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## Agriculture.

### STATE AID TO AGRICULTURE IN GERMANY AND IN QUEENSLAND.

A few years ago a consular report was issued by the British Foreign Office showing the causes which have enabled German agriculture to fight against depression so much more successfully than British rural industry. Some of those burdens which press so heavily on the latter are, or rather, were, previous to the present disastrous war, unknown in Germany, while at the same time her farmers enjoyed the benefit of protection, which, however mischievous in its general effects, undoubtedly answers its purpose in the case of those for whom it is primarily intended. The British consul at Düsseldorf on the Rhine agreed with the German authority who drew up the report in attributing the most salutary effects to fair freights and moderate protection. Other causes also have contributed very largely to the same result, but that is not saying that these alone, without the other two, would have enabled the German farmer to prosper as he did.

In Germany State aid has been carried out on a scale wholly unknown in Great Britain and her dependencies. The State founded Agricultural Colleges at many of the old Universities, and where there are no colleges there is a Chair of Agriculture, with professors to lecture on the subject. Thus an amount of scientific knowledge has been disseminated among the German farmers which has qualified them to cope with the dishonesty of many dealers in cake, meal, seed, and mineral manures in that country: has taught them how to feed their stock so as to produce either meat,

milk, or muscle; and what quantities of nitrogen, phosphates, and potash a crop needs and which must be replaced. In Germany it is assumed that the British farmer is deficient in this kind of knowledge. If so, it is much to be deplored, since he can buy all mineral manures, cakes, and meal more cheaply than his Continental rivals. While plenty of scientific agricultural knowledge exists in Britain and in her oversea dominions, it does not appear to be generally diffused, but sticks fast somewhere amongst the wealthier and more highly educated farmers.

It is not, however, only the Agricultural Colleges at the Universities to which our attention is directed. By means of schools established all over Germany, and maintained or subsidised by the State, agricultural science is brought home to the peasant farmer, and there are special schools for the training of farmers' sons. There are dairy and farriery schools. One of the greatest of German institutions is the State Experimental Station, of which there are several, established for the purpose of making experiments of all kinds, and for testing fodder, manure, seeds, &c., for farmers, at quite a nominal fee. There are also some private establishments of the same kind, but the greater part are subsidised by the State.

Even local Chambers of Agriculture receive State assistance, and travelling lecturers are supported by the Government. Then, as to co-operation. Even more importance is attributed to the principle of co-operation than to State education. Co-operation is the German farmer's stronghold and bulwark, and he means to stand by it. It is of various kinds. There are co-operative credit banks, co-operative dairies, co-operative steam ploughs, and co-operative drainage and irrigation. This co-operative operation has proved to be the key to success in Germany, and has saved many thousand farmers from ruin. The banks conducted on this principle enable farmers to obtain loans on personal security only, the collective guarantee of all the members or depositors being considered sufficient. Wealthy banking firms and rich capitalists were all willing enough to lend money on real estate if sufficient security was forthcoming, but personal credit is what German farmers wanted. It is indispensable to buy stock, mineral manures, cake, meal, seed, tools, machinery, and to pay wages—in short, to run the business. All the union requires is the co-operative guarantee of the members of the co-operative society, a body of men of recognised standing. As all the members are personally acquainted with each other, the risk is next to nothing. That the system is a sound one seems to be proved by the results of the audit. So far back as 1897, the auditors reported that of 649 banks in Württemberg, 450 were thoroughly satisfactory, 192 were satisfactory with room for improvement, and only seven were unsound. In Germany, the Government, by having the management of the railways in their hands, are able to arrange an equitable system of freightage, while, thanks to the co-operative principle, the farmer can avail himself of the lowest freights on all the materials he requires, and on all products sent to market, by loading in quantities of at least one ton. Under this system preferential rates in Germany are an immense advantage to the farmer, whereas in England they are dead against him,

the advantages there being reaped by his foreign competitor. How much longer, in view of the present war, this ancient industry will retain its position in Germany seems very uncertain. It is already beginning to yield to time and fate and the competition of the New World. A large proportion of the land is in the hands of peasant proprietors. Some of it is let, as in England, and a considerable extent, the property of the nobility, is farmed by the owners. The proprietor cultivates his estate with the labour of the peasantry, who are practically *ascripti glebæ*, receiving only a small modicum of wages in cash, and the rest in kind, being boarded and lodged at the landlord's expense. It would seem that if the proprietors in Great Britain chose to do the same thing, and to work as hard as the Germans, they might not only improve their financial position, but regain much of their former influence. In Germany, though the fall in rents during the past few years would indicate a decline in the returns from agriculture, this class of proprietors make their own rents and appear to thrive. They (we write as matters stood before the war) live the life of an English country gentleman. But the exodus of the farm labourers commenced in Germany many years ago. German vessels, so far back as 1860, brought hundreds of German labourers to Queensland, whose descendants to-day are prosperous colonists, the more profitable industries in America and Australia drawing them from their native fields. Hence, the supply of farm labour in Germany has been yearly growing more scanty. Men are imported from Russia and Poland, and the increase in the number of women and old men employed in field labour shows that the pick of the peasantry have been turning their thoughts elsewhere. And how greatly this want of farm labour is now felt, when the said pick of the labourers are driven into the battlefields of France, Belgium, and Austria! To induce men to remain in the country, land owners and even small farmers were only too ready to let small holdings at a moderate rent, but this inducement could not tempt them, when the British colonies, especially Queensland, held out to them the prospect of becoming owners of their own freehold on the richest lands of the State, by means of land orders granted to all immigrants. This prospect brought many hundreds of Germans to the State, who, as a rule, became well-to-do farmers.

Now, coming to live stock; sheep farming in most parts of Germany has declined, and cattle are kept chiefly with a view to milk and draught purposes.

In Westphalia, Mecklenberg, and Saxony, the sugar beet reigns supreme, but here again the dearth of skilled labour, which it requires, constitutes a serious difficulty, owing to the higher wages to be obtained in towns. Agricultural wages vary, of course, in different districts. The ordinary labourer earns 1s. 9d. a day in summer, 2s. a day at harvest time, and 1s. 6d. a day during the rest of the year, but he gets a cottage free, a small plot of ground for potatoes, vegetables, and flax, and is allowed the use of farm horses to work his allotment. Piece work, especially in Saxony, is paid much higher. Beer being one of the staple products of Bavaria, much attention is, of course, paid to the barley crop. It may be mentioned that Bavarian beer may only be brewed from malt

and hops, and this regulation is enforced by very heavy penalties. With regard to German agricultural implements, these are as good as in any countries advanced in agriculture, with the exception of mowing machines and binders, in which the United States are first, and of steam ploughs and threshing machines, in which England excels. It seems, on the whole, that if our farmers had the scientific knowledge of the German ones, they would be able to hold up against taxes, railway rates, open ports, and foreign competition. It is an incontestable fact that the chemical laboratories of the Agricultural Colleges have revolutionised agriculture. Nowadays, thanks to the Agricultural Chemist, we know the chemistry of the soil, the plants, the live stock, the manures, the foods. Thus, agriculture to-day is as much a science as in old times it was a matter of purely practical experience.

So we come to this, that the best foundation a State can give to its people is a thorough genuine and technical education, to fit them out adequately in order to be able to successfully fight their way. It affords them the best chances of being able to work against long odds, so that they may hold their own in bad times, and even through such a crisis as severe droughts such as that which terminated in 1902 in Queensland, and which is even now threatening this State with disaster. The German farmer has had to fight against agricultural depression, but, by means of his thorough education and resources, backed up by science and State help, he has withstood bad seasons and low prices; he has been going ahead all the time, learning how to increase his crops and increase his income per acre in the same proportion as prices receded. With this object in view, no stone was left unturned, and his resources were strained to the utmost. He found great help in co-operation—co-operation in credit, loans, purchase and sale of produce, purchase of foods, seeds, mineral manures, in drainage and irrigation works of large dimensions, and in dairying. In all his struggles, the State helped him. by encouraging scientific research at its experiment stations, by gratis advice, and farmers recognised the value of unions and combined efforts to swim up-stream. He recognised that, single-handed, he was powerless to achieve anything, but, although not individually intrinsically wealthier when combined, he found himself, when united, and working hand in hand co-operatively, strong enough and able to withstand the worst of times.

In this State of Queensland, State aid has a bad name, and though all classes are ready enough to take it when they can get it, most of them denounce it when offered to any but themselves. The prejudice, however, has its good side, and if the land were treated fairly in other respects, we doubt if our Queensland farmers would either require or desire such fostering care as is bestowed on their calling elsewhere. If a great industry like agriculture cannot rest upon its own bottom, there must be something wrong in the conditions under which it is pursued. Nor are we at all satisfied that a case has been made out for German agriculture which political economy could approve. Still, it must be recognised that State aid in Queensland in certain directions has done very much of late years to assist the farmer, not only in improved

methods of agriculture, but in the establishment of an up-to-date Agricultural College, in the institution of an Agricultural Bank, in the introduction of instruction in agriculture in State schools, in the appointment of instructors in all branches of agriculture, including sugar experiment stations, stock-breeding, wheat-growing, in the establishment of State Farms, institutions for instruction in tropical agriculture, in dairying, stock-raising. Furthermore, every encouragement is given to farmers throughout the State to improve their methods of raising and marketing their products, by means of travelling exhibits, accompanied by competent instructors. The dairying industry is especially encouraged, and has usually been under the supervision of highly-qualified scientific experts. Tropical industries have also for many years enjoyed the fostering care of the Department of Agriculture, whilst horse-breeding is assisted by a constant inspection of stallions by Government veterinary surgeons, and chemical analysis of soils, water, fodders, &c., is at the service of farmers throughout the whole State. It might be said, indeed, that the system of Government assistance to the rural industries of Queensland in many respects is quite as up-to-date as that of any European country, although, owing to the sparse population of the State, there has been as yet no necessity for the vast expenditure incurred in the United States of America, and in some European countries, in the interests of the man on the land.

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### **KILLING TIMBER BY RINGBARKING AND POISONING, AS PRACTISED IN NEW SOUTH WALES.**

Mr. A. H. Farrand, Diddillibah, writes:—When ringbarking was in its comparative infancy in New South Wales, thirty to forty years ago, mostly only box timber was ringed, where it had become too dense to allow pasture to grow. Areas were large and rentals very cheap, so that reclaiming inferior country was unnecessary. The style of ringbarking was sapping, but after a time other methods were tried, such as chip ringing, frill ringing, removing strip of bark around tree, &c., but chip ringing remained in general use. It was thought that sapping, causing the tree to die quickly, conduced to a plentiful and vigorous growth of suckers, and there were no doubt good grounds for such opinion. By destroying the timber quickly one is able to bring the land into use so much more quickly that such very much more than compensates for the extra suckers that it may bring. Ringing being done in the summer, when sap is well up, its effect, when tree has been sapped, is shown in a few days by leaves turning colour; and slumming of work can easily be detected, but contractors for this style might not now be easily obtained.

For some years past in New South Wales there has been a great rush for land, and any small area now made available, within reach of a railway, that can be improved into farming land, commands numerous applicants. Such blocks in almost every case are heavily timbered, and the best and cheapest method of destroying such has become an important matter.

Various liquids for poisoning trees have been put on the market, and poisoning with arsenic has been extensively practised of late years. Arsenical poisoning, like sapping, produces a very quick effect, and when it was first tried in New South Wales the Press was deluged with letters extolling its merits. The experimenter was so elated with its apparent success that he made his deductions without waiting sufficiently long to be fully seized of all the points. Arsenic is applied in a liquid form by pouring it into ring cut around tree from a vessel such as a teapot, and frill-ringing, holding such liquid best, is generally adopted. The poison is at once carried up by rising sap and the top of the tree dies as in sapping, but as such poison does not go below the ringed cut, the bottom of the tree is not affected, and a good healthy crop of suckers soon arrives.

Arsenical poisoning of trees is about on a parallel with sapping. If four cuts are put in tree opposite one another and arsenic applied tree will die, and if just one cut is put the limbs on tree on that side die, whilst the rest of the tree flourishes, thus showing how arsenic is carried up. The other liquids put on the market had much the same effect as arsenic, and as none of them had any effect below cut into which they were poured, the bottom part of tree still went on producing suckers. After a very considerable experience in dealing with timber in New South Wales in various parts, and many years with the Government, where one of my duties was to inspect ringbarked areas, so that I saw the work being done and years afterwards saw the effect, I would summarise as follows:—Have work done, whether arsenic is used or not, late in the summer, so that the suckers will begin to sprout in the winter time, when the tree is in its most unhealthy period, as you will then have fewer suckers, and those that do grow will not be such strong growers. Also, if the country is stocked with sheep, they will, in the winter time, keep nibbling at green shoots and so impede their growth, and, in some instances, altogether kill them.

Poisoning with arsenic repays the trouble, but do not make your solution too weak, as the arsenic itself is cheap. The "rise and fall of sap," so generally spoken of, is apt to deceive you, but remember, when the arsenic is applied, the sap is rising, and poison therefore carried upwards, so be prepared to see the tree below the cut still growing. This applies to every poison I have seen used.

Fire sapping is being extensively used in the farming districts of New South Wales. A little earth is removed at the foot of the tree and it is lightly ringed at the bottom, and any small timber stacked around it and burned. This causes the tree to die quickly, and it will burn up when grubbed.

### A RIVAL OF LUCERNE.

Mr. R. S. Nevill, formerly Tobacco Expert to the Department of Agriculture and Stock in Queensland, sends us the following notice, published in the "Kansas City Star" (U.S.A.), on sweet clover, as a substitute for lucerne for stock and as a soil improver. Mr. Nevill was for many years in Queensland, where he made many friends, who will be glad to hear that he is in the best of health, and comfortably settled at Carthage, Missouri:—

Sweet clover excels alfalfa as a cattle pasture and is superior to all other crops for improving soils deficient in organic matter, though it has been lately overrated as a crop to grow under all circumstances. These conclusions are reached as a result of investigations by the agronomy department of the Kansas State Agricultural College.

"In the last two years," says C. C. Cunningham, assistant in co-operative experiments, "there has taken place in the popular mind a radical change in opinion regarding sweet clover. Once considered a noxious weed, it is now recognised as a valuable crop. To a large extent sweet clover is deserving of this change of opinion regarding it, but, like any new crop that suddenly comes into favour, it has been overrated for growing under all conditions in Kansas. It has proved valuable, however, under certain conditions and for special purposes.

#### A SUBSTITUTE FOR ALFALFA.

"Sweet clover can be grown to advantage for hay in Eastern Kansas on some soils not adapted to alfalfa or red clover. It is, however, a substitute for these crops and is useful for hay when the more valuable kinds cannot successfully be grown.

"Sweet clover is of value as a pasture and soil improvement crop and will undoubtedly be extensively utilised for these purposes. Properly handled, sweet clover will furnish more pasture than most other pasture crops, especially on the poorer types of soils. It excels alfalfa as a pasture for cattle, in that it rarely causes bloat. Sweet clover is superior to all other crops for use in improving soils deficient in organic matter.

#### NOT FOR DRY LAND.

"During the last two years the agronomy department has co-operated with many farmers in Western Kansas in testing sweet clover on the uplands. The results obtained were not very successful. Evidently sweet clover has been overrated as a dry land crop. Under dry land conditions—that is, where alfalfa cannot be successfully grown on the uplands because of the limited amount of precipitation—sweet clover is subject to the same disadvantages. The same difficulties in obtaining a stand are met with, although sweet clover is more hardy and the chances

of failure are slightly less. Attempts to seed sweet clover under dry land conditions during the last two seasons have nearly all resulted in failure due to various causes.

#### DEFEATED BY THISTLES.

“In many tests the sweet clover seeded early in the spring failed to compete successfully with the ever present Russian thistle. In other tests the young plants perished in temporary periods of drought that prevailed before the sweet clover obtained a good roothold. Other stands were destroyed by beating rains before the plants made much growth. Grasshoppers relish young sweet clover plants and may, if they are numerous, destroy the crop. Where stands of sweet clover were obtained on uplands it failed to make profitable yields of hay the first season.

“Because of the high cost of the seed, the short life of the crop, the uncertainty of getting a stand, and the smaller yields of forage as compared with the sorghums, it is doubtful if sweet clover will prove a satisfactory crop on the uplands in Western Kansas.”

[We do not think that Queensland farmers would care to utilise their best lucerne lands for the planting of sweet clover, which has long been looked upon as a weed, and which appears to have proved a failure for the reasons given in the above article.—Ed. Q.A.J.]

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### PRICES OF WHEAT AND THE EQUIVALENT PRICES OF MANUFACTURED PRODUCTS.

By the courtesy of the Government Statistician, Sydney, the Queensland Department of Agriculture and Stock has received the results of an investigation by Mr. J. B. Trivett, Government Statistician, New South Wales, into the cost of producing flour in Sydney, and also a copy on “The Prices of Wheat, and the Equivalent Prices of Manufactured Products” therefrom.

In view of considerable complexity surrounding this question, and the many confusing statements given by witnesses during the investigation of the price of flour, and of bran and pollard, by the Necessary Commodities Control Commission, Mr. Trivett deemed it necessary to make an examination into the whole matter of milling charges attaching to the production and distribution of flour and wheat products. For obvious reasons, details of the mills cannot be given, but the salient features of the figures supplied by millers respecting the manufacture and sale of flour in Sydney are given.

The returns now under discussion related to 5,296,457 bushels of wheat, which were bought and delivered at mills for £977,218, or at an

average price of 3s. 8-3d. per bushel, and from which 111,978 tons of flour were produced.

The following table gives the massed cost arising from the various operations during milling, and business charges attaching to the selling of the products of five city mills:—

| —  | Total Cost. | Cost per Ton of Flour Produced. |    |      |
|--|-------------|---------------------------------|----|------|
| Gristing—  | £           | £                               | s. | d.   |
| Mill wages, bags, repairs, maintenance, fuel, and other materials .. .. .  | 67,998      | 0                               | 12 | 1-73 |
| Other Charges of Production—   |             |                                 |    |      |
| Rent, stacking, rates, fire and accident assurance, interest, depreciation.. ..  | 34,161      | 0                               | 6  | 1-22 |
| Selling Charges—   |             |                                 |    |      |
| Discount and exchange, stamps, stationery, advertising, commission, law, salaries, travelling, bad debts, and other.. .. | 42,404      | 0                               | 7  | 6-89 |
| Total cost of milling and selling ..   | 144,563     | 1                               | 5  | 9-84 |

I have endeavoured to find out what proportion can be fairly allowed for waste in the gross bushels purchased by the miller, and to do this have accepted, under their own definition, the figures for cleaned and uncleaned wheat, which give me the following statement:—

*Uncleaned Wheat.*—39,312 tons of flour were obtained from 1,893,865 bushels of wheat, or an average of 48·175 bushels of wheat per ton of flour produced.

*Cleaned Wheat.*—72,666 tons of flour were obtained from 3,402,592 bushels of wheat, or an average of 46·825 bushels of wheat per ton of flour produced.

Hence we get the following consideration:—

|                         |                        |
|-------------------------|------------------------|
| Uncleaned wheat .. .. . | 48,175 bushels per ton |
| Cleaned .. .. .         | 46,825 .. ..           |
| Waste .. .. .           | 1,350 bushels per ton  |

This waste is equivalent to 2·8 per cent.

Using the above figures, and assuming the average weight for uncleaned wheat at 60 lb. per bushel, we have the following results:—

|   |   |         |
|---|---|---------|
| 48,175 bushels, at 60 lb. per bushel .. | = | 2,890·5 |
| Waste at 2·8 per cent. .. .. .          | = | 80·9    |
| Net weight of products .. .. .          | = | 2,809·6 |
| Of which flour is .. .. .               | = | 2,000   |
| Offal (bran and pollard), &c. .. .. .   | = | 809·6   |

Whence I assume that with every ton of flour produced there is available as offal 810 lb., and the rest, viz., 81 lb., must be written off as waste which may or may not provide some small monetary advantage.

Having thus cleared the groundwork, I have calculated tables which should prove useful, showing the prices per ton at which flour can be manufactured, assuming stated prices of wheat per bushel, and of offal (bran and pollard) per ton. This gives the actual cost of the flour without any allowance for delivery charges and profit. The tables are attached.

## PRICE AT MILL, SYDNEY, AT WHICH FLOUR CAN BE MANUFACTURED WITH WHEAT AND OFFAL AT STATED PRICES.

This does not allow for Profit, but is the actual Cost.

Assumed 48.175 Bushels of Wheat = 1 ton (2,000 lb.) of Flour and 810 lb. (effective) Offal.

| Price of Wheat<br>per Bushel. | Offal at £4 10s.<br>per Ton. | Offal at £5<br>per Ton. | Offal at £5 10s.<br>per Ton. | Offal at £6<br>per Ton. | Offal at £6 10s.<br>per Ton. | Offal at £7<br>per Ton. | Offal at £7 10s.<br>per Ton. | Offal at £8<br>per Ton. | Offal at £8 10s.<br>per Ton. |
|-------------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| <i>s. d.</i>                  | £ <i>s. d.</i>               | £ <i>s. d.</i>          | £ <i>s. d.</i>               | £ <i>s. d.</i>          | £ <i>s. d.</i>               | £ <i>s. d.</i>          | £ <i>s. d.</i>               | £ <i>s. d.</i>          | £ <i>s. d.</i>               |
| 3 6                           | 7 18 0                       | 7 13 11                 | 7 9 10                       | 7 5 10                  | 7 1 9                        | ..                      | ..                           | ..                      | ..                           |
| 3 7                           | 8 2 1                        | 7 18 0                  | 7 13 11                      | 7 9 11                  | 7 5 10                       | 7 1 10                  | ..                           | ..                      | ..                           |
| 3 8                           | 8 6 1                        | 8 2 0                   | 7 17 11                      | 7 13 11                 | 7 9 10                       | 7 5 10                  | ..                           | ..                      | ..                           |
| 3 9                           | 8 10 1                       | 8 6 0                   | 8 1 11                       | 7 17 11                 | 7 13 10                      | 7 9 10                  | ..                           | ..                      | ..                           |
| 3 10                          | 8 14 1                       | 8 10 0                  | 8 5 11                       | 8 1 11                  | 7 17 10                      | 7 13 10                 | ..                           | ..                      | ..                           |
| 3 11                          | 8 18 1                       | 8 14 0                  | 8 9 11                       | 8 5 11                  | 8 1 10                       | 7 17 10                 | 7 13 9                       | ..                      | ..                           |
| 4 0                           | 9 2 1                        | 8 18 0                  | 8 13 11                      | 8 9 11                  | 8 5 10                       | 8 1 10                  | 7 17 9                       | ..                      | ..                           |
| 4 1                           | 9 6 2                        | 9 2 1                   | 8 18 0                       | 8 14 0                  | 8 9 11                       | 8 5 11                  | 8 1 10                       | ..                      | ..                           |
| 4 2                           | 9 10 2                       | 9 6 1                   | 9 2 0                        | 8 18 0                  | 8 13 11                      | 8 9 11                  | 8 5 10                       | 8 1 9                   | ..                           |
| 4 3                           | 9 14 2                       | 9 10 1                  | 9 6 0                        | 9 2 0                   | 8 17 11                      | 8 13 11                 | 8 9 10                       | 8 5 9                   | ..                           |
| 4 4                           | 9 18 2                       | 9 14 1                  | 9 10 0                       | 9 6 0                   | 9 1 11                       | 8 17 11                 | 8 13 10                      | 8 9 9                   | ..                           |
| 4 5                           | 10 2 2                       | 9 18 1                  | 9 14 0                       | 9 10 0                  | 9 5 11                       | 9 1 11                  | 8 17 10                      | 8 13 9                  | ..                           |
| 4 6                           | 10 6 2                       | 10 2 1                  | 9 18 0                       | 9 14 0                  | 9 9 11                       | 9 5 11                  | 9 1 10                       | 8 17 9                  | 8 13 9                       |
| 4 7                           | 10 10 3                      | 10 6 2                  | 10 2 1                       | 9 18 1                  | 9 14 0                       | 9 10 0                  | 9 5 11                       | 9 1 10                  | 8 17 10                      |
| 4 8                           | 10 14 3                      | 10 10 2                 | 10 6 1                       | 10 2 1                  | 9 18 0                       | 9 14 0                  | 9 9 11                       | 9 5 10                  | 9 1 10                       |
| 4 9                           | 10 18 3                      | 10 14 2                 | 10 10 1                      | 10 6 1                  | 10 2 0                       | 9 18 0                  | 9 13 11                      | 9 9 10                  | 9 5 10                       |
| 4 10                          | 11 2 3                       | 10 18 2                 | 10 14 1                      | 10 10 1                 | 10 6 0                       | 10 2 0                  | 9 17 11                      | 9 13 10                 | 9 9 10                       |
| 4 11                          | 11 6 3                       | 11 2 2                  | 10 18 1                      | 10 14 1                 | 10 10 0                      | 10 6 0                  | 10 1 11                      | 9 17 10                 | 9 13 10                      |
| 5 0                           | 11 10 3                      | 11 6 2                  | 11 2 1                       | 10 18 1                 | 10 14 0                      | 10 10 0                 | 10 5 11                      | 10 1 10                 | 9 17 10                      |
| 5 1                           | 11 14 4                      | 11 10 3                 | 11 6 2                       | 11 2 2                  | 10 18 1                      | 10 14 1                 | 10 10 0                      | 10 5 11                 | 10 1 11                      |
| 5 2                           | 11 18 4                      | 11 14 3                 | 11 10 2                      | 11 6 2                  | 11 2 1                       | 10 18 1                 | 10 14 0                      | 10 9 11                 | 10 5 11                      |
| 5 3                           | 12 2 4                       | 11 18 3                 | 11 14 2                      | 11 10 2                 | 11 6 1                       | 11 2 1                  | 10 18 0                      | 10 13 11                | 10 9 11                      |
| 5 4                           | 12 6 4                       | 12 2 3                  | 11 18 2                      | 11 14 2                 | 11 10 1                      | 11 6 1                  | 11 2 0                       | 10 17 11                | 10 13 11                     |
| 5 5                           | 12 10 4                      | 12 6 3                  | 12 2 2                       | 11 18 2                 | 11 14 1                      | 11 10 1                 | 11 6 0                       | 11 1 11                 | 10 17 11                     |

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|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 5 6  | 12 14 5 | 12 10 4 | 12 6 3  | 12 2 3  | 11 18 2 | 11 14 2 | 11 10 1 | 11 6 0  | 11 2 0  |
| 5 7  | 12 18 5 | 12 14 4 | 12 10 3 | 12 6 3  | 12 2 2  | 11 18 2 | 11 14 1 | 11 10 0 | 11 6 0  |
| 5 8  | 13 2 5  | 12 18 4 | 12 14 3 | 12 10 3 | 12 6 2  | 12 2 2  | 11 18 1 | 11 14 0 | 11 10 0 |
| 5 9  | 13 6 5  | 13 2 4  | 12 18 3 | 12 14 3 | 12 10 2 | 12 6 2  | 12 2 1  | 11 18 0 | 11 14 0 |
| 5 10 | 13 10 5 | 13 6 4  | 13 2 3  | 12 18 3 | 12 14 2 | 12 10 2 | 12 6 1  | 12 2 0  | 11 18 0 |
| 5 11 | 13 14 5 | 13 10 4 | 13 6 3  | 13 2 3  | 12 18 2 | 12 14 2 | 12 10 1 | 12 6 0  | 12 2 0  |
| 6 0  | 13 18 6 | 13 14 5 | 13 10 4 | 13 6 4  | 13 2 3  | 12 18 3 | 12 14 2 | 12 10 1 | 12 6 1  |
| 6 1  | 14 2 6  | 13 18 5 | 13 14 4 | 13 10 4 | 13 6 3  | 13 2 3  | 12 18 2 | 12 14 1 | 12 10 1 |
| 6 2  | 14 6 6  | 14 2 5  | 13 18 4 | 13 14 4 | 13 10 3 | 13 6 3  | 13 2 2  | 12 18 1 | 12 14 1 |
| 6 3  | 14 10 6 | 14 6 5  | 14 2 4  | 13 18 4 | 13 14 3 | 13 10 3 | 13 6 2  | 13 2 1  | 12 18 1 |
| 6 4  | 14 14 6 | 14 10 5 | 14 6 4  | 14 2 4  | 13 18 3 | 13 14 3 | 13 10 2 | 13 6 1  | 13 2 1  |
| 6 5  | 14 18 6 | 14 14 5 | 14 10 4 | 14 6 4  | 14 2 3  | 13 18 3 | 13 14 2 | 13 10 1 | 13 6 1  |
| 6 6  | 15 2 7  | 14 18 6 | 14 14 5 | 14 10 5 | 14 6 4  | 14 2 4  | 13 18 3 | 13 14 2 | 13 10 2 |
| 6 7  | 15 6 7  | 15 2 6  | 14 18 5 | 14 14 5 | 14 10 4 | 14 6 4  | 14 2 3  | 13 18 2 | 13 14 2 |
| 6 8  | 15 10 7 | 15 6 6  | 15 2 5  | 14 18 5 | 14 14 4 | 14 10 4 | 14 6 3  | 14 2 2  | 13 18 2 |
| 6 9  | 15 14 7 | 15 10 6 | 15 6 5  | 15 2 5  | 14 18 4 | 14 14 4 | 14 10 3 | 14 6 2  | 14 2 2  |
| 6 10 | 15 18 7 | 15 14 6 | 15 10 5 | 15 6 5  | 15 2 4  | 14 18 4 | 14 14 3 | 14 10 2 | 14 6 2  |
| 6 11 | 16 2 8  | 15 18 7 | 15 14 6 | 15 10 6 | 15 6 5  | 15 2 5  | 14 18 4 | 14 14 3 | 14 10 3 |
| 7 0  | 16 6 8  | 16 2 7  | 15 18 6 | 15 14 6 | 15 10 5 | 15 6 5  | 15 2 4  | 14 18 3 | 14 14 3 |

### JOHNSON GRASS AND SORGHUMS.

Johnson grass, like other plants of the sorghum family, will supply bulky succulent feed for dairy cows. Ordinarily, sorghum is, by analysis, low in proteids (flesh formers), and relatively high in carbohydrates (sugars, starch, gums, &c.).

Johnson grass is not rich enough to support dairy cows satisfactorily, and other concentrated foods or lucerne must be added to increase its food-value. Practically all sorghums contain, at certain stages of their growth, a poisonous principle, hydrocyanic acid; plants of this description, particularly when immature (before the seed heads have formed), should be allowed to wilt in the sun before use, to allow any poisonous substances to pass off in a volatile condition. Johnson grass is not recommended for fattening cattle and sheep. It makes a coarse, pithy chaff. Coarseness reduces its value as a hay plant. Good lucerne must be blended with it to increase the palatability of the mixture. Under normal conditions the grass will start growth in the spring and early summer months.

*Summary.*—Johnson grass is likely to prove a serious pest to cultivated land and is not recommended.

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## MARKET GARDENING.

### SHORT NOTE ON SEED TESTING.

By J. F. BAILEY, Director of the Brisbane Botanic Gardens.

In a climate like that of Queensland, where rains are experienced during the summer months, it has been found that seeds do not keep so well as they do in places where the reverse is the rule; therefore, when it is stated in works on the subject that certain seeds keep good for a considerable length of time, we must dismiss such from our minds if we desire any measure of success. For instance, here are a few of the cases quoted, as the result of experiments carried out in Great Britain:—Beans, 4 to 5 years; turnip, 3 to 4 years; cabbage, 3 to 4 years; carrot, 3 years. Probably for the reasons given above, the percentage of germination allowed in the Queensland Act has been fixed at a somewhat lower scale than that allowed in other countries.

In testing samples of seeds several important factors must be considered, chief among which are—power and energy of germination, quality, purity, and absence of insect and fungus pests. Energy of germination is an item of great importance. The grower desires an even crop, and this can only be obtained by putting in seed of an even nature, not, as is sometimes done, mixing old seed with new, however good the former may look. In the matter of purity, consideration must be given to the amount of foreign substances included, such as dirt, and, worst of all, seeds of weeds of an injurious character. Every care should therefore be taken by the growers to see that the sample they are about to sow conforms to the foregoing conditions. Most of our leading seedsmen, we are given to understand, are careful to see that the article they



PLATE 15.—SEED TESTING AT THE BOTANIC GARDENS.

sell conforms to the conditions of the Pure Seeds Act, but where any doubt exists in the mind of the grower he should carefully test his seeds before sowing them. From a purity point of view this is, in most instances, simple enough, but in the case of some grasses it becomes a more difficult matter.

Germinating tests are carried out by several very simple methods. It is our usual practice to adopt two methods, so that one may act as a check to the other, and so far we have found it answer well. One is by sowing in earth which has been sterilised by roasting or steaming, and the other by placing the seeds on two thicknesses of thick flannelette placed in the bottom of shallow galvanised trays. These trays are placed on blocks of wood standing in deeper trays in which water is held, and if the flannelette is allowed to go over the ends and into the water, a siphon will be formed which will ensure a continual and even supply of moisture to the material. Plates might be used instead of the trays with equal chance of success.

When planting the seed in earth a general rule to go by is to sow it not more than its own depth of soil, or in the case of grasses, silver sand. The material must be kept continually moist. The trays or pots should be covered with glass, which if darkened greatly assists in the work of germination and is a protection against vermin. Before using, and after each test has been completed, the flannelette should be boiled to ensure its being free from fungus growths.

Poor germinating power may be attributed to several causes. For instance, the seeds may not have been allowed to ripen before being gathered, or too long a time may have elapsed between the time of gathering and sowing, or they may have been exposed in the shops for a considerable length of time, or may have been attacked by insect or fungus pests. Legumes, such as peas, beans, &c., and cereals like maize, wheat, &c., are usually preyed upon by insects in an alarming degree.

[An excellent article on testing seeds, by G. B. Brooks, Instructor in Agriculture, will be found in the May issue of the Journal, 1912.—Ed. Q.A.J.]

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### CHICORY.

In the April issue of the Journal we drew attention to the value of chicory, and we showed that the cultivation of the chicory plant is not more troublesome than the growing of carrots, parsnips, or beets. We have since then made inquiries from firms in Brisbane, who are purchasers of this crop, sliced and dried. Before the war the price of the dried root was about £16 per ton. To-day it runs, according to quality, from £24 to £32 per ton. The chief advantages of chicory as a farm crop are, its adaptability to dry, poor soils, its power of growing several large cuts of green food per annum when once established, and its perennial character and easy cultivation. It is hardy, and provides food for stock when other green crops are scarce. A crop of leaves can be cut in the autumn, and afterwards three or four crops per annum will be provided. The plant will last in a productive state for four or five years. From 8 to 10 tons of fresh roots are obtained per acre.

## Dairying.

### THE QUEENSLAND MILKING-MACHINE.

Messrs. Preston and Co., agents for the above machine, are, we understand, receiving satisfactory reports from all districts where the "Shepperson" milking-machine is in use; and it is gratifying to find that the *first* and *only* Queensland patent milker is more than holding its own against the competition of the imported machine, upwards of 10,000 cows being milked each day by this means.

The reason of the marked and immediate success of the "Shepperson" machine is not far to seek; the new patents, as well as improvements, enabled a dairyman with a single "Shepperson" bucket to milk twice as many cows as could be done by the old style of milking-machine, and three times as fast as by hand, the milking being better done, and each cow properly stripped.

All rubber parts can be boiled, thus ensuring absolute cleanliness.

Both the bucket and releaser machines are manufactured of the very best material; and each part—no matter how small—is made by skilled workmen, not boys; so that the machine can be guaranteed in every respect.

Messrs. W. A. Preston and Co., dairy machinery merchants, Brisbane, are the Australasian agents for this machine, and would, we feel sure, be only too pleased to show intending purchasers the machine under construction, or a plant erected and at work on a dairy farm close to Brisbane, or possibly in their own neighbourhood.

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### THE UDDER OF THE COW AND MILKING MACHINES.

The udder of the cow consists of four quarters and four teats, of which a fore and hind quarter constitute a lateral half. The fore and hind quarters of each side, although functionally distinct, have no fibrous division between them. The udder is held in position by broad suspensory bands which attach it to the abdominal tunic, and secondly by the skin which covers it.

The milk vein from each half of the udder unites with its fellow of the opposite side in front of that organ, and immediately afterwards divides to form the two milk veins which pass along the under surface

of the abdomen. The veins of the udder are exceedingly numerous, and so are the lymphatic glands.

The gland tissue is made up of a number of minute vesicles surrounded by a network of minute bloodvessels. The milk is formed in these vesicles and conveyed to a cavity at the base of the teat. These cavities are very small in dry cows, but during lactation they are much increased in size. They hold the milk which is slowly formed during the milking. The teats have thick walls and a single orifice or opening. The walls are composed of skin and a mixture of elastic and unstriped muscular tissue. At the base of each teat the muscle fibres are very few indeed, but increase towards the free extremity, where they form into a band which by keeping the orifice closed prevents the milk from escaping. The inside of the teat is lined by a delicate mucous membrane.

From the above description it will be readily seen that any foreign body introduced into the udder will set up serious complications. In milking, the human hand is the oldest method, but in large herds it is often found to be impossible to get through all the animals unless at great cost—labour. As a result the milking machine has been introduced. Many of these instruments are of great value, as they are worked by suction, thus acting in the same manner as the human hand. A great mistake is made by some people, who think by introducing a foreign body into the teat they will carry off the milk easier and at less cost. Now, take the construction of the teat as mentioned above, and it will be seen that the teat is lined with a delicate mucous membrane, and unless one understands this thoroughly, there is a grave danger in injuring the membrane and setting up stricture or obliterating the teat altogether.

Another danger one has not to forget in introducing a foreign body into the udder, is the introduction of various germs which set up serious complications. The cow owner would be well advised before inserting any instrument into the udder to take into consideration the anatomy of the gland and teat and also its accompanying dangers.

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### SPLIT PEAS.

Special varieties of field peas are grown for split peas, viz.:—Prize-taker, Woodford, Partridge, and Dun. It is somewhat surprising that the cultivation of this crop has not received attention by our farmers, considering the quantities which are imported into Australia every year. There is this much to be said of the crop: That it requires very little labour to prepare the product for the market—merely harvesting, threshing, and winnowing. For split peas, choose those which produce small pods and seeds, divide easily into halves, and of which the skin of the pea is loose. It will be found that, in threshing such kinds, the seeds split in halves, and that, in winnowing, the skins are blown off, leaving the article ready for market.

# The Horse.

## THE CLYDESDALE HORSE.

By P. R. GORDON.

The Clydesdale has unquestionably established itself as the heavy draught horse, *par excellence*, of Queensland. There have been occasional introductions of the heavy English Shire horse, but that breed has never made headway here. It is not contended by modern breeders that the breed is indigenous to Scotland. It is freely acknowledged that it has been evolved from the blood of the Flemish horse engrafted on a native Scottish breed, by skilful breeding. The writer has been fortunate enough to obtain from a gentleman, who made his mark as a Clydesdale breeder in Scotland, some interesting notes on the origin of the breed, and the extent to which additional weight has been imparted to the modern type by judicious selection of English mares, the characteristics of the type, however, having been carefully preserved. Regarding the origin of the Clydesdale, there is a certain amount of doubt concerning the tap root from which the breed originally sprang. Three hundred years of time have left the most enlightened in doubt on certain points, which, however, are now narrowed down to insignificance. That it is a composite breed is not now in dispute, and the only serious argument to the contrary ended when the final evolution started about the beginning of last century. Whether at that time they were the ancient horses of Caledonia graded up with, or without, the assistance of Flemish blood was a matter that was seriously in dispute some hundred years ago. At the present time, however, the only or at least the most important point in dispute is the exact date of the introduction of Flemish blood. One matter is clear. At one time there was a distinct species of horse in Britain—a survival of the fittest. There certainly is no time hinted at when there were no horses in Britain. Another matter that is equally certain is that climate and environment have moulded that common ancestry into variations consistent with the surroundings, and formed a base upon which external influences have gradually evolved a now celebrated breed of horses, famous for general utility from the rising to the setting sun. Given a groundwork of a native race of horses in separate localities, all clearly defined and characteristic of their surroundings, the question that first presents itself is, why should they be called Clydesdales? There can be little doubt that there was a trade of considerable dimensions in horses with the continent in the early Stuart reigns, and that this trade was prosecuted with success by the Douglasses, the ancestors of the ducal line of Hamilton, whose headquarters were in the valley of the Clyde, and the introduction of this foreign influence, together with the conditions of agriculture in Lanarkshire—the valley or dale of the Clyde—at a much earlier date than any other part of Scotland resulted in the first efforts to improve the breed to a standard

sufficient to insure recognition from other parts of Scotland; notably Aberdeenshire and Galloway, both of which districts accepted the superiority of the Lanarkshire or Clydesdale horses, and profited thereby. There is still a strong belief that in the seventeenth century the Duke of Hamilton imported six black stallions from Flanders, and that they were located at Strathaven Castle. This matter gave rise to much discussion in agricultural circles about a hundred years ago, when no trace of their probable existence could be emphatically established by those engaged in the controversy. Strange to say, there was not the slightest shadow of doubt expressed as to the magnitude of the importations into England of the Flemish stallions. Nor was any consideration given to the depredatory raids into England by the adjacent border clans, to whom horses were a valuable commodity, and it is no disgrace to say the Scotchmen held their own in their forays, and no doubt brought many a good English horse to their country. But, in spite of all, a large number of Scotchmen could not be persuaded that there was Flemish or even English blood in their Lanarkshire horses. But a few more years settled matters beyond dispute, and about 1715 the Duke of Hamilton, associated with John Paterson, of Lochlyoch, brought over Flemish stallions from England, and these horses, whatever may have been done before then, exerted such an influence on the native mares that they, practically, brought Clydesdale history down to the early part of the nineteenth century, and handed over a distinct breed of horses ready to be moulded to the ever-changing demands of a progressive country. It will be well to consider the groundwork upon which these Flemish stallions were to exercise their influence, and at an early date two districts stand out prominently where the improvement of draught horses began at a very early age—Galloway and Aberdeenshire. In both these districts the climate and soil favoured horsebreeding, and, given the advantage, even at the present day, of a Galloway or Aberdeenshire up-bringing, the Clydesdale starts in life with a considerable advantage over those of other districts. A new era awoke in the nineteenth century. The Clydesdale now established proved himself the *beau ideal* of a farm horse, but with the advent of the city trade, and more especially of the coal and iron portion of it, a demand sprang up for a heavier horse with the same activity—a horse that could shift his two-ton load with reasonable expediency. Reference has already been made to the importation of Flemish stallions into England, just as they were into Scotland, and that their influence was on one and the same breed. But it is well known the external influences alone will not produce similar effect; environment plays its part, and it did so with a thoroughness just as pronounced as it had done in the resulting difference between the highland garron and a seventeenth century Aberdeenshire draught—till then both of the same strain. The result was that in England there was to be found a class of horses two to three hundredweight heavier than the Clydesdale, and yet of the same breed. With a draught horse of ideal weight, the next step was to see how his other qualifications fitted with the requirements of a dray horse for city use. The Clydesdale was, except his deficiency in weight, the ideal in every other respect.

Scottish breeders always made for good feet, correct pasterns, flinty limbs, and oblique shoulders in their principal objective. They had been breeding and cultivating such for years and had generous assistance from local influences of soil and climate. But in England the demand was for size, and the fens of Lincolnshire lent themselves admirably to that purpose, while neither man nor nature troubled much about the quality of the limbs or the slope of the shoulder. They got the size. It was then that the science of breeding began to tell, and the theory spread that, everything equal in health and vigour, breeding could be controlled to some extent, and desired objects accomplished. The idea that the sire influenced the locomotive and the dam the internal organs of the progeny began to find favour among the more enlightened class of the agricultural community. A very strong proof of this can be seen in the

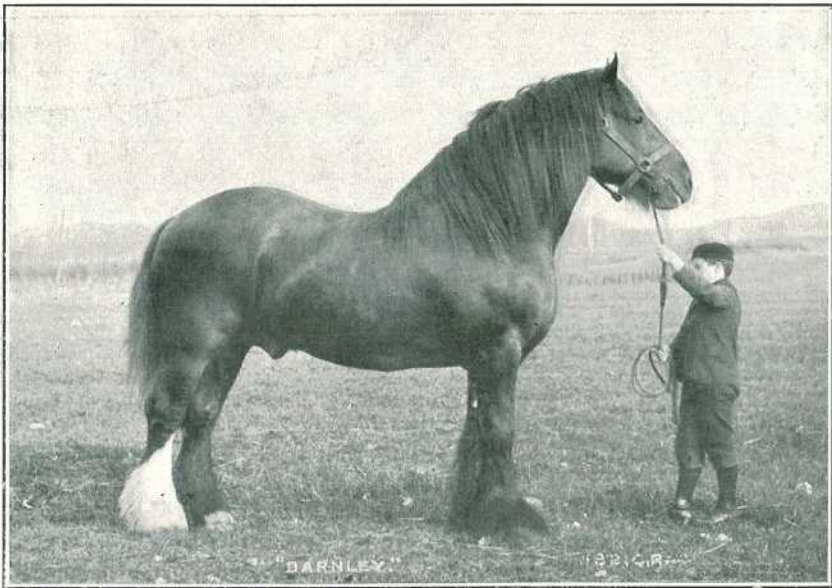


PLATE 16.—DARNLEY, THE GREATEST CLYDESDALE OF LAST CENTURY, AND A CHAMPION OF FORTY YEARS AGO.

breeding of the mule—the progeny of a donkey and a mare. The resulting mating gives the donkey's legs, tail, mane, ears, braying voice, the bodily structure and respiratory organs of the mare. The reverse form of breeding—the stallion on the she-ass—produces an animal with the horse's legs, tail, mane, neighing voice, and the body and respiratory organs of the she-ass. Whatever doubt there may be about the above theory, history itself is ample manifestation of its success in the breeding of the Clydesdale, and it is not wise to ignore all modern history, for several prominent examples have been apparent of what can be done by judicious care and judgment in draught horsebreeding as well as in other things. And the lesson was not thrown away on the Clydesdale breeders, for Shire mares, by the hundred, were rushed into Scotland to be mated with the Clydesdale stallions for the production of a draught

horse with plenty of size and substance, possessing good legs, feet, pasterns, and the slope of the shoulder that so readily indicates freedom and boldness of action. It was a success—so successful indeed that the demand could not be supplied, and Shire stallions were taken to Aberdeen to cross on the Clydesdales with the sole object of founding a base of brood mares—at the expense of a few faulty geldings, inheriting their sires' locomotive organs—on which the Clydesdale stallions afterwards wrought up to the high state of perfection that they are to be found to-day. So successful was the blending the Clydesdale and Shire for ordinary working purposes, that a few of the Lanarkshire breeders initiated it for stud purposes, and quite a number of Shire mares were introduced to Scotland. The result was just as pronounced as in the former case and, practically, left the landmarks of Clydesdale history.



PLATE 17.—PRINCE OF WALES, A CHAMPION OF A LATER PERIOD.

Darnley, the greatest Clydesdale of the past century, both as a show horse and a breeder, had Southern blood in his veins. Both grand-dams of Prince of Wales were Shire mares. Lork Erskine was, at least, a quarter full of Southern influence and Lord Lyon was half Shire—a first cross. In fact, there is not a registered Clydesdale in Scotland to-day that does not trace to Shire blood in a greater or less degree, while some of the leading successes are saturated with it. The history of the Clydesdale has, therefore, well-defined epochs—a foundation on the stock of ancient Caledonia or Britain; an amelioration to climatic conditions, and a survival of the fittest; the introduction of the Flemish blood at whatever age may be expected; the benefits secured through improved agriculture and better feed; the introduction of a heavier species of close affinities in English blood; and the glorious triumph of

consummated excellence in a draught horse that is, practically, the history of Scotland. The photos accompanying this paper are very interesting as showing the evolving results in Clydesdale breeding during the last half-century. Darnley, as above stated, was the greatest show and breeding horse of last century, and all Clydesdales of the present day—Baron's Pride, Bawn of Bucklyvie among others—are in-bred to him—some severely, others, it is thought, out of reason. Prince of Wales represents a horse bred towards an end, and Marcellus—full of Darnley blood—represents that “end”—the finished article, so to speak.

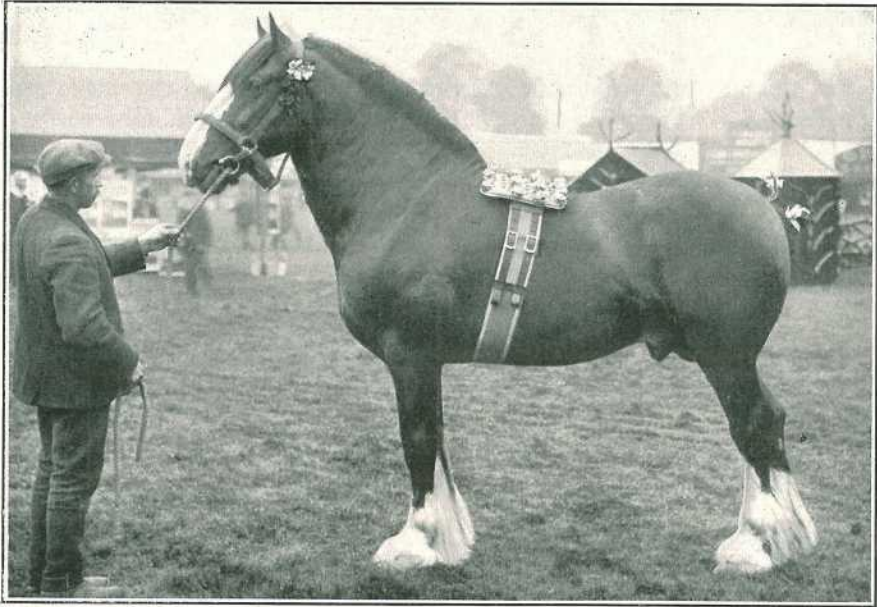


PLATE 18.—MARCELLUS, A CHAMPION OF TO-DAY.

### CURE FOR MANGE IN HORSES.

*Re* a cure for mange in horses, we have at different times given recipes for a cure in this Journal. Amongst these, stabling and grooming are stated to be the best cure. Where this is not possible, oleaginous substances are the most effective applications. Many horses have been cured by daily washings with soft soap. In 1898, Colonel Moore, P.M. at Brisbane (then P.M. at Warwick), applied the following remedy to a horse of his own with complete success:—

Boiled linseed oil 1 pint, sulphur 1 lb., spirit of tar 2 oz. First mix the oil and sulphur, then add the spirit of tar and mix well. Apply with a hard brush or with the hand. Also a teaspoonful of carbolic acid to a pint of lard, stirred in and well mixed. This latter recipe is approved by our veterinary officers.

# Poultry.

## REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MARCH, 1915.

Three thousand nine hundred and sixty-five eggs were laid during the month, making a total for the whole twelve months of 54,202, an average of 1,355 per pen for the forty pens. Coomber's White Leghorns win the first prize with 1,545 eggs, beating Moritz Bros. by one egg. The Loloma Poultry Farm takes third place, being eleven eggs behind the winning pen—a really good finish. T. Fanning's Black Orpingtons win the monthly prize with 141 eggs. A full report of the whole competition will be issued later. The following are the individual records:—

| Competitors.                           | Breed.                       | Mar.  | Total. |
|--|------------------------------|-------|--------|
| A. T. Coomber ... ..                   | White Leghorns ...           | 95    | 1,545  |
| Moritz Bros., S.A. ... ..              | Do. ... ..                   | 110   | 1,544  |
| Loloma Poultry Farm, N.S.W. ... ..     | Do. ... ..                   | 117   | 1,534  |
| T. Fanning ... ..                      | Do. ... ..                   | 97    | 1,488  |
| Geo. Tomlinson ... ..                  | Do. ... ..                   | 110   | 1,478  |
| Marville Poultry Farm, Victoria ... .. | Do. ... ..                   | 131   | 1,456  |
| R. Burns ... ..                        | Black Orpingtons (No. 1) ... | 129   | 1,449  |
| A. H. Padman, S.A. ... ..              | White Leghorns ... ..        | 127   | 1,447  |
| Mrs. Munro ... ..                      | Do. ... ..                   | 129   | 1,443  |
| T. Fanning ... ..                      | Black Orpingtons ... ..      | 141   | 1,441  |
| Cowan Bros., N.S.W. ... ..             | White Leghorns ... ..        | 110   | 1,440  |
| E. Le Breton ... ..                    | Do. ... ..                   | 131   | 1,426  |
| A. F. Camkin, N.S.W. ... ..            | Do. ... ..                   | 103   | 1,422  |
| E. V. Bennett, S.A. ... ..             | Do. ... ..                   | 127   | 1,416  |
| Derrylin Poultry Farm ... ..           | Do. ... ..                   | 129   | 1,416  |
| F. McCauley ... ..                     | Do. ... ..                   | 112   | 1,380  |
| R. Burns ... ..                        | S. L. Wyandottes ... ..      | 118   | 1,379  |
| Loloma Poultry Farm, N.S.W. ... ..     | Rhode Island Reds ... ..     | 71    | 1,373  |
| R. Burns ... ..                        | Black Orpingtons (No. 2) ... | 108   | 1,372  |
| J. T. Coates ... ..                    | White Leghorns ... ..        | 98    | 1,358  |
| Mrs. Beiber ... ..                     | Brown Leghorns ... ..        | 84    | 1,352  |
| J. R. Wilson ... ..                    | White Leghorns ... ..        | 116   | 1,350  |
| J. Franklin ... ..                     | Do. ... ..                   | 105   | 1,348  |
| J. Zahl ... ..                         | Do. ... ..                   | 125   | 1,344  |
| Kelvin Poultry Farm ... ..             | Do. ... ..                   | 44    | 1,334  |
| J. M. Manson ... ..                    | Do. (No. 1) ... ..           | 103   | 1,326  |
| J. T. Coates ... ..                    | Black Orpingtons ... ..      | 94    | 1,319  |
| Range Poultry Farm ... ..              | White Leghorns ... ..        | 119   | 1,317  |
| G. E. Austin ... ..                    | Do. ... ..                   | 95    | 1,314  |
| J. Kilroe ... ..                       | Do. (No. 2) ... ..           | 88    | 1,298  |
| D. Moreton, N.S.W. ... ..              | Do. ... ..                   | 91    | 1,262  |
| J. D. Nicolson, N.S.W. ... ..          | Do. ... ..                   | 83    | 1,240  |
| J. N. Waugh, N.S.W. ... ..             | Do. ... ..                   | 94    | 1,240  |
| Mrs. Bradburne, N.S.W. ... ..          | Do. ... ..                   | 82    | 1,227  |
| J. Gosley ... ..                       | Do. ... ..                   | 46    | 1,215  |
| R. Jobling, N.S.W. ... ..              | Do. ... ..                   | 36    | 1,205  |
| J. Murchie ... ..                      | Brown Leghorns ... ..        | 72    | 1,196  |
| J. Kilroe ... ..                       | White Leghorns (No. 1) ...   | 80    | 1,194  |
| J. M. Manson ... ..                    | Do. (No. 2) ... ..           | 71    | 1,165  |
| C. M. Jones ... ..                     | Do. ... ..                   | 44    | 1,149  |
| Totals ... ..                          | ...                          | 3,965 | 54,202 |

# State Farms.

## WINTER CEREALS, 1914.

By R. E. SOUTTER, Manager, Bungeworgora State Farm.

The preparation of the seed bed for this season's crop was concluded under difficulties. In the early part of the season the extreme dryness of the soil precluded satisfactory work being accomplished, whilst during the latter portion wet delayed operations considerably. Good germinating rains were experienced in May, followed by good soaking rains in June and July, accompanied by mild weather, resulting in crops making heavy growth. Unfortunately, these conditions were followed by a spell of dry weather during August and September, which reduced the ultimate yields somewhat, and resulted in the season being very early. Ideal weather for harvesting prevailed.

The following is a record of the precipitation for the twelve months ending 30th November, 1914:—

| Month.            | Wet Days. | Total Precipitation. | As per Fall. |
|-------------------|-----------|----------------------|--------------|
| December .. .. .  | 11        | 1·67                 | ·151 +       |
| January .. .. .   | 6         | ·82                  | ·136 +       |
| February .. .. .  | 13        | 5·92                 | ·455 +       |
| March .. .. .     | 10        | 3·98                 | ·398         |
| April .. .. .     | 5         | 1·74                 | ·348         |
| May .. .. .       | 8         | 1·43                 | ·18 —        |
| June .. .. .      | 8         | 2·38                 | ·297 +       |
| July .. .. .      | 7         | 1·18                 | ·17 —        |
| August .. .. .    | ..        | ..                   | ..           |
| September .. .. . | 5         | ·58                  | ·116         |
| October .. .. .   | 5         | 1·36                 | ·272         |
| November .. .. .  | 6         | 1·23                 | ·205         |
| Total .. .. .     | 84        | 22·29                |              |

## MANURIAL EXPERIMENTS.

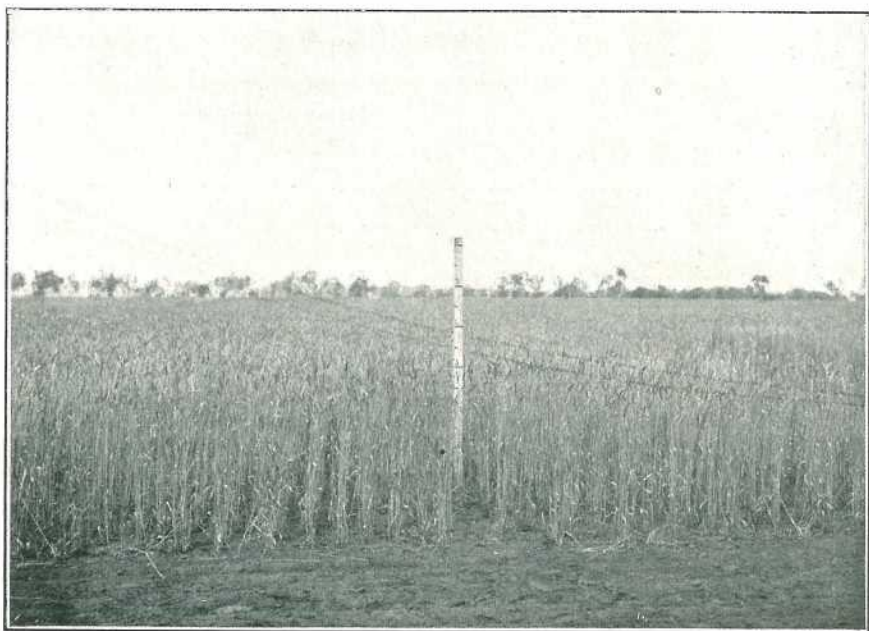
The season 1914 was such that the nitrogenous manures, or the combinations containing such, gave the best results, whilst the benefits accruing from the use of phosphatic manures alone was infinitesimal, and were the same returns and differences obtained every season the use of artificial fertilisers would not be advocated. Such results only demonstrate how necessary it is to thoroughly test over a number of seasons everything supposed to influence the ultimate yields of different farm crops. Had any private individual manured his crop for the first time this year and obtained similar results, it would not be wondered at if he did not apply fertiliser next season. No doubt many in the past have entered into something similar and have had the anticipated results nullified in the same way, with the result they went back to the old methods, and in most instances still practise them. The preparation of the land whereon the following tests were made was as follows:—

Ploughed, January, last week, 5 in. to 6 in. Disc harrowed, April, first week, harrowed. Cultivated (one way), May, first week, 4 in., harrowed. Seed sown, 11th May. Variety, Bunge No. 1, treated 2 per cent. solution bluestone and dipped in lime water as a prevention against smut. Rate seeding, 37 lb. per acre. Germinated, peeping 17th. Harvested, 19th and 20th October. Crop harrowed once, 26th May.

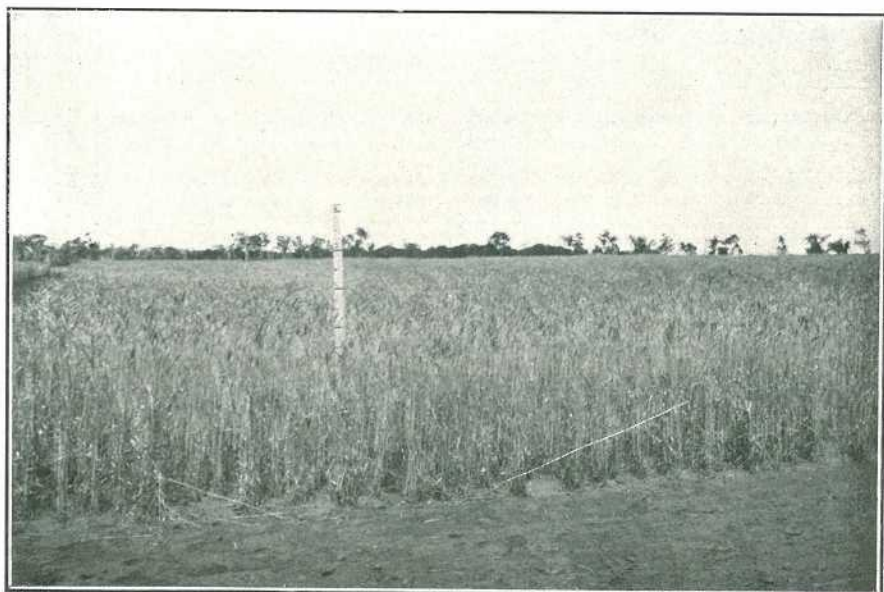
| Manure.  | Cost.  | Yield per Acre, 1914. | Yield Average, 5 Years. | Remarks.  |
|--|--------|-----------------------|-------------------------|---|
|  |        | Bushels.              | Bushels.                |   |
| 1. Shirley's No. 1 Cereal Manure—<br>1 cwt. per acre .. .. .                                   | 0 11 0 | 20.5                  | 22.1†                   | Earing, 24th August, evenly; crop nice, even; foliage light in colour; little rust lower flag; height, 3 ft.; straw fairly fine; crop thin; head good, fairly well filled; grain good.  |
| 2. Shirley's No. 1 Cereal Manure—<br>1 cwt. per acre .. .. .<br>½ cwt. Nitrate of Lime .. .. . | 0 17 9 | 23.5                  | 24.0†                   | Earing, 24th August, evenly; crop even; colour foliage much darker in colour than No. 1; rust lower flag; straw fairly fine, slightly taller than No. 1; heads good, fairly well filled; grain good.  |
| 3. Shirley's No. 1 Cereal Manure—<br>½ cwt. per acre .. .. .<br>¼ cwt. Nitrate of Lime .. .. . | 0 12 3 | 24.20                 | 24.7†                   | Earing unevenly, 24th August; colour foliage good in appearance; heavier crop, slightly uneven; little more rust than 1 and 2 on lower flag; height, 3 ft.; head good, fairly well filled; grain good.  |
| 4. Control (unmanured) .. .. .   | ..     | 21.6                  | 19.8†                   | Earing unevenly, 24th August; crop uneven; colour lighter than 2 and 3; crop uneven, thin; straw fine, little flag; very little rust; height, 2 ft. 6 in. to 3 ft.; heads good, fairly well filled; grain good.   |
| 5. 1 cwt. Superphosphate .. .. .   | 0 7 0  | 22.4                  | 22.9†                   | Earing evenly, 24th August; crop even, thin, straw fine; colour similar to 4; little flag; very little rust; height, 3 ft.; heads good, fairly well filled; grain good.   |
| 6. Thomas's Phosphate .. .. .  | 0 5 6  | 22.6                  | 20.8                    | Earing evenly, 24th August; crop fairly even, thin; straw fine; colour similar to 5; little flag; very little rust; height, 3 ft. 6 in.; head good, fairly well filled; grain good.   |
| 7. Stable manure, 15 tons .. .. .<br>Superphosphate, ½ cwt. .. .. .                            | 2 8 6  | 26.6†                 | 22.3                    | Germination 1 to 2 days earlier than other blocks; earing unevenly, 26th to 29th August; crop very thick, very flaggy, straw coarse; crop uneven, height from 2 ft. 6 in. to 3 ft. 6 in.; felt dry spell very much; a goodly portion of the crop was tips withered and ears failed to just more than clear shot |

|                                  |    |    |    |        |       |       |  |
|----------------------------------|----|----|----|--------|-------|-------|--|
| 8. Superphosphate, 1 cwt. .. ..  | .. | .. | }  | 0 13 9 | 24.12 | 21.0† | blade; heads poorly filled and grain pinched; had a good fall of rain been experienced in the latter part of August, it is considered this plot would have produced at the rate of between 35 and 40 bushels per acre.<br>The application of this manure has so improved the mechanical condition of the soil here as to render it workable when the implements in use will hardly scratch that adjacent.<br>It is intended to omit the application during 1915. |
| Nitrate of Lime, ½ cwt. .. ..    | .. | .. |    |        |       |       |  |
| 9. Nitrate of Lime, ½ cwt. .. .. | .. | .. | }  | 1 1 9  | 24.4  | 18.9  | Earing unevenly, 26th August; crop uneven owing to great inequalities in soil which peculiarities of seasons made more pronounced; height, 2 ft. 6 in. to 3 ft.; fairly flaggy in places; rust on lower flag; head fairly well filled; grain fairly good.<br>Earing unevenly, 26th August; crop uneven; other remarks as applied to 8.   |
| Superphosphate, 1 cwt. .. ..     | .. | .. |    |        |       |       |  |
| Sulphate of Potash, ½ cwt. .. .. | .. | .. |    |        |       |       |  |
| 10. Dried Blood, ½ cwt. .. ..    | .. | .. | }  | 0 19 6 | 25.6  | 21.3  | Earing fairly evenly, 26th August; crop more even than 9; height, about 3 ft.; fairly flaggy in places; grain good; heads well filled.   |
| Superphosphate, 1 cwt. .. ..     | .. | .. |    |        |       |       |  |
| Sulphate of Potash, ½ cwt. .. .. | .. | .. |    |        |       |       |  |
| 11. Control (unmanured) .. ..    | .. | .. | .. | ..     | 22.6  | 19.8  | Crop earing very unevenly, 24th August; height very uneven, from 20 in. to 3 ft. 6 in.; flaggy in places; inequalities of soil very clearly shown in crop; rusty in places on lower flag; heads fairly well filled; grain uneven, some slightly pinched where crop tip withered.   |
| 12. Dried Blood, ½ cwt. .. ..    | .. | .. | }  | 0 18 0 | 26.2  | 22.5  | Crop earing fairly even, 24th August; height uneven, 3 ft. to 4 ft. 6 in.; flaggy in places; crop now thick; rusty lower flag where crop inclined to be flaggy; heads well filled; grain good.   |
| Thomas's Phosphate, 1 cwt. .. .. | .. | .. |    |        |       |       |  |
| Sulphate of Potash, ½ cwt. .. .. | .. | .. |    |        |       |       |  |
| 13. Dried Blood, ½ cwt. .. ..    | .. | .. | }  | 1 6 3  | 27.1  | 22.5  | Crop earing fairly evenly, 24th August; height, uneven, 3 ft. 6 in. to 4 ft. 6 in.; block inclined to be flaggy; crop fairly thick; rusty, lower flag; head well filled; grain good.   |
| Sulphate of Potash, ½ cwt. .. .. | .. | .. |    |        |       |       |  |
| Superphosphate, 1 cwt. .. ..     | .. | .. |    |        |       |       |  |
| Nitrate of lime, ½ cwt. .. ..    | .. | .. |    |        |       |       |  |

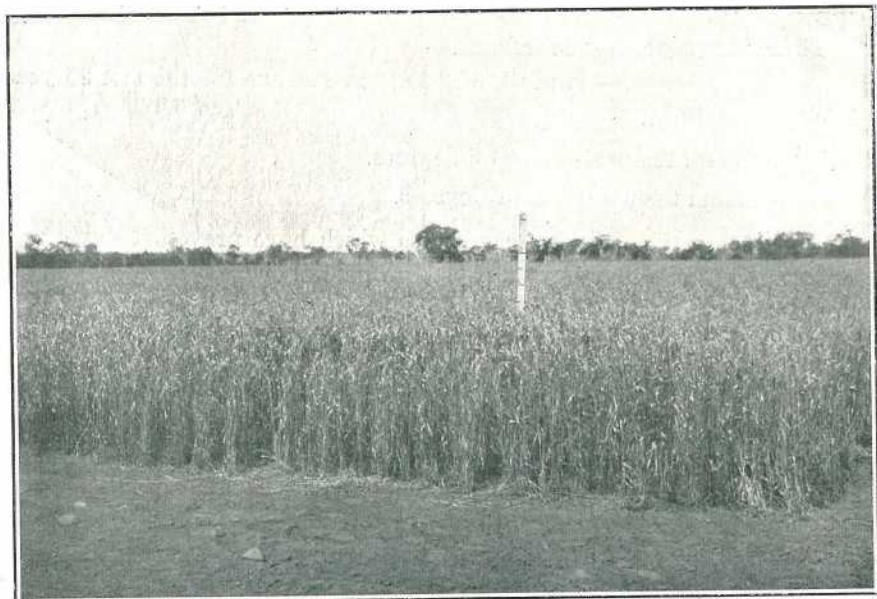
NOTE.—It will be noticed that, notwithstanding that the soils of the two Control Blocks Nos. 4 and 11 are totally different—No. 4 being a sandy loam, whilst No. 11 has clayey soil, a clay pan, and a sandy loam rich in humus within its boundaries—the average yield for the two blocks over the 5 years is exactly the same.



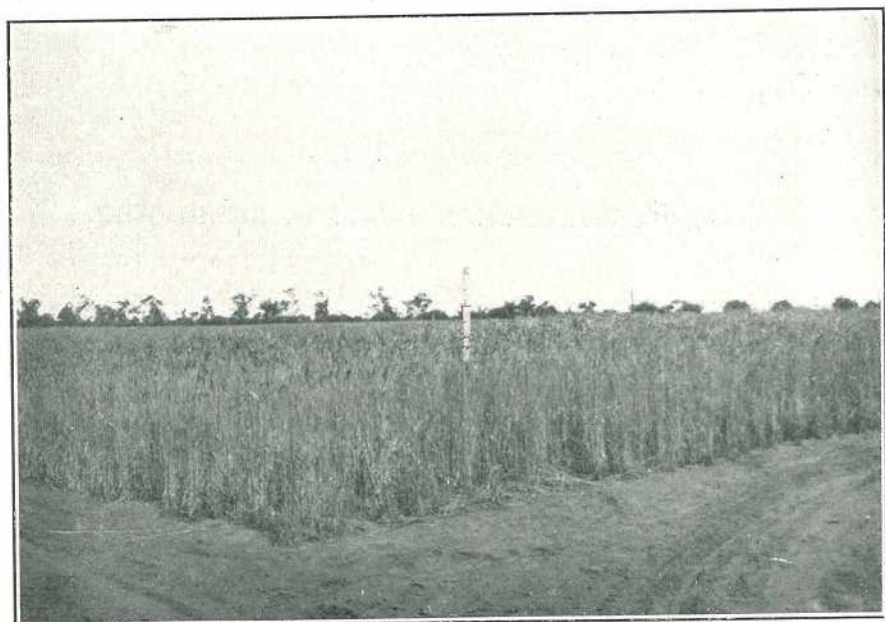
Block 4.—Unmanured



Block 6.—Thomas's Phosphate. Yield, 22.6 bushels per acre.  
PLATES 19 AND 20.—WINTER CEREALS AT ROMA STATE FARM.



Block 7.—Stable Manure, 15 tons per acre ;  $\frac{1}{2}$  cwt. Superphosphate.  
Yield, 26.6 bushels per acre.



Block 12.—Dried Blood,  $\frac{1}{2}$  cwt.; Thomas's Phosphate, 1 cwt.; Sulphate of Potash,  $\frac{1}{2}$  cwt.  
Yield, 26.2 bushels per acre.

PLATES 21 AND 22.—WINTER CEREALS AT ROMA STATE FARM.

**NOTES FROM KAMERUNGA STATE NURSERY FOR MARCH, 1915.**

The Manager reports as follows:—

*Meteorological.*—Rainfall, 3.72 in., the average for the last 25 years being about 19 in.

Maximum temperature, 91.5 degrees.

Minimum temperature, 62 degrees.

Owing to the very dry conditions which have prevailed during the last three months, many crops have been partial or total failures. Gingers are almost a failure, being very late and growth weak.

*Coffee.*—The young trees are still looking well owing to the attention given to them; but the dry season has had the effect of making the crop ripen early, picking having already started, and anyone requiring seed should apply at once. Seed sown now should produce plants for putting out about October, provided moist enough conditions prevail. Ordinarily, I consider the end of June or beginning of July the best months to form nursery seed beds for coffee. Plants raised then would be ready for planting out from January on; but seed maturing now, if kept to that date, would be much weaker in germinating power than if sown during this month or May.

Some excellent young plants of the Tonquin Bean (*Dypteris odorata*)—raised from seed at the Brisbane Botanic Gardens—were received and planted out both at this Nursery and other parts of the Cairns and Mossman districts.

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**CHAMPION AYRSHIRE BULL—BRAE RISING STAR.**

Mr. Thos. Jones, Manager of the State Farm, Warren, supplies the following interesting information on the pedigree of the sire of the newly imported Ayrshire bull Sun Yat, now available for service at the farm:—

BRAE RISING STAR, No. 8187, at 3 Years Old.

This great bull was champion Ayrshire bull of Scotland for the years 1911 and 1912, and is the sire of the recently imported bull Sun Yat 12501, at present situated at this farm.

The following notes may interest the breeders of Ayrshire cattle in Queensland:—

I have just received a letter from Mr. Howie, of Hillhouse, Kilmarnock, giving me some very interesting news concerning Brae Rising Star, as follows:—

Mr. Howie sold this great bull to Mr. Clements, of Netherton, in 1912, for £450, and has repurchased him for £500 to head his great herd

at Hillhouse. This step was taken when it was seen that the bull's progeny were likely to make good yielders. Three of his heifers have just finished their first year's records, as follows:—

Tibby II., champion as a 2 year old, 9,210 lb. milk, with 3.7 per cent. butter fat.

Blossom, 8,007 lb. milk, with 3.8 per cent.

Flossie, 9,099 lb. milk, with 4.2 per cent.

Brae Rising Star's dam, Whitehill Lily II., 17511, exported to U.S.A. in 1910. Record as a 4 year old, 856 gallons of milk, with 3.8 per cent., in 38 weeks.

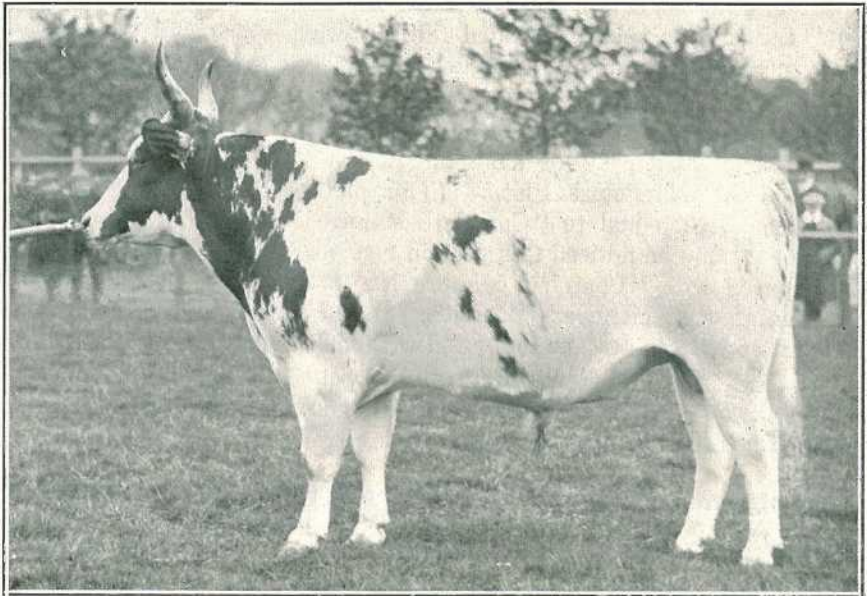


PLATE 23.—AYRSHIRE BULL, BRAE RISING STAR, AT THREE YEARS OLD.

Mr. Howie mentions that with daughters like these the bull was cheap at £500.

The dam of Sun Yat, Knockterra Carolina 31626, on her first calf gave 8,391 lb. milk, with 3.8 per cent. (she calved in midwinter).

The newly imported bull Sun Yat is now available for service at Warren State Farm.

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### DISEASES AND TREATMENT OF ANIMALS.

The best book for the information of the stockowner on the diseases and treatment of animals is "Leeny's Home Doctoring," which may be obtained from Thomson Bros., booksellers, George street, Brisbane. The Agricultural Department does not issue books on diseases, but publishes pamphlets on various stock ailments common to this country. Useful information on these subjects is given in the "Queensland Agricultural Journal."

# The Orchard.

## BANANAS AT BUDERIM MOUNTAIN.

Through the courtesy of the Under Secretary, Department of Public Instruction, we are enabled to publish the following interesting annual return of banana manurial experiments at the Woombye State School, Buderim Mountain. The following useful deductions may be made therefrom:—

1. That as the supply of food in the soil is used up in "No Manure Plot" the returns show a decided falling away, which will be greater each year. Hence banana growing even on fairly good land soon becomes unprofitable if systematic manuring is not resorted to. (Plot land by analysis reported "very fair soil.")

2. That the supply of available potash in the soil is becoming exhausted in "No Potash Plot." (This plot produced average bunch last year, almost equal to "Complete Manure Plot.") As a result, a greater gap may be noticed this year in returns from "No Potash Plot" as compared with "Complete Manure No. 1 Plot." Hence manuring with "meatworks manure," "fertiliser," and such-like pays, but only to extent of £10 per acre, as compared with £93 when potash is added.

3. That, seeing no manure was applied till the latter part of November, complete manure with dried blood as a source of nitrogen is of more lasting benefit than complete manure with nitrate of lime as the nitrogen base.

In conclusion, it is gratifying to report that still greater interest on the part of local growers is being shown in the experimental work done, while those who have lately bought farms in the district are trusting wholly to the advice and information supplied at the school.

### ANNUAL RETURN OF PLOT.

1st March, 1914, to 28th February, 1915.

|                              | No Manure.          | No Potash.           | Complete. No. 1.       | Manure. No. 2.       |
|------------------------------|---------------------|----------------------|------------------------|----------------------|
| No. of stools .. .. .        | 7                   | 7                    | 7                      | 22                   |
| No. of bunches .. .. .       | 13 (15)             | 14 (16)              | 23 (20)                | 61 (53)              |
| No. of dozen .. .. .         | 134½ (206)          | 172½ (242)           | 332 (303)              | 790 (819)            |
| Average per bunch .. .. .    | 10·3 (13·7)         | 12·3 (15·1)          | 14·4 (15·2)            | 12·9 (15·4)          |
| Average per stool .. .. .    | 19·2 (29·4)         | 24·6 (34·5)          | 47·4 (43·2)            | 35·9 (37·2)          |
| Value at 3d. per dozen       | £4s. 9½d. (7s. 4d.) | £6s. 1½d. (8s. 7½d.) | £11s. 10d. (10s. 9½d.) | £8s. 11½d. (9s. 3d.) |
|                              | £71 17s. 6d.        | £91 17s. 6d.         | £177 10s.              | £134 7s. 6d.         |
|                              | (£123 6s. 8d.)      | (£150 18s. 9d.)      | (£188 17s. 1d.)        | (£162 12s. 8d.)      |
| Increase due to manure       | ..                  | 1s. 4d. (1s. 3½d.)   | 7s. 0½d. (3s. 5½d.)    | 4s. 2d. (1s. 11½d.)  |
|                              | ..                  | £20                  | £105 12s. 6d.          | £62 10s.             |
|                              | ..                  | (£27 12s. 1d.)       | (£65 10s. 5d.)         | (£39 5s. 5d.)        |
| Gain after paying for manure | ..                  | 9½d. (9)             | 6s. 4d. (2s. 9d.)      | 2s. 10d. (7½d.)      |
|                              | ..                  | £10 11s. 6d.         | £93 6s.                | £39 6s.              |
|                              | ..                  | (£18 3s. 7d.)        | (£53 3s. 11d.)         | (£16 1s 5d.)         |

NOTE.—1. For this year's return 300 stools to an acre were counted; last year 350 stools were counted.

2. Figures in brackets are returns for year 1913-1914.

3. Manure was applied in November only, so that returns are practically from manure applied in the year 1913-1914.

(Sgd.)

REG. G. BARTLETT,

Head Teacher,

State School, Buderim Mountain.

## Science.

### SOURCES OF COMMERCIAL POTASH.

With the check to imports of German potash caused by the war, and the consequent rise in price of all potash salts, American manufacturers may find it necessary to consider domestic sources of supply.

Most of the potassium compounds used in pharmacy to-day are derived in the first instance from the famous salt deposits of Stassfurt, Germany, where the element occurs as potassium chloride, in the mineral called silvine, and as magnesium-potassium chloride in carnallite. The "potash" of commerce is obtained by the leaching of ashes from land plants, the ashes of sugar beets from molasses residues, and in the purifications of sheep suint. The product of wood ashes is purified by repeated crystallisation from hot water and enters the market as "pearl-ash."

In a recent issue of the "Scientific American," a correspondent drew attention to beet-sugar molasses as a source of commercial potash and suggested that the production of potash salts from beet-sugar refuse might be profitably carried on in this country.

The French sugar-beet sugar contains a notable proportion of potash salts, and the recovery of potash from the waste material of the stills used in treating beet-sugar molasses was an industry of some importance prior to the introduction of German potash, which became available in far greater abundance than was possible with beet-sugar refuse.

It may, therefore, be opportune to direct attention to early efforts in this country to provide material for the manufacture of potash salts. In a paper contributed to the American Pharmaceutical Association in 1892, Prof. John Uri Lloyd recalled the fact that American potash was formerly an article of much importance, and was exported from this country in large quantities. Years ago a well-known American firm manufactured yellow prussiate of potash on a large scale. In the beginning of the work the crude potash was obtained principally from Michigan from forest stumpage, the ashes of the stumps being collected and leached in the final clearing up of the land. This potash, as shown in the paper by Prof. Lloyd, already referred to, was, as a rule, mixed with more or less common salt, in some instances being extraordinarily adulterated. The German potash, both carbonate and caustic, came along about the time the Michigan source was exhausted, and has continued to be used in chemical factories generally. Now that a scarcity of German supply impends it would seem that there must be an opportunity for the development of potash manufacture as a by-product of the beet-sugar industry, provided the American molasses of the beet contains the same proportion of potassium that was evidently present in the French sugar beet. Prof. Lloyd states that his firm used considerable quantities of beet potash imported from France, and the material was equal to the

German as a basic substance for the manufacture of yellow prussiate of potash, though, naturally, the supply was somewhat irregular. Prof. Lloyd thinks it likely that the crude molasses of the South contains an abundance of potash, which, if there is a continued famine in German potash, might well be investigated.

Meanwhile, it is encouraging to note from a recent statement by Secretary Lane of the Department of the Interior, that the home production of potash will be started at a plant in Searles, Cal., at an early date. The initial output will be only 5 tons a day, but the plant under construction is expected to ultimately produce 120 tons.—“Scientific American.”

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### “THE SOILS OF NEW SOUTH WALES.”

By H. I. JENSEN, D.Sc., Government Geologist of the Northern Territory, late of the Chemist's Board, N.S.W. Department of Agriculture.

By direction of the Minister of Agriculture of New South Wales, a most valuable book on “The Soils of New South Wales” has been issued, which is without doubt a very important addition to the literature of soil geology. The author, Mr. H. I. Jensen, has for over twenty years been engaged in the collection and analysis of farmers' soils throughout the mother State, and has now embodied in the above work the results of his researches. After pointing out how physical, biological, and chemical forces exert their influence in what is known as “rock-weathering,” he shows how, whilst soil is continually being formed by these processes, it is also continually being removed by the kindred process of soil waste under the same influences, although biological agencies which stimulate rock-weathering do not favour soil waste to the same extent. “Indeed, many of them tend rather to hold back the soil, and to prevent it from being swept into the creeks. No doubt the movements of worms and other soil fauna, and the secretions of small animal organisms, bacteria, algae, and fungi in the soil, help to comminute it; but in so doing they render it more favourable to the growth of plants. Plants are active restrainers of soil waste . . . their network of roots and their organic products of decay have the effect of binding the soil and of preventing its being swept away by heavy rains.”

A valuable lesson on the connection between forests, floods, and rainfall, which should have been learned years ago by settlers, is given as to the devastation caused by floods due to the destruction of large areas of timbered country traversed by flooded rivers, but where the rainfall has annually lessened in proportion as the land is denuded of timber. We, in Queensland, have had bitter experience of the results of land clearing, in the washing away of the rich soil into the rivers and creeks, leaving the scrub farms in an impoverished state owing to the loss of the surface soils.

“Thus,” writes the author, “man is an active promoter of soil waste, often quite unconsciously and with the best of intentions. By clearing forests on hill sides, he loosens the soil, and leaves it exposed

to torrents, which sweep it down more rapidly than rock decay replaces it. By cutting drains he often starts a storm-water channel which removes his soil at an alarming pace. By ploughing in the direction of the slope instead of at right angles to it, he hastens soil waste. By neglecting to maintain forest belts as wind-breaks, he allows prevalent winds to carry away the most fertile particles of soil from his newly-ploughed fields."

"Clearing the forests and draining and ploughing the lands are necessary proceedings to human existence. These things can, nevertheless, be done without skinning Nature—without giving the forces of destruction full play. Just as by our action we can call into operation the forces of Nature that destroy the soil, and ruin the land from an agricultural point of view, so we can, by a careful study of the country, so modulate our work that the forces of Nature will help us to preserve just as much of the soil as we require."

We quote in particular the above portions of the book, as they are of vital importance to the agriculturist and pastoralist, and may very easily be understood. Other chapters equally absorbing are devoted to a technical description of soils, to manures and their application, to irrigation and artesian wells, and a description of the alluvial soils of New South Wales, which apply equally to most of the soils of Queensland. The work, which is well illustrated, must prove of great value not only to the scientific reader, but also to the man on the land.

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### AUSTRALIAN WHEAT.

The following notes on the wheat position in Australia are taken from the "Producers' Agency" circular issued by H. M. Suttor and Company, Sydney:—

The wheat harvest of Australia, if it can be called such, for the past season, works out at about 25,053,950 bushels, provided that the crop of New South Wales was not less than 14,000,000 bushels. Victoria accounts for 3,940,950; South Australia, 2,600,000; West Australia, 2,513,000; Queensland, 1,500,000; Tasmania, 500,000. The requirements for food and seed will not be less than 35,000,000 bushels, which leaves a deficiency of about 10,000,000 bushels to be imported. This is the greatest all-round failure since 1902, when the total yield was 12,378,000 bushels; with the different and unusual result that New South Wales has more than the total of all the other States together. In the previous harvest the yield was 103,350,000 bushels. Past wheat history shows that heavy yields follow failures, and the probability is that the 1915 crop will be a heavy one also. In 1903 the imports of wheat were 9,115,000 bushels. Flour, 70,000 tons; total valued at £2,600,000. This year the import will probably reach a value of £4,000,000. Last year our exports of wheat and flour were valued at £11,500,000, so that Australia, as compared with last year, will have a direct wheat loss of £15,500,000.

The High Court has decided that the Wheat Acquisition Bill, which the Interstate Commission declared invalid, is valid, and stands good.

# Entomology.

## COPING WITH THE CANE GRUB.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from Mr. E. Jarvis, Entomologist to the Bureau:—

During the coming autumn and winter it is proposed, as stated last month, to investigate some of the more promising means of coping with the grub stage of cane beetles, and it may not be out of place in the present report to introduce this side of the question to our growers by briefly enumerating the various recognised control measures that may be brought to bear on such research work, and which employed collectively could hardly fail to produce highly beneficial results.

I have previously pointed out that ideal methods of combating this notorious beetle are admittedly those in which we succeed best in preventing oviposition by destroying as many egg-laden females as possible; but at the same time it would be well to bear in mind that the greater length of the larval existence compensates to some extent for its secondary importance, since it enables us to practise control measures throughout a period of at least six months whilst the sphere of action of the pest underground is greatly restricted, and it is subjected also to the injurious influences of certain forms of climatic and natural control that do not affect the adult beetle stage.

In the list given below I have attempted to arrange the principal preventive and remedial methods in numerical order of merit, determined by their relative claims to efficiency and practicability although irrespective of individual value at the present time. No. 3, for example, is already extensively practised and of great economic importance, but theoretically No. 1, which is still in the experimental stage, must ultimately prove superior to it, as under such ideal soil treatment many larvæ would succumb a few days after hatching and the remainder before being able to work appreciable damage; whereas on the other hand grubs exposed to view while ploughing or pulling up stools, &c., represent but a small proportion of the number actually present in the soil, and many, being of fair size, have already injured the crops; moreover, such destruction of second and third stage larvæ entails the probable loss of a small percentage of useful parasites.

### CONTROL OF GRUB STAGE.

#### DIRECT AND REMEDIAL METHODS.

1. Incorporating with the whole of the soil by ploughing and other cultural operations some enduring substance (preferably cheap and non-poisonous) that shall prove quickly fatal to grubs and at the same time possess manurial properties.
2. The application to cane sets or furrows of an inexpensive deterrent sufficiently obnoxious and durable to protect a limited area containing main roots from invasion during most of the growing season.

4. Fumigation of the soil with a gas deadly to animal life but having, if possible, a stimulating effect on vegetation.
7. Applying an insecticidal solution to the main roots by pouring same into a trench against base of stools.

Whilst striving to attain ideal results from an application of such speculative remedies as Nos. 1, 2, 6, we must not neglect the claims of more practical though commonplace control measures, some of which, in addition to being easily carried out, cost comparatively little and are beneficial both from a cultural as well as an entomological standpoint (*see* Nos. 3, 5, 8, 9). All influences affecting the economy of cane grubs as a direct result of agricultural operations should be closely studied, the probability being that future developments in this connection may lead to issues of the first importance. Results brought about by such factors, for instance, as the physical character of soils, manuring, &c., are naturally influenced more or less by weather conditions which tend to regulate the subterranean movements and position of grubs and thereby affect indirectly the habits of their parasitic enemies.

#### PREVENTIVE METHODS.

3. Collecting grubs by hand whenever possible, both from behind the plough and under trash in hot weather.
5. Working the soil, if practicable, whenever grubs are known to be close to the surface and can easily be exposed to the influence of intense solar heat and attack from natural foes.
8. Encouraging a vigorous root development and conditions favourable to conservation of moisture by judicious manuring and thorough cultivation.
10. Maintaining the soil in a friable state and free from weeds throughout the growing season.

A large percentage of cane grubs perish annually, as a necessary outcome of the controlling influence of various natural laws designed to prevent their undue increase. Unfortunately the establishment of artificial conditions and consequent destruction of native flora over vast tracts of country has interfered with the complex workings of these laws, with the result that our grey-back beetle and other insects, being induced to substitute cultivated plants for their natural food, have gradually acquired a liking for the former and become serious pests.

The following procedure will serve in a measure to counteract this evil:—

#### NATURAL CONTROL.

6. Infecting the soil artificially with the "Green Muscardine" fungus, or with other parasitic diseases that may be found readily procurable and sufficiently effective to warrant the expense of such distribution.
9. Promoting the protection of all indigenous grub-eating mammals and birds; together with the preservation when feasible of insect enemies of cane beetles.

11. The introduction from other countries of special parasitic and predaceous insects that are known to attack grubs of scarabæidæ closely related to our own species.

12. The destruction where practicable of a large bombylid hyperparasite which materially checks the increase of our parasitic "digger wasps" by preying on the larvæ of these useful insects.

Other methods of controlling the grub stage of cane beetles could be mentioned, but the twelve already enumerated will enable growers to realise the nature of operations likely to be serviceable when fighting the larval form of this pest.

## Statistics.

### RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MARCH IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MARCH, 1915 AND 1914, FOR COMPARISON.

| Divisions and Stations.   | AVERAGE RAINFALL. |                        | TOTAL RAINFALL. |             | Divisions and Stations.                 | AVERAGE RAINFALL. |                        | TOTAL RAINFALL. |             |
|---------------------------|-------------------|------------------------|-----------------|-------------|---|-------------------|------------------------|-----------------|-------------|
|                           | Mar.              | No. of Years' Records. | Mar., 1915.     | Mar., 1914. |   | Mar.              | No. of Years' Records. | Mar., 1915.     | Mar., 1914. |
| <i>North Coast.</i>       |                   |                        |                 |             | <i>South Coast—</i>                     |                   |                        |                 |             |
|                           | In.               |                        | In.             | In.         | <i>continued:</i>                       |                   |                        |                 |             |
| Atherton ... ..           | 9.55              | 13                     | 0.69            | 13.10       | Nanango ... ..                          | 3.75              | 27                     | 0.12            | 5.34        |
| Cairns ... ..             | 20.20             | 27                     | 4.74            | 14.81       | Rockhampton ... ..                      | 5.54              | 27                     | 0.03            | 5.53        |
| Cardwell ... ..           | 15.65             | 27                     | 0.99            | 28.70       | Woodford ... ..                         | 9.29              | 27                     | 0.06            | 6.34        |
| Cooktown ... ..           | 15.17             | 27                     | 2.58            | 16.34       | Yandina ... ..                          | 10.82             | 21                     | 0.06            | 11.06       |
| Herberton ... ..          | 8.62              | 27                     | 0.58            | 14.01       | <i>Darling Downs.</i>                   |                   |                        |                 |             |
| Ingham ... ..             | 16.04             | 22                     | 3.87            | 43.66       | Dalby ... ..                            | 3.65              | 27                     | 0.39            | 3.55        |
| Innisfail ... ..          | 26.78             | 27                     | 3.44            | 24.96       | Emu Vale ... ..                         | 2.99              | 17                     | 0.13            | 6.40        |
| Mossman ... ..            | 25.26             | 5                      | 4.80            | 32.31       | Jimbour ... ..                          | 2.84              | 24                     | 0.25            | 2.17        |
| Townsville ... ..         | 8.58              | 30                     | 0.02            | 14.34       | Miles ... ..                            | 3.07              | 27                     | Nil             | 3.32        |
| <i>Central Coast.</i>     |                   |                        |                 |             | Stanthorpe ... ..                       | 3.33              | 27                     | 0.36            | 6.08        |
| Ayr ... ..                | 8.40              | 27                     | 0.17            | 11.24       | Toowoomba ... ..                        | 4.68              | 27                     | 0.27            | 4.28        |
| Bowen ... ..              | 6.43              | 27                     | 0.09            | 7.58        | Warwick ... ..                          | 3.07              | 27                     | 0.80            | 6.31        |
| Charters Towers ... ..    | 3.92              | 27                     | 2.32            | 4.09        | <i>Maranoa.</i>                         |                   |                        |                 |             |
| Mackay ... ..             | 11.47             | 27                     | 2.37            | 13.35       | Roma ... ..                             | 4.09              | 25                     | 0.10            | 2.05        |
| Proserpine ... ..         | 14.69             | 11                     | 1.35            | 17.77       | <i>State Farms, &amp;c.</i>             |                   |                        |                 |             |
| St. Lawrence ... ..       | 6.71              | 27                     | Nil             | 2.87        | Gatton College ... ..                   | 4.22              | 14                     | 0.64            | 3.88        |
| <i>South Coast.</i>       |                   |                        |                 |             | Gindie ... ..                           | 3.06              | 13                     | 0.07            | 2.91        |
| Biggenden ... ..          | 4.89              | 14                     | Nil             | 11.09       | Kamerunga Nurs'y ... ..                 | 18.24             | 23                     | 3.72            | 17.76       |
| Bundaberg ... ..          | 6.40              | 27                     | 0.07            | 5.60        | Kairi ... ..                            | 6.11              | 2                      | 0.75            | 11.46       |
| Brisbane ... ..           | 6.09              | 64                     | 0.11            | 7.75        | Sugar Experiment Station, Mackay ... .. | 13.53             | 16                     | 3.97            | 12.49       |
| Childers ... ..           | 5.64              | 19                     | 0.15            | 10.49       | Bungeworai ... ..                       | 1.99              | 2                      | Nil             | 3.98        |
| Crohamburst ... ..        | 13.44             | 22                     | 0.25            | 16.92       | Warren ... ..                           | 2.16              | 2                      | Nil             | 4.32        |
| Esk ... ..                | 5.39              | 27                     | 0.48            | 3.83        | Hermitage ... ..                        | 3.42              | 7                      | 0.46            | 5.88        |
| Gayndah ... ..            | 3.90              | 27                     | Nil             | 9.98        |   |                   |                        |                 |             |
| Gympie ... ..             | 7.21              | 27                     | 0.02            | 9.73        |   |                   |                        |                 |             |
| Glasshouse M'tains ... .. | 11.69             | 6                      | 0.10            | 11.25       |   |                   |                        |                 |             |
| Kilkivan ... ..           | 4.74              | 27                     | Nil             | 8.93        |   |                   |                        |                 |             |
| Maryborough ... ..        | 7.23              | 27                     | 0.29            | 12.74       |   |                   |                        |                 |             |

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for March this year and for the same period of 1914, having been compiled from telegraphic reports, are subject to revision.

## General Notes.

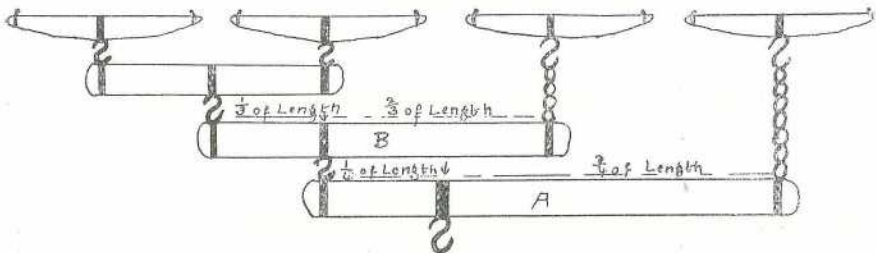
### GOONDIWINDI PASTORAL AND AGRICULTURAL SOCIETY.

The secretary notifies that in consequence of the continued dry weather, the show fixed for 21st and 22nd April had to be abandoned.

### DESTROYING WHITE ANTS.

There is no need to make a solution of arsenic to destroy white ants. It is best to use dry arsenic and put a small quantity into places where the ants are working. By simply putting a knife point full into one of the cracks in stumps, or into their working channels, the whole lot may be poisoned, as the live ants eat the poisoned ones.

### A FOUR-HORSE PLOUGH BAR.



A to be divided into four equal parts.

B to be divided into three equal parts.

Bar marked A to take draught at  $\frac{1}{4}$  from end, and bar marked B to take draught from  $\frac{3}{4}$ .

Width of one-horse bars left to discretion of user, according to class of horse (medium or heavy draught) used.

Above is an illustration of a four-horse bar for a plough, so arranged that the right-hand horse can walk comfortably in the furrow, and the other three on the land. Drawn by Mr. A. E. Gibson, of this Department.

## Answers to Correspondents.

### UTILISING WILTED MAIZE CROPS.

Y. V. H., Mundubbera—

Wilted crops of maize such as yours can be most profitably turned to account by making into ensilage; but as you state you do not possess any stock this phase of the question cannot be taken account of. Maize cut and cured into a form of hay, in stooks, makes a useful chaff-forage for dairy stock, particularly when they have access to other classes of richer foods like lucerne or cowpeas. There is no sale for maize chaff under normal conditions in Queensland. It is entirely a product for use on the farm.

When maize fails to set a crop of grain, the only alternatives are those mentioned above, or else the fodder can be cut and fed direct to stock.

### BEANS, PEAS, AND GREEN CROPS FOR ENRICHING THE SOIL.

F. J. HULL, Cardwell—

Mr. H. C. Quodling, Inspector of Agriculture, replies as follows to your questions:—

- Q. 1.—Whether your department supplies manure to farmers, and if so at what price? Can you supply 1 ton of meatworks manure?
- A. The department does not deal in manures, but most meatworks sell their fertilisers in small lots.
- Q. 2.—What is the best sort of leguminous plant to use for manuring an orange orchard (a non-runner)?
- A. Nearly all the best leguminous cover crops are runners and are preferred for this reason, as they keep the ground well covered. The place under the trees should always be kept free from crop and eventually be mulched with some of the cut down green crop. Mauritius beans are one of the best cover crops for the North. Upright growing cowpeas might be tried as well as the Mauritius beans.
- Q. 3.—Is the Pigeon Pea a legume, and does it enrich or impoverish the land?
- A. Pigeon Pea is a legume and enriches the soil, but it is liable to grow too salt and rank. It is more suitable for land lying fallow.
- Q. 4.—With legumes what is the difference in manure value between a crop ploughed in while growing and the same crop left to seed and then ploughed in after the seed has been gathered and the plant is dead and dry?
- A. The best time to plough green crops under is at time of seeding, but good results are obtained even after seeds are allowed to ripen as the ground is covered with dead leaves and vines.

### HEAVIEST COB OF MAIZE.

E. A. HOFFMANN, Guluguba.—

We have obtained the weight of a single cob of maize. Thoroughly dried it turned the scale at a little over 14 oz. This was not, however, a competition cob. Twelve such ears would, of course, weigh  $10\frac{1}{2}$  lb.

### PRICKLY-PEAR ASH.

J. S., Inglewood—

There is no market for crude prickly-pear ash, as this has to be manufactured into sulphate before it can be used as a fertiliser. The best way would be to prepare a sample of such ash and send it to a wholesale chemist, such as Elliott Bros., or Taylor and Colledge, of this city, for valuation.

### SPLIT PEAS.

J. F. KEANE, Carbeen—

For split peas, choose those old peas which produce small pods and peas, which divide into halves easily, and of which the skin of the pea is loose. It will be found that, in threshing such kinds, the seeds split into halves, and that, in winnowing, the skins are blown off, leaving the article ready for market.

### SEX OF PAPA W TREES.

A. H. F., Diddillibah—

Mr. C. Ross, F.R.H.S., Instructor in Fruit Culture, says:—"There is no way of telling the male from the female papaw whilst the plants are young. The safest way to insure having all female trees is to graft all seedlings, male and female alike, when from one-quarter to one inch in thickness. If the cleft graft is performed, very few misses will occur."

### POISONING TREES WITH ARSENIC AND SODA.

Many complaints have been received as to the want of effectiveness in ring-barking. This seems to be principally due to the fact that trees are ring-barked or sapped in the wrong season of the year.

Some varieties of trees, notably the round-leaf box, sucker and throw up shoots from surface roots if the trees are not dealt with when the sap is up, *i.e.*, when they are in full growth. April and May are probably the most suitable months for ring-barking.

The arsenical mixture used for killing trees is made up in the following proportions:—2 lb. arsenic to 1 lb. caustic soda to 2 gallons of water. This is a very concentrated solution and care must be taken to keep all utensils containing same away from stock. Animals should not be allowed access to portions of a paddock dealt with in this way for some weeks afterwards.

The easiest method for distributing the arsenical solution is to fit a tap into a kerosene tin and attach a 2 ft. length of rubber hose to the tap; solder D's to the sides and bottom of the kerosene tin, so that straps can be used to carry it about; a screw-top or other water-tight lid is necessary.

When preparing arsenical solutions the ingredients should be dissolved by boiling for about an hour; the fumes should not be inhaled.

Although there is probably more danger to stock where plants like prickly-pear have been "sprayed" with a poisonous compound, the advice given in previous part of letter is to be regarded as precautionary.

# The Markets.

## PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR APRIL, 1915.

| Article.                    | APRIL.  |                    |
|-----------------------------|---------|--------------------|
|                             | Prices. |                    |
| Bacon ... ..                | lb.     | 11½d.              |
| Bran (Mill price)...        | ton     | £10                |
| Butter ... ..               | cwt.    | 142s.              |
| Chaff, Mixed ... ..         | ton     | £7 10s. to £8      |
| Chaff, Oaten ... ..         | "       | £10 to £12         |
| Chaff, Lucerne ... ..       | "       | £8                 |
| Chaff, Wheaten ... ..       | "       | £4 5s. to £5       |
| Cheese ... ..               | lb.     | 8¾d. to 9d.        |
| Flour ... ..                | ton     | ...                |
| Hams ... ..                 | lb.     | 1s. 2d.            |
| Hay, Oaten ... ..           | ton     | £13 10s.           |
| Hay, Lucerne (Prime) ... .. | "       | £7 to £7 10s.      |
| Honey ... ..                | lb.     | 3d. to 3½d.        |
| Maize ... ..                | bush.   | 5s. 8d.            |
| Oats ... ..                 | "       | 6s.                |
| Onions ... ..               | ton     | £8 10s.            |
| Peanuts ... ..              | lb.     | 2¾d. to 4d.        |
| Pollard (Mill price) ... .. | ton     | £12                |
| Potatoes ... ..             | "       | £9 to £10          |
| Potatoes (Sweet) ... ..     | cwt.    | 4s. 6d.            |
| Pumpkins ... ..             | ton     | £6 5s.             |
| Eggs ... ..                 | doz.    | 1s. 5d. to 2s. 1d. |
| Fowls ... ..                | pair    | 3s. 6d. to 4s. 6d. |
| Ducks, English ... ..       | "       | 3s. 3d.            |
| Ducks, Muscovy ... ..       | "       | 4s. 3d.            |
| Turkeys (Hens) ... ..       | "       | 6s. to 7s.         |
| Turkeys (Gobblers) ... ..   | "       | 9s. to 11s.        |
| Wheat (Seed) ... ..         | bush.   | 9s.                |

## SOUTHERN FRUIT MARKETS.

| Article.                                   | APRIL.  |                      |
|--|---------|----------------------|
|  | Prices. |                      |
| Bananas (Queensland), per case ... ..      | ...     | 8s. to 12s.          |
| Bananas (Fiji), per case ... ..            | ...     | 22s. 6d. to 23s. 6d. |
| Bananas (G.M.), per case ... ..            | ...     | ...                  |
| Mangoes, per case ... ..                   | ...     | ...                  |
| Oranges (Navel), per case ... ..           | ...     | ...                  |
| Oranges, Italian, per case ... ..          | ...     | ...                  |
| Oranges (Other), per case ... ..           | ...     | ...                  |
| Passion Fruit, per half-bushel case ... .. | ...     | 1s. 6d. to 3s.       |
| Papaw Apples, per half-case ... ..         | ...     | ...                  |
| Pineapples (Queens), per case ... ..       | ...     | 6s. to 7s.           |
| Pineapples (Ripleys), per case ... ..      | ...     | 3s. 6d. to 6s.       |
| Pineapples (Common), per case ... ..       | ...     | 3s. to 5s.           |
| Tomatoes, per quarter-case ... ..          | ...     | 3s. 6d. to 5s. 6d.   |
| Persimmons, per half-case ... ..           | ...     | ...                  |

**PRICES OF FRUIT—TURBOT STREET MARKETS.**

| Article.                                   | APRIL.             |  |
|--|--------------------|--|
|  | Prices.            |  |
| Apples (American), Eating, per case ... .. | 8s. to 9s.         |  |
| Apples (Local), per case ... ..            | 5s. to 7s.         |  |
| Apples, Cooking, per case ... ..           | 8s. to 9s.         |  |
| Bananas (Cavendish), per dozen ... ..      | 1½d. to 4½d.       |  |
| Bananas (Sugar), per dozen ... ..          | 1½d. to 4½d.       |  |
| Cocoanuts, per sack ... ..                 | 12s. to 15s.       |  |
| Custard Apples, per quarter-case ... ..    | 4s. to 6s.         |  |
| Lemons (Local), per case ... ..            | 3s. to 5s.         |  |
| Lemons (Italian), per case ... ..          | 9s. to 10s.        |  |
| Mandarins (Northern), per case ... ..      | 7s. to 8s.         |  |
| Oranges (other), per case ... ..           | 3s. to 6s. 6d.     |  |
| Passion Fruit, per case ... ..             | 4s. to 8s. 6d.     |  |
| Peanuts, per pound ... ..                  | 2¾d. to 4d.        |  |
| Pears (Victorian), per case ... ..         | 10s. to 11s.       |  |
| Persimmons, per quarter-case ... ..        | 3s. 6d. to 4s.     |  |
| Pineapples (Ripley), per dozen ... ..      | 3s. to 5s.         |  |
| Pineapples (Smooth), per dozen ... ..      | 2s. to 4s. 6d.     |  |
| Rosellas, per sugar bag ... ..             | 2s. to 4s.         |  |
| Tomatoes, per quarter-case ... ..          | 3s. 6d. to 7s. 6d. |  |

**VEGETABLES.**

|                         |                   |                    |
|-------------------------|-------------------|--------------------|
| Cabbages ... ..         | per dozen         | 4s. to 10s.        |
| Peas ... ..             | per sugar bag     | 7s. to 10s. 6d.    |
| Beans ... ..            | " "               | 5s. 6d. to 9s.     |
| Parsnips ... ..         | per dozen bunches | 6d. to 1s. 3d.     |
| Carrots ... ..          | " "               | 1s. 6d. to 1s. 9d. |
| Cucumbers ... ..        | per dozen         | 6d. to 1s. 9d.     |
| Custard Marrows ... ..  | " "               | 2s. 6d. to 5s.     |
| Vegetable Marrows... .. | " "               | 3s. to 5s. 6d.     |
| Chocos ... ..           | per quarter-case  | 2s. to 2s. 6d.     |
| Table Pumpkins ... ..   | per dozen         | 3s. to 3s. 6d.     |
| Tomatoes ... ..         | per quarter-case  | 3s. 6d. to 7s. 6d. |

**TOP PRICES, ENOGGERA YARDS, MARCH, 1915.**

| Animal.                  | MARCH.          |             |
|--------------------------|-----------------|-------------|
|                          | Prices.         |             |
| Bullocks ... ..          | £14 15s. to     | £18         |
| Cows ... ..              | £10 12s. 6d. to | £12 7s. 6d. |
| Merino Wethers ... ..    | 22s. 3d.        |             |
| Crossbred Wethers ... .. | 24s.            |             |
| Merino Ewes ... ..       | 19s. 9d.        |             |
| Crossbred Ewes ... ..    | 22s.            |             |
| Lambs ... ..             | 17s. 6d.        |             |
| Pigs (Porkers) ... ..    | 46s.            |             |

## TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

COMPUTED BY D. EGLINTON, F.R.A.S.

| Date. | MAY.   |       | JUNE.  |       | JULY.  |       | AUGUST. |       | PHASES OF THE MOON, 1915.  |
|-------|--------|-------|--------|-------|--------|-------|---------|-------|--|
|       | Rises. | Sets. | Rises. | Sets. | Rises. | Sets. | Rises.  | Sets. |  |
| 1     | 6.14   | 5.17  | 6.31   | 5.0   | 6.39   | 5.3   | 6.30    | 5.18  | <p>On or about the 150th Meridian, East Long.</p> <p style="text-align: right;">H. M.</p> <p>6 May ) Last Quarter 3 22 p.m.</p> <p>14 " ● New Moon 1 31 "</p> <p>22 " ( First Quarter 2 50 "</p> <p>29 " ○ Full Moon 7 33 a.m.</p> <p>The moon will be at its brightest not only when full, but because it will this month be at its least distance from the earth at that time.</p> <p>5 June ) Last Quarter 2 32 a.m.</p> <p>13 " ● New Moon 4 57 "</p> <p>21 " ( First Quarter 12 24 "</p> <p>27 " ○ Full Moon 2 27 p.m.</p> <p>The moon will be at its greatest distance from the earth on 11th June at 10 a.m., and nearest on the 26th at midday.</p> <p>4 July ) Last Quarter 3 54 p.m.</p> <p>12 " ● New Moon 7 30 "</p> <p>20 " ( First Quarter 7 9 a.m.</p> <p>26 " ○ Full Moon 10 11 p.m.</p> <p>The moon will be at its greatest distance from the earth on 8th July, about 9 p.m., and at its nearest on the 24th at 3.24 p.m.</p> <p>3 Aug. ) Last Quarter 7 27 a.m.</p> <p>11 " ● New Moon 8 52 "</p> <p>18 " ( First Quarter 12 17 p.m.</p> <p>25 " ○ Full Moon 7 40 a.m.</p> <p>The moon will be at its greatest distance from the earth on 5th August at 36 minutes after 12, midday, and at its nearest on the 29th about midnight.</p> |
| 2     | 6.14   | 5.16  | 6.31   | 5.0   | 6.39   | 5.3   | 6.30    | 5.18  |  |
| 3     | 6.15   | 5.15  | 6.32   | 5.0   | 6.39   | 5.3   | 6.29    | 5.19  |  |
| 4     | 6.15   | 5.14  | 6.32   | 5.0   | 6.40   | 5.4   | 6.28    | 5.20  |  |
| 5     | 6.16   | 5.13  | 6.33   | 4.59  | 6.40   | 5.4   | 6.27    | 5.21  |  |
| 6     | 6.17   | 5.12  | 6.33   | 4.59  | 6.40   | 5.4   | 6.27    | 5.21  |  |
| 7     | 6.17   | 5.12  | 6.34   | 4.59  | 6.40   | 5.5   | 6.26    | 5.21  |  |
| 8     | 6.18   | 5.11  | 6.34   | 4.59  | 6.40   | 5.5   | 6.25    | 5.22  |  |
| 9     | 6.18   | 5.11  | 6.34   | 4.59  | 6.40   | 5.5   | 6.24    | 5.22  |  |
| 10    | 6.19   | 5.10  | 6.35   | 4.59  | 6.40   | 5.6   | 6.24    | 5.22  |  |
| 11    | 6.19   | 5.10  | 6.35   | 4.59  | 6.39   | 5.6   | 6.23    | 5.23  |  |
| 12    | 6.20   | 5.9   | 6.35   | 4.59  | 6.39   | 5.6   | 6.23    | 5.23  |  |
| 13    | 6.20   | 5.9   | 6.35   | 4.59  | 6.39   | 5.7   | 6.22    | 5.24  |  |
| 14    | 6.20   | 5.8   | 6.36   | 4.59  | 6.39   | 5.7   | 6.21    | 5.25  |  |
| 15    | 6.21   | 5.8   | 6.36   | 5.0   | 38     | 5.8   | 6.20    | 5.26  |  |
| 16    | 6.21   | 5.7   | 6.36   | 5.0   | 6.38   | 5.8   | 6.19    | 5.26  |  |
| 17    | 6.22   | 5.6   | 6.37   | 5.0   | 6.38   | 5.9   | 6.18    | 5.26  |  |
| 18    | 6.22   | 5.5   | 6.37   | 5.0   | 6.37   | 5.10  | 6.17    | 5.27  |  |
| 19    | 6.23   | 5.5   | 6.37   | 5.0   | 6.37   | 5.11  | 6.16    | 5.27  |  |
| 20    | 6.23   | 5.4   | 6.38   | 5.0   | 6.36   | 5.12  | 6.15    | 5.27  |  |
| 21    | 6.24   | 5.4   | 6.38   | 5.0   | 6.36   | 5.12  | 6.14    | 5.28  |  |
| 22    | 6.24   | 5.4   | 6.38   | 5.0   | 6.36   | 5.12  | 6.13    | 5.28  |  |
| 23    | 6.25   | 5.3   | 6.38   | 5.0   | 6.35   | 5.13  | 6.12    | 5.29  |  |
| 24    | 6.25   | 5.3   | 6.38   | 5.1   | 6.35   | 5.13  | 6.11    | 5.29  |  |
| 25    | 6.26   | 5.3   | 6.39   | 5.1   | 6.35   | 5.13  | 6.10    | 5.30  |  |
| 26    | 6.26   | 5.2   | 6.39   | 5.1   | 6.34   | 5.14  | 6.9     | 5.30  |  |
| 27    | 6.27   | 5.2   | 6.39   | 5.2   | 6.34   | 5.14  | 6.8     | 5.31  |  |
| 28    | 6.28   | 5.2   | 6.39   | 5.2   | 6.33   | 5.15  | 6.7     | 5.31  |  |
| 29    | 6.29   | 5.1   | 6.39   | 5.2   | 6.32   | 5.16  | 6.6     | 5.32  |  |
| 30    | 6.30   | 5.1   | 6.39   | 5.3   | 6.31   | 5.17  | 6.5     | 5.32  |  |
| 31    | 6.30   | 5.1   | ...    | ...   | 6.31   | 5.17  | 6.5     | 5.33  |  |

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun will rise and set about 4 minutes later than at Brisbane, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

At St. George, Cunnamulla, and Thargomindah the times of sunrise and sunset will be about 18 m., 30 m., and 38 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset during May, June, July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given for Brisbane.

The moonlight nights each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case it will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably with regard to the ecliptic.

[All the particulars given on this page were computed by D. Eglinton, F.R.A.S., and should not be reproduced in local newspapers without acknowledgment.]

## Farm and Garden Notes for June.

FIELD.—Winter begins on the 24th of this month, and frosts will already have been experienced in some of the more exposed districts of the Southern coast and on the Darling Downs. Hence, insect pests will, to a great extent, cease from troubling, and weeds will also be no serious drawback to cultivation. The month of June is considered by the most successful lucerne-growers to be the best time to lay down this crop, as any weeds which may spring up in the event of a dropping season will be so slow-growing that the young lucerne plants will not be choked by them.

The land should now be got ready for millets, sorghums, panicum, &c. Oats, barley, vetches, clover, tobacco, buckwheat, field carrots, and Swedes may now be sown. Some advocate the sowing of early maize and potatoes during this month, but, obviously, this can only apply to the more-tropical parts of Queensland. The land may be got ready, but in the Southern districts and on the tableland neither maize nor potatoes should be planted before August, or at the earliest, in warm, early districts, at the end of July. There is always almost a certainty of frosts, more or less severe, during these months. Arrowroot will be nearly ready for digging, but we would not advise taking up the bulbs until the frosts of July have occurred. Take up sweet potatoes, yams, and ginger. Should there be a heavy crop, and consequently a glut in the market, sweet potatoes may be kept by storing them in a cool place in dry sand, taking care that they are thoroughly ripe before digging. The ripeness may be known by the milky juice of a broken tuber remaining white when dry. Should the juice turn dark, the potato is unripe, and will rot or dry up and shrivel in the sand pit. Before pitting, spread the tubers out in a dry barn or in the open, if the weather be fine. In pitting them or storing them in hills lay them on a thick layer of sand, then pour dry sand over them till all the crevices are filled and a layer of sand is formed above them. Then put down another layer of tubers, and repeat the process until the hill is of the requisite size. The sand excludes the air, and the potatoes will keep right through the winter. Late wheat may still be sown, but it is too late for a field crop of onions. In tropical Queensland the bulk of the coffee crop should be off by the end of July. Yams may be unearthed. Cuttings of cinnamon and kola nut tree may be made, the cuttings being planted under bell glasses. Collect divi-divi pods and tobacco leaves. English potatoes may be planted. The opium poppy will not be blooming and forming capsules. Gather tilseed (sesame), and plant out young tobacco plants if the weather be suitable. Sugar-cane cutting may be commenced. Keep the cultivator moving amongst the pineapples. Gather all ripe bananas.

In our Farm and Garden Notes for May, published in the April issue of the Journal, it was inadvertently stated that Messrs. Kitchen

and Sons and Messrs. Joyce Bros. were purchasers of seed cotton. These firms, we understand, are not at present cotton buyers. The Department of Agriculture and Stock are still buyers of this product.

**KITCHEN GARDEN.**—Cabbage, cauliflower, and lettuce may be planted out as they become large enough. Plant asparagus and rhubarb in well-prepared beds in rows. In planting rhubarb it will probably be found more profitable to buy the crowns than to grow them from seed, and the same remark applies to asparagus.

Sow cabbage, red cabbage, peas, lettuce, broad beans, carrots, radish, turnip, beet, leeks, and herbs of various kinds, such as sage, thyme, mint, &c. Eschalots, if ready, may be transplanted, also horse-radish can be set out now.

The earlier sowings of all root crops should now be ready to thin out, if this has not been already attended to.

Keep down the weeds amongst the growing crops by a free use of the hoe and cultivator.

The weather is generally dry at this time of the year, so the more thorough the cultivation the better for the crops.

Land for early potatoes should now be got ready by well digging or ploughing.

Tomatoes intended to be planted out when the weather gets warmer may be sown towards the end of the month in a frame where the young plants will be protected from frost.

**FLOWER GARDEN.**—No time is now to be lost, for many kinds of plants need to be planted out early to have the opportunity of rooting and gathering strength in the cool moist spring time to prepare them for the trial of heat they must endure later on. Do not put your labour on poor soil. Raise only the best varieties of plants in the garden; it costs no more to raise good varieties than poor ones. Prune closely all the hybrid perpetual roses, and tie up, without pruning, to trellis or stakes, the climbing and tea-scented varieties, if not already done. These and other shrubs may still be planted. See where a new tree or shrub can be planted; get these in position; then they will give you abundance of spring bloom. Renovate and make lawns, and plant all kinds of edging. Finish all pruning. Divide the roots of chrysanthemums, perennial phlox, and all other hardy clumps; and cuttings of all the summer bedding plants may be propagated.

Sow a first lot, in small quantities, of hardy and half-hardy annuals, biennials, and perennials, some of which are better raised in boxes and transplanted into the open ground, but many of this class can, however, be successfully raised in the open if the weather is favourable. Antirrhinum, carnation, picotees, dianthus, hollyhock, larkspur, pansy, petunia, *Phlox Drummondii*, stocks, wallflower, and zinnias, &c., may be sown either in boxes or open beds; mignonette is best sown where it is intended to remain.

To grow these plants successfully, it is only necessary to thoroughly dig the ground over to a depth of not less than 12 in., and incorporate

with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should then be raked over smoothly, so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days, thin out so as to leave each plant (if in the border) at least 4 to 6 in. apart.

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## Orchard Notes for June.

### THE SOUTHERN COAST DISTRICTS.

The Notes of last month, referring to the care to be taken in the handling and marketing of all kinds of citrus fruits, apply with equal force during this and subsequent months till the end of the season.

Keep the orchard clean, and work the land to retain moisture. The handling of the citrus crop is the main work in many orchards, but where slowly acting manures are to be given their application should not be later than this month. They should be well mixed with the soil, so that when the Spring comes and the trees start a fresh growth a certain percentage of plant food will be available for the trees' use. Heavy pruning should be done now, whilst the trees are dormant. All large limbs should be cut off close to the main stem; the edges of the cuts should be carefully trimmed, and the whole wound, if of large size, covered with paint or grafting wax, so that it will not start to decay, but soon grow over. When the soil of the orchard is becoming deficient in organic matter, the growing of a winter green crop, such as mustard or rape, is well worth a trial. Clear the crop of fruit from the part of the orchard to be so treated. Plough the land well; work the soil down fine so as to get a good seed bed, and broadcast the mustard or rape. A manuring of 4 cwt. of meatworks manure and 1 cwt. of sulphate of potash per acre will produce a very heavy crop of green manure, and the plant food not required for the production of such crop will be still available for the trees' use in Spring.

Pineapples and bananas should all be cleaned up, and the land got into first-class order. Pineapples, where at all liable to frost, should be covered with grass or other suitable material. The growth of weeds between the rows of pines on land liable to frost is one of the best ways of encouraging frost, as frost will strike dirty, weedy ground, and injure the pines growing thereon severely, when it will do little, if any, damage where the land is kept perfectly clean—another advantage of cleanliness in cultivation.

### THE TROPICAL COAST DISTRICTS.

Keep the land well cultivated—plough when necessary to bury weed growth, and get the surface of the ground into a state of thorough tilth, as moisture must be retained in the soil by cultivation to mature the spring crop of fruit. This applies not only to oranges and other tree fruits, but to bananas and pines as well. A good start in spring means good bunches of bananas and early ripening pineapples. Heavy pruning can be done now in the case of all trees not carrying a heavy crop of fruit, but where citrus trees are heavily loaded, the pruning should be put off till after the spring crop of fruit has been gathered. The spraying of the trunks and inside of the trees with the lime and sulphur wash can be carried out, and where Maori is making its appearance the sulphide of soda wash should be used as well.

### THE SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all kinds of deciduous fruit trees is the chief work of the month in the Stanthorpe district. Do not be frightened to prune severely, first, in the case of young trees, so as to get strong well-grown trees instead of straggling top-heavy trees; and, second, in the case of trees that are going off in the size and quality of their fruit. Where peaches, apricots, plums, or nectarines are only making very little new growth, and that weak, so that the fruit produced thereon is small, it is advisable to head the tree hard back, so that it will throw out some vigorous branches in Spring that will form a new head for the tree. Apples, as well as plums and apricots, are sometimes inclined to over-produce fruit spurs, which become long and straggling, and bear a large quantity of small-size fruit. A vigorous shortening back and cutting out of such spurs will have a very beneficial effect in the quality and size of the fruit produced.

Gather and burn all prunings; and, where codlin moth is present in the orchard, examine the tree carefully when pruning it, so as to see if there are any cracks, crevices, or masses of loose bark in or under which the larvæ of the moth may be hibernating. All larvæ so found should be destroyed, and if the work is carried out systematically it will tend to materially decrease the crop of moths that will hatch out the following spring.

As soon as any part of the orchard is pruned, gather up the prunings, and work the land, as a thorough winter weathering of the soil is very beneficial in its effects; and, further, it will tend to destroy many insects that may be wintering in it. The planting of new orchards or of trees to replace any that may have died, or that have been proved to be unsuitable to the district, may be continued during the month, and right on till the end of winter.

Do not prune vines in the Stanthorpe district, as it is advisable to leave the pruning as late as possible, but vine pruning can be done at any time now in the Roma or Central districts. Tree pruning can be continued during the month, and the orchard should be kept well worked. Citrus fruits can be marketed. Lemons should be gathered and cured.