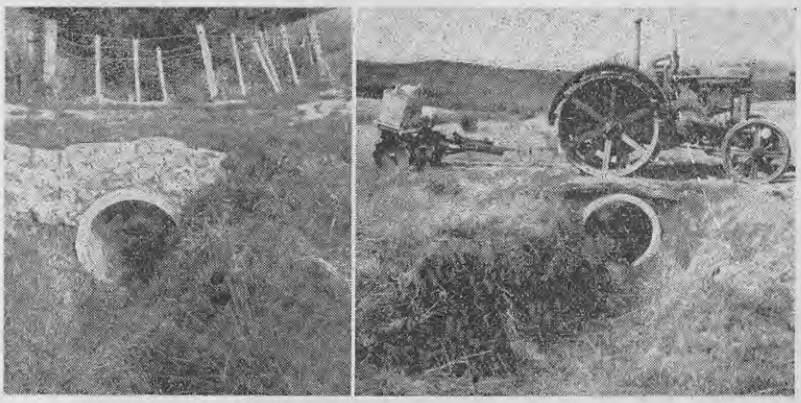


Fig. 1 (left).—Erecting the mould used by Messrs. Barr Bros. Note the angle iron for joining the ends of the outer mould casing. *Fig. 2 (middle).*—The base-board with the circular distance-piece used as a foundation for the mould. *Fig. 3 (right).*—A plentiful supply of home-made pipes. These pipes can be used for culverts if required, or they may be easily converted to useful watering troughs for stock.

simply held in position by a number of small bifurcated rivets, which are inserted through registering nail holes, with their open ends pointing to the centre. In this way the inner section can be easily uncoupled and withdrawn by merely pinching the exposed ends of the rivets. In order to insure complete rigidity, a cross-piece of wood with a saw cut 3 inches from the end of each arm is fitted over the top of the mould, the inner rim of which fits into the saw cuts.

The mould itself rests on a circular foundation of wood, which is nailed to a wooden platform, and which acts as a distance piece for the bottom of the mould. Where a special heavy gauge steel mould is used, these distance pieces are not required. Such a mould, however, is rather expensive, and its cost might not be warranted unless it is intended to manufacture a very large number of pipes.

As designed by Messrs. Barr, the mould produces pipes with an inside diameter of 3 ft. and with 3-inch walls. It can be used to turn out pipes 3 ft. long, but as these are rather heavy to handle, only 2 ft. pipes have so far been made.



Figs. 4 and 5.—Alternative "facings" for retaining the earth covering. Fig. 5 provides a guarantee of strength.

Filling the Mould

As the culverts may have to carry very heavy loads, the material used in the aggregate must be of good quality. The mixture should be filled in slowly enough to allow very thorough ramming. This is important to insure

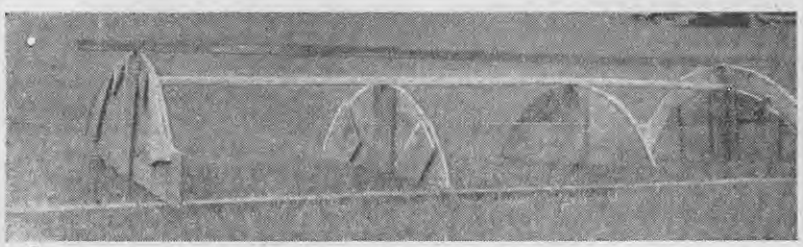


Fig. 6.—Showing the mould used by Mr. McLean. Note the ridge for the inner casing on the end section of the mould.

Fig. 7.—This illustration shows a bridge with the outer ledge resting on the hard sub-soil.

Fig. 8.—A bridge in miniature. This picture gives some idea of the size of the drain on Mr. McLean's farm.

good, strong, clean pipes. The pipe should not be removed until at least five days after casting, and some care must be taken when moving it off the base-board on to its side. Before doing this, a rolled up sack or a bundle of hay should be pushed close against the bottom of the pipe to act as a cushion and to distribute the weight as the pipe is gradually being tilted over on to its side. With reasonable care, there is little risk of breakage.

Constructing The Culvert

The number of pipes required for each culvert depends on circumstances. For general convenience, however, both for stock and implements, ample width—say about 12 ft.—should be allowed.

In placing the pipes in the culvert, sufficient room should be left to ram the soil—preferably clay—completely round each pipe if possible. This is particularly important if the culvert is intended to carry heavy loads. The pipes can be easily and safely lowered into position by means of a rope used in the same way as for rolling heavy casks from a wagon.

The job should be finished off with a clear 6 inches of well-packed soil above the pipe. The sides may be finished with stone "facings" to retain the earth as shown in Fig. 3, or timber may be employed as in Fig. 5.

Bridge Pattern Culverts

Part of the farm of Mr. W. L. J. McLean, Kanohi, is rather low lying and is intersected by a big open drain. As this drain carries a large volume of water after heavy rains, the old wooden crossings were a constant source of trouble and were often entirely carried away. Taught by bitter experience, Mr. McLean decided to build crossings of concrete which would be strong enough to carry a very heavy load.

As will be seen from the illustration, the mould used is of quite simple construction. The inner decking is constructed of eighteen 4 in. x 4 in. boards each 12 ft. long. These are fitted on to the inside ridge on each end-piece, and are supported by two arches towards the middle. The curved length of the inside of the arch is 6 ft. long, and the vertical height of the arch is 18 inches at the centre. The mould casings are 3 in. apart.

Construction Of Bridge

Before filling in the concrete, the complete lower decking is first placed in position. One plank of the outer casing of 4 in. x 2 in. timber is then laid along the bottom of each side and nailed at each end to prevent bulging. When this space has been filled with concrete another plank of casing is laid, and so the work proceeds from the two outsides to finish at the top

centre of the arch. It will be noted that provision is made for a ledge at each side, and that this ledge rests on the hard subsoil. The recess for this ledge is prepared when erecting the mould over the drain, and acts as a portion of the mould.

The mixture used for the concrete comprised 4 parts of blue metal chips and 2 parts of sand to 1 part of cement. Although no reinforcing has been used, the design of the bridge contributes to its strength, and it has carried loads of over 4 tons with safety.

The new bridges constructed by Mr. McLean have been subjected to some very heavy floods, but they have easily withstood every test. He can now cross with a fully-loaded truck without anxiety, and no longer worries in the event of heavy rains.

Cress tainting of cream is one of the biggest problems facing the dairy industry. Recent experiments show that control methods must come from the farm, and ways and means by which the farmer can avoid a great deal of trouble from cress taint are described in this article. It is pointed out that, while controlled grazing is effective, it will not prove a complete remedy.

REDUCE CRESS TAINT IN CREAM

By

A. V. ALLO, Instructor in Agriculture, Tauranga, and F. H. McDOWELL, Chemist, Dairy Research Institute, Department of Scientific and Industrial Research, Palmerston North.

IN spite of all that has been written, the tainting of cream by land cress is becoming more widespread every year. The taint was first noticed as being very prevalent in the South Auckland district, but in recent years reports of its occurrence have been received from districts all over the North Island. The subject is thus serious—in fact, one of the biggest problems facing our dairying industry. It is one meriting the serious attention of the farmer, because in the first place cress-tainted cream, if detected on the grading stage, will be given a low grade or may even be rejected altogether. Also, and of far greater moment to both dairy farmers and factory managers, such a loss of cream grade is reflected in the grade of the butter, with consequent financial loss to all the suppliers of the factory.

In the factory itself the taint is troublesome because it is difficult to detect in cold cream, and because a small quantity of tainted cream can affect a large volume of clean cream with which it may be mixed in the holding vat before churning. Tainted cream from one or two farms on one day can thus lower the returns to the factory for the whole of that day's make of butter.

Unfortunately, experience shows that the cress taint cannot be removed completely by treatment in the factory. Careful experimental work carried out by the Dairy Research Institute at the Tauranga factory substantiates the evidence, although such investigations are still being continued, and will be reported on elsewhere. In this article it is sufficient to state that, with the knowledge at present at our disposal, control measures must come from the farm. It is our purpose to indicate to the dairy farmer ways and means by which he can avoid a great deal of trouble from cress taint.

What Can Be Done On the Farm?

During the past two seasons a series of careful field trials have been conducted at Tauranga and Te Puke and in the Manawatu district, and the recommendations which are made in this article are based on the results of these trials.

The farmer who desires to keep his cream free from land cress taint has a twofold task—(a) To do his utmost to prevent the growth of cress in his dairy pasture by a carefully planned system of pasture management, and (b) if, in spite of his efforts, or through any other cause outside his control, cress invasion occurs, he must be prepared to institute a system of controlled grazing on the infested areas.

Prevention of Land Cress Growth

Land cress, *Coronopus didymus*, is an annual with trailing stems, finely divided leaves, and small, clustered, white, inconspicuous flowers. It appears in the early spring, and in a normal season may last until after Christmas. When the leaves are crushed one can smell the pungent mustardy odour so characteristic of the plant.

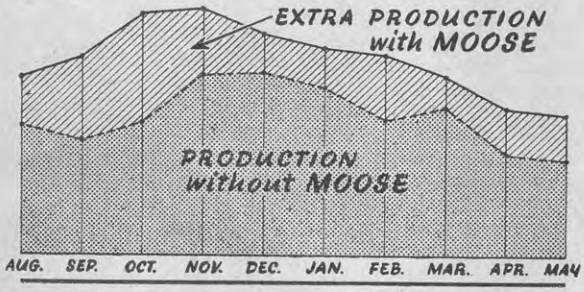
As the plant is an annual, making its growth when the principal pasture species are making their main growth, it does not usually cause much concern in a pasture containing a dense sward of grasses and clovers. The seeds in such a sward get little chance to germinate and grow before the smothering grasses get away. It is in a weak thin sward that the weed shows up at its worst.

JULY PROBLEMS
on the dairy farm . .

1 EARLY CALVERS

The whole season's production is dependent upon the feeding of dairy cows NOW. Until spring pastures come away cows are milking on winter grass, hay or silage, and unless high protein food is added to balance the daily rations, they will drain their vital resources. It is not easy to lift production once it has dropped; but the remedy is to feed Moose Oil-cake meal until pastures are adequate. MOOSE supplies the nutriments for milk and prevents the cows drawing on body reserves. Fed daily in boxes in the dummy bails 1 lb. Moose or more according to the cow's production.

The graph below shows the added production of butterfat throughout the season from a North Taranaki herd of 28 cows fed on Moose during the critical weeks after calving.



2 CALF REARING

The attention given calves NOW will determine their future stamina for butterfat production. Skim milk and whey supply valuable milk minerals for calf rearing, BUT they lack fat and protein.

Fed alone, skim milk or whey will not result in well-grown healthy calves necessary to build an early maturing disease-free future herd. Moose oil-cake meal replaces fat and proteins lacking in skim and whey and makes a COMPLETE AND NATURAL CALF FOOD.

★

Approximately 1 gallon of pure Linseed Oil in each 100-lb. bag of Moose.

Send enclosed unstamped post card for complete information and free sample of MOOSE.

A thin, bare sward which resulted from sowing cheap seed —a good opening for cress.

Weeds in a paddock lying fallow after a crop of maize.

Factors favouring the appearance of cress in a pasture are:—

(1) Heavy stocking or trampling of a pasture during winter, with consequent overgrazing and pugging leading to a deterioration and opening up of the sward.

(2) The practice of leaving old stack bottoms and ensilage pits unfenced from stock. Cress grows very freely in such places and may cause trouble, even though the areas are small. All such areas should be shut off from stock until the end of December.

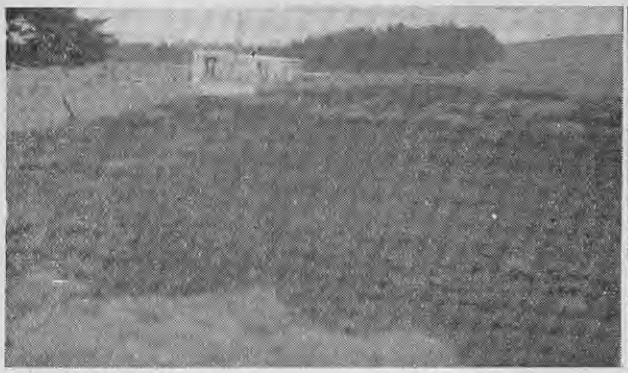
(3) Heavy tramping around gateways, and bare ground around cowyards, stockyards, and under hedges give conditions where cress is likely to appear and thrive. It is not always possible to fence off these areas, but they should be watched and any cress plants destroyed by hand cultivation.

(4) Even in a dense sward cress may sometimes occur if chain harrowing has been neglected. The writers have often seen cress growing strongly around old cow pads. Similarly, the bare ground around the base of a thistle may be found to provide conditions suitable for cress growth.

(5) Grass grub attack, which weakens the pasture growth and leaves bare patches in the sward.

(6) Paddocks lying uncultivated after a crop such as maize usually have a high cress population, and should not be grazed by milking cows.

(7) Spring sowing of pastures, particularly after a maize crop, gives rise to conditions suiting cress development, and such a practice has been responsible for considerable loss to certain farmers. The danger is accentuated if cheap seed is sown, or if the mixture of seed contains a high preponderance of slow-establishing pasture species. The sowing of a suitable pasture mixture in the early autumn, combined with thorough preparation of the seed bed and adequate phosphate manuring, will help to ensure



Asking for trouble. Bare ground near the cow shed gives rise to ideal conditions for cress invasion.

Gravel pugged by heavy grazing during the winter, which invites cress invasion.

that the new pasture will contain little or no cress in the following spring. If spring sowing cannot be avoided, the mixture should be dominantly rye-grass and white clover.

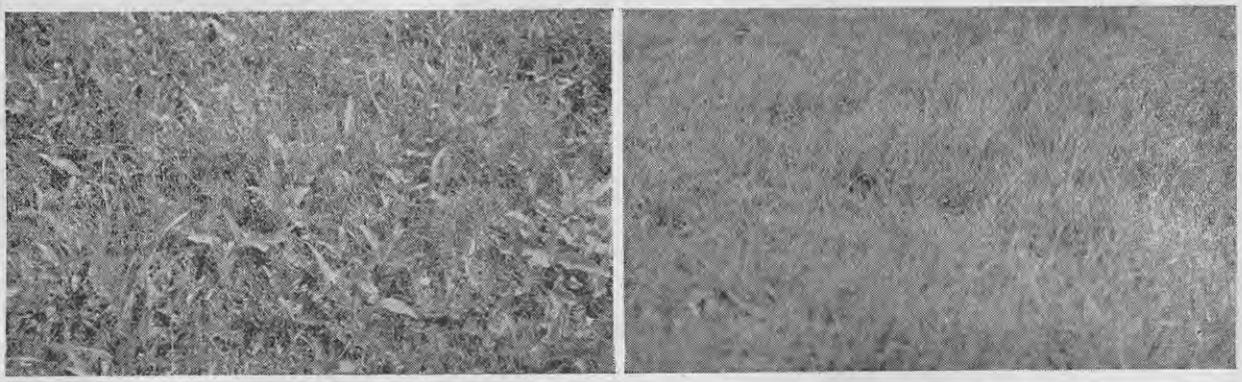
From the foregoing, it is obvious that cress control will be a matter of pasture management, the aim being to graze the pastures in such a way that conditions favouring the establishment of the cress will not arise.

Control Grazing of Cressy Pastures

It will be generally accepted that, where possible, cress-infested pastures should be grazed with dry stock, but this is not always practicable. In many instances farmers have not the necessary area of non-infested pasture available, and in other cases the number of dry stock is not large enough to deal with the cressy pasture. Moreover, the badly infested pastures are sometimes young grass of great value for milk production, and the loss of this grazing is definitely a serious matter for the dairy farmer.

It is therefore of paramount importance that the possibilities of reducing land cress taint in cream by controlled grazing of the infected pastures should be fully explored.

Last season detailed experiments were carried out in the Tauranga and



Left.—Spring-sown pasture infested with cress, spurry and redshank. Every time the cows were grazed on this pasture the cream was graded 88 or else rejected.

Right.—A grassy sward which should give little trouble.

Te Puke districts by the writers, using commercial dairy herds turned on to cress at various times before milking, and at the Dairy Research Institute the feeding of specified quantities of cress to individual cows at different times before milking was studied. The following remarks are based on the evidence afforded by these trials.

Time Taken for Taint To Appear in Milk

Cress-flavoured milk, cream and butter have a characteristic flavour, rather harsh to the palate, and with a burning mustard-like quality. The taint is difficult to detect in cold milk or cream unless it is fairly strong, but it becomes much more evident when the milk or cream is heated. This introduces a very great difficulty for the factory grader, who may allow a tainted cream to pass as clean, while the cress taint becomes evident in the pasteurised cream and in the butter. Many cases have come to our notice where a can of tainted cream which has been pasteurised and mixed with a large bulk of clean cream in a 3,000-gallon vat has tainted the whole day's make of butter.

It has been shown that with most cows cress taint appears in the milk within a few minutes after the plant is eaten. Apart, also, from the state of health of the cows, it has been found that some animals give a tainted milk more rapidly than others. It does not take much cress to produce a taint in the milk, and strong cress taint has been reported in the milk of a cow that had consumed 1½ oz. of cress.

How Effective Is Controlled Grazing?

Much has been written on the system of controlled grazing for the prevention of feed taints. The usual recommendation is to graze the cows on the "weedy" paddock to within three

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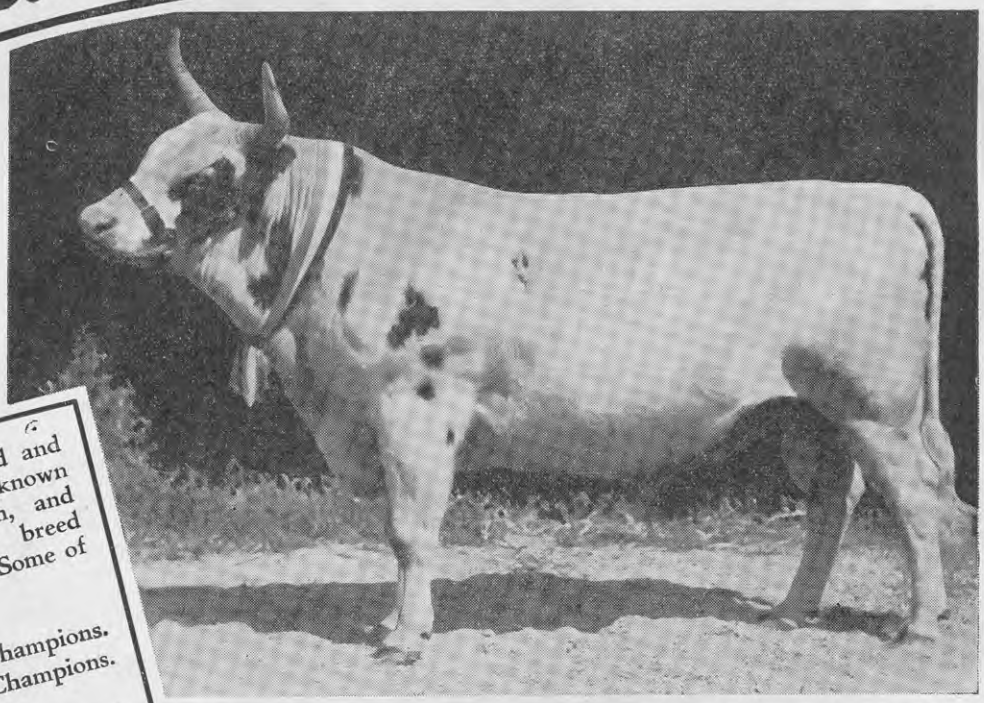

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INVERCARGILL:
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8 Firsts, 2 Champions.

WYNDHAM:
8 firsts, 2 Champions, 2 Reserves.

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6 Firsts, 2 Champions.

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GUARANTEED TO CONTAIN:

Pure Bone Flour	Salt	Potassium Iodide
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or four hours of milking, and then to transfer them to a clean paddock until milking time. Unfortunately, experiments have proved conclusively that with cressy pastures this control is not absolute and will not always give the desired results. The indications are that, if the amount of cress in a field is small, such a system of controlled grazing will give satisfaction. If the feed is badly infested with cress, controlled grazing will not result in the production of a cress-free cream. It will undoubtedly result in a better cream being produced than would have been the case had the cows been on the cress all day, but the cress taint will not always be completely eliminated.

In last season's experiments cows were grazed on a very cressy paddock until noon and were then run into a concrete yard until milking time. The resultant cream still had a cress taint. In another trial cows were grazed between 9 and 10 a.m. on a paddock badly infested with cress and were then taken to a clean paddock for the rest of the day. The evening's cream was strongly tainted. In several instances cress taint had been noted in cream from cows the following morning—that is, 14 to 18 hours after the ingestion of the cress. There is evidence to indicate that cress taint is more pronounced during wet weather, and that controlled grazing is more effective in dry weather than in wet weather.

The position should not be misunderstood. Controlled grazing for three to four hours before milking in all cases will result in a better cream being produced than if the cows were on the cress paddock all day, but in cases of fairly heavy cress infestation, the controlled grazing system will not remove the taint from the milk completely.

Pasture Management Important

The whole scheme of control must hinge on the method of pasture management. It has been proved conclusively that the paddocks most likely to be affected, other than paddocks of young grass, are those which are heavily overstocked during the winter. Consequently, control depends upon better provision of winter supplementary feed, combined with winter spelling of pastures. By the latter is meant the closing of a few ryegrass-dominant paddocks in the autumn, and lightly grazing them during the winter so that they will be in good strong grassy growth in the following spring. Such paddocks should contain little or no cress. Cows can be grazed on them for one and two hours daily, and can then be turned into a clean run-off paddock. Cressy paddocks should be grazed by dry stock, wherever possible.

Remember, always, that prevention is better than cure. The farmer who has ample supplies of winter feed and who winter-spells part of his farm is not likely to encounter trouble with cress taint on an uncontrollable scale, and at the same time he gets the best out of his cows, as they are being fully fed at the period of the year when they are producing their maximum.

Even on the most carefully controlled farm cress plants may appear in places. All farmers in their own interest should learn to recognise the plant by sight, and all plants seen should be hoed out immediately.

Other Feed Taints

Many other weeds can give taints in cream, for example, pennyroyal, camomile, sweet vernal, and water cress. Control measures on the farm should be based on the methods advocated for cress.

Unfortunately, certain plants of vital importance in a sward, more particularly the clovers, can in certain circumstances give just as much trouble as weeds. The chief offenders are subterranean clover, suckling clover, and white clover, in that order of importance. Trouble is usually experienced when a pasture contains a high percentage of one or more of these clovers, especially in the period of their rapid growth and before the pasture has had a chance to harden off. Such clovery pastures usually follow close grazing in late autumn and winter, and control measures to be adopted are similar to those advocated for cress.

Winter spelling of pastures will encourage grassy rather than clovery swards, thus helping to ensure a better quality cream. Also, controlled grazing of clover swards with a run-off into a grassy paddock three or four hours before milking, gives far better taint control than is obtained when adopting such measures with cress, and should be practised in all cases where a farmer is getting "feedy" cream.

Many farmers have a defeatist complex on the whole taint question, and are inclined to take the view that the trouble is just seasonal and is "just one of those things." This is definitely not the case, and examples can be quoted of many farmers who have made a material improvement in the grading of their cream by adopting the various measures suggested in this article.

Answers to Correspondents

Burning Out Stumps

F.J.B. (WANGANUI):—

Will you please let me know whether you are aware of any treatment that can be applied to old macrocarpa stumps in order to burn them out?

FIELDS DIVISION:—

The idea that tough tree stumps can be treated with chemicals to make them burn easly or to rot them quickly has persisted for many years. It has often been stated that saltpetre put into large auger holes in such stumps will, after a few weeks, cause the stump to burn readily right into the ground, getting rid of the roots as well as the stump. Another suggestion is that strong acids, such as nitric or sulphuric acid, poured into auger holes will rapidly rot both green and dead stumps so that they will readily burn in a few weeks.

There is no foundation whatever in these statements. Careful trials with both acids and saltpetre have shown that the method is quite ineffective.

If explosives can be used without danger to buildings, etc., the burning out of tough stumps such as those referred to can be speeded up by using blasting powder or gelignite to loosen the ground under and round the stump and also to split and shatter the stump. By shattering the stump the fire can work much more freely and effectively, while the loose soil round the roots allows the fire to penetrate more deeply, thus getting rid of more of the roots than would otherwise be the case.

The use of explosives as stated is the only effective method which can be of assistance in burning out such stumps.

PAMPAS GRASS

The provision of supplementary winter feed is a problem on many farms. In suitable districts pampas grass can be made to produce a large bulk of good winter fodder, as is shown in this article. The experiences of a number of farmers with this grass will be given in next month's issue.

Successful Methods Used For Establishment In The Bay of Plenty

By

C. R. TAYLOR,
Fields Instructor, Whakatane.

GENERALLY speaking, pampas grass is not particularly exacting in its demands so far as soil and climate are concerned. Many people imagine that nothing short of a soil possessing the highest fertility—a drained swamp, for instance—is of any use for successful pampas grass culture, but this is by no means the case, as has been demonstrated many times in actual practice. The plant will naturally do best under really good soil conditions, but perfectly satisfactory results are possible in less favourable circumstances, provided reasonable attention is given to the selection of a plantation site and consideration is shown to the young seedlings or rooted cuttings during their first year of establishment.

Soils which do not retain an average amount of moisture over the summer period or, on the other hand, become thoroughly waterlogged in the winter are, however, useless for good pampas grass growth and consequently should not be so employed. With regard to climate, it will be found that moderate to warm conditions, together with a well-distributed rainfall, such as is experienced in most parts of the Auckland Province, particularly the coastal areas, suit pampas grass best. Nevertheless, it is surprising what rigorous climatic conditions it will tolerate when firmly established.

High Feeding Value

The feeding value (from analyses) of pampas grass has been stated by a prominent agricultural authority in this country to be comparable with other green fodders, such as green maize and oats, etc., **provided that the components are equally digestible.** While one cannot honestly overlook the importance of digestibility when comparing the relative feed values of various fodders as indicated by chemical analyses—the only real test being actual feeding trials made under controlled conditions—still it would seem that, after many years of practical experiment by farmers over a very wide area, any doubts that may have existed regarding the feeding value of pampas grass have by now been completely dispelled.

This is emphasised when one recalls how well cattle in Bay of Plenty districts thrive when wintered largely

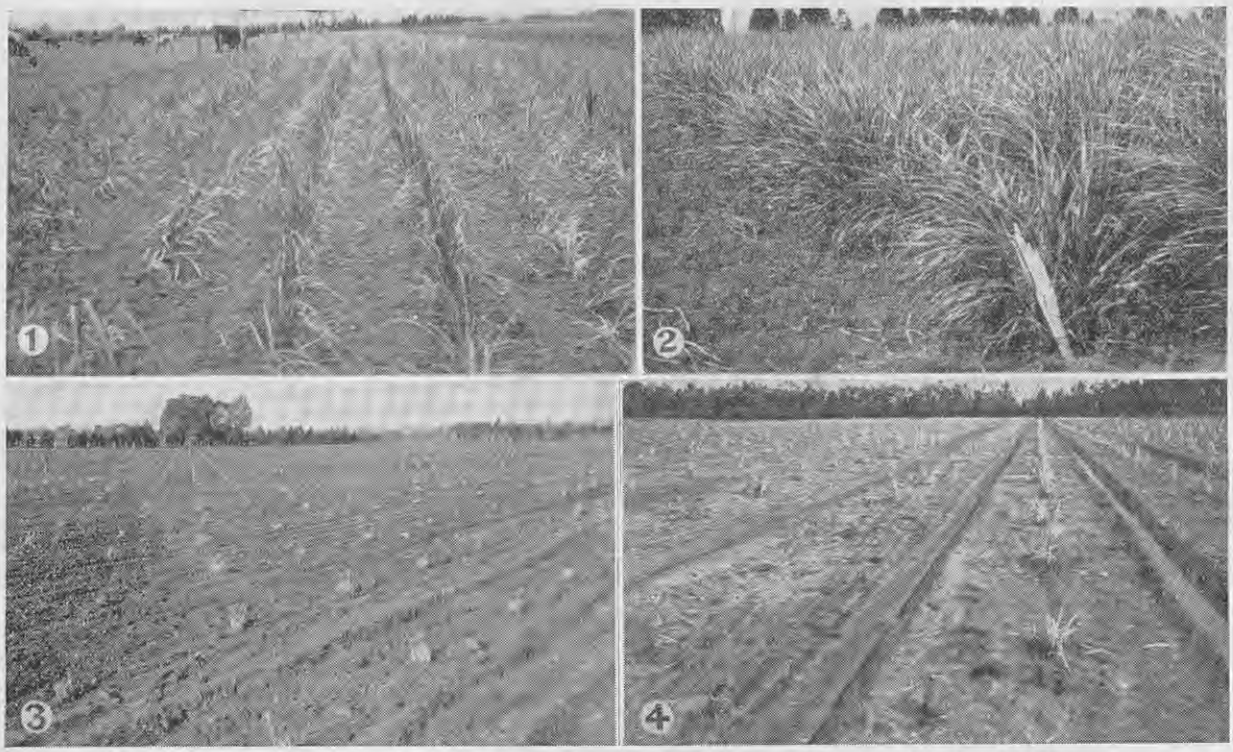

Fig. 1.—Showing 6,000 seedling pampas grass plants set out in nursery rows before the establishment of the permanent plantation. The seedlings had been two months in nursery rows when the photograph was taken on November 10, 1938, and had made tremendous growth in that time. *Fig. 2.*—Part of the same nursery shown in Fig. 1 five months after being set out. Note the enormous development of the plants and their obvious vigour. When transplanted about one month later, all foliage was cut from the plants 1 ft. from the ground. The discarded herbage was then fed to dairy cows. *Fig. 3.*—The plants shown in Fig. 2 after the top growth had been cut away and they had been transplanted into their permanent quarters. Note the care taken in planting out, which makes cultivation possible from three directions. The soil is light in character and of medium fertility only. *Fig. 4.*—Part of a relatively large pampas grass plantation established by another farmer in the Whakatane district. Careful attention was given to every phase of the work, as is clearly indicated. One row of maize was later planted between two rows of pampas grass.

on the dead, dry, unpalatable-looking maize stalks that remain after the grain has been harvested. Nothing could be more fibrous and less wholesome in appearance than this material, and yet for years past it has been keenly sought after as a supplementary winter fodder.

It should be remembered that ruminating animals, such as cattle and sheep, are specially provided by Nature with a means of dealing with coarse, fibrous foods, and that in actual fact the health of these animals is liable to be upset if a certain amount of roughage is not included in their diet. Thus, all things considered, it would seem that not only need farmers have no fear of feeding pampas grass to their stock, but that an increased benefit would result if they were to extend the practice.

Average Yield

The yield is influenced by such factors as climate, soil fertility, and general care given the plantation, but under average conditions it can be generally accepted that one acre of firmly-established pampas grass, plus a reasonable run-off or its equivalent, will provide one month of grazing for 50 to 60 head of grown cattle. Under better conditions the carrying capacity is, of course, correspondingly higher, but it would be a mistake and quite unfair, both to the farmer and to pampas grass, to make too extravagant claims. On occasions in the past such extreme claims have been made for pampas grass that a disservice has been done to this young, growing-up farm practice.

Therefore, the writer, who has had considerable experience with pampas grass, would urge farmers to take a moderate view of its potentialities and not one with a tendency leading to either extreme. If this suggestion is adopted, little or no disappointment will later result from any attempt to establish and maintain this well worthwhile perennial crop.

Method of Establishment

A description of the very successful method of establishing a pampas plantation adopted by two practical dairy farmers will be of interest. Realising that pampas grass possessed no really unusual habits of growth the farmers set to work to establish it in a way that any other crop would be treated if a good result was desired. Haphazard, slap-dash methods were avoided, and after nearly two years two splendid pampas grass plantations of approximately six acres each are the reward for thoughtful planning and capable management.

Pampas grass seedlings, as against stock from rooted cuttings, were procured from the Whangarei district in mid-spring—although autumn is also quite satisfactory in mild climates—and were immediately planted out in nursery rows for further development. The nursery rows (Fig. 1) were spaced

about 18 inches apart, and the seedlings were set approximately 6 inches apart in the rows. Frequent weeding and cultivation were carried out, with the result that by the following autumn when they were lifted and put out into the permanent plantations they had grown from seedlings with only a single shoot to plants with a score or more of strong tillers (Fig. 2). The rooting system had also developed correspondingly.

Thus, by the simple and inexpensive nursery treatment, small weakling seedings which would probably not have survived being set out in their permanent sites developed so vigorously that later mortality was negligible, and the plantation was ready to graze a full 12 months earlier than could otherwise have been the case. A period of between five and six months appeared to be sufficient in nursery rows, by which time the plants had grown to 4 ft. and more in height (Fig. 2). On transplanting, however, this growth was cut down to within about 12 inches of the ground (Fig. 3) and fed to dairy cows.

Selection of Site

The next step was the selection of an area for the permanent plantation. Bearing in mind the necessity for the efficient utilisation of the herbage produced, it was considered that several factors had to be taken into account. Among these were (1) the practicability of adequate preparation of the area in both initial and inter-row cultivation; (2) the location of site in relationship to suitable run-off paddocks; (3) the proximity to an adequate water supply for the stock, or, alternatively, the ease with which water could be made available; (4) the shape of area in view of the need for breaking off the pampas grass when grazing it (a rectangular field is generally better than a square field because of the shorter lengths of fencing required to furnish the breaks); and (5) sufficient shelter, especially where winter utilisation is envisaged.

These conditions represent practically the ideal, but not every farm has a suitable lay-out. Such a circumstance should not, however, deter farmers from making a start with a pampas grass plantation, for, to the writer's knowledge, many valuable areas have been established under less favourable conditions. Nevertheless, it is always a good plan to have an ideal at which to aim, even if one falls short of achieving it. Hence, as a good guide to the selection of a suitable site for a pampas grass plantation, prospective growers are earnestly recommended to make a study of the preceding paragraph.

Having selected what were regarded as the most suitable sites, the farmers concerned thoroughly cultivated each area. Ploughing was well done, and, following a rolling on the furrow, discing and harrowing completed the job. The areas were next lined out in 6 ft. rows—lengthwise and across (Figs. 3 and 4)—to facilitate inter-cultivation, thus controlling weed growth,

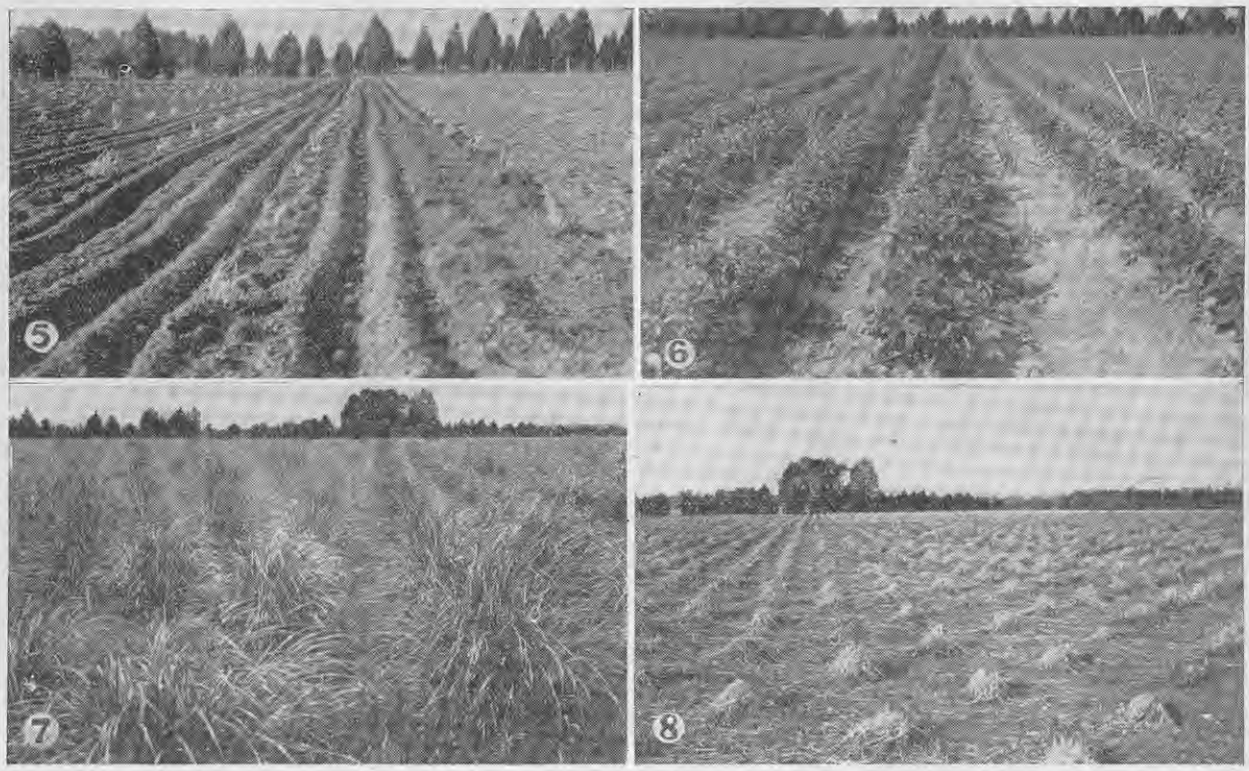

Fig. 5.—One method of utilising the waste land between the rows of newly transplanted pampas grass, which is part of the same plantation shown in Fig. 2. Two rows of early potatoes have been planted between the rows of pampas grass. The cultivation given to the potatoes was naturally most helpful to the pampas grass. *Fig. 6.*—The same plantation as Fig. 5 taken two months later. Note how well the pampas grass is establishing, and also how free from weeds is the plantation as the result of thorough inter-row cultivation. The potato crop pays most of the expenses incidental to the establishment of the pampas plantation. *Fig. 7.*—The growth of pampas grass a few months after the potato crop had been harvested and just 12 months following transplanting. Grazing for the first time took place nearly three months after this photograph was taken in April, 1940. *Fig. 8.*—What was left of the pampas grass shown in Fig. 7 after it had been fed off for the first time last winter. Rapid recovery was made, and the present height of the herbage is in the vicinity of 5 feet.

which is especially necessary in the first year, and also to conserve essential soil moisture by the provision of an earth mulch.

Lining-out

Several methods of lining-out were available, but the one used consisted of a pair of runners spaced 6 ft. apart and otherwise constructed in much the same way as an ordinary sledge. Decking was, of course, unnecessary. A row of lined up poles was used to secure two straight runner lines, but afterwards all that was necessary was to follow the outside mark on the ground with the inside runner of the sledge until the entire area was lined out one way. Cross lining was then undertaken in a similar fashion, and this resulted in the formation of approximately 1,000 intersections per acre, at each one of which a generous sized hole (9 inches in diameter by 9 inches deep) was dug to accommodate the pampas grass transplants.

The work of transplanting from the nursery rows, while not difficult, was rather slow and monotonous because of the care necessary to ensure that the rooting system of the plants was not unduly damaged by breakage or excessive drying out. This slight difficulty was readily overcome, however, by lifting only a relatively few plants at a time and transporting them to their permanent quarters under cover of sacking. Considerable time was occupied in doing the work in this way, but the results have more than justified the method adopted.

Before transplanting, a good double handful of blood and bone fertiliser was thoroughly incorporated in the bottom soil of each hole to assist the plants in getting a new start. The young transplants were then carefully inserted in their respective holes with their roots spread out in all directions away from the crown, and at a depth not significantly deeper than when in nursery rows. The soil was then drawn in around each plant and thoroughly consolidated by being well tramped. Failure to carry out these few essential but simple details will result in unthrifty, vigour-lacking plants which are as unprofitable as they are unsightly. Wrenching of plants in the nursery rows was done approximately six weeks before transplanting time.

Season to Transplant

As already mentioned, transplanting from nursery to permanent plantations was carried out in the autumn and not in the spring, as is commonly the practice. To avoid any misunderstanding, and therefore possible disappointment, it should be understood that this is not necessarily an all-round suitable season for pampas grass establishment. In localities which have a climate somewhat similar to the Bay of Plenty, and where weed growth in the spring is troublesome, it is considered that autumn is preferable to spring transplanting. Where winter conditions are rigorous, however, experience indicates that the work should be left until the early spring, especially where the soil retains its moisture over the dry summer period.

In view of the fact that in the first year following transplanting there was considerable unproductive land between the 6 ft. rows of pampas grass,

one farmer whose experience is being related conceived the idea of planting potatoes between them. He planted two rows between each row of pampas grass (Fig. 5), and secured a very profitable crop. Moreover, the cultivation and moulding up of the potatoes proved highly beneficial to the growth of the young establishing pampas grass (Fig. 6). The other farmer planted a row of maize between his rows of pampas grass, and he also obtained a splendid yield of grain, at the same time assisting the pampas grass by adequate cultivation and the partial shade created by the tall-growing maize. In the second year, however, so well developed was the pampas grass as a result of its generous treatment that there was no possibility of taking a second temporary crop of any kind.

Feeding-off

The first feeding-off of pampas grass established along these lines will naturally be governed by its development, and this in turn will be influenced by those factors responsible for plant growth—namely, soil fertility, climatic conditions, and general care bestowed on the crop. In the cases under consideration, however, the plantations were sufficiently advanced in growth to feed off in breaks in 15 months from the time of transplanting (Fig. 7). To obviate the possibility of serious injury to the plants while still young, grazing was only of moderate intensity, and this resulted in a very rapid recovery, the present height of the plants being in the vicinity of 5 ft. The inevitable litter that remained after grazing was left to rot on the ground and was not burnt, as is sometimes the case.

In conclusion, one can definitely state from actual experience that the culture of pampas grass is a perfectly sound practice for the average farmer where soil and climatic conditions are suitable. The feed produced by a thrifty plantation is immense in quantity and is relatively high in nutritive value. It is also quite palatable, especially when stock become accustomed to it. Pampas grass is very easily established if given a little care in the early stages, and is truly perennial in character, thus calling for the minimum of attention in later years. It is a great labour-saver at any time, and this aspect should particularly appeal to the farmer in wartime. And finally, but by no means least, a suitable area of good pampas grass can definitely save the farmer money, and "Money Saved IS Money Earned."

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Answers to Correspondents

Building a Concrete Water Tank

"ENTHUSIASTIC SUBSCRIBER" (OHURA):—

Will you kindly answer my questions through the columns of the "Journal"? I am thinking of building a water tank, concrete, square, to hold approximately 1500 to 2000 gallons. The tank would be dug into a hill, and would not project above the surface. Could you tell me the thickness of walls and bottom necessary, whether reinforcing would be needed, and approximately the quantity of shingle and cement needed?

FIELDS DIVISION:—

The inside measurements of a tank to hold the following quantities are:—

6 ft. all ways square, 1350 gallons.
6 ft. 6 in. all ways, 1716 gallons.
7 ft. square all ways, 2143¾ gallons.

For your future information, 6¼ gallons of water equal to 1 cubic foot.

The walls, floor, and roof should be at least 4 inches thick, and should be reinforced. Wire-netting or No. 8 wire will be sufficient for a tank this size, and it would be wise to have plenty of reinforcing in the roof.

Quantities of material needed for a 1716-gallon tank are:—

2¼ yds. of metal (crushed to ¾ in.).
1½ yds. of sharp sand.
11 bags of cement.

The aggregate (shingle and sand) and cement should be thoroughly mixed (at least three times dry) before any water is added.

The mixture should be well rammed into the boxing, and if the inside faces are finished off with a wooden float, use a cement wash of 1 part of cement to 2 parts of sand.

Concreting Cow Bails

H.J. (TE AWAMUTU):—

I intend renewing the concrete in my cow bails this winter. It was thinking of thoroughly washing the surface of the present floor and then placing the mixture, good coarse sand and cement, on top of that. I have been told, however, that this would not be satisfactory, and that the present floor should be completely broken up and the mixture put on top of that. Would you be good enough to tell me what should be done?

FIELDS DIVISION—

The method you suggest would not be satisfactory, as new concrete does not bond well with older mixes no matter how thoroughly it is washed. The best method is to break up the present floor completely and lay the new mixture on top of that.

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Coughing in Animals (Sheep)

(Continued from the June issue.)

FOLLOWING last month's notes on coughing in animals, the significance of coughing in sheep claims attention. There is a significant difference between sheep and cattle in that the sheep is seldom, if ever, affected with tuberculosis, a common cause of coughing in adult cattle. Adult sheep are seldom affected with disease of the lungs or chest if one rules out such cases as may be caused by some form of traumatism or dipping or drenching. Occasional cases of pleurisy or pneumonia may be set up in sheep following careless dipping or drenching, but, as already stated in the case of cattle, the dullness of the animal and the laboured breathing are more significant for diagnostic purposes than the nature of the cough.

The history of the animals is always most important, and in many cases will give a clue to the origin of the condition which brings about coughing. It is rather common to find sheep coughing following a journey by road when the surface is covered with dust. Any irritant inhaled by sheep, whether dust, dip fumes, or fumes from irritant medicinal preparations, such as worm drenches, may cause a temporary outbreak of coughing which is soon overcome when the irritant has been removed.

Coughing in Young Sheep

In young sheep, particularly lambs and hoggets, the most common cause of coughing is a specific small, thread-like worm which becomes attached to the small bronchial tubes in the lungs. The condition set up is frequently described as lung-worm disease of sheep. It is so common that very few young sheep are entirely free from this class of worm. The infective worms are picked up from the contaminated pastures during grazing, and the disease in sheep is comparable in many ways to the disease of calves already described under lung-worm disease, husk or hoose. The small bronchial tubes may contain hundreds of the small thread-like worms, which, because of their irritation, set up a permanent type of cough in lambs and hoggets.

The worms may be clearly demonstrated when the lungs are examined at a post-mortem examination of an affected animal. Some worms may even be found imbedded in the lung tissue as well as in the tubes. The coughing due to lung worms is frequently much more marked after exercise, and it is quite common to hear and recognise the characteristic cough in travelling sheep.

Treatment

Specific treatment for the removal of this worm in young sheep is not carried out as a routine practice under

normal farming conditions. This is mainly due to the risk involved in carrying out such a treatment, and must not be viewed as other than desirable and, in many cases, very necessary. When the worms are present in large numbers they have a very debilitating effect, and every endeavour should be made to overcome and remove them. If this cannot be carried out by some direct or specific treatment, then other means must be considered.

In practice, the most common method of attack is to dose affected sheep for the removal of worms in the digestive tract in order to reduce this centre of infestation, and then to provide a change of pasture or other feed and build up the resistance of the affected animals by providing supplementary feeding if necessary. It is common knowledge that if lung worms are present in large numbers there is also invariably a heavy worm infestation in the digestive tract. If the pasture and environmental conditions are favourable for the propagation of lung worms they also favour propagation and infestation by the worms normally found in the digestive tract.

Adult sheep tend to rid themselves of lung worms and are said to develop an immunity against reinfestation. Many such animals no doubt harbour a few parasites, and in this way the disease is carried on from year to year. Under the most favourable conditions for the spread and development of the worms—namely, warmth and moisture—heavy pasture contamination in such seasons results in heavy animal infestation, and so the life cycle of the offending parasites is carried on.

Apart from other parasitic causes in the lungs, such as hydatid cysts, coughing in adult sheep is not commonly seen. Hydatid cysts are frequently found in the lungs of sheep, particularly in the case of aged ewes.

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.

Breach of Stock Remedies Act

Morrinsville Proprietor Fined

CONVICTED of selling an unregistered stock remedy described as "Edmur C Wash," Edward Francis Murphy, trading as the Edmur Co., was fined £5 and costs by Mr. W. H. Freeman, S.M., in the Magistrate's Court, Morrinsville, on June 5. Defendant pleaded guilty.

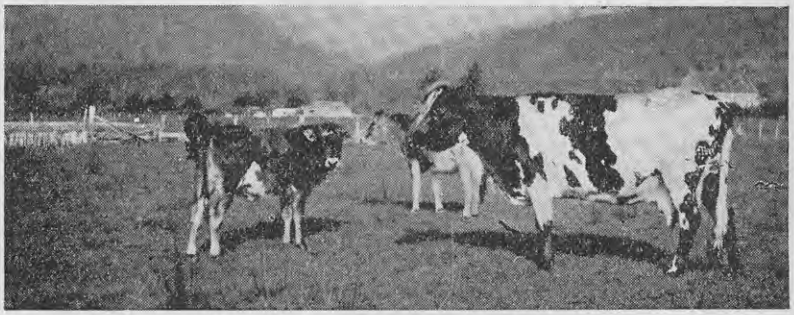
It was stated in evidence that Murphy had actually applied for the registration of his preparation, but the Stock Remedies Registration Board refused registration on the grounds that it was unsuitable for the purposes claimed.

Production Record of 25-year-old Cow

FROM time to time one hears of outstanding dairy cow performances, but the record of Mr. J. Bain's 25-year-old crossbred cow, "Cider," will be hard to beat. Her 23rd calf, a well-grown and promising heifer, can be seen facing the camera in the accompanying illustration.

The cow was purchased at the age of two years for £5, and for 22 years was a high and trouble-free producer. Under herd test from the age of 13 years, this cow averaged more than 400lb of fat. During the season 1938-39 when under test for part of the time only 300lb of butterfat were produced.

To appreciate the production capacity of this cow, readers must be reminded that the average cow reaches her maximum production at the sixth lactation, and that production falls off each year thereafter, until at the twelfth calf it is only about 60 per cent. of the maximum. The phenomenal average of 400lb of fat per year from the age of 13 years for a period of ten years puts this cow among the world's record breakers, combining longevity, high production, and apparent freedom from disease.



The 25-year-old crossbred cow "Cider," with her 23rd calf facing the camera. Indications are that she will rear yet another calf.

Mr. Bain maintains that this "old faithful" deserves the best pasture his farm at Seddonville can supply, and has left her to rear her 1940-41 season heifer calf.

When the photograph was taken on May 1 the opinion was formed that "Cider" would rear another calf, as all indications pointed that way.

—JAS. FLEMING, Inspector of Stock, Greymouth.

Answers to Correspondents

Mixing Cobalt

"SHEPHERD" (STRATFORD):—

Could you please tell me whether it is quite all right to mix cobalt with nicotine and bluestone when drenching lambs. We have always used them separately, but this makes a lot of work. Whenever we have used cobalt we have always had good results with it. Could I get cobalt from the Department in my own district?

LIVESTOCK DIVISION:—

Cobalt sulphate may safely be mixed with the bluestone nicotine drench when drenching lambs.

In the "Journal," July, 1939, p. 52, the Animal Research Division replies to a similar query that cobalt is not likely to be beneficial if administered at longer intervals than one week. Cobalt is not available directly from the Stratford office, Department of Agriculture, but can be forwarded from this office at 1s per oz. and 1d. postage, cash with order.

Cheap Lick for Stock

H.M. (MARTON):—

Could you kindly let me know per medium of the "Journal" the ingredients and way of mixing for making a reliable and cheap lick for sheep and dairy stock for the Marton district?

LIVESTOCK DIVISION:—

A straight bonemeal-salt lick should be sufficient, made of equal parts of steamed bone-flour and agricultural salt. If stock do not take it readily, the proportion of salt may be increased

at first. If covered lick boxes are not used, 1 gallon of raw linseed oil per cwt. will "water-proof" it to some degree, but also adds to cost. A trace of iodine in the form of 1 ounce of potassium iodide per cwt. dissolved in pint of water and sprinkled over bone-meal before mixing may also be added.

Cobaltised salt is obtainable from the Department of Agriculture at 2s per 5 lb. bag, plus 1s postage, 1 lb. being added to each cwt. This is necessary in cobalt deficient (bush-sick) areas, but we have no knowledge that this is needed in your district.

Red Worms in Water

A.G.M. (RUNCIMAN):—

I have noticed large numbers of red worms in the mud and water at the drinking places this year. I would appreciate any information you can give about these worms. Are they a stock parasite? If so, how to get rid of them. I have been advised to drench wormy calves with a teaspoonful of Lysol in a cup of milk for four days running, and repeat treatment in ten days' time. Would you recommend this?

LIVESTOCK DIVISION:—

The worms at the drinking places do not affect stock, and consequently are of no importance from that point of view.

Regarding Lysol for the treatment of parasites in calves, this agent, though frequently used some years ago, has been superseded by bluestone (copper sulphate). The solution for drenching is made by dissolving 8 ounces of bluestone in 3 gallons of water. Doses are as follows:—4-month calves, 3oz; 6-month calves, 4oz; 9-month calves, 6oz; 12-month calves, 8oz.

Where parasitic infection is likely to occur, perventive treatment from weaning time is much more economical than more frequent drenching later, when the animals have received a set-back which may prove fatal or difficult to overcome. Drenching should be carried out once monthly as a prevention; as a remedial measure, however, dosing should be repeated in 14 days and then at three-weekly intervals.

Good results will not be obtained unless a concentrated food (1 to 2lb of a mixture of crushed oats and linseed nuts) be fed daily and the animals moved to upland pasture. Drinking should be from troughs only.

Farm Practice and Management

Contributed by Officers of the Fields Division

Augmenting the Early Spring Feed Supply For the Dairy Herd

THE most critical period in the care of the dairy herd and in the maintenance of an adequate feed supply is early spring, when supplies of hay, roots, or silage are at a low ebb —at times amounting to an acute shortage—resulting in a loss of production which is never reclaimed. The increased production during the past spring and summer due to Nature's bountiful supply of pasture feed has forcibly drawn attention to the necessity of adequate feed in the early spring.

Mr. F. M. Donovan's dairy herd grazing on young pasture and oats—autumn-sown.

There are many methods of augmenting the August-September feed requirements, such as the sowing of oats with an autumn-sown pasture, when Nature does not usually respond as last spring.

Mr. F. M. Donovan and Mr. K. M. Martin, Central Road, Ngongotaha, are two farmers of this district who have made the sowing of oats with an autumn-sown pasture a farming practice for augmenting the dairy herd spring feed supply. Hay, roots, and silage form the main winter-early spring stock foods. After the swede crop is fed off a catch crop is grown to be utilised for early autumn supplementary feed and also as a means of checking weed growth. Sometimes a few pounds of red clover and Italian ryegrass are sown with the swedes to serve this purpose.

The autumn-sown pasture is put down in the first or second week of April, 1½ bushels of Garton oats per acre being sown with the grass mixture. A good growth of green feed is available, and by rotational grazing this will last right through October. If the sowing is done in March the oats will require some feeding off in July. Garton oat variety is preferred to Algerian's, as its upright growth has less tendency to smother young grasses and clovers than the more spreading and low growth of the Algerians. Five to six acres is the average sowing for herds of 30 to 35 cows.

The butterfat production on both farms has been consistently good over a number of years, Mr. Martin's herd averaging 360 lb. of butterfat per cow and Mr. Donovan's herd 331 lb.

Both Mr. Martin and Mr. Donovan strongly advocate rugging the dairy herd during the spring. This, together with attention to adequate feeding at this critical period, are important factors in securing consistent and satisfactory returns.

—*C. S. DALGLIESH, Fields Instructor, Rotorua.*

Extra Care Necessary In Handling Aucklander Short Top Potatoes

WITH the grading of certified seed potatoes now in full swing, the time is opportune to bring to the notice of growers the danger likely to arise from rough handling of tubers. It is well known that the Aucklander Short Top potato, with its delicate skin and soft flesh, is very susceptible to damage. It may not, however, be so widely known that any slight damage sustained by this tuber very quickly turns to dry rot.

The fact that this disease can occur only through injury is quite definite. The disease is caused by wound parasites, and a point of entry to a tuber must be effected by an outside agency before infection can take place. Infection proceeds from spores present in the soil, and these may adhere to the tubers, human hands or any gear used in handling the potatoes. In many cases the disease spreads inwards at a greater rate than it does to the outside tissues, and the smallest abrasion, scarcely discernible, may overlie a large decayed inner cavity.

The after-harvest period is most important from the dry rot point of view, and damage causing the disease can occur in various ways. Three of the most likely are:

(1) During digging, either by piercing with the fork or slicing with the shoe of the digger.

(2) When passing through certain types of grading machines.

(3) By rough handling of the sacks.

In the case of certified seed the first two causes can be controlled. In the third instance, however, control can be obtained only up to the time of tagging, and it is with this cause we are chiefly concerned.

At planting time in 1939 many complaints regarding damaged seed were received by the Department. In view of the high standard demanded at tuber inspection (a maximum of 4 per cent. damaged tubers) it was realised from a purely "certification" point of view that these complaints could not be substantiated, as much of the damage must have occurred after the seed had been tagged.

During a routine inspection last season a man was noticed dumping sacks of potatoes to the ground from a tier one sack in height. One of these sacks was opened at the end which contacted the ground, and the tubers were found to be damaged, as is shown in the accompanying photograph. It will be observed that the damage to the tubers, all in the nature of cracking, is in some instances almost unnoticeable, and it is in this that the danger of this damage being overlooked at planting time lies. Although it may be considered that the almost invisible cracks are of no consequence, they are wide enough to permit entry of dry rot spores, which will lessen the viability of the seed.

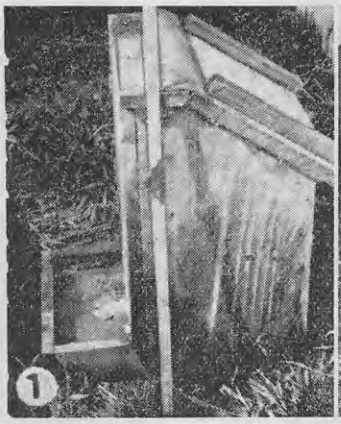
It is realised that there are occasions when damage to tubers cannot be avoided, but in view of the trouble which may arise, however slight the damage may be, it will be seen that the utmost care must be exercised in handling this variety of potato.

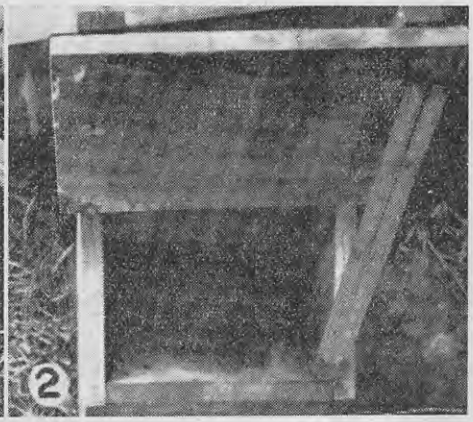
—A. GRANT, Fields Instructor, Timaru.

A Home-made Stock Lick Box

A SERVICEABLE stock lick box, as depicted in Fig. 1, was noted recently on Mr. A. Denize's farm, Matatoki. This had the virtues of low cost, easy construction, efficiency in delivering lick to stock, and good protection of material from the weather.

As indicated in Fig. 1, the box is about 22 in. high, 15 in. in depth and width, and is fitted with a feed tray in front. This consists of an extension of the floor altogether with retaining boards as shown. Between the floor and the front wall a space of about 1 in. is left for the lick to fall through on to the feed tray.





As shown in Fig. 2, the hopper for the lick is tapered so as to throw material towards the feed tray.

Another noteworthy feature (see Fig. 1) is the hinge. This is made of old belting which, in addition to serving as a hinge, also acts as a protection against rain.

The box in these illustrations was made of pine, and is therefore quite inexpensive if home-made.

—*C. WALKER, Instructor in Agriculture, Thames.*

CORRECTION.

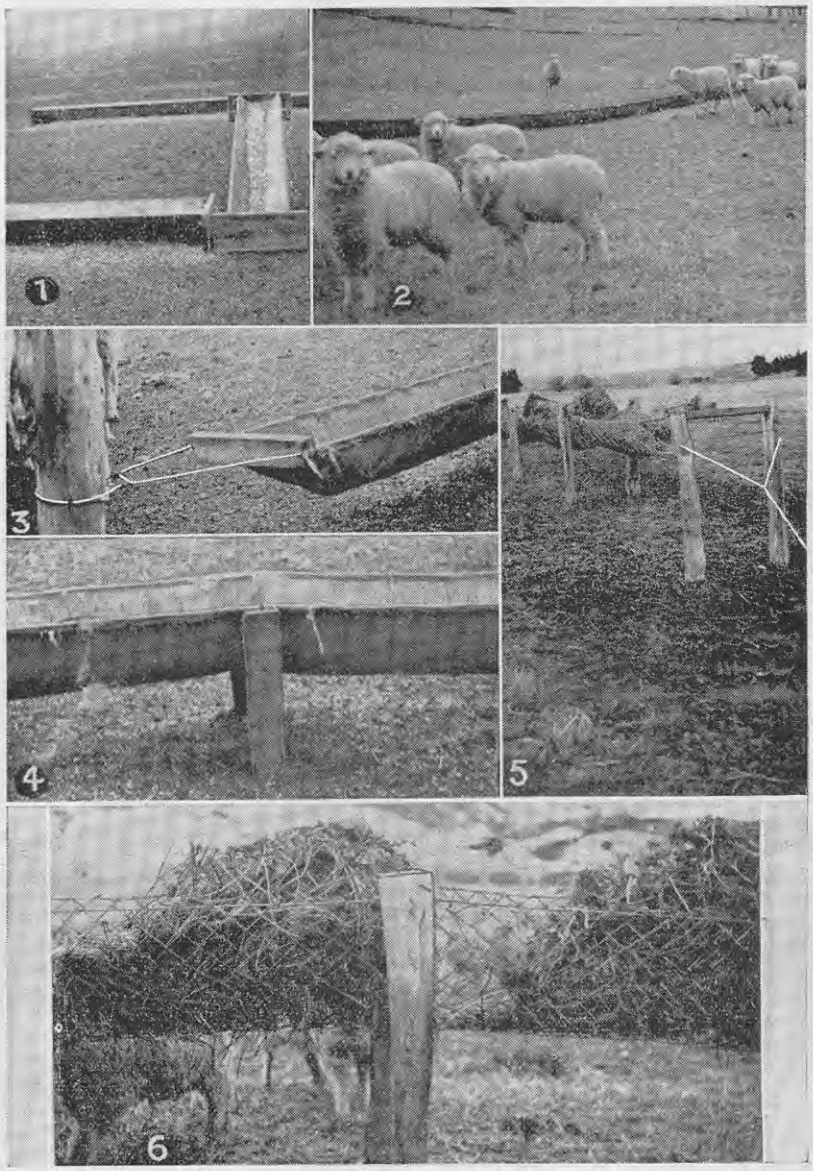
In an article entitled "Winter Feeding of Store Pigs," by C. E. Ballinger, published in the April, 1940, issue of the "Journal," an error in calculations appeared in Table 4, which gave the returns for root crops. The table gave the return per ton approximately 47/1 and the return per acre 941/-. This should have read: Return per ton, approximately 30/1½; return per acre, 602/6.

Feeding Hay to Sheep by Bag and Wire Trough

THE wintering of sheep usually requires some form of supplementary feeding, which is supplied as green feed, turnips and swedes, chaff, hay, or ensilage. Whichever is supplied is usually a matter of choice, based mainly on the ease of producing the feed under the local conditions.

The methods of feeding-off green feed and turnips are universal—that is, they are fed-off in breaks of sufficient size to keep the flock going for some days. With turnips and swedes, failing or broken-mouthed sheep or lambs may go first to clean up the foliage, the sound-mouthed sheep following and feeding on the roots. The system of feeding-off breaks or temporarily fenced-off areas is seldom varied, except in odd cases when some turnips or swedes may be pulled and carted out to sheep, as is done in feeding-out mangolds.

There are many methods of feeding out chaff, and especially hay. Occasionally, chaff is poured on to the bare ground in lines, and the sheep feed from there. Probably the most common method is to use wooden troughs either triangular (see Fig. 1) or rectangular in cross section, but feeders made from bags are becoming common. These are sometimes erected alongside a permanent fence, in which case one of the fence wires is used for holding one side of the bags, or the feeder is erected well away from a fence on a well-drained piece of the paddock. Fig. 2 gives a general view of this type of feeder made from used superphosphate bags. Fig. 3 is a close-up view of the end of the bag feeder and post to which the two supporting wires are strained, and on which the bags are sewn lengthwise. It also shows the piece of wood stapled between the two supporting wires to keep the



feeder open. Fig. 4 is close-up view of the two wooden supports placed periodically along the feeder to hold it off the ground and to keep it open.

Probably the most common method of feeding hay is to cart out what is required for the day and toss it on the ground where it is consumed by the sheep. Although it may be claimed that this method has some advantages, it also has some serious disadvantages in that it is a wasteful method, as sheep trample over and dirty the hay, rain will spoil it, and wind will remove it.

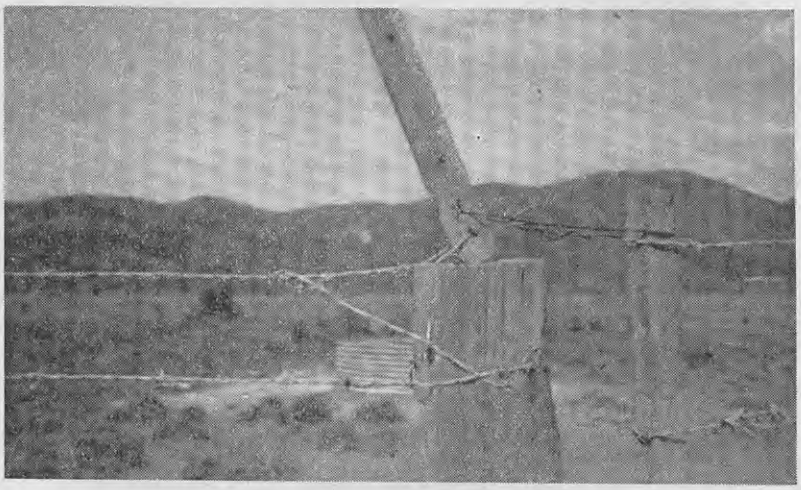
On travelling through the country one sees many types of hay feeders, all of which do the job quite satisfactorily. The following details of one observed by the writer may be of interest.

It is somewhat similar to the bag feeder mentioned above, except that heavy gauge, interlocking wire netting is used instead of bags, and the whole is raised higher off the ground. Fig. 6 gives an end view of the feeder, showing the construction and supports, while Fig. 7 is a close-up of the side view.

—G. G. CALDER, Instructor in Agriculture, Alexandra.

Simple Fastener For Wire Gate

WHERE none of the many efficient designs of wooden or metal gates is provided on farms the most popular substitute is the wire structure commonly known as the "Taranaki" gate. Its principal advantages are simplicity and cheapness of construction, but against these there is often a serious loss in efficiency, especially where sheep are concerned, because of the difficulty experienced in keeping a gate of this nature properly strained. With a view to overcoming this difficulty and at the same time providing a means whereby gates may be easily opened and shut, many adoptions of the leverage principle have been incorporated into home-made gate fasteners, but none, in the opinion of the writer, is so neat, simple, and efficient as the one shown in the accompanying illustration.



A simple arrangement for keeping a wire gate properly strained, which at the same time provides a means by which it may be easily opened and shut.
[C. R. Taylor, photo.

The construction details of this excellent little wire-gate fastener are few, and the materials required are easily obtained. All that is needed is a piece of durable timber about 18 inches long by 3in x 2in, two short pieces of plain galvanised wire, and a few staples.

The piece of timber which is used as a lever is rounded slightly at the end resting on top of the strainer post, while the other end may be either tapered down to form a handle or left as it is. At the rounded end two small holes are bored—one approximately 2 or 2½ inches from its extremity, and the other a similar distance above, or towards, the handle end. A piece of plain wire is threaded through the bottom hole and its two ends securely fastened to the fence side of the strainer. This not only holds the wooden lever in position, but also acts as a hinge on which it turns. The top hole is then used for the customary wire loop that fits over the batten forming the main pillar of the gate.

The actual length of each piece of wire can be found only by trial, but there is nothing difficult in this. When the gate is closed the lever will be hard over to the left and lying along or parallel to the top wire of the fence. To open the gate the lever is brought into an upright position, which relieves the extreme tension on the gate loop, and the gate may be opened without the slightest trouble. The reversal of this procedure is employed to shut the gate.

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

The Orchard and Vineyard

Contributed by the Horticulture Division

Orchard Notes

Spraying to Control Insect Pests

THE first indication of approaching spring will be in evidence early in August in the swelling and bursting of buds on some of the early flowering stone fruit trees. Because of the uncertainty of the weather at this time of the year, every advantage should be taken during fine days to push on with all seasonable work as it becomes due. The following operations should receive attention and be prepared for:—

1. Complete all pruning as early as possible.

2. Prepare for spraying stone fruit trees for fungus diseases.

3. Complete the preparations of any land for planting.

4. Arrange for the application of manures.

Spraying

Unless insect pests have had to be dealt with, the spraying plant will have had little use during the past three months. However, early August will see it again in operation, which will be almost continuous throughout the season. The first trees to receive attention will be the stone fruits for the control of fungous diseases. The following are some of the principal diseases which can be prevented if spraying is done at the correct time:—

Peaches and Nectarines: Leaf Curl (*Taphrina deformans*).

Plums: Bladder Plum (*Taphrina Pruni*).

Apricots: Shot-hole (*Phyllosticta Prunicola*).

If not prevented, the leaf curl on peaches and nectarines attacks the foliage and gives it a puckered and distorted appearance, which is noticeable in the early spring, and is caused by the parasitic fungus indicated above. The disease becomes more aggravated where the trees are subject to cold winds, but this is not the primary cause. The foliage eventually falls, and new leaves are produced to replace them.

The strain on the vitality of the tree caused by defoliation and by the production of new foliage is constantly weakening the tree, resulting in some cases in the partial or total loss of the crop.

The diseases mentioned can be controlled or prevented by an application of a fungicide. A fungicide is merely a material capable of controlling fungi by reason of its toxicity to this form of plant life. The principal fungicide in practical use for this purpose is Bordeaux mixture, which is perfectly safe to use. It is possible by logical and correct applications to prevent the development of fungi on plants or trees, so that a thorough application of Bordeaux mixture 5-4-50 should be made just as the buds are beginning to swell. One application is usually sufficient, but if a variety is very susceptible to the disease, a further application of 3-4-50 can be made when the buds are showing pink.

Insect Pests

Insect pests which have to be contended with in fruitgrowing include the green aphis, which has often proved troublesome, especially on young trees, and which, if neglected, may cause considerable damage. These can be controlled by spraying with lime sulphur 1-150 plus 1 pint of nicotine sulphate to 100. If the application is made under cloudy conditions the spray will be more effective.

Red spider, which becomes very troublesome in most districts from December onwards, is somewhat difficult to control, but can be kept reasonably well in check if spraying is carried out as instructed in the "Journal" from time to time.

Woolly aphis, which at one time caused considerable damage to many of the best leading varieties of apples, is now kept well under control by the natural enemy *Aphilinus mali.*

Planting

If the soil has not already been prepared, it would be better to delay planting for another year, but if the land has been well prepared, the planting may be done when the

weather is fine and the soil sufficiently dry.

Planting seems quite a task to the inexperienced, but it is really quite simple. It has often been said that more trees are killed by kindness than by wilful neglect. Many people are so fussy in planting trees that they consume a great deal of time in getting a single tree into the ground, while there are twenty others drying up waiting their turn.

The depth to plant will be indicated by the collar of the tree, and they should be planted about 1 inch deeper than they were before being lifted from the nursery.

Some "dont's" in planting are:—

(1) Don't forget that deep cultivation before planting is one of the secrets of success.

(2) Don't cram the roots of fruit trees into small holes; make the holes roomy enough to allow the roots to be well spread out.

(3) Don't plant the trees while the soil is wet and sticky.

(4) Don't buy poor trees because they may happen to be cheap; it is cheaper in the end to pay a good price for good trees.

Manures

In order to get the best possible crops, the trees must have sufficient food. For some time after they are planted they may be able to find in the soil all that they require, but as a rule there is a deficiency of one or other of the three principal ingredients in a complete food. The three ingredients are phosphate, potash, and nitrogen.

When bearing heavily, fruit trees exhaust the soil of its nutriment. Application of fertilisers should therefore be made at least once a year in order to maintain the vigour and productiveness of the trees. As animal manures are practically unobtainable, one has to resort to the use of artificial or chemical manures.

A general recommendation has been given as follows:—

Nitrogen (N) 30lb contained in 100lb of nitrate of soda, or 150lb of dried blood, or 150lb of sulphate of ammonia.

Phosphoric acid (P_2O_5), 50lb, contained in 350lb of acid phosphate, or 200lb of bone meal, or 300lb of basic slag.

Potash (K_2O), 25 to 50lb contained in 50 to 100llb of muriate of potash, or 100 to 200lb of low-grade sulphate of potash.

The above amounts are for an acre of bearing trees, and would be reduced for younger trees.

Peach trees require more fertilisers than apples, as they grow more rapidly and bear fruit much earlier. When peach trees come into bearing a more liberal supply of nitrogen is required than at the outset.

Constant watchfulness is required to make sure that neither too little nor too much nitrogen is used. An excess of nitrogen will delay the ripening of the fruit, whereas too little may mean lighter crops and loss of vigour in the trees.

—L. PAYNTER, District Supervisor, Auckland.

Citrus Notes

Planting Trees and Shelter Belts

NOW is planting time for citrus trees and shelter belts—the time when the future of the new citrus orchard may be made or marred. There are six key factors which must receive consideration now, because after an orchard is established little can be done to alter these original factors. These factors are:—Climate, soil, topography, shelter, rootstock, and variety.

Climate

Under climate must be considered primarily freedom from frost, adequate rainfall, and number of hours of sunshine. The site chosen must be practically frost-free, as frost prevention by heaters is not considered an economic proposition in New Zealand. To run the risk of periodic severe frosts would be unwarranted while frost-free land is available. Such plants as Poinsettia, Jacaranda, and tree tomato are suitable indicators as to the degree of frost experienced in the district.

Adequate rainfall is essential when the citrus growing areas do not practice irrigation, but it must be borne in mind that the total annual rainfall is of far less importance than even distribution. A rainfall of 40 to 50 inches with an even distribution of 4 inches per month is of much greater value than a rainfall of 80 inches with 60 inches from April to September and practically none from January to March.

A shelter belt of *Bambusa vulgaris* in an orchard at Henderson.

Citrus trees must have adequate moisture at their roots during their actively growing period from October to March. The number of hours of sunshine in most citrus fruit areas in New Zealand is adequate, and this seldom becomes the limiting factor except for certain varieties, such as American grapefruit.

Soil

Soil texture is probably of greater importance than soil fertility, for upon the soil texture depends to a great extent whether the tree is able to absorb water and mineral requirements in solution. Soils can be analysed chemically and mechanically. By mechanical analysis the soil particles are separated into four distinct fractions depending upon particle size—coarse sand, fine sand, silt, and clay. If the soil contains too much of the coarse sand fraction or the soil particles are large, then the soil is readily worked, but soil water and mineral salts will be rapidly leached from such a soil, and it will soon become dry in summer. If the soil contains too much of the clay fraction, the soil will be sticky when wet and will bake hard when dry. A soil intermediate between these extremes and known as a sandy loam should be selected. This will retain adequate moisture in summer and provide adequate drainage in winter.

After the mechanical composition of a citrus soil must be ranked the depth of soil. There should be no hard pan which will restrict the tree roots to the upper strata of soil. A hard pan under a light soil, with a large coarse sand fraction, will accentuate the trees' difficulty in obtaining adequate moisture during dry weather, whereas a hard pan under a clay soil will tend to create water logging and thus have equally adverse effects on the trees.

Finally, comes soil fertility. Adequate organic matter or humus is desirable. Colour is a guide in this respect—the darker the soil the warmer and more fertile it generally is.

Topography is an important factor. A citrus orchard site in New Zealand should have a gentle slope facing north so that the trees may receive maximum sunshine, both in duration and in intensity. A steep slope is not recommended, as erosion may become a problem, the retention of soil moisture will be more difficult, and the undertaking of all orchard practices—cultivation, spraying, pruning, and picking—will also be made more difficult.

Shelter

A naturally sheltered locality is definitely of value, provided the area is not in a frost pocket or liable to be too damp through poor drainage.

Shelter is essential for every citrus orchard, and it should receive most careful consideration in the planning and establishment of the plantation. A citrus orchard cannot be oversheltered except from the point of view of the difficulty in working very small areas and in the exclusion of direct sunlight. Shelter is important not only because it prevents citrus trees from being broken or blown over, but also because it reduces the constant rubbing of developing fruits

against stems and thorns, resulting in so many abrasions and blemishes. It is also of extreme importance in that by reducing air currents it reduces transpiration from the foliage of the citrus trees, and this conserves moisture during periods of inadequate rainfall.

The ideal shelter should be relatively quick growing, remain dense to the base, acquire a height of from 30 to 40 feet, and require no heading back or topping. For permanent shelter on the southern and western boundaries of an orchard the following can be considered:—*Cupressus lawsoniana, C. Benthami, C. arizonica; Pinus radiata (insignis), Cryptomeria japonica,* and *Acmena floribunda.* For intermediate shelter around the various subdivisions of an orchard, which should not be greater than two acres each, *Hakea saligna* and barberry, *Berberis vulgaris* have proved useful. If a wattle is planted as temporary shelter, the black wattle (*Acacia decurrens*) is to be preferred to *Albizzia lopantha,* as the timber of the former is stronger and forms denser shelter.

Time spent now in the preparation of the site for shelter trees and the cultivation and manuring of these trees is well justified, as a citrus orchard should never be established until the shelter is adequate.

Rootstocks and varieties will be discussed in next month's notes.

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

Viticulture

Points in Making Cider

Preservation In Bulk

CIDER is undoubtedly best preserved in bottles, and the lighter the cider the greater the risk of keeping it in the wood. However, dry or slightly effervescent ciders (a little life should be kept in the cider if possible) can be kept satisfactorily for some time in barrels that have been varnished or treated with paraffin wax to make them air- and gas-tight. The cider is filled up to the bung, which should be tight-fitting and without sacking wrapped round it, and a little melted tallow or paraffin wax run round it. Bungs four inches or five inches in length dipped in tallow or wax should be used in the cellar; they are much easier to withdraw from the barrel than shorter bungs.

To prevent cider in untreated barrels from becoming quite dry when it is intended to bottle it at a later date, and to assure the generation of sufficient gas to protect the surface of the cider when the barrel is partly empty, an addition of sugar at the rate of eight ounces per month and per barrel of 42 gallons will suffice to keep up the supply of gas.

In commercial cider-making establishments, where large wooden or glass-lined cement vats are used for maturing and storage purposes, carbon-dioxide gas is introduced through a system of pipes and taps from cylinders charged under pressure with the gas to fill up the partly-empty vats and keep the cider from going sour.

Perry

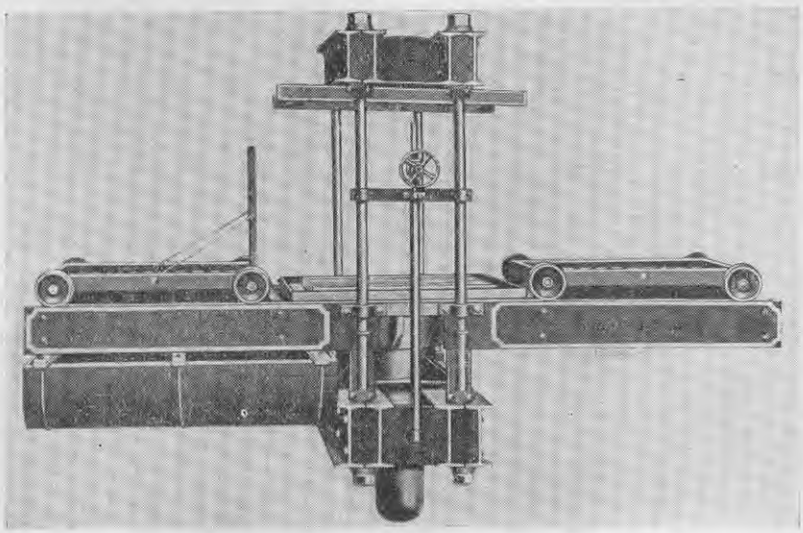
Perry is made from pears in the same manner as cider from apples. It is often employed in the manufacture of imitation champagne. When pears are available they can be mixed in a small proportion with apples for making cider, or a small proportion of apples can be employed in the manufacture of perry. About 10 per cent. of either would not materially alter the nature of the cider or of the perry. Quinces are also recommended for giving an extra flavour to cider. As the juice is rather difficult to extract, it is advisable to let the quince-pomace macerate after grinding, protected from the air, for 12 to 24 hours before pressing; or the quinces can be boiled and then pressed, and the juice added to the apple juice.

Care of Cellar And Plant

The most scrupulous cleanliness should be exercised in regard to the cellar and plant—everything, in fact, that comes in contact with or near the cider. This is most important. Cider is very subject to deterioration through taking up bad odours and flavours from its surroundings, and is extremely susceptible to invasion by vinegar bacteria. The press-house and cellar should be thoroughly whitewashed and the floors concreted—more especially that of the press-house—and well drained. A good water supply is essential for hosing and scrubbing down the mill and press every day, and for cleaning barrels, washing press cloths, etc. Press cloths should be washed daily in water to which a little washing soda has been added to neutralise the acidity, and then rinsed in pure water.

Barrels and vats should be kept quite dry and sweet when not in use. As the barrels are emptied they should be well rinsed out with clean water and allowed to drain, and, when dry, filled with sulphur fumes by burning a piece of sulphur wick or sulphur rings in them and then bunging them tightly. This treatment, which should be renewed about every three months, will keep the barrels free from mould.

When examining a barrel before use to ascertain if it is in a suitable condition for the storage of cider, take out the bung and give the barrel a sharp rap with a stick or bung starter;



A large type hydraulic cider press.

then place the nose near the bung and inhale the air from the barrel. If the slightest vinegary, mouldy, or other foreign odour is perceived, pour a solution of hot water and soda (1lb. to the gallon) into the barrel, bung it down, and roll the barrel about for ten minutes, then rinse with clean water. Now prepare a 10 per cent. solution of bisulphite of lime and water, pour it into the barrel, and roll the latter again for 15 minutes. Rinse again, and fill the barrel with clean water, and let it remain therein for a day or two. This treatment will be found efficacious in eradicating slight acetic or mouldy taints. Barrels or vats having even a very slight acetic taint before treatment should not be used for storing cider.

Main Points

The following are the main points to be observed in the making of cider:—

(1) Harvest the apples carefully.

(2) Avoid letting the apples come in contact with the earth for any length of time.

(3) If the apples are dirty, run through a trough of running water to wash.

(4) Allow the apples to remain stored till fully ripe.

(5) Carefully test fruit for sugar, and blend juices accordingly.

(6) Mill or crush with properly cleaned machinery.

(7) Keep the juice out of contact with air as much as possible—that is, do not aerate to any extent.

(8) Allow fresh juice to settle as much as possible, and rack off clear before fermentation sets in.

(9) Add required amount of sugar well dissolved before fermentation.

(10) Check fermentation, when necessary, by filtration or racking.

—B. W. LINDEMAN, Vine and Wine Instructor, Auckland.

(To be continued.)

Pear Tree Slugs

"PEAR" (NORTH AUCKLAND):—

I had trouble with some of my pear trees last summer. Something ate all the solid green matter off the leaves, leaving them like skeleton lace work. Would you please tell me what is the trouble and cure.

HORTICULTURE DIVISION:—

The black slug-like larvae which strip off the upper surface of pear leaves in summer, leaving the skeleton of veins and lower surface to wither up, are commonly known as pear slugs. The eggs from which they hatch out are laid by small, glossy black, four-winged flies, *Caliroa limacina*, which begin laying in early summer.

If a solution of arsenate of lead powder is applied as soon as the attack begins it is most effective, and it will also prevent the codlin moth caterpillar from damaging the fruit. Repeat the application at fortnightly intervals as required; 1½lb. arsenate of lead powder to 100 gallons water is the right strength—1oz. to 4 gallons.

Cool Storage Notes

Stacking Fruit in Cool Storage

THE importance of stacking fruit in cool storage to a plan that provides uniform air distribution throughout the stacked cases must be emphasised, as the method of stacking the cases is an important factor in securing a successful out-turn of fruit from cool storage. It is also essential that the method should be influenced by the system of air circulation which is operating in the cool chambers.

When pears, in particular, are being stacked in cool storage chambers, plenty of air spaces are necessary around the cases so that the air circulating in the chamber can quickly remove the heat from the stacked fruit. This is all the more necessary when the pears are wrapped and "all-round" pads are used, as is usually the case. The delay caused by wrapping and packing pears, and any subsequent delays which may occur before they are placed in cool storage, makes it all the more necessary that the flesh-temperature of the fruit should be quickly reduced to 30deg. F. after it has been stacked in the cool chamber. The crossing of alternate tiers of cases is inadvisable, as this method interferes with the air spaces which are provided by the bulge in each case.

The method of dealing with pears which provides for their cooling as soon as they are harvested loose in orchard boxes is recommended. By this method the pears can be placed quickly into cool storage at the correct state of maturity, which will enhance their keeping qualities until they are required for marketing. Handled under this system, pears can be marketed in sound condition throughout the season, and repacking losses caused from over-maturity and subsequent deterioration are avoided.

At this time of the year it is necessary to take a stock of all lines of fruit held in cool storage. Large-sized fruit of all varieties should be carefully examined, as deterioration will develop rapidly from now on. The detection in time of deterioration in stored fruit will enable it to be placed on the market without the necessity of repacking and consequent extra costs.

—A. POWELL, Cool Storage Officer, Wellington.

The Home Garden

Small Fruits and Flowers

Asparagus in the Home Garden

ASPARAGUS, which is comparatively easily grown, should be more extensively cultivated in the home garden, and August is the best month for planting. It is highly productive, and once a bed is properly established, cutting may be continued for two consecutive months each season, extending over a period of 15 to 20 years. To ensure best results, however, the greatest possible care should be exercised in (1) the preparation of the bed, and (2) the kind and quantity of manures and fertilisers used.

Soil and Manures

The ideal soil is a deep, well-drained, rich, moist, sandy loam—not too light—which contains an abundant supply of humus. The home gardener, however, will have to make the best use of the soil available.

The location of the bed should be deeply trenched and all traces of perennial weeds removed, the soil worked to a fine tilth, and, if available, plenty of stable manure incorporated with the bottom spit. Well-weathered straw, lawn, and tender green hedge clippings can be utilised as a substitute. It would be an advantage to mix with the soil two handfuls of blood and bone, a handful of superphosphate, and one of potash for each crown to be planted. This will ensure a good start, and, being a combination of water-soluble and water-insoluble plant nutrients, will be available for some considerable time.

Planting

One-year-old crowns are best for planting. A trench should be opened in which to plant the crowns, which are better not set flat on the bottom. They should be placed on a very slight mound, with the roots spread out evenly and not covered in a tangled mass. The correct depth is about 8 inches below the soil level of the garden, but less in heavy soil, and the soil should be made firm on top of the roots. It is inadvisable to cover the crowns to a greater depth than 2 inches. Trenches should not exceed the depth of the top soil, and the young crowns must never be planted in hard subsoil through which the soft fleshy roots cannot penetrate in their search for plant food. The crowns should be spaced 18 inches apart. If a double row is planted, an equal distance each way between the crowns will be sufficient.

In view of the length of time the plants may remain in the same place in the garden and the tall and abundant growth which will be produced each season, a planting site should be chosen where no other products will be overshadowed. If the soil is of insufficient depth to permit trenching, raised beds may be made by building up the soil. With the crowns spaced 18 inches apart, the bed intended for a double row should not be less than 42 inches wide; 48 inches would be better. In view of the subsequent development of the plants this width must be maintained.

Cultivation

Cultivation should never be neglected, but care must be taken to see that the young shoots are not covered. As the plants grow, the trenches will gradually fill through cultural operations. During early spring and summer cultivation should be regular, but not deeper than is necessary to destroy weeds and assist in conserving soil moisture. Weeds, if allowed to grow, rob the soil of plant nutrients and moisture, which are necessary for the growth and future productivity of the crowns.

After-treatment

Provided the suggested manurial recommendations have been adopted, no further applications will be necessary until the top growth has been cut and destroyed at the end of the growing season. Except on light soils, the whole of the fertiliser considered essential for the following season's development may be applied in one dressing and worked into the soil.

Of necessity, New Zealand-produced organic fertilisers will need to be used. As soon as practicable after the top growth has been cleared, a good handful of blood and bone should be spread round each crown, combined with as much soot and wood ashes as possible. Soot contains from 1 per cent. to 6 per cent. of nitrogen in the form of sulphate of ammonia, and also a little potash and phosphoric acid. It is a protection against slugs and snails, and improves the physical property of the soil. Wood-ashes are rich in potash, and in addition contain lime and phosphoric acid. (At the time of writing potash is exceedingly scarce, and obtainable only at high prices. It is advisable, therefore, to conserve all wood-ashes for the garden.)

As soon as growth begins in spring nitrate of soda or sulphate of ammonia should be applied at the rate of ¼ oz. of the former and 1/5oz. of the latter to each crown. If preferred, this may be done in solution with a watering can. Watering this crop must on no account be neglected, and occasional soakings should be given.

Harvesting

No spears should be taken from the first year's growth, and light cuttings for two weeks during the second sea-

Arbor Day

We owe a debt of gratitude to those who planted the trees which beautify our towns and countryside. We should set aside Arbor Day—the first Wednesday in August—for some practical demonstration of our appreciation. Many of those trees already planted require some attention to improve their appearance and to lengthen their life, and there is also room for many more to be planted. But before any more planting is done think what the small tree could be in 10 or 20 years' time, and with that thought in mind select the position where it will have plenty of room to develop.

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, 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 to the end of Dec.

Broad beans, globe beetroot, summer cabbage, 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 sowing of parsnips should be delayed until Oct.

SEEDLINGS TO TRANSPLANT AND PLANTS TO SET.

Summer cabbage, lettuce, onion, early potatoes (Arran Banner), shallots (complete planting this month).

PERENNIAL CROPS.

Asparagus transplant seedlings (1-yr. plants are the most suitable). 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, early 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 (Mar.).

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 three to four weeks before sowing further crops.

SMALL FRUITS SECTION.

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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son and a week longer in the third year will be sufficient. During the remainder of the life of the crowns cutting may extend from seven to eight weeks each season. Whatever length the spears are allowed to grow above the soil before cutting—it may be 2 inches or 6 inches—it is important that they should be cut before the bud begins to open. The cut should be made from 2 to 3 inches below the surface. When cutting, great care must be taken not to injure the young shoots which remain covered with the soil.

Raising Tomato Plants

PREPARATIONS for growing tomato plants for outside production should start in August, but the best time for setting the plants in their permanent location is important. To produce the best fruit and to bring the full crop to maturity, in outside tomato production, a frost-free period of six months is essential. Home gardeners who intend growing tomatoes in the open should therefore proceed with caution through the various stages involved in propagating their own plants.

Throughout the recognised tomato-growing areas in the Dominion there does not appear to be any considerable difference in the "safe" time for outside planting, but this reference does not apply to a few particularly favoured localities. Except where the plants will obtain the maximum sunshine and full protection from cold winds and rain, near the end of October will be early enough; Labour Day is a good guide for outside planting. Even then, a sharp lookout should be kept until the end of the month for a late frost, two or three degrees of which will destroy the plants.

If it is intended to grow plants instead of buying them, sterilised soil is specially recommended. Sterilisation may be done by steam, but should this not be convenient, the best chemical substitute is formalin, which contains 40 per cent. formaldehyde. This

(*Continued on page 65.*)

APIARY NOTES

Contributed by Officers of the Horticulture Division

Moving Bees to New Sites

WHILE the subject of apiary legislation has been dealt with on a number of occasions, the following explanation of legislation governing the removal of bees from one location to another is well worth repeating for the benefit of beekeepers who may find it necessary to move their bees during the coming season.

The beekeeper who gives proper attention to his bees is a benefactor to his neighbours, as he fills gardens, orchards, and fields with willing workers, but he has no control over the flight of his bees. Therefore, he must run the risk of their contracting infectious disease unless all other beekeepers in the neighbourhood co-operate. He cannot take precautions against his neighbours' carelessness, and consequently he wages a losing battle where disease exists in neighbouring apiaries unless the State gives him legal protection.

Section 7 of the Apiaries Act deals with the moving of bees and appliances from one location to another. No colonies may be moved without the written consent of an Inspector. This precaution is taken to prevent the transfer of diseased bees to the neighbourhood of clean apiaries, as much harm has been done in the past by such practices. Any beekeeper who moves colonies more than 10 chains without a permit, or fails to observe the conditions imposed by an Inspector, is liable to a fine of £25. The allowance of a range of 10 chains is mainly to facilitate local readjustments of apiary sites.

Moving Bees

As indicated in last month's notes, the best time to move bees in New Zealand is in the early spring, when the bees have begun to take interest in the new season's activities and there is little brood in the hives to be injured. Shifting bees long distances may be carried out with perfect safety during the next three months, provided adequate ventilation is allowed and certain precautions are taken.

It is not necessary to use both top and bottom screens to shift hives of bees short distances. The supers, lids, and floorboards should be secured with either crate staples or wooden slats sufficient to hold a complete hive firmly together and not allow the escape of bees. Finally, the entrance of each hive may be closed with a piece of wire gauze which can be conveniently removed when the hives have been placed on their permanent stands at the new location. The removal of the crate staples or wooden slats should not be attempted immediately the bees are released, as they are in no mood for further disturbance, and should be allowed to settle down as quickly as possible.

Where medium-strength hives are to be moved only a few miles, the entrance to each hive may be closed with a wad of green grass or sacking, which is easily and quickly pulled away after all hives have been placed in position.

At this time of the year, when the colonies are not very strong, there is usually sufficient ventilation through the cracks and joints of the hive without the use of top screens.

Long-distance Removals

To rail and ship hives long distances, when the bees must be confined for weeks, requires a great deal more care, and special precautions must be taken.

The combs selected should be built with full sheets of foundation securely wired and completely fastened to every part of the frames, including the bottom bar. Partly fastened combs built on unwired foundation will break down and crush or smother the queen and bees.

Self-spacing frames (Hoffman type) wedged tightly together to prevent movement are best.

Where the combs are narrow and inclined to wobble at the bottom when the hives are tilted, it is advisable to place suitable wedges in position between the bottom bars. Loose, swinging frames irritate the bees, and very often crush large numbers of them during transit.

It is important to provide the bees with the very best stores, and the honey should be mostly capped over. Any combs containing freshly-stored nectar should be removed, as this would shake out of the combs in the first few hours and smother the bees.

Old Field Bees

To get rid of the old flying bees as far as possible, the hives should be moved from their original stands two or three days before finally closing them up. Old field bees worry a great deal and die off quickly when they are confined. Where there are large numbers they block the bottom ventilation screen.

Screens

A wooden frame 7-8in. x 2in. the same dimensions as a ten-frame hive should be made and covered with close-mesh wire gauze. To place in position, remove the mat covering the bees and screw the screen down on top of the hives. The screen should fit flush with the outside edge. Close the entrance to each hive with wire gauze held in place by two slats of wood—one across the lower edge of the hive front and the other across the bottom board. If these precautions are taken it is possible to ship bees long distances over a period of weeks, provided the hives are placed where there is a circulation of fresh air at all times.

Another very serviceable type of screen for use where constant removals take place, is constructed similar to a flat hive lid with wire gauze running the full length down the centre and about 9 inches wide. Nail a piece of wood 2in. x 1in. on the top of the screen across each end. These pieces allow a one-inch air space, and act as standing blocks when the screen is in

use. To fit the screen in position, place it on the ground upside-down and lift the hive into it. Where the screen is neat-fitting the weight of the hive is usually sufficient to hold it secure, otherwise metal clips should be fitted to hold the lid tightly enough to the hive to prevent the escape of the bees. Hives shifted in this way are merely lifted out of the screens and placed on floor boards on arrival at their destination. This method of closing hives for short distance removals is quick and causes a minimum of disturbance, which is very desirable.

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

RAISING TOMATO PLANTS.—Continued from page 63.

may be purchased in small quantities from most of the leading seedsmen.

Sterilised Soil

If the soil to be sterilised is dry, it should be thoroughly drenched with a dilution of 1 part formalin to 99 parts water. With moist soil, however, the dilution is preferably 1 in 49. In the event of the dry soil not absorbing the liquid quickly, give half at the first application and the remainder after half an hour. Immediately the soil has been treated, cover it with bags moistened with the mixture, and leave for 48 hours. After removing the covering, the soil should be stirred daily until all the fumes of the formalin have disappeared. Fourteen days after treatment the seed may be sown.

In warm localities the seed, particularly for a main crop, may be sown in prepared beds under a glass frame. Generally, a seedling box 3 inches deep, which may be made from an apple case, will be found more convenient. A glasshouse, however small, is an acquisition to any garden, and is invaluable for growing early plants.

The seedling box should be filled with a good friable soil which has been put through a sieve, the meshes of which do not exceed ¼ inch, or crushed fine between the hands. The soil should be pressed well down along the sides, and particularly at the corners, not omitting the centre. When the soil has been levelled off on top of the box, the seed may be broadcast thinly and lightly covered with soil which has been passed through a very fine sieve and to which has been added about one-third coarse sand. To assist germination, press the contents of the box down firmly with a piece of dressed timber. If the box is situated in a sunny position, cover it with a piece of light-coloured paper and a sheet of glass, which must be removed as soon as germination begins. The box should be placed in the warmest position possible, and if neither a glasshouse, a hotbed, nor a coldframe is available, a glassed-in porch or verandah will be the most suitable.

From this early sowing, but depending on the method of growing, the seedlings should be ready for "pricking out" or transplanting to other boxes in about 21 to 25 days.

Transplanting

The main object of transplanting is to assist the plants to proper development and to encourage greater root production, and it is therefore necessary to space the seedlings 3 inches apart each way. When transplanting, hold the young plants by the leaves. The seedlings must never be removed by pulling, but should be eased from the bottom of the box with the small dibber which is being used for transplanting.

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

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Making a Success of Incubation

SUCCESSFUL poultry farmers usually have a good general knowledge of the various phases of poultry keeping, but it is not uncommon to find some lack of knowledge in one of the various operations, such as incubation, brooding, feeding, or breeding. It is hoped, therefore, that for those whose weak point is incubation this article will supply some pointers which will be of assistance to them in improving their results during the coming hatching season.

It must be realised first of all that the health and condition of the breeding stock is of utmost importance. If the birds are overfat or are being fed too much protein it will have a detrimental effect upon the result obtained in hatching. Close attention must, therefore, be paid to the breeding pens.

Overhaul Your Machine

At the end of each hatching season the incubators should be thoroughly cleaned and everything put away ready for the following season. If this is done there will be less worry and risk when it comes to setting the machine for the first hatch, quite apart from the fact that the machine will be kept in better order and hence have a longer life.

The whole of the incubator should, however, be thoroughly checked before it is started to ensure that all movable parts are in satisfactory working order, particularly the heating apparatus. Make sure that the ventilation system is free from cobwebs. Although many people do not realise it, a ventilator blocked with cobwebs makes a big difference to the hatching results. It is necessary to remove the top of the machine in order to clean the ventilator properly, which is done by taking out all the screws which hold the top down and then lifting it off completely.

It is a good plan to run some hot water and washing soda through the pipes to clean out any rust, etc., before finally filling them. The first step in filling the boiler and pipes is to place blocks under the two legs at the boiler end in order to raise this end 3 or 4 inches, when the water may then be poured into the cap. If this is done and the water is poured in **without a stop** until the pipes are full there should be no air locks to cause any trouble. When the pipes have been filled, remove the blocks and make the machine perfectly level, using a builder's spirit level from end to end and from back to front. This is most important if satisfactory hatching is to be obtained.

Care of the Lamp

A new wick should be used each season in the lamp, and should be of sufficient length to reach the bottom. Once the wick has been cut and trimmed so that the flame is round and without peaks, further cutting is unnecessary. It is then only necessary to rub off the char each day with a piece of rag. Rub either to the left or the right each time, as this will ensure the flame remaining even. Once the height of the flame has been set, the regulation of the temperature should be done by altering the damper whenever necessary.

It is advisable to trim the lamp every day, and this operation should be carried out in the morning so that the flame can be watched during the day. This is desirable, as the flame is likely to become drawn and increase in size to some extent after the trimming has been done. Always refill and turn an incubator lamp after turning and cooling the eggs to prevent putting kerosene on to the eggs or egg trays from the hands of the operator. Another important point is to see that the gauge round the burner is kept free from fluff.

The incubator should be run empty for about a week to make sure that it is operating correctly.

The Eggs

All eggs used in incubation should be carefully selected for size, shape, colour, and texture. No egg should be used which is under 2 oz., which is the absolute minimum. See that the

eggs are of good shape without any ridges, and that they are the correct colour for the breed. Do not, for instance, use White Leghorn eggs which are tinted or brown in colour. Select only eggs with a smooth textured shell. An egg which is thin in shell will allow more air to pass through than is desirable compared with the other eggs in the machine.

Turning the Eggs

Eggs should not be turned until the third day after setting, and then twice daily until the eighteenth day. Care should be taken during very cold weather not to have the eggs out of the machine at turning time longer than is absolutely necessary. Obviously, this precaution is not necessary where the incubator room temperature is at a reasonable level, and the best incubator rooms are those which are least affected in temperature by outside conditions.

Every care should be taken when turning during the first week to prevent the eggs from being jarred, as the embryo is very delicate and jarring may injure or kill this delicate organism.

Cooling the Eggs

As with all other directions in the handling of incubators, no hard and fast rules can be laid down on the length of time to cool eggs. For the first week very little cooling is required—usually the time it takes to turn the eggs is sufficient—and during the second week the time may be increased to 20 minutes, and the third week to approximately 30 minutes each day. These times apply only for one cooling each day, which should be done in the morning; in the evening the eggs merely require to be turned and placed back in the machine. These amounts of cooling, however, must only be taken as a guide, as the weather and the condition of the air-cell must always be taken into consideration.

Moisture and Ventilation

Only a competent man can work these two items to the best advantage, and experience is the only teacher. Usually, moisture should be kept in the moisture tray for the first five to seven days and then removed, and no more should be required until the machine is closed up for hatching on the eighteenth day. If it is found that the air-cell does not dry down fast enough, then it is advisable to reduce the amount of moisture supplied. Aim at increasing the air-cell until it occupies fully one-quarter of the egg at the eighteenth day. Observation, plus common sense, tells the poultryman the best method of working his machine having regard to local conditions.

Hatching

On no account must the incubator be opened after it is closed for hatching, as this will stop the rest of the chicks from coming out. Some people dislike seeing chicks lying on their backs half out of the egg and open the machine to help them. This is a very foolish policy, as the result will be a poorer hatch just for the sake of one or two chicks.

Temperature

The machine should be run empty for approximately one week to make sure that it is regulating correctly. The temperature of the machine when empty, with the thermometer on the tray, should be 100 degrees, and once the eggs are put in and have heated up, the thermometer should register 102 degrees. This should be kept constant for the first week and then in-

creased to 103 degrees for the remainder of the time—that is, two weeks. If the temperature is allowed to drop and is not corrected, the hatch will be late and consequently will be poorer on that account. Care must be taken to see that the bulb of the thermometer is suspended not more than 1 in. above the eggs in the tray.

Testing Eggs

The eggs should be tested for cracks or blood spots before being put in the incubator, and twice during incubation. The first test is made about the seventh to tenth day, when all infertile eggs are removed, and the second at the sixteenth day, when any dead germs are taken out.

The term "infertile" when applied to the first test means any eggs which have not been fertilised. Such infertile eggs will appear to be clear when placed before the testing lamp except for a floating shadow, which is the yolk. At the second test the egg with a dead germ will be quite easy to pick when compared to a live germ, which will easily be seen to be "jumping" if the egg is given a gentle twist. Furthermore, dead germs are obviously undeveloped as compared with the live embryos.

Holding Eggs

The longer eggs are kept before incubation the poorer will be the hatching result, and for that reason the eggs should not be kept longer than ten days at the most. All eggs which are being kept for hatching should be stored at a temperature of between 50 degrees and 55 degrees Fahrenheit, and should not be exposed to a draught, as this causes excessive evaporation of moisture from the eggs. If eggs are to be stored up to ten days, they should be turned once per day.

Close of Hatch

Once it is seen that the eggs have finished hatching the machine should be opened, the unhatched eggs removed, the moisture tray drained, and the ventilators opened wide. A piece of string should then be tied to each end of the incubator so that it runs along the front of the doors and, with the doors unlatched, holds them open about one inch. This will allow the chicks plenty of fresh air, and will aid the drying out of the down on their bodies.

Should any reader desire further information on incubation, inquiries should be addressed to the Poultry Instructor for the district at the Department of Agriculture. Instructors are always willing to help in any way, whether by correspondence or by a personal visit.

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

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Trees Available for Centennial Tree Planting Scheme

FOR the information of clubs which were unable to participate in the Centennial Tree Planting scheme last year, or those who desire to extend the areas already planted, the following is a list of trees available this year from the Christchurch Botanic Gardens, the height being given in brackets. Orders for trees should be placed with the Organising Secretary, Young Farmers' Clubs, P.O. Box 3004, Wellington.

Acer colchicum (3 to 4 ft.).

Aesculus hippocastanum (horse chestnut) (2 ft.).

Betula Ermani (English birch) (3 to 5 ft.).

Betula japonica (English birch) (3 to 5 ft.).

Betula spp. (no name) (2 to 3 ft.).

Carpinus betulinus (hornbeam) (3 to 4 ft.).

Castanea sativa (Spanish chestnut) (6 to 8 ft.).

Fagus sylvatica (English beech) (2 to 3 ft.).

Nothofagus Solandii (native beech) (18 in. to 2 ft.).

Nothofagus fusca (native beech) (18 in. to 2 ft.).

Plagianthus betulinus (ribbonwood) (2 to 3 ft.).

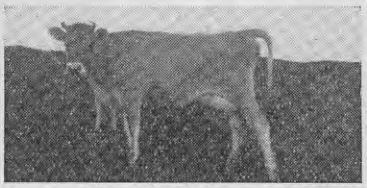
Quercus laciniata (oak) (3 to 5 ft.).

Quercus sessiliflora (dry area oak) (2 ft. 6 in. to 3 ft.).

Alton Club's Stock Judging

By L. GARNETT, Hon. Secretary, Alton Y.F.C.

The winning calf.



The winning heifer.

THE Alton Club's annual stock judging was held recently under good weather conditions. The judge, Mr. G. Scown (official Jersey Breeders' judge) commented on the fine line of stock brought forward. The awards were as follows:—

A line of ten calves.—L. Garnett's entry, 1; G. Garnett's entry, 2; A. Garnett's entry, 3.

In the yearlings there was a line of four.—A. Garnett's entry, 1; G. Garnett's entry, 2; F. Garnett's entry, 3.

There was a keen class of five two-year-old's in milk. The judging, however, was rather late in the season for them to appear at their best.—E. W. Burnand's' entry, 1; G. Garnett's entry, 2; L. Garnett's entry, 3.

An enjoyable afternoon tea was served, after which the judge presented the prizes. The chairman, H. Williamson, expressed the club's thanks to the judge, and also to Mr. Gibbs and to all who had contributed to the success of the competition.

Field Day at Wesley College

THE following are the results of the successful field day held at Wesley College, Paerata, on May 2:—

Horses.—1st prize to C. E. Wolfgram, Franklin Club. 1st, Clevedon Club.

Friesians.—Bull: E. K. Alexander, Harrisville Club, 1. Cows: R. W. Franke, Franklin Club, 1. Heifers: J. Burgoyne, Cleveland Club, 1. All Friesians, E. K. Alexander, Harrisville Club, 1. Harrisville Club, 1; Clevedon Club, 2; Franklin Club, 3.

Pigs.—Baconers: E. D. Williams, Harrisville Club, 1. Sow: C. Appleby, Franklin Club, 1. Boar: E. D. Williams, Harrisville, 1. Harrisville Club, 1; Franklin Club, 2.

Jerseys.—Bull: A. Cochrane, Franklin Club, 1. Cow: A. Litten, Mauku Club, 1. Heifers: A. Litten, Mauku Club, 1. Mauku Club, 1; Clevedon Club, 2.

Sheep.—Fat Lamb: T. D. M. Hoult, Franklin Club, 1. Ewes: A. S. Bull, Clevedon Club, 1. Ram: J. Broadstreet, Hunua Club, 1. Franklin Club, 1; Clevedon Club, 2; Harrisville Club, 3.

E. D. Williams, Harrisville Club, and A. Litten, Mauku Club, tied for first for the trophy donated by the Auckland Farmers' Trading Co. Ltd., Pukekohe.

The total points were: Clevedon, 17; Harrisville, 13; Franklin, 12; Mauku, 5; Hunua, 0.

Tahuna Club's Sheep Dog Trials

By E. T. SMITH, Hon. Secretary, Tahuna Y.F.C.

THE Tahuna Club held its first annual sheep dog trials at Tahuna recently, and a great deal of enthusiasm was shown by club members and also by outside competitors. The attendance was close on a hundred, eighteen being club members.

The trials were run in three classes: (1) for club members—this drew seven entries; (2) for local farmers—with eight entries; and (3) open championship—21 entries.

Results were as follows:—

Class 1.—E. T. Smith's "Pip," 1; I. Harris's "Pull," 2.

Class 2.—I. Stewart's "Toss," 1; H. L. Taylor's "Laddie," 2.

Class 3.—J. T. Robinson's "Glee," 1; —. Johnson's "Queen," 2.

Entries were from as far afield as Waingaro, Coromandel, Putaruru, and Te Kuiti. Among the well-known contestants were Mr. Johnson, four entries; Mr. P. McNaughton, three entries; Mr. J. T. Robinson, one entry; Mr. A. Palmer, three entries.

A silver cup was presented to the winner in each class at the close of the trial, bringing the day to a most successful conclusion.

Balance Sheet of N.Z. Federation of Y.F.C.

REVENUE ACCOUNT FOR YEAR ENDING 30th APRIL, 1941.

	£ s. d.		£ s. d.
To Affiliation Fees Payable	217 1 9	By Affiliation Fees Receivable	217 1 9
„ Office Stationery	3 18 0	„ Profit from Trading A/c.	11 11 0
„ N.Z. Y.F.C. Debating Contest	31 11 0	„ Government Grant £500 0 0	
„ Distribution to Councils from Fed. Funds—		*Less* Deductions O/S Journal Subscriptions 74 5 4	
Auckland Council £100 0 0			425 14 8
Wellington Council 100 0 0		„ Reimbursing Payments from Clubs on A/c. above Deductions	19 14 7
Canterbury Council 100 0 0		„ Reimbursing Payments for 1939/40 Subs.	4 11 6
Otago-Southland Council 100 0 0		„ Dishonoured Cheques Renewed	1 1 6
	400 0 0	„ Excess Expenditure over Income	37 9 11
„ Australian Young Farmers' Expenses A/c. (balance)	0 16 6		
„ Film Library Subscriptions	15 0 0		
„ Holmes Projector Maintenance A/c.	20 6 5		
„ Trophies	0 9 6		
„ Lamp for Bell and Howell Projector	0 10 0		
„ Hire of Halls for Meetings	4 9 0		
„ Freight on Trees for Centennial Memorial	0 5 2		
„ Expenses of Members attending Deputation to Minister	7 1 0		
„ Bank Debits (fees, cheque book, etc.)	3 2 6		
„ Depreciation on Holmes Projector (11 months at 15 per cent.)	10 18 10		
„ The Zealandia Chair Co. Ltd.	1 3 2		
„ Petty Cash—Sundry Expenses	0 3 8		
„ Stock Written Off	0 8 5		
	£717 4 11		£717 4 11

BALANCE SHEET AS AT 30th APRIL, 1941.

LIABILITIES.

	£ s. d.	£ s. d.
Sundry Creditors—		
The Zealandia Chair Co. Ltd.	1 3 2	
Affiliation Fees received but not paid to Councils	38 1 0	
		39 4 2
Affiliation Fees Due and Payable but not received from Clubs		75 9 3
Affiliation Fees in Advance		10 10 0
Royal Show Fund		27 17 1
United Kingdom Y.F.'s Trust A/c.		0 5 9
Accumulated Funds A/c.—		
Balance at 1/5/40	277 2 7	
Less Excess Expenditure over Income	37 9 11	
	239 12 8	
Plus Profit on Sale of Projector	6 7 1	
		245 19 9
		£399 6 0

ASSETS.

	£ s. d.
Cash at Bank	156 9 7
Cash on Hand (Petty Cash)	2 6 4
Sundry Debtors—	
Notice of Meeting Cards	0 1 11
Affiliation Fees Due and Payable by Clubs	75 9 3
Stock on Hand	29 8 11
Film Projector—Bell and Howell	110 0 0
Exhibition Cup	0 10 9
N.Z. Jersey Breeders' Cup	10 0 0
N.Z. Pig Breeders' Cup	5 0 0
Federations Challenge Cup	9 19 3
	£399 6 0

Among the Clubs: Reports on Activities

WESTERN SOUTHLAND.

Drummond.—General discussion on the Y.F.C. Experimental Scheme and the laying down of the trials.

Orepuki.—Arrangements for stock judging competition. Address by Mr. B. C. Horrell on the "Principles of Agriculture and the Cultivation of the Soil." Officers elected at the annual meeting:—Advisory president, Mr. H. Townshend; chairman, M. Young; secretary and treasurer, S. G. Dillon.

Thornbury.—General business. Messrs. J. Taylor and A. Craigie, of the Southland Frozen Meat Company, gave a talk on "Meat Inspection and Diseases."

Woodlands.—Radio talk discussed. Arrangements made for annual ball. A parcel to be sent to Gunner Delamore, a club member now on active service. Mr. G. Stevenson, advisory president, spoke on "Farming Operations in the Woodlands District."

EASTERN SOUTHLAND.

Balfour.—General business. Mr. F. J. S. Holden, Department of Agriculture, showed a number of talkie films to the meeting.

Five Rivers.—General business. A lecture entitled "The Care of Farm Tractors" was given by Mr. Heenan.

Moa Flat.—Annual meeting. Officers elected:—Advisory president, Mr. G. M. Love; chairman, Stuart McKenzie; secretary, N. A. Duff.

SOUTH OTAGO.

Clinton.—Address by Mr. W. McDonald, stock agent, on "Fat Lambs for the Freezing Works."

Lawrence.—Report on the South Otago District Meeting and the annual meeting of the Otago-Southland Council given by W. Labes, a delegate to the meetings.

CENTRAL OTAGO.

Roxburgh.—Talk by Mr. G. G. Calder, Department of Agriculture, on the Y.F.C. Experimental Scheme. Mr. Calder also gave an address on "The Limiting Factors in Production, and How to Treat Them." At the previous meeting a debate was held on "Town v. Country," all members taking part in the debate.

Upper Clutha.—Talk by Dr. Douglas on "The Sights of London."

DUNEDIN.

South Taieri.—Discussion on minutes of annual meeting of Otago-Southland Council. Report and balance-sheet of ploughing match. Exhibition of "talkie" film, by Mr. S. H. Saxby, Department of Agriculture, "Malting Barley," "Spoils of the Sea," "Salt of the Earth," and "Seed Research in Wales."

West Taieri.—Address by Mr. A. Walker on "Light Horses." The speaker dealt with, among other aspects, the preparation of horses for show purposes.

NORTH OTAGO.

Enfield.—Club debate, "Horses or Tractors."

SOUTH CANTERBURY.

Arno.—Address by Mr. T. L. Hayman, Studholme, on "My Experiences of Farming." A field day was held on Messrs. T. L. and A. F. Hayman's property at Studholme. A demonstration of Romney sheep was given by Mr. Alan Grant, Waimate, and the pastures, farm machinery, etc., were inspected. There was an attendance of twenty.

Geraldine.—Miniature cup to be obtained for stock judging. A talk on "First-aid and St. John Ambulance" was given by Mr. C. C. Knight. The speaker also dealt with electricity and the treatment for shocks. At the previous meeting Mr. C. C. Burdon spoke on "The Dorset Horn Sheep." Officers elected at annual meeting:—Chairman, G. S. Speed; secretary, P. Temple; treasurer, J. S. Heed; advisory members, Messrs. W. S. Crotty and C. Lynn.

Milford.—Meetings to be held fortnightly until further notice. Teams selected for club debate. Subject: "That Farming in New Zealand Offers the Most Attractive Career for a Young Man." Talk by Mr. F. Hayhurst, Temuka, on "Stock Breeding and Ryeland Sheep." At the previous meeting, Leading Aircraftman G. R. Lyall, a club member on leave, gave an interesting talk on his training in the R.N.Z.A.F. At a previously unreported meeting about 20 local residents attended by invitation to view an exhibition of "movie" films by Mr. G. Witthell, Hinds Y.F.C. The films shown covered "Scenic Travels in New Zealand," "Public Works Activities," and "shorts" taken at Mr. Witthell's home at Ealing, of his father's Stud Ryeland Flock.

Maungati.—Lecture by Mr. Baker, a prominent farmer of Cave, on "The Care of the Breeding Ewe for Fat Lamb Production."

Pleasant Point.—Arrangements for club debate. Address by Mr. C. C. Leitch, Department of Agriculture, dealing with the Y.F.C. Experimental Scheme. Mr. Leitch urged members to co-operate with the Department in connection with the scheme. At the previous meeting Mr. D. Wraight gave a talk on his recent visit to Australia, touching upon "Manures and Their Uses."

MID-CANTERBURY.

Ashburton.—The sum of £2 voted to local patriotic funds. Arrangements for club social—committee, A. Hydes, A. Davison, and G. Watson. Talks by club members were given as follows:—Messrs. Driscoll (pop-corn), Latimer (drains), Tilson (twitch), Copland (haymaking).

CHRISTCHURCH.

Ellesmere.—Election of R. Tilley as acting-secretary. A lantern lecture on "Soil Conservation on the Farm" was given by Mr. L. W. McCaskill.

Darfield.—Report of stacking competition results, etc.: W. Wilson, 1; R. Reid, 2; G. Inness, 3. Address by Mr. E. G. Cooney, superintendent of the Selwyn Plantation Board, on "Trees for Farm Shelter." Officers elected at annual meeting:—Advisory members, Messrs. C. O. Redfern and R. S. Gunn; chairman, R. M. Fechney; vice-chairman, A. McLachlan; secretary, L. P. McLaughlin.

Amuri.—Address by Mr. McLean on "High Country Sheep Farming."

Cust.—Lecture by Dr. O. H. Frankel, Agronomy Division, Lincoln, on "Wheat and Manurial Trials." At the previous meeting a lantern lecture was given by Messrs. Smith and Beggs, Department of Agriculture, on "Linen Flax"; samples of untreated and treated flax were exhibited.

Cheviot.—Business meeting. Arrangements for annual ball. Club debate to be held in August.

Oxford.—Business meeting. Arrangements for dance and also ploughing match.

MARLBOROUGH.

Blenheim.—Motion of sympathy extended to D. K. Mulligan, in the loss of his brother, Flying Officer T. Mulligan, in air operations. Motions of thanks passed to the Senior and Junior Women's Divisions, and Messrs. E. W. Rose and H. H. Gifford for their help with the annual dance. Congratulations extended to an old club member, L.A.C. W. Thurston, on being successful in his "wings" examination at Woodbourne. The dance secretary gave a report of the annual dance, showing a net profit of £9 2s 11d. The chairman reported having purchased two medals for replicas of the Y.F.C. Agriculture Cup at Marlborough College; also that the parcels to be sent by the club to its members overseas were being prepared and would be ready for posting in the near future Dr. N. F. Boag gave an interesting talk on his trip to England and Scotland with the overseas forces, and was cordially thanked.

Flaxbourne.—Annual meeting. Officers elected: Advisory president, Mr. A. F. Loe; chairman, G. McNabb; secretary, J. L. Loe.

NELSON.

Moutere.—The Y.F.C. Experimental Scheme was explained to the club by Mr. D. Merry (district secretary), Department of Agriculture. Discussion on debate with Farmers' Union. Mr. Merry gave a lantern lecture on "Crop Diseases and Their Control."

WAIRARAPA.

Alfredton.—Club debate, "Should 'Farmeresses' be Allowed to Join Young Farmers' Clubs?"

Carterton.—Nomination of two new members. Talk entitled "The Life and Writings of Oliver Goldsmith," by Mr. B. Brasell.

Masterton.—Selection of debating team. Discussion on Y.F.C. Experimental Scheme. Report on dance, showing a net profit of £5 0s. 6d. Lecture by Dr. N. H. Prior on "The Fundamentals of First Aid," dealing with emergency treatment in cases of excessive bleeding, poisoning, broken limbs, etc.

HOROWHENUA.

Johnsonville.—Business meeting. Discussion on presentations to members leaving for overseas.

MANAWATU.

Apiti.—General. A talk on "Australia" was given by A. Viles, a club member. This lecture was illustrated with suitable lantern slides on the subject.

Feilding.—Discussion on holding a club show in November; committee elected to deal with the matter. Report by the chairman on the recent District Meeting. Four new members elected. Address by Mr. C. E. Taylor, Palmerston North, on "Swedes."

Kairanga.—General business. The speaker for the evening was Mr. Taylor, his subject being "Swedes."

Kimbolton-Kiwitea.—Lecture by Mr. D. S. Hart on "Breeding."

Oroua Downs.—Arrangements for annual ball. Debate to be held at next meeting. Field day finalised. Address by Mr. H. F. Dodson, Department of Agriculture, "The Facts that Make Honey an Ideal Food."

Rongotea.—Discussion on dance. J. Luxford and M. Lind appointed to Rongotea Patriotic Committee. Address entitled "My Trip Abroad," by Mr. J. Bradley.

Waituna West.—Dance to be held, profit to go to Patriotic Committee. Two debates arranged for next meeting. Lecture by Dr. G. F. Findlay, of Rata, on "Science in Animal Breeding."

Whakarongo.—Sound film dealing with animal genetics, shown by Mr. H. de O. Chamberlain, Department of Agriculture. Members of the Girls' Auxiliary Club were present.

WANGANUI.

Hunterville.—Annual meeting. Officers elected: Advisory president, Mr. W. K. Morton; club chairman, P. Weston; honorary secretary, E. McLachlan.

Bulls.—Lantern lecture by Dr. J. S. Yeates, Massey College, on "The Planning and Planting of Shelter Belts."

CENTRAL TARANAKI.

Cardiff.—Arrangements for a social evening. Lantern lecture by Mr. G. A. Blake, Department of Agriculture, on "Liquid Manure and its Distribution."

NORTH TARANAKI.

Inglewood.—Business meeting. Acting secretary elected in absence of secretary in camp. Discussion re proposed field day. A "drive" to be held to enrol younger members.

SOUTHERN HAWKE'S BAY.

Ballance.—Report on annual ball; net profit £3 10s., to be divided between the Makomako and Ballance Red Cross funds. Lantern lecture by Mr. P. Sears, Grassland Division, on "The Influence of the Animal on Pasture Production."

Mangatainoka.—Three new members elected. Decided to donate the profits of recent dance to the Patriotic Fund. Talk by Mr. J. E. Hewitt (patron of the club), on "Hill Country Sheep Farming"; the speaker dealt also with topdressing and watering of paddocks. Officers elected at the annual meeting: Patron, Mr. J. E. Hewitt; advisory president, Mr. F. E. Ward; chairman, J. Aislabie; vice-chairman, I. Algie; secretary and treasurer, H. Bairstow.

Woodville.—Annual meeting. Officers elected:—Advisory president, Mr. M. D. Murray; chairman, A. Arrow; secretary, D. Miller; treasurer, I. Gilbert.

CENTRAL HAWKE'S BAY.

Takapau.—Annual meeting. Officers elected:—Advisory president, Mr. V. Tilley; chairman, M. Tilley; vice-chairman, W. Craig; secretary and treasurer, W. H. Mawson. A discussion was held on the membership "drive" to be held shortly.

NORTHERN HAWKE'S BAY.

Matapiro.—Mr. B. Teague, Wairoa, gave an interesting lantern lecture on "Deer-stalking and Mountaineering in the Southern Portion of the South Island." Mr. W. G. Brownlie, Wairoa, gave an address prior to his retirement from his position as chairman of the Northern Hawke's Bay District Committee. Mr. S. Freeman, Dominion Organising Secretary, gave a short talk on Y.F.C. matters generally.

Putorino.—Report of chairman on the recent district meeting. Discussion on club attendance. Talk by Mr. F. Saunders on "Farm Buildings."

Wairoa.—Discussion on "Distemper in Dogs." Impromptu debate, "That Girls Should be Admitted to Membership within the Y.F.C. Movement"; speakers, W. T. Powdrell, G. McIntyre, E. Powdrell, and A. Wright. A practical demonstration on the uses of the soldering iron

was given by Mr. L. W. Patterson, who illustrated his points by actual jobs on various metals. Officers elected at the annual meeting:—Club patron, Mr. A. T. Carroll; advisory president, Mr. A. C. de Latour; vice-presidents, Messrs. C. O. Mackay, N. McKinnon, and G. F. Hudson; chairman, R. Watson; vice-chairman, D. Bell; secretary, W. G. Brownlie; treasurer, W. Richmond.

POVERTY BAY.

Te Karaka.—Discussion on attendance at meeting, etc. Talk by Mr. F. R. Bould, Inspector of Stock, on "Stock and Their Diseases."

TE KUITI.

Mokauiti.—A picture evening to be held. A discussion took place on a proposed sheep shearing competition, and arrangements were made for the club's forthcoming annual ball.

Otorohanga.—General business. Mention was made of the club's effort in gaining second place equal in the Y.F.C. District Courts at the Waikato Show.

EASTERN BAY OF PLENTY.

Edgecumbe.—Business meeting. Report on the recent Auckland Council meeting given by G. Crang, a delegate to the council. At the previous meeting a member was nominated for the Y.F.C. short course scholarship at Ruakura; a committee was elected to arrange the Y.F.C. Court at the Whakatane Winter Show, and arrangements were made for a debate.

Waimana.—Annual meeting. Officers elected:—Advisory president, Mr. N. J. C. Macdonald; chairman, D. Woolfield; secretary, B. Burnett; treasurer, J. Cain. Club debate arranged, best speakers to represent the club against Edgecumbe Y.F.C. Discussion on Y.F.C. Court at Whakatane Winter Show.

WESTERN BAY OF PLENTY.

Kati Kati.—Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "The Development of Pumice Lands."

Paengaroa.—Business meeting. Arrangements for club dance. Discussion on junior debating; Mr. J. B. Cawte offered a trophy for the best junior team in the club. Decided to arrange for a bus to bring a full load through to the stock judging competition to be held at Tauranga.

Te Puke.—Letter from Private J. H. Nichol, a club member now on active service, was read to the meeting. Three-minute speeches were given by club members under 19 years of age.

WAIKATO.

Cambridge.—Teams selected for club debate at next meeting, subject to be "That Women be Admitted to the Y.F.C." Arrangements for club dance, proceeds to go to Red Cross Funds. Farewell and presentation to Private F. Searle (past hon. secretary), who is going on active service. The meeting concluded as a social, items being contributed by club members.

Kakepuku.—Debate to be held with Te Awamutu Club. A lecture was given by Mr. Geo. Spinley, Te Awamutu, on "My World Tour."

Tahuna.—Two delegates appointed to work in connection with the Waikato Show. Report on recent sheepdog trials. Arrangements for films to be exhibited at next meeting.

Te Awamutu.—Exhibition of films by Mr. Dawick, secretary, N.Z. Jersey Cattle Breeders' Association, depicting the best types of Jersey cattle throughout the Dominion. A field day was held on Mr. H. Allen's farm, taking the form of demonstrations by Mr. Bull, as follows:—Adjusting machinery (mowers, tedders, etc.), towing a topdresser behind a truck, using a sweep attached to the front of a truck, setting and adjusting draught of a plough. There was an attendance of 26, and members displayed keen interest.

AUCKLAND.

Harrisville.—Arrangements for annual dance. Selection of debating team. Presentation to H. W. Barnaby.

Hunua.—Arrangements for dance. Subject of debate for July meeting, "Electric Fencing v. Ordinary Fencing"; ping-pong tournament to be held. Club debate, "Ploughing v. Topdressing"; speakers, S. Wilson, F. Sexton, D. Sleeth, G. Redshaw (ploughing); K. Richardson, W. Chamberlain, E. Sexton, L. White (topdressing); the award was given to the team favouring topdressing. Officers elected at the annual meeting:—Advisory president, Mr. G. L. Lockwood; chairman, W. Chamberlain; vice-chairman, E. Sexton; secretary, G. Redshaw; treasurer, D. Sleeth.

Mauku.—Arrangements for club debate. Club to assist school calf club. Talk by Mr. A. Longwill on "Pig Housing."

WARKWORTH.

Wellsford.—Business meeting.

Health Notes for the Farm

Contributed by the Department of Health

Clean Food in Clean Homes

DIRT is a danger to health, and in no case is the danger greater than in the case of dirty food. Just as the engine needs fuel to enable it to run, so the body requires food to enable it to work and live. This fuel we call food. Just as inferior fuel will hamper the working of an engine, so will unclean food endanger the efficiency of the body and cause disease.

All housewives are particularly concerned in this question of clean or dirty food for the following reasons. They purchase the provisions, and are responsible for the care of the food in the home and for its cooking. In purchasing their provisions they should buy their food at clean shops where it is served by clean assistants, and in these days there is no difficulty in doing this. Many years ago the sanitation of shops had by no means attained the high standard of today. Then much of the stock in the average grocery shop was piled on the floor; vegetables and fruit and cereals in bulk, when stocked, were not protected from contamination. Cheese was seldom covered, milk was kept in open containers from which small quantities were dipped by a ladle, bulk butter was piled high in yellow mass on the counter. Such gross violations of the first principles of sanitation are fortunately rarely encountered today. Credit is also due to manufacturers, who have realised the importance of packaging, so that in very many places it is now possible to buy sweets, biscuits, bread, and other foodstuffs in sealed containers.

However, the careful housewife is exacting in such matters, as is the one in the following rhyme:—

When Mum and I go shopping,
We shop with greatest care,
Of some shops in our district,
We know we must beware.

For instance, there's a baker's
Which has no covered carts;
The bread exposed to drifting dust,
So are the cakes and tarts.

We watched some people buying,
The bags blown open were,
When Mum and I go shopping,
We never shop in there!

A pound of cheese we're wanting,
One hates the cheese one buys
To be without a cover—
A playground for the flies.

Now homeward we must hurry,
We're thinking with delight,
Of eating up our shopping,
With such good appetite.

Then comes the problem of care of the food in the home. The most perishable foods, such as milk, cream, butter, fresh meat, fish, etc., are those which require the greatest care. In many cases house facilities for proper storage are rudimentary or absent. An intelligently planned house, even though it be small, is always provided with a well-ventilated safe with a cool aspect. Ice boxes or refrigerators are, of course, very useful, but even without these assets, by the exercise of

a little care and forethought, much can be done to protect food from contamination and keep it in a cool condition.

Protecting Milk

Milk is one of the most valuable foods, but because of the very nature of its composition it requires most careful handling. Indeed, the evidence is strong that, as milk may be a vehicle of disease, the home is probably the most dangerous place of infection. Fortunately, the principles

and precepts to be observed in the proper domestic care of milk are few and simple. They may be summed up in the statement that the milk must be kept cool and covered up, and that all receptacles containing it must be thoroughly cleansed before and after use. It should be kept in the coolest place available, such as in some simple form of home-made dust-proof cooler. Access of dust should be avoided, chiefly by ensuring that the house is as free from dust as cleanliness can make it.

The milk should always be put in clean vessels; a jug which has held milk should be rinsed out first with cold water and then washed in hot water and soda. A good method of protecting milk in jugs or bottles is to make net covers of white material known as "mosquito netting" cut large enough to cover the mouths of the different receptacles. To the edge of these circular pieces glass beads should be sewn, the weight of which will tighten the net over the edge. These covers should be kept very clean.

When milk is supplied in sterilised bottles it should, if possible, be kept in the bottle until used, as it is certain that no household utensil can be as clean and afford such complete protection as a sterilised bottle. In leaving milk bottles at the home the milkman finishes his job, and it is the duty of the householders to see that the care which has been taken to bring the milk to them clean, cold, and quickly is then continued until it is used. When milk is prepared for infants it should be poured out into a clean, scalded jug. Feeding bottles should be kept scrupulously clean, and should be sterilised before use. The advice of the Plunket nurse on the care and preparation of infant food is always available.

Storage of Meat

Cold meat and meat preparations, such as brawn, meat pies, etc., are readily contaminated, and therefore require protection from flies, rats, or mice. They should not be kept too long, especially in unwholesome conditions. Storage in a cool place is desirable, because cold is a great preserver from decay. It was cold storage that solved the enormous problem of how to bring to the 44,000,000 inhabitants of Great Britain wholesome foodstuffs from the uttermost parts of the earth.

Lettuces, celery, watercress, and similar vegetables should be washed thoroughly under running water before they are consumed. Because of their content, raw salad foods are a valuable part of the diet, and it is important that they should be freely available in as fresh and uncontaminated a condition as possible. Lack of freshness and cleanliness removes their virtues. Even vegetables such as spinach, cabbages, etc., should be well washed before cooking, so as to remove ingredients of any poisonous sprays that might have been used in their cultivation.

All cooking utensils should be cleansed with plenty of soap and hot water and a good scouring powder. They are then made safe. The hands should be well washed in soap and hot water before beginning to cook the food. The nails should be cut short and scrubbed thoroughly clean.

It should be remembered that cleanliness is the first law of health, so the housewife's motto should be: Clean food, cleanly handled, eaten by clean people with clean mouths, in clean homes.

Slaughterings of Stock

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

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island.						
Meat Export Slaughterhouses—						
Auckland	38,032	4,831	17,270	6,569	75,074	51,392
Poverty Bay-Hawkes Bay	12,491	203	18,138	754	123,782	4,365
Taranaki-Manawatu ..	20,088	518	9,187	1,045	86,544	24,753
Wairarapa-Wellington ..	12,356	261	9,563	883	80,124	4,365
Totals	82,967	5,813	54,158	9,251	365,524	84,875
Abattoirs	10,506	3,349	40,670	20,544	5,976	12,268
North Island Totals .	93,473	9,162	94,828	29,795	371,500	97,143
South Island.						
Meat Export Slaughterhouses—						
Nelson-Marlborough ..	64	2	2,111	566	39,656	2,048
Canterbury	1,606	1,089	112,326	88,229	248,917	4,148
Otago-Southland	844	—	99,293	92,438	321,877	1,032
Totals	2,514	1,091	213,730	181,233	610,450	7,228
Abattoirs	5,066	1,281	25,514	14,148	3,412	4,295
South Island Totals ..	7,580	2,372	239,244	195,381	613,862	11,523
Dominion.						
Meat-expt. Slaughterhouses	85,481	6,904	267,888	190,484	975,974	92,103
Abattoirs	15,572	4,630	66,184	34,692	9,388	16,563
Grand Totals	101,053	11,534	334,072	225,176	985,362	108,666
Same Period, 1940—						
Meat Export Slaughterhouses and Abattoirs ..	124,974	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

Slaughterings of Pigs

The 108,666 pigs slaughtered in meat export slaughterhouses and abattoirs during May were distributed in weight ranges approximately as follows:—

Under 60 lb.	4,422
60-120 lb.	80,977
121-160 lb.	17,339
161-180 lb.	1,391
Over 180 lb.	1,656
Sundries	2,881

The grading of porkers is 89 per cent. first and 11 per cent. second quality, and of baconers 77 per cent., 18 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 quality is as follows:—

121-160 lb.	78%, 17%, 5% of P1, P2 and Seconds.
161-180 lb.	70%, 22%, 8% of P1, P2 and Seconds.

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THE Good Neighbour

BY MARY

From Me To You

MARY MARIE, in her essay this month, wrote: "My very small daughter, when asked what made an empty house into a home, said 'Put some curtains up, Mummy.' 'But it would still be empty,' I said. 'Well, you go there, Mummy, then it would be all right.'"

What a glorious thing it is to be a mother—have you ever stopped to realise it? Perhaps not, for you are too busy looking after the thousand and one wants of your family. Every thing you do, whether big or small, is a labour of love, and you seek no reward richer than sonny running to you with a sore finger and asking you to kiss it better.

Home is no home without a mother. She is the centre of the household, the pivot on which everything and everyone depends for smooth running. She may be tired, but never too tired to mend those socks that will be needed in the morning; she may be downhearted, but never so downhearted that she is not waiting to welcome the family with a smile.

Somebody there — that is you, Mother. Somebody waiting, eager to welcome them in from the night, ready to hear our adventures of the day, happy to laugh at our jokes, or to join in our sorrows.

I know that amongst my readers to-day there is many a sorrowing mother. My heart goes out to every one of you who is the mother of boys overseas, for although there is some consolation to be derived from that poem of Milton's wherein he tells us that "they also serve who only stand and wait," it is nevertheless a very trying time. But it is up to you, Mother, to keep the fires blazing on the home front, the fires of courage and cheerfulness, for it is to you that the family is looking for the strength that it needs so much to-day.

Every mother these days is a hero, and this mother—like so many others I know—as she goes through her ordinary, everyday tasks—is fighting for victory in just as noble a manner as the son who will so soon be serving 'neath distant skies.

"Purity has brought you grace,
Kindness is your daily guide,
Love has glorified your face,
What you touch is sanctified."

So, mothers of sons and daughters who are overseas, keep smiling, and keep going.

Mary

Mary's "At Home"

WE certainly hear of some unusual punishments in our primary schools of today! When I attended school it was the usual thing to write, say, five hundred lines if you were caught having a chat to your neighbour. But here is a more modern method of punishment. The children of a certain school have to find, say, fifty worms for two or three spelling mistakes, and next morning present them to the headmaster. If the worms are forgotten when teacher requires them, then the number to be found is doubled. The catch seems to be the goldfish in the pond in the school grounds—for they have to be fed, and that is where the worms go to! It's a novel way of getting the fish fed, isn't it? I know one child who got her worms collected in a tin for the teacher, but was never asked for them, so the poor worms stayed in the tin for weeks!—**Crakey, Nelson.**

I DON'T see how anyone can find life on a farm humdrum. There is always something to be done, and in spare time there is always knitting for the boys overseas. And any of these boys will always welcome a letter. They always say they can't get enough, so think of the joy you are bringing them by just dropping a line—write about the little things that happen at home, how the crops are getting on, and they'll like it far better than any long-drawn-out epistle about what the heads of the country are doing. And when you are making up a parcel, have you ever made a fruit cake in a

cocoa tin? Try it, and see how they like it?—**Keep Smiling, Waimate.**

DO you play golf, Mary? We have just started again after five years. The nearest club is four miles from here, and we go over every Saturday and Sunday, taking a picnic lunch with us. Everyone else does the same, and we have a jolly good time. Last Sunday we got wet to the skin, and as we had a bit of spare benzine we dashed home, changed all our clothes, and dashed back again! Properly mad, aren't we?—**Plain Jane, Taupiri.**

THE value to countrywomen of a page where they may express themselves is beyond computation, and I do find your new section of definite interest. It has been said to me that with all kinds of organised activities countrywomen now do not yearn to express themselves thus. But I, for one, know that they do. Some have not the opportunity to join any group of women, others have no inclination to do so—and these last possibly find their page a place where, despite shyness, or difficulty in screwing up their courage, they learn the art of putting their thoughts into words. Possibly haltingly at first, but with the drive of their need and sincerity they find themselves able in time to join in the "silent debates" of a printed forum. Unless she has experienced it, no woman can imagine the thrill of seeing painfully-written words from a "new chum" magically transformed into a printed paragraph. So, Mary, good luck to all our "Journal" pals.

Here on my acre of ground, in my wee quaint cottage, I love the quiet of a very remote country spot. With very little left to me of material resources, I do find myself passing rich in friendships. Perhaps the very griefs and sufferings which seem the losses in our

Going golfing? Then what about a frock like this one, worn by the Columbia star, Frances Robinson? The colour is tan, the fabric is flannel, the style two-piece, and very comfortable. An eight-gore skirt is belted at the waist over a tuck-in monogrammed shirt with full-length sleeves and mannish cuff line.

experience, in the end give us some healing wisdom to help others. And helping others is certainly the best thing I know for helping myself out of the dark depths which are so close to me at times.—**Silver Fern, Christchurch.**

I DO love the messages you send us each month—they are just splendid and so uplifting for us in these grey days when our loved ones are paying supreme sacrifices to save our beloved Empire from that tyrant Hitler. When I read them, Mary, I think of how many women will benefit from them and take heart again. I enjoy them so much that I am cutting them out to keep, and will later paste them in a book—my "Mary" book—that my friends and I can read and enjoy together.

Your article about books I did enjoy, and here is another verse about books:

If thou art borrowed by a friend.
Right welcome shall he be
To read, to study, not to lend,
But to return to me.
Not that departed knowledge doth
Diminish learning's store,
But books, I find, when doubly lent,
Return to me no more.

—Peggy, Pleasant Point.

I HAD intentions of having early peas for the coming season, so got very busy, and put three rows in. But, alas and alas, the joys of a farmer's wife weren't going to pass me by, and those terrible hens decided they would have Christmas dinner early, so my peas are all gone. I thought they would be right when I staked them when they were hardly through the ground, but the stakes must have caught the eyes of those greedy hens, and over the fence they came. However, that is a mild trouble compared with what a large number of people have to put up with at present. To-day has been a very sad day for many folk. The soldiers are away back to camp after their final leave, and it is very hard to say good-bye with a smile, isn't it?—**Judith, Windsor.**

SO pleased am I to meet you and greet you, Mary—you were long overdue, you know. Many a time I have said that every section of the farming community was catered for by the "Journal" but the women. And, believe me, women are a very important section of the farming community. Probably in no other business is a wife such a real partner to her husband. No longer young, my husband and I work a hilly 500-acre sheep farm. Labour is not to be had, so we just battle on. Last year I did my first wool rolling and picking up, and, though I am but a few years off 60, there is a great urge at present to keep our bodies flexible. Yet I wonder that there is not more stress laid nowadays on the idea of keeping our **minds** flexible. In the present crisis we are glad to work hard all day, that we may sleep at night. My husband is a returned soldier, and my brother died a terrible death through the last war. My other brother was in the Boer War, and in this war we have many relations, although we have no family. So we do not need to call on our imaginations to picture the horrors that our boys are going through.—**Helen, Dipton.**

HERE on the first day of June the sun is streaming down, on to garden and house, and, although winter should be here, a blaze of colour comes stretching up the drive, and the quiet of the Sunday is broken but little by the traffic passing. Yet in the morning I may rise to a frozen white world, or perhaps to dark grey rain clouds. But for the present here's sunshine for us both.—**M., Feilding.**

The Language of the Flowers

DO you know the language of the flowers? Some of the most beautiful of the old English fancies are in danger of extinction through the lack of someone to record them for the future. It is said that the younger generation of today is sophisticated, but who could resist the charm of these old-world flowers, and their romantic meaning? Romance is often scoffed at in public, yet it is often very much alive even in the hearts of the scoffers. Apple-blossom, hawthorn, and roses: they conjure up an age of shy-eyed English lasses, of quiet days, of the sound of lapping waters, the purl of the running brook, the whirr of the grasshopper's fiddle, the lazy twitter of birds, and the glory of the English countryside.

The English countryside today may not be quite the haven of contentment and enchantment that it was in those long-ago days, yet the flowers still bloom—despite the bombs, there is still apple-blossom in spring, roses in summer, chrysanthemums in autumn, and while the flowers themselves live, then will their language still whisper soft secrets from lover to lover. And although there are realists who will laugh at it, there are amongst us many who agree with the old Hindu saying: "If I had two loaves of bread I would sell one and buy hyacinths, for they would feed my soul."

Here are the meanings of some of the flowers:

Apple-blossom: You are preferred.
Iris: Have faith in me.
Bluebell: Tender and true.
Red carnation: My heart is broken.
Primrose: Don't be so bashful.
Lavender: Sweets to the sweet.
White heather: Good luck.
Hawthorn: Courage in adversity.
White clover: Think of me.
Daffodil: Welcome.
Petunia: I believe in you.
Sweet pea: I long for you.
Verbena: You have my confidence.
Yellow rose: Why wanes your love?

So next time your lover sends you flowers, perhaps you will be able to translate his thoughts.

Flowers—they have been with us all down the ages of the world, and they will always be with us, as an everlasting reminder that life is good and beautiful, and surely it is a lesson to us all that if a fragile flower can withstand the stormy winds and cold of winter and yet still bloom bravely when spring comes, then surely we can too?

Marion Acton-Bond wrote a very lovely little piece about rosemary, and here it is for you to share: "The scent of rosemary is like incense, and its upthrust fronds like branches of green candles, which seem to burn with a grey-green flame. Always they point to the sky. It is this intensity of worship which gives rosemary its aura of holiness, and sets it a little apart, as though rarefied."

How to Get On

"Tell me how to get on in life," said the kettle.

"Take pains," said the window.

"Never be led," said the pencil.

"Do a driving business," said the hammer.

"Make light of everything," said the fire.

"Make much of small things," said the microscope.

"Never do anything offhand," said the glove.

"Reflect," said the mirror.

"Be sharp," said the knife.

"Find a good thing and stick to it," said the glue.

"Try to make a good impression," said the sealing wax.

Our Competition

"What Makes a House Into a Home?"

THIS time you are all agreed, in the main things, on what makes a house into a home—they are love, kindness, and a mother always waiting to welcome you back again. Not easy to judge these essays, they were all so interesting, and written with such a depth of sincerity, that I am sure in every case they came right from your heart.

To "Alter Ego," Clinton, goes the first prize, while "Ageyli," Marlborough, is a close second. Highly commended we have "Silver Puss," Taihape, "A.M.D.," Inglewood, and "Fay," Kaipara.

I know you'll enjoy reading the entries, so here they are for you:—

First Prize

ONLY one answer to that—Love. Love makes a home, and not just a habitation. Love cleans and polishes, and doesn't growl when tiny feet patter over the newly-washed kitchen. Love doesn't snatch away cushions just when a tired head is about to recline on them. Love doesn't scream, "You can't smoke in here!" "Don't yell like that—play quietly!" or "You'll have to mend your own socks. I'm tired of it."

No. Love cooks plain meals, and tries to slip in the time for an "extra-special" dainty that is somebody's favourite. Love remembers birthdays and anniversaries, and makes them real fete days. Love keeps an open door, and all and sundry are welcome to come in to share a meal, or have a chat. Love remembers to laugh a lot, to deal out praises, and little words of endearment. And Love never forgets that a home is not a home unless there are higher, nobler sentiments than "the three-meals-a-day" philosophy. Love never forgets the Grand Things of Life, and tries to remember that the place to learn about these things that are "lovely and of good report" is the home.

In short, Love makes a home, because Love keeps its tone high, physically, mentally, and spiritually.—**Alter Ego, Clinton.**

Second Prize

YOU ask what is the secret alchemy that turns four walls and a hearth into that most precious noun in the English language, "Home." The answer lies in many things, but principally in these three: affection and harmony between those who live in the house; comfort (regular meals, easy chairs, cosy fires); and, lastly, something that is implied in the two first—a woman's hand, or, rather, a woman's self-sacrifice, gladly given.

Tops in sweater fashions are worn by Maureen O'Sullivan. The Metro-Goldwyn-Mayer actress selects for sports a bright red long-sleeved sweater with a Tyrolean motif. Gay embroidered flowers in green and white accent the front and back of the sweater.

The happiest home I ever saw was not a wealthy one. The wallpaper was torn and dingy, the crockery battered, the tablecloths darned, the bed linen home-made, but there was always a fire in the living-room on cold days, plenty of well-cooked food, and an atmosphere of peaceful harmony over all. The woman who was responsible for all this never spared herself. Nothing was too much trouble—the finding of young sonny's Meccano screws, the mending of daughter's frock, the making of dad's favourite curry. When people asked this woman the secret of her happy home, she would laugh and say: "There's no secret about it. Just make people comfortable, that's all. Anyone can have a happy home if she likes to take the trouble."

I agree with her. The foundations of a home are built upon self-sacrifice, but I think it is worth it. Don't you? —**Ageyli, Marlborough.**

Highly Commended

IT is a much-quoted saying that "Home is where the heart is," and although it is a very much used and well-worn phrase, it is so true that I can think of none better to express the great difference between a house and a home. Two of the loveliest words in the English language are Peace and Joy. Peace is the absence of fear of any kind, but Joy is a more positive thing—it is something that goes from one to all other people. We can have peace without joy, and joy without peace, but the two combined make happiness. If we find peace and joy in a dwelling we find happiness also, and we find a home. Without these it is merely a house, and as both peace and joy come from the heart we find ourselves back at the old saying, "Home is where the heart is," only in a slightly different manner to the general way of saying.

A home reaches out and embraces you the moment you enter the door, a house is cold and aloof. It is the hearts within that make the home, be it a mansion or a cottage. If warm hearts live within the walls their effect on the house is evident in a thousand ways: the little touches that transform it into something friendly, something that welcomes you, something that puts you at ease. The room talks to you as its owner would. The sound, or merely the echo, of children's voices, the scent of flowers, the presence of well-worn, loved, and familiar things—all these make a home.

I, who have been happily married for years, have had the joy of many friends, and I have known their homes well. And I have found that where there is joy and peace, there also is happiness and a heart, and as a quiet reflection of all these—a home.—**Silver Puss, Taihape.**

What is it makes a house a home,
Wherever o'er the world we roam?
It is its comfort, love, and charm,
That keeps us glad, and safe from harm.

YES, that is the secret: comfort, love, and charm. Comfortable surroundings, our favourite chair by the fire, old slippers, our favourite book, in fact, a complete relaxation of heart and mind and soul. And love—loved ones, father, mother, and children living in happy companionship. Sharing everything—meals, experiences, the joys of

Life and the sorrows, too. Then charm—charming faces, happy smiles, thoughtful ways, lovely pictures on the walls, bowls of bright and sweet-scented flowers. Yes, these are what make a house into a home—comfort, love, charm. Simple, commonplace words, yet what a world of meaning they convey.—**A.M.D., Inglewood.**

THE answer is Love, when we really believe that:

"Home means ever giving without a thought or price,
Of love and joy and laughter, and willing sacrifice."

Not elegant carpets or labour-saving devices can make a home. I've seen a home in a little slab-boarded bush hut. Ruled over? Yes—with the dictatorship of Love. A mother there, who believed she must live a life worth while for her children, looking up, to see. No day so long, no task so hard, but she had a half-hour at bedtime to spend with the bairns she loved, when she spoke to them of God's love, of her faith in them, kissed their hurts better, and told them of brave deeds.

Was my answer Love? Well, Mother and Love go together, hand in hand. It is only when the mother realises that

"The best that thou canst be
Is the service asked of thee."

that a home in the true sense of the word can be founded. Three things to remember to make a house into a home: Look up, laugh, and love.—**Fay, Kaipara.**

THERE is one great need, and I think in youth it is even stronger than in older people, and that is a home should be a place where we can express some of our own personality, and have some freedom. It is this compelling desire to express herself, to be free, that makes Joan go off to her little back bed-sitting-room so happily, rather than stay in the family circle, where she feels that she is smothered. Young Tom, for the same reason, makes a home of his rough little whare with its glowing stove, its roaring, tinny, old radio, its door ever open to give a rough-and-ready welcome to his pals. Given our dear ones about us, a little freedom to live our own lives, any place, be it high or lowly, becomes home, the dearest spot on earth to us, a place to be hallowed by memory, a lodestone to draw us back again, if needs be, from the very ends of the earth.—**Kowhai, Mangatainoka.**

HOME is a place where one can completely relax, and live as God meant human beings to do. We must have warmth in our hearts, and blazing fires in our fireplaces, comfy chairs, cushions that no one is afraid to use, a few good ornaments, and, yes, I know it is old-fashioned, but I love a few portraits of those friends who have shared my home, and vice versa.—**Scotch Lass, Southland.**

MANY little stones are needed to make up a mosaic, and just such a mosaic of different reasons is a woman's love for her home. Foremost, I believe, is the feeling Ann Bridge, the author of "Illyrian Spring," expresses so beautifully in the same book, her heroine praying for her children: "I'll love and cherish them, whatever they are, because they're mine"—and we can draw our home into the same circle: it is so very dear to us, because it is so very much our own. More than that, it is our creation, we make it what it is. Do we ever cease to work in order to make it more beautiful?"—**Heidi, Kati Kati.**

BEING the mother of young children, to me a home as opposed to a house is a place where I can take my children visiting, and the hostess does not mind if little fingers touch things, or if crumbs are spilled at afternoon tea time. Of course, one should not allow one's children to meddle with things, but it is unnatural for little children to sit still, and the friend who welcomes my children into her home has a real home. It is the spirit of the lady of the house that makes a home a place of quiet pleasure, of comfort, rest, and real enjoyment to those who live in it.—**Makarau, Kaukapakapa.**

I MUST confess that I am sentimental enough to believe that home is where the heart is, and for that reason it is because "someone" dwells in this house, that makes it home to me. The "someone" who shares my joys and sorrows is interested in my work and play, and to whom I am the first person.—**Laurel, Feilding.**

AS I unlocked the back door the other day, after a trip to town, I thought, "That's it." That is how I could tell I was home, even if I was blindfolded. It was a **smell**. Some may say, "Fancy her house being smelly!" But aren't all houses smelly, and all different? You know that mixture of soap and polish, the cooking of breakfasts and dinners and teas, of pickles, jams, and fruits in the cupboard, that seem to combine with the warm sunlit air in the kitchen. Too, in my kitchen, I have a **sound**. The boiling water tap of the electric hot water service rumbles and grumbles away, and it seems so companionable. And when I open the kitchen door into the other rooms, there is still a smell, but this time of sweet flowers—at present daphne and violets.—**F.S., Levin.**

What Makes a Successful Marriage?

I WONDER how many a girl, when she says "Yes" to the man of her dreams when he pops the question, pauses even for a fleeting second to think of the great step she is taking? In the gay whirl of love and romance, she is sure that life with him must be a glorious adventure, but sadly, and only too frequently, we find that some years later these two, who once were so confident that they would face the future together until death parted them, have come to a stage where they feel they must part. Yet what tragedy could be greater than the breaking of these precious ties?

"WHAT DO YOU CONSIDER THE SECRET OF A SUCCESSFUL MARRIAGE?"

Perhaps your ideas will help to keep some home together, help to solve the problem for some unhappy folk who feel that life is nothing more than disillusionment. So send me your entries, before August 20th.

Two prizes will be awarded: First 10/-, and second 5/-.

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

¶ Closing date: August 20th, 1941.

"... Only Skin Deep"

Your Hands—Are They Lovely to Look At?

I WONDER how many of you look down at your hands with a despairing droop of spirit as you see them. There are so many calls on your hands, and perhaps the calls have been made on them over a very long period and you just feel it is too late now to begin to worry about how they look. But that is not true—you may be surprised, but more people look at hands than fortune-tellers! You never know when you are going to meet someone who will judge you from the look of your hands—are they smooth, and supple, with nails neatly filed, and perhaps polished if it is an "occasion"? Or are they just as you left them after you had finished the dishes for the last washing-up?

Take a good look at your hands, and then make a mental resolve that you will be kind to them from now on. It's not hard; it's largely a matter of patience and perseverance. To begin with, give them an oatmeal pack. This is easily made, just mix some fine oatmeal with equal parts of lemon-juice and peroxide, and there is your pack ready to use. Spread it on evenly all over your hands, back and front, and leave it for 20 minutes, before washing it off in tepid water. Now rub a little cold cream into them, remembering always to rub towards the wrist. A treat like this once a week for a little while will soon repay you for the time and trouble it may take.

Do you wear gloves when you are doing your housework? Until you become used to the feel of them, you may regard them as a handicap, but if you want beautiful hands you must persevere.

If you have already formed the habit of keeping your lemon skins on the shelf above your sink and rubbing your hands after each washing up, then you are part way to success already. Do buy yourself a dishmop for doing the dishes—it is so inexpensive, and keeps your hands out of the water for quite a good portion of the washing-up time.

Gardening? Well, even if you use gloves, it is often a good idea to dig the nails firmly into some soft castile soap before you put them on, for the dirt is inclined to seep through the finger-tips if the gloves are beginning to wear. When you come to washing after the gardening is done, you'll be surprised how easily the dirt comes away from under your nails.

Never wash your hands in water that is any hotter than tepid, and always be careful that you dry your hands carefully. So many people give them a hasty wipe over with the towel, and then wonder why their hands become red and chapped.

Night-time is the best time to treat your hands. Always wash them carefully before retiring, and have a good lotion which you must rub into the hands regularly. Some hand lotions are inclined to be a little sticky, and if yours is like this then cut the fingers out of an old pair of gloves, and slip these on when you go to bed. However, glycerine and rose-water is very good, and you will find that the skin absorbs this almost instantly.

I thought I would give you a few tips about manicuring your nails, but these will have to wait till next month. But here is a final tip, if you wish to have hands "pink-tipped, like lotus buds" for a very special occasion: Make up your hands with a rachel-tinted powder cream, and for an extra-special bit of appeal, rouge the palms slightly.

Lovely hands give you confidence, so do look after yours.

While the Log Burns . . .

"Rebecca"

—By Daphne du Maurier.

HERE is a fascinating book indeed! If you are one of those people who just can't bear to leave a book until you have finished reading it, then put "Rebecca" on the shelf until you have a good chance to bury yourself in it, for I can assure you it is gripping.

"Rebecca" is the story of the girl who becomes the second wife of Maxim de Winter. Obviously, she has married above herself, yet she is desperately in love with her husband, and the book tells of the struggle she puts up against great odds to win the confidence and respect of the servants, in the house called Manderley, who were all devoted with a queer passion to their former mistress. Everywhere she goes, this girl-wife of Maxim, she is met with the ghost of his former wife, Rebecca; everything she does is measured against those standards set by Rebecca. Probably many a girl who has become the second wife of a man has had to fight against circumstances which must have been similar in many respects.

Daphne du Maurier has a style all of her own, and a tale to tell which carries you breathlessly from the first page to the last.

She is one of England's leading women writers, and today she is still writing, and writing of vital problems which affect us all. You will find her articles in leading English and American periodicals. You will perhaps enjoy, too, her latest publication, which is on sale in New Zealand in an edition which is very modestly priced. This is entitled "Come Wind, Come Weather," and consists of a series of stories of inspiring efforts made by those at Home under these very trying conditions of wartime.

You will enjoy them both, "Rebecca" and "Come Wind, Come Weather," and although they are both so different, I think you will agree with me that here is a writer whose works will live in our hearts for a very long time.

Appetising Stews

Best Stew Recipe

The prize of 2/6 for the best stew recipe is awarded to Mrs. I. M. Quinlan, Matamata, for the following recipe:—

BROWN STEW.

2lb blade steak, 1 tablespoon dripping, 1 large onion, 2 large carrots, 1 medium potato, 1 cup dried peas (soak overnight), salt and pepper, hot water to cover.

Method.—Melt the dripping and fry the onion in it, also the steak cut into dices and fried till brown. Add the hot water, carrot rings, peas, and salt and pepper. Lastly, grate in potato; this thickens the stew. Simmer gently until tender 2 to 2½ hours.

IRISH STEW.

2lb neck of mutton (or stewing chops), about 6 potatoes, 3 onions, 3 carrots, pepper and salt.

Trim off the fat and cut into chops or small pieces. Pare and half the potatoes, cut onions into slices, scrape and slice carrots. Place meat and vegetables in saucepan, add warm water. Bring to a boil and simmer gently until meat is tender—about 1½ hours.—**Mrs. J. Ferguson, Auckland.**

OXTAIL STEW.

1 oxtail cut in small pieces, 2 carrots, 1 swede, 2 onions, 2oz sago, 1 tablespoon tomato sauce (or Worcester), pepper, salt and pinch of curry powder, 1½lb potatoes (roughly sliced and seasoned).

Method.—Cut oxtail up. Add vegetables (except potatoes). Also add sago, seasoning, and curry powder, and 2 pints water. Put all in casserole, or saucepan with well-fitting lid, and slowly simmer for 2½ or 3 hours. Put away for fat to settle. Skim, add potatoes, and simmer for another ¾ hour. A suet crust instead of potatoes is delicious, and may be added about 40 minutes before serving.—**"London Lass," Wellington.**

JARRETT STEW.

1lb stewing beef, 1 tablespoon tomato sauce, Worcester sauce to taste, flour, salt, and pepper.

Cut meat into small pieces, roll in seasoned flour and put into casserole, add tomato and Worcester sauce. Just cover the meat with cold water and cook slowly in the oven. I always cook all stews in the oven as it prevents burnt saucepans. Dumplings can be added before serving.—**"Plain Jane," Taupiri.**

"WATERLESS STEW."

1½lb stewing steak cut up and rubbed slightly in flour, 4 good-sized onions, 6 good-sized carrots scraped and washed, pepper and salt, knob of butter the size of a walnut.

Put butter in saucepan, then layer of onion, meat, and carrot, repeat layers till all vegetables and meat are used up. Add pepper and salt to taste. Put on slow heat, shake saucepan gently at 10-minute intervals until stew is boiling about ½ hr. You will then find your vegetables, etc., almost covered with liquid. Simmer slowly for 2 hours altogether. Do not add water or any liquid, and do not thicken; very rich and tasty. This can be done in casserole in oven, if desired. Either way is satisfactory.—**Mrs. R. J. Croucher, Henderson.**

MUTTON STEW (BROWN).

Cut a neck of mutton into convenient-sized pieces, roll in flour and brown in a large saucepan (lid off) using 1 tablespoon of dripping. When browned put in 1 onion and 3 or 4 carrots cut in small pieces and, in season a finely-sliced stalk of silver beet. Add 1 level teaspoon of salt, pepper to taste, and barely cover with hot water. Put lid on and cook gently for 2-2½ hours. Remove the meat to serving dish, skim off fat and thicken the gravy. Pour gravy and vegetables over the meat and serve very hot.—**Mrs. J. S. Tricker.**

OXTAIL AND KIDNEY STEW.

1 ox tail, 6 kidneys (sheep's), 1 teaspoon salt, 1 pt. water, 1oz dripping, 1oz flour, ½ small teaspoon pepper, 1 large onion, 1 carrot, 1 turnip.

Mix flour, salt, and pepper. Wash the tail and cut into joints; skin and halve the kidneys. Dip the joints and kidneys in the flour and brown them in the dripping, also the onion. Pour away the fat, add 1 pint of hot water, stew gently for 2 hours, add vegetables and stew another hour. Take out joints and kidney, strain the gravy and make it thicker with flour if necessary. Pour over meat and serve hot.—**Mrs. O. Stuart, Wellington.**

VEGETABLE TAP.

1½lb topside, 2 parsnips, 3 large kumeras, pepper and salt, 6 small onions, 6 smallish carrots, 1 tablespoon chopped parsley.

Cut meat into small pieces. Place in saucepan and cover with cold water. Add salt and pepper and put on to cook slowly while the vegetables are being done. Now peel onions and carrots but leave them whole. Skin the kumeras and cut into pieces a little bigger than the onions. Then the parsnips are to be cut into small pieces, and then all the vegetables are to be put on top of the meat and slowly cooked for about 2 hours. Just before serving thicken with a little cornflour and then add the parsley.—**Mrs. Ferguson, Glenbrook.**

Cakes for the Boys Overseas

TO-DAY nearly everyone regards their cooking for the boys overseas as the most important part of their weekly baking. What is your favourite recipe for fruit cake? Economy is a vital element in cooking to-day, and perhaps your recipe is a better one than your neighbour uses.

A prize of 2/6 is offered for the best fruit cake recipe sent to the "Mixing Bowl" before August 20th.

CURRY STEW.

½ leg mutton, 1 onion, 1 apple, 1 carrot and any other vegetable desired, handful sultanas, 3lb rice.

Slice apple and onion and brown in a little dripping, add to the mutton which has been cut into squares; add other vegetables and sultanas and seasoning, cover with water and simmer for 2 hours. Thicken and flavour with curry. Serve with rice which has boiled for 20 minutes in water and pinch salt.—**"Blue Bell," Temuka.**

RABBIT STEW.

Take a nice young rabbit, joint it, and cut the ribs into two pieces. Now peel and slice 3 large onions, put into a saucepan with a little dripping and cook until brown. Next add the rabbit, a piece at a time, and brown slowly. Now add about a quart of cold water and put to the back of the stove and simmer for 2½ hours. Just before serving, thicken with cornflour. This is delicious and one rabbit goes a long way with a large family.—**"Biddi-Jan," Redcliffs.**

CRUNCHIES.

1 cup flour, 1 cup coconut, 1 cup rolled oats, 1 cup sugar, ½ cup butter, 2 teaspoons golden syrup, 1 teaspoon bicarb. soda.

Mix flour, coconut, rolled oats, and sugar. Melt butter and syrup, mix with soda dissolved in a little hot water, stir into flour, etc., and bake in a slow oven.

CUSTARD PATTIES.

Puff pastry, ½ pint milk, 1 teaspoon cornflour, 2 eggs, 2 good teaspoons sugar, essence vanilla.

Line patty tins with puff pastry, prick them well, and bake till half-cooked. Bring milk to the boil, mix cornflour with a little cold milk or water, add the sugar, and stir into the milk. Flavour with essence of vanilla. When thick, beat eggs, and stir in slowly. Fill the patties and bake till done.

PRUNES IN BATTER.

Soak some prunes overnight, then drain, and dry the surface. Remove the stone carefully, and replace it with a blanched almond. Dip each prune into a good batter, and fry in deep fat until golden-brown. Drain, and sprinkle with castor sugar and cinnamon.

BACON AND MACARONI.

4oz. macaroni, bacon, tomato sauce, breadcrumbs, and seasoning.

Boil the macaroni in salted water until soft, then drain it. Grease a baking dish, and put in half the macaroni, then add a layer of fried bacon, cut in dice. Cover with the rest of the macaroni, then with more diced bacon, and the fat from frying it. Pour over enough tomato sauce to make it moist, and then scatter with browned breadcrumbs. Bake in a good oven until very hot, and serve at once.

CREAM PIE.

Line a pie-plate with puff pastry, mix 2 tablespoons flour and two-thirds of a cup of sugar together, blend with ½ cup milk, and 1 cup thick fresh cream, then stir in the stifly-whipped white of one egg. Turn into pie-plate, and bake in a quick oven.

YO-YO BISCUITS.

Take 6oz. each of butter and flour, 2oz. custard powder, 2oz. icing sugar.

Cream the butter and sugar, add flour and custard powder, roll in small pieces, mark criss-cross with fork, and bake 10 minutes in a moderate oven. Join the biscuits together with icing, and ice the top, if desired.

CORNISH APPLE FLAN.

Short pastry, 4 large apples, ¼ cupful each of seeded raisins and sugar, 1 lemon, 4oz. almonds, ½ teaspoonful ground cinnamon.

Line flan dish with short pastry, and bake in the usual way. Cool on a wire sieve. Peel, core, and chop up apples into saucepan, add blanched and chopped almonds, chopped raisins, sugar, cinnamon, and strained juice, also rind of lemon. Cover, and stew 5 minutes until apples are tender. Cool, put into the prepared pastry case, dot with nuts of butter, and make piping-hot in oven.

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