QUEENSLAND AGRICULTURAL JOURNAL

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Agriculture.

SETTLEMENT AND IMMIGRATION.

Writing on this subject in October last year "The Farmers' Advocate," Johannesburg, Transvaal, South Africa, says that some may be of opinion that a negative to immigration aspirations is being furnished by the course of the present disastrous war which threatens to decimate the male population of Europe. History suggests, however, the converse result. Bloodier as this war is than the Napoleonic wars, nobody supposes that it will destroy any large percentage even of the males belonging to the belligerent nations. Looking to the United Kingdom, and supposing (which may Providence forfend) that the whole of its existing levy of about three million men were blotted out the loss to the British nation would be qualitative rather than quantitative. The best of the males, as a whole, would have gone, but the most of them would remain. Even this depletion, bad as it would be, would only affect the

generation between the ages of 18 or 19 and 40. The lads and girls below these ages would grow up in undiminished numbers and speedily restore to the nation its wonted numbers. Malthus has left on record with what celerity the population of certain parishes in Scotland, depleted towards the close of the eighteenth century, alike by war and immigration, restored itself. His deduction, consonant with the teaching of all sociological science, was that artificial checks of the kind above instanced, restrict for only a brief period the multiplication of the human species where the means of subsistence continue unreduced. War, however, has an aftermath of economic unsettlement which is peculiarly stimulative of emigration from the countries it has afflicted. South Africa, prior to the discovery of the diamond and gold fields, owed indirectly to the Napoleonic conflict the presence within its territory of the bulk of its English population. These for the most part, traced their origin to the Albany immigrants of the year 1820, themselves mainly driven from their native land by the hardness of the economic conditions —the destruction of capital and consequent shortage of business and employment which were the natural sequel to the century or so of exhausting struggle wherein England had been engaged. Like results may be expected from the present war, as much more acute as it is to be trusted it will be briefer than the other. And as an added factor of immigration we must include that tendency of a military career which makes it difficult for men who have tasted its excitements to settle down again in the monotonous routine of a crowded old-world civilisation, but rather drives them abroad in the hope of making homes and a competence in the roomier sphere of some new country.

The men will probably come to us after the war. Shall we prepare or not to receive them? Some of them will bring capital as well as constitution and character, and for these the State needs to make little or no provision beyond that provision of scientific and practical advice which the experts of the Agricultural Department already so willingly give. Such men will acquire land and develop it otherwise unaided. As to a large residue of the future immigrants who will have the constitution and the character without much cash, the option for us already in the country appears to be that they shall either swell the unemployed and, in the end, unemployable class in the towns or be assisted to benefit themselves and us by becoming producers on the soil. If the latter is to be our policy we can only give it effect by means of the "prepared" farm. South African readers do not require to have it explained to them how disastrous it would be to dump oversea men without capital or, for that matter, penniless men of the country, on dry bare veld. The methods which the Land Settlement Department is already adopting must be persevered in, but upon a much bigger scale. A hundred bore holes must be sent down where we have been sinking one, and housing and fencing operations in behalf of the prospective settlers will need to be similarly multiplied. No doubt the good land is expensive; mostly it cannot be bought under £5 per morgen,* and of the Crown lands little,

* The Cape morgen is reckoned equal to 2·11654 acres.

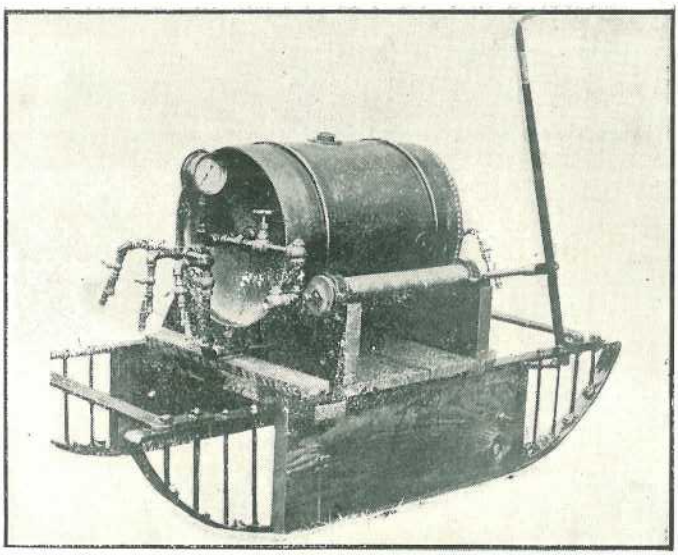


PLATE 2A.—WEED-KILLING MACHINE.

unfortunately, is adapted to close settlement. If we want really to grapple with the problem of preserving our heritage as a white people, making "scour" to cease and robbing the native problem of its menace, we should devote a great State loan to immigration of the large kind.

WEED-KILLING BY MACHINERY.

It has been generally accepted that the application of arsenical solutions for the destruction of weeds amongst growing crops is destructive to the crops, and prevents the growth of plants on the affected soil. This has apparently been disproved, as will be seen by the following account of the destruction of weeds in canefields, which the "Australian Sugar Journal" reprints from a special edition of the "Honolulu State Bulletin":—

"The Olaa Sugar Company is putting into extensive use a new method of destroying weeds in the canefields. An arsenical spray is applied by means of a specially constructed sled carrying a tank fitted with nozzles, through which the liquid is expelled under air pressure downward and directly upon the weeds between the cane rows. One man with a mule operates the contrivance. The solution is composed of a mixture of arsenite of soda and caustic soda, there being about 5 lb. arsenic to 100 gallons of the solution. By this means the cost of weed destruction at Olaa has been reduced by 25 per cent.; the cost of spraying per acre for a single application is said to be about one dollar. The great saving found in the use of this spray is in the control it gives of the weed growth between the cane rows. The cane being less hampered, the tops meet sooner across the space between the rows, shading the ground and retarding the weed growth earlier in the life of the crop than would otherwise be the case. Various tests made show that no harmful results accrue from the application of arsenic to the soil. It is demonstrated that if all the arsenic that would be used in sixty years of such application were given in one dose, no harmful results to the soil would follow. It was shown also that no retardation in the growth of the cane was occasioned. Care, however, is taken to prevent the spray coming into contact with the cane leaves. Besides the mule-drawn sled, spraying for weed destruction is also accomplished with hand sprayers carried on the shoulders of labourers."

POTATO CULTIVATION.

Potato planting in the Southern districts will be general during this month, and success will depend largely on the character of the land and the season experienced, the chief factor lying in its proper preparation some time before planting. Hurriedly prepared fields are only courting a partial failure or a serious reduction in the yield. After a few years of general cropping the texture of the soil undergoes a change, detrimental to the crop, unless especial care has been taken to prepare the land

some months before planting, the primary object being to bring the soil to a good tilth, and the secondary the retention of moisture for the approaching planting season and the subsequent development of the crop. To effect this, the cultivation should be deep and in accordance with the nature of the soil.

Very heavy crops have been obtained in old lucerne fields, but in this case, after breaking up, ample time must be allowed for the weathering and mellowing down of the soil. If this is not done, the soil particles for the most part remain about the size of peas, and are incapable of retaining moisture for any length of time, to the consequent reduction of the crop.

Preparation of the Soil.—Whilst the successful raising of marketable crops is dependent largely on the character of the land and the season experienced, the factor in chief lies in its proper preparation.

Hurriedly prepared fields are only courting a partial failure or serious reduction in yield.

Generally speaking, the heaviest falls of rain come in the latter end of the summer, and the winter months are inclined to show averages slightly below normal. Assuming that it is intended to take advantage also of the mellowing and sweetening influences of frost, and plant immediately it is safe after the winter, it is imperative that on virgin soils, apart from scrub land, the work of preparation should extend over several months. Operations should be directed in accordance with varying local conditions, but it remains that certain fixed objects must be kept in view—the primary one being tilth, and the secondary a retention of moisture for the approaching planting season and the development of the crop. Any encroachment of weeds or grass on the "fallowing" land will have as its corollary an unsatisfactory condition for all subsequent operations, and, if fouled in this way, the work of the potato-digger is very much hampered.

Cultivate deeply and in accordance with the nature of the soil. On virgin land shallow "breaking up"—say, in October or early November —with an English type mould-board plough to invert the furrow slice, is commended. Should couch be present, the surface must be worked consistently during the hot weather with the disc and tine harrows to give all the exposure possible to dry it out. If otherwise, roll after the plough, and harrow to fill the interstices between the furrows.

Use the disc harrows just previous to cross ploughing, which should be carried out as soon as grass has rotted down sufficiently, and to a depth of not less than 6 in., which should be increased gradually in the seasons following.

Selection and Condition of Seed.—No matter how well the land has been prepared, if the sets are inferior in quality, a full return cannot be expected; the selection of suitable seed apart from variety has an important bearing upon the success of a crop.

Select from a variety true to type, well grown, uniform in character, and having a clean skin and free from disease (see specific for the

disinfection of seed potatoes under the heading of "Diseases"); flesh should be firm to the touch, but yielding slightly under pressure.

The eyes require to be almost level with the surface in most varieties, and particular attention directed to the condition of the buds or young shoots. Sets in a condition to plant should have short robust sprouts; those showing a long or attenuated growth are to be avoided.

Storage in large heaps and a lack in turning the potatoes encourage this condition. Shallow layers are to be preferred, with frequent turning, and the picking out of any showing traces of rotting.

The sets for planting are either tubers too small for table use—but graded from a good crop—or those of ordinary commercial size and which have to be cut into sections.

It is generally recognised that, for conditions prevailing over most of the State, whole sets are preferable. Exceptions are to be considered in the event of a possibility of the introduction of disease, when an additional precaution may be taken by cutting, when detection is easier.

For the autumn planting, whole seed is certainly to be recommended. The reason for this lies in the fact that, if wet conditions follow after the planting of cut sets, accompanied by warm weather, the planting may be lost by rotting.

The safest season for "cut" seed is for the August or spring planting, when the soil is colder and generally not so moist.

If whole sets be used, care should be taken to procure from a reliable grower or reputable seed firm.

Very small whole potatoes are not likely to give the same results as a more robust sample about 2 in. in diameter. This latter carries a store of nourishment for the young plant, tides it over a dry time, and gives it an earlier start.

For cut seed, moderately sized tubers are to be preferred; nothing is to be gained by making small sets for reasons similar to above, and they are relatively more subject to rot.

Number of Eyes to Set.—Much importance is often placed as to the number of eyes that should be set, but this is of much less value than the size of set. Where several eyes may inadvertently be left on a cut set and these start simultaneously into life, or when whole potatoes are used and planted at a seasonable time, the primary shoot assumes control and gives rise generally to one stem. Exceptions occur in backward seed or if planted late in the spring, and when humid weather is experienced; then considerable suckering takes place.

Cutting Seed.—As to the best method of cutting the tuber into sets, it will be observed that at one end of the potato, in most varieties, there is a bunch of eyes called "the crown." In the case of the smaller-sized potatoes all that is necessary is to cut them in half lengthways and right through the centre of crown, leaving about an equal number of eyes on each side.

With larger-sized potatoes the first cut should be made across its length and about one-third from the end opposite the crown; this "stem"

end forms a set; whilst the other section is cut through the centre of crown at right angles to the first cut, making three sets in all.

Extra large potatoes should be cut evenly into four pieces with a regular cut lengthways as before noted, and then crossways or else into pieces containing from two to three eyes and weighing about 2½ oz. each. A thin knife is preferable, and should pass more freely through a seed potato than a crisp table one.

Time to Cut.—This should be done a day previous to planting to allow the raw surface to heal up; a sprinkling of wood ashes or slaked lime is advisable.

Sprouting Seed.—Mention has been made previously as to the difficulty of maintaining supplies of seed for the two plantings—July-August and in February—obtainable during the twelve months in this State, necessitating an importation for one planting, as the time between the harvesting of one crop and the planting of the next is so short. Changes of seed from a cooler climate are thus assured, as, if otherwise and an attempt was made to carry on with an early maturing variety, its vitality is soon irredeemably impaired. It is possible to make use of a quick-maturing variety to provide seed for a succeeding planting, provided it is put in early and harvested as soon as "ripe," and then shortly afterwards spreading out the potatoes in a shed or barn in shallow layers to dry thoroughly. Exposure to strong light will turn the colour of skins to a greenish hue, and the process will assist in prolonging their keeping qualities even when planted again.

If bagged subsequently, they will sprout much earlier than if kept in a large heap in a shed, which, if moist, will have a tendency to cause decay in the potatoes, and when they do sprout the shoots will be nothing like as robust as the treated seed.

Stored potatoes require to be frequently turned and picked over to take out decaying tubers.

Amount of Seed per Acre.—This will vary and depend on the class and size of sets. Usually 7 cwt. to the acre may be taken as an average.

Planting.—It is generally recognised that the earlier the spring crop can be put in, the better the chances of a heavy return, assuming, of course, that conditions are favourable. A late crop, or an unseasonable variety planted at this season, may strike humid weather and have a tendency to produce an over-abundance of haulms and a minimum amount of tubers.

For the autumn crop, the time is regulated by being put in sufficiently early to allow the tubers to grow and mature before the advent of frost. Whether the crop is to be planted on the flat or ridge will depend largely on the soil and environment. In dry localities, planting and subsequent working should be kept on the flat; the potatoes being planted every 15 in., and at a depth of approximately 4 in., immediately after the plough, and in every third or fourth furrow, according to the width being cut, so as to bring the rows from 32 to 36 in. apart, and allow for horse cultivation. When ploughed in, whether with disc or other type, it is preferable to plant on the side of the furrow

rather than the bottom, to prevent trampling of seed potatoes by horses. For ridge planting, the double mould-board hilling type of plough is to be preferred, but the single plough may be used; in any case the furrows should be planted up and filled in as quickly as possible after opening. Care should be taken in setting the hilling plough so that it will leave a hollow rather than a pointed crown. In the event of the use of fertilisers, reference should be made to the previous notes governing their application.

When opening furrows, undue exposure should be avoided and the planting and covering in arranged simultaneously; three good planters will keep one plough going. Machines may be used with advantage where large areas are planted; these are designed to complete the opening, the planting, and covering in at one operation.

After Cultivation.—The first cultivation should be given just after the young plants show up through the ground. Light lever harrows, with the tines set back from the perpendicular, are to be recommended.

A pair of light home-made harrows, useful for any class of work where "hills" are put up, can be made in a half-moon shape with short tines; these overcome the damage often associated with heavy and flat harrows which do not possess the adjustable tines.

Scuffling between the rows is most important, the ordinary Planet Junior type of machine being used, at least twice. The manner in which the ground has been worked will determine how the tines should be adjusted, so that the earth may be moulded in as desired towards the plants at each cultivation, taking care not to stir too closely or too deeply to disturb the roots.

Where hilling is practised, a special mould-board type of sweep can be attached to the machine for the purpose of combining the two operations at the time of the last stroke of the scuffler. The moulding over of friable soil is important in relation to protecting the tubers from the attack of the potao moth, also to prevent discoloration of potatoes which may be exposed to sunlight, and, if in cold districts where an autumn crop is obtainable, a protection of this character helps to save the potatoes from severe frost bite, if they have to remain any length of time before lifting.

Hilling up with the double-mould plough is advisable in damp positions, and in situations where this class of work is required; and it is equally as important to give the ridges plenty of body and not bring them to a point.

No further horse cultivation is required between the rows after earthing up.

Harvesting.—To anticipate a harvest is to take reasonable precautions other than careful cultural operations to get one, by paying attention to directions laid down, as preventive measures against blight, and the various troubles incidental to potato-growing.

When the crop is sufficiently ripe, this is generally ascertained by the dying down of the haulms, also by the condition of the skin of the potatoes, which should be fairly dry and set, and not readily peeled off.

Early frosts will often hasten the harvesting of the autumn crop, but in the case of the summer-ripening crop, growth is prolonged, and careful observation is necessary to determine how soon they can be lifted, as the hot weather and, at times, the potato moth make it expedient to harvest as soon as ready. Another reason is that some varieties have a predilection to a second growth.

The means adopted in the harvesting of the crop are many.

The flat-pronged digging fork is still in vogue, but where large fields have to be dealt with it is too slow and expensive, contract prices running from 1s. to 1s. 3d. a bag, and in some cases up to 1s. 6d.

An ordinary single-furrow plough acts fairly well, provided the ground is worked in lands, the side of the furrows on one side of the hill being trimmed off first before ploughing the potatoes out for the "pickers."

A double mould-board plough with a specially shaped pronged share is used largely in some localities, the potatoes being left on the surface after it.

If the ground becomes fouled with weeds or grass, the disc plough may be used, and it is in such situations that a potato-digger cannot operate to any advantage.

Potato-diggers are to be recommended when they can be used on friable soil free from rubbish. Many classes are on the market, some being designed for grading the crop; but, like most machines, they cannot accommodate themselves to all conditions.

Suitable weather and conditions are to be looked for when harvesting; the soil should be sufficiently dry so as not to stick to the tubers, and they should on no account be left lying exposed to the hot sun or to strong winds, which have a damaging effect on their keeping qualities.

Grading.—No grower can afford to neglect this most important feature. The vagaries of the market may at times shatter the good intentions of those who carefully class their products, but it is well known that the law of averages does not apply to a line of mixed-sized potatoes, and a depreciated price has to be accepted when the smaller and unmarketable stuff is included with that of better quality.

With a partly perishable product, there is usually little inducement to hold over for a rise, particularly with the summer crop when the wet season is at hand; and there is, moreover, always a fair and sometimes a heavy percentage of unmarketable potatoes after storing, as well as the extra cost entailed in picking over to be considered.

Potatoes of a regular and uniform size are preferred by the large consumer. The grower who can arrange his grading by a machine or with the "pickers up," in the field, does so to his own advantage.

Once in the barn, under cover, sorting-machines certainly facilitate this work; and, if a grower is specialising in seed potatoes, there is some justification in rehandling the "smalls," to cater for the "seed" trade with an even selection of the first grade, and brand up his marketable stuff with his own name or trade mark.

A recommendation has been made that when potatoes are stored they should be kept in thin layers, a dry airy place being preferred. There is little gained in neglecting to protect the open bags of potatoes in the field, as it is here that infestation may readily take place by the potato moth, owing to a practice (which is to be deprecated) of covering the open bags with a bundle of potato haulms.

The Varieties to Grow.—Several references have been made to the seasons and conditions governing the supply of seed potatoes to suit this State's varied requirements.

To recommend varieties—let them be early, medium, or late—is to conjure up the fact that our climatic conditions preclude the chance of a grower arranging a continuity in the production of one or more kinds where there are two distinct seasons in the year, unless fresh seed is brought in once a year from a cooler climate. The Stanthorpe district climate resembles more than any other that of New England, for instance, and it is quite possible to use seed from an early maturing crop planted there in October, harvest it in March, and hold over for the August planting in warmer localities instead of importing seed. But, although potatoes do remarkably well in some picked spots, the Stanthorpe district (from the nature of its soils) is unlikely to produce, for some time at least, anything approaching a percentage of the seed potatoes required in more favoured potato-growing localities. Varieties regarded as standard procurable types on the market as are follows:—

Early kinds—Early Rose, Early Vermont, Bliss Triumph.

Medium—Brownell's Beatuy, Satisfaction, Up to Date.

Late—Circular Heads, Guyra Blues.

Irrigation.—The potato is not a plant whose growth it is advisable to force. Should the land be dry at the planting season, and both the conditions and water be suitable for irrigation purposes, water may then be applied with advantage by well soaking the drills. After allowing a day or sufficient time to elapse, readily observed by noting the condition of the soil, planting may be proceeded with in the ordinary way.

A second watering, if necessary, may be given between the rows at a period when the young potatoes begin to form, but not later than this. After any form of irrigation, the breaking up of the crust or covering in, in the case of furrows, should be consistently adhered to.

POTATO TOPS AS FORAGE.

Last month it was stated in one of the Brisbane daily journals that a farmer lost two cows owing to their having eaten potato tops. From investigations carried out on the Continent of Europe it has been concluded that potato tops are equal in value both as regards chemical composition and digestibility to good meadow hay; if anything they are slightly superior to the latter in their proportion of digestible protein. The results of a feeding experiment with dairy cows confirmed this conclusion; the yield of milk and the proportion of fat and dry matter were at least as high as when good meadow hay was fed. If well harvested and made into hay or artificially dried the tops were found to be quite unobjectionable for feeding purposes from a hygienic point of view. When properly prepared they were also found to form good silage, which was willingly eaten.

To prevent any unnecessary disturbance of the tubers it is advised that the tops should be cut just before the potatoes are harvested in the normal course. Care should be taken not to include any roots, as the adhering soil may lead to disturbances in the health of the animals.

MARKET GARDENING.

HINTS ON SEED GROWING.

SOWING SEED IN DROUGHTY WEATHER.

Just as it is well to fill with water the holes into which we put seedlings, and to dip the roots of the seedlings into a thin mud of eleven parts loam and one part lime or soot (which protects to some extent from fungi and insects, as well as tending to keep the roots moist and active), so it is a wise proceeding to make thoroughly damp overnight any bed into which seed is to be sown, and to fill with water the drills into which we propose to put most seeds, and particularly such seeds as peas and beans.

The only seeds that do not seem to benefit from this treatment are those of the carrot. There is a well-established theory that carrots should be sown on dry soil. I have never heard a convincing argument as to the why and the wherefore of this; but experience suggests that there is a reason for the practice. At any rate, dry sowing appears to do just as well as wet sowing, however hot the weather.—*New Zealand Farmer.*

[Whatever may be the reason why carrot seed germinates when sown on dry ground, the fact remains that it does so in this State. If carrot seed is sown, and covered with some material, even sacks, for a week or so, the seed will germinate, whilst parsnips, lettuce, &c., will not succeed unless sown in moist ground.—ED. *Q.A.J.*]

Pastoral.

DENTITION IN SHEEP.

BY W. G. BROWN, Instructor in Sheep and Wool.

A most important matter in the keeping of sheep is the matter of judging the age of the animals. From the number of inquiries reaching this office concerning the subject, I conclude that a description of animals' mouths from birth to maturity will be useful to those whose knowledge of sheep is small.

In buying sheep, as in all other things which are bought and sold, the old Roman adage *Caveat emptor* applies, and a man who believes

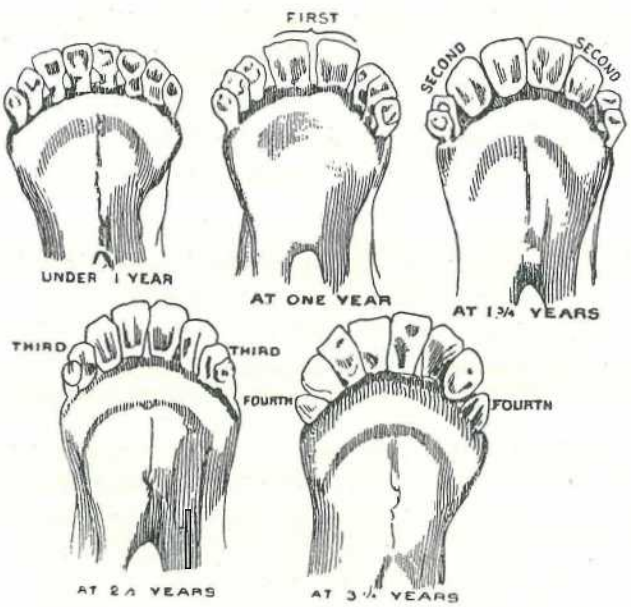


PLATE 3.

that he is buying young animals without knowing that they really are young or old, stands a very good chance of making a bad bargain. I know of two particularly hard cases to the buyers, neither of whom understood sheep, and consequently were saddled with unsuitable animals.

In the first case, the buyer thought that he was inspecting wethers of from two to three years old. He really bought sheep not less than six years old, and quite 20 per cent. "broken mouthed." In the second case, the sheep were supposed to be young wethers. This was literally

true, for they were certainly not more than five months old, and quite unsuited to the purpose for which they were bought—*i.e.*, fattening quickly for market. Wether lambs was their proper designation. An elementary knowledge of dentition would have saved the buyers from mistake on account of age at least.

I give in the accompanying plate (No. 3), taken from Professor Simonds' "On the Age of the Ox, Sheep, and Pig," an illustration of the incisors or cutting-teeth. In Plate No. 4 is shown the molars or grinders at various periods of the sheep's life up to maturity, which is, roughly, four years of age (Armitage's "Sheep Doctor"). At maturity a sheep has thirty-two teeth, eight incisors and twenty-four grinders.

At birth a lamb possesses two central temporary incisors, and at the end of four weeks all the temporary incisors (eight) are up, with three molars in each of the upper and lower jaws.

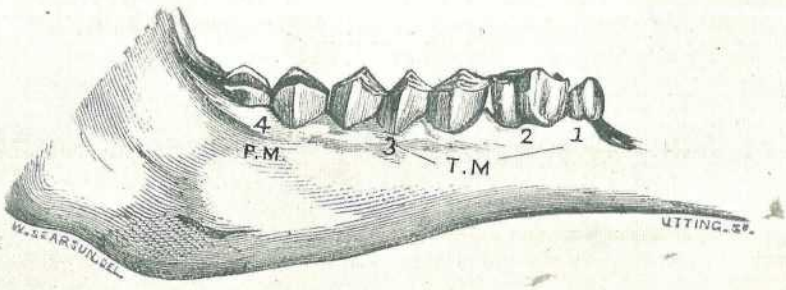
From the age of four weeks to the time of cutting the central permanent incisors, at from twelve to fifteen months, the only changes that occur are in the molars.

At three months the fourth molar (Fig. 1, Plate 4) is cut, and is a permanent tooth. Six months later another molar, the fifth, is to be seen (Fig. 2, Plate 4).

At eighteen months the sixth permanent molar is cut; the third temporary molar, like a shell, covers the top of the permanent tooth, while the first and second permanent molars have pushed off the temporary ones. Thus, a sheep has all its permanent molars at from eighteen months to two years old.

With the incisors, the first two, or central permanent teeth, make their appearance at from twelve months in early, and fifteen months in late, dentition. At from eighteen months to twenty-four months, the second pair of permanent incisors are up; at from twenty-seven months to thirty-three months, the third pair are in use; and from thirty-six months to forty-two months, the fourth and last pair of permanent incisors are shown, and the sheep is "full-mouthed" at about four years.

After this, it depends upon the class of country, and the early or late maturity of the breed, as to the wear of the teeth, whether the mouth is defective or otherwise. Only experienced sheepmasters can, even approximately, give the age of any particular animal. In the case of "broken-mouthed" sheep it is wise, if only three or four or fewer teeth are left, to pull them out and leave the animal "gummy." They cannot bite with odd or gapped teeth as well as they can with gums. But do not buy old sheep unless very, very cheap.



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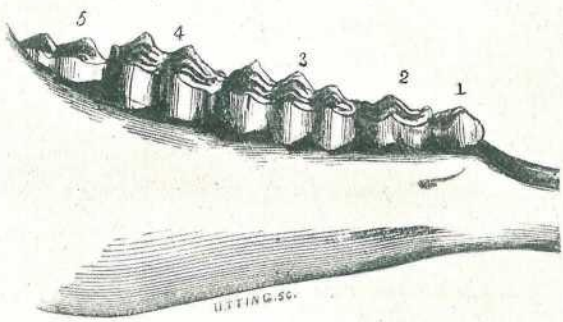

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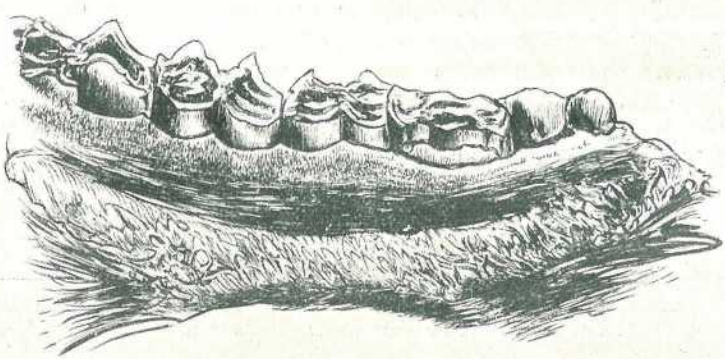

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PLATE 4

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF DECEMBER, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Margaret	Ayrshire	14 Oct., 1915	822	4·2	40·58	
Sweet Meadows	Jersey	28 Sept. ,,	549	5·7	37·02	
Madam Melba	Holstein	28 Oct. ,,	856	3·5	36·10	
Miss Melba	,, ...	30 Sept. ,,	828	3·7	35·89	
Constancy ...	Ayrshire	24 Nov. ,,	767	3·9	35·10	
Twylish's Maid	Jersey	22 Oct. ,,	598	4·7	33·13	
Miss Jean ...	Ayrshire	5 Nov. ,,	778	3·7	32·72	
La Hurette Hope	Jersey	17 Nov. ,,	617	4·3	31·21	
Miss Edition	,, ...	27 Sept. ,,	616	4·3	31·16	
Rosebud II.	Ayrshire	11 Oct. ,,	661	3·9	30·24	
Gretchen ...	Holstein	16 Aug. ,,	776	3·3	29·90	
Bluebell ...	Jersey	20 June ,,	527	4·5	27·83	
Laurette II.	Ayrshire	9 Oct. ,,	653	3·6	27·53	
Daisy ...	Holstein	23 Nov. ,,	706	3·2	26·35	
Sylvia II. ...	Shorthorn ...	25 Aug. ,,	585	3·9	26·31	
Mischief ...	Ayrshire	27 Sept. ,,	606	3·5	25·56	
Lady Twylish	Jersey	5 June ,,	412	5·1	24·81	
Special Edition	,, ...	1 Nov. ,,	507	4·2	24·78	
Iron Plate ...	,, ...	21 Feb. ,,	372	5·6	24·63	
Miss Lark ...	Ayrshire	8 Sept. ,,	538	3·9	24·62	
Miss Bell ...	Jersey	2 July ,,	389	5·2	23·89	
Jeannie ...	Ayrshire	1 Nov. ,,	547	3·7	23·71	
Dottie ...	Shorthorn ...	27 Nov. ,,	477	4·2	23·53	
Nellie II. ...	,, ...	20 July 1914	535	3·7	23·19	
Violette's Peer's Girl	Jersey	8 Dec. 1915	436	4·5	23·10	
Silver Nell ...	Shorthorn... ...	16 Aug. ,,	445	4·4	23·03	
Noble Dot ...	Jersey	2 May ,,	364	5·2	22·35	
Windyhill Davidina	Ayrshire	21 Aug. ,,	515	3·7	22·33	
Lady Melba	Holstein	17 Dec. ,,	517	3·5	21·17	
Simple Interest	Jersey	22 Oct. ,,	397	4·5	21·04	
Lady Dorset	Ayrshire	10 Aug. ,,	480	3·7	20·80	
Lucinda ...	,, ...	14 Oct. ,,	480	3·7	20·80	
Lilia ...	,, ...	19 Aug. ,,	521	3·4	20·70	
Rosine ...	,, ...	7 Aug. ,,	518	3·4	20·58	

In addition to the rough feed available in the paddocks, each cow received a daily ration composed of 12 lb. oaten chaff, 8 lb. lucerne chaff, and 4 lb. bran.

Poultry.

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

Six thousand three hundred and sixty-four eggs were laid during the month, an average of 120 per pen. S. Chapman's Brown Leghorns win the monthly prize with 141 eggs. The following are the individual records:—

Competitors.	Breed.	Dec.	Total.
C. E. Bertelsmeier, S.A....	White Leghorns ...	140	1,175
Mrs. Munro	Do.	127	1,146
J. D. Nicholson, N.S.W.	Do.	130	1,140
Jas. McKay	Do.	110	1,137
J. Gosley	Do.	129	1,135
A. H. Padman, S.A.	Do.	139	1,135
E. F. Dennis	Do.	133	1,121
J. R. Wilson	Do.	131	1,119
J. M. Manson	Black Orpingtons ...	126	1,118
A. W. Bailey	White Leghorns ...	124	1,116
J. M. Manson	Do.	136	1,096
Kelvin Poultry Farm	Do.	112	1,096
King and Watson, N.S.W.	Do.	115	1,081
Mrs. J. Jobling, N.S.W.	Black Orpingtons ...	101	1,081
O.K. Poultry Yards	White Leghorns ...	125	1,077
A. T. Coomber	Do.	129	1,073
E. A. Smith	Do.	125	1,064
S. E. Sharpe	Do.	98	1,063
W. Parker	Do.	138	1,061
C. T. Clark	Do.	121	1,056
C. Knoblauch	Do.	129	1,056
T. Fanning	Black Orpingtons ...	112	1,052
T. Fanning	White Leghorns ...	128	1,046
H. Hammill, N.S.W.	Do.	120	1,044
E. V. Bennett, S.A.	Do.	122	1,043
W. Purvis, S.A.	Do.	127	1,043
R. Burns	Black Orpingtons ...	124	1,030
Cowan Bros., N.S.W.	White Leghorns ...	129	1,027
F. Clayton, N.S.W.	Do.	121	1,025
E. Le Breton	Do.	105	1,018
Moritz Bros., S.A.	Do.	128	1,015
E. A. Smith	Black Orpingtons ...	131	1,011
W. Lindus, N.S.W.	White Leghorns ..	131	1,008
R. Burns	S. L. Wyandottes ...	117	991
Geo. Tomlinson	White Leghorns ...	114	990
W. Meneely	Black Orpingtons ...	111	988
R. Jobling, N.S.W.	White Leghorns ...	103	984
Derrylin Poultry Farm	Do.	101	982
Cowan Bros., N.S.W.	Black Orpingtons ...	113	972
J. G. Richter	White Leghorns ...	127	971
J. H. Gill, Victoria	Do.	128	970
W. Lyell	Do.	106	960
J. Zahl	Do. (No. 1)	108	953
Loloma Poultry Farm, N.S.W. ...	Rhode Island Reds ...	123	937

Competitors.	Breed.	Dec.	Total.
J. Aitcheson	White Leghorns ...	105	935
R. Jobling, N.S.W.	S. L. Wyandottes ...	97	931
G. H. Turner	White Leghorns ...	102	931
J. Zahl	Do. (No. 2)	117	915
E. Pocock	Do.	110	896
S. Chapman	Brown Leghorns ...	141	868
W. H. Forsyth, N.S.W.	White Leghorns ...	128	840
F. Clayton, N.S.W.	Rhode Island Reds ...	112	839
J. R. Johnstone	Plymouth Rocks ...	105	664
Totals	...	6,364	51,019

PURIFYING WATER.

A simple method of purifying almost any infected water needed for drinking, without boiling it, has been worked out by Dr. G. G. Naismith, Director of Health Laboratories of Toronto, Canada, and Dr. R. R. Graham, Assistant Chemist. The process is as follows:—Add a teaspoonful (not heaped up) of chloride of lime (costing about 6d. a ½-lb. bottle), containing about one-third available chlorine, to a cupful of water. Dissolve and add in any convenient receptacle three more cupfuls of water. Stir and allow to stand for a few seconds in order to let the particles settle. This stock solution, if kept in a tightly-stoppered bottle, may be used for five days. Add a teaspoonful to two gallons of the water to be purified, stir thoroughly in order that the weak chlorine solution will come into contact with all the bacteria, and allow to stand for ten minutes. This will effectively destroy all typhoid and colon bacilli or other dysentery-producing bacilli in the water. The water will be without taste or odour, and the trace of free chlorine added rapidly disappears.

From inquiries made in Brisbane, the editor of the "Australian Sugar Journal" says that the above can be thoroughly recommended, the only caution given by the Government Analyst's Department being against the tendency to use more of the chloride of lime than is prescribed, which may impart an undesirable taste. Use less rather than more.

Water containing mud in suspension is easily clarified by dropping hot wood ashes into it, or by the application of lime or alum. These two latter substances make the water hard. Chloride of iron may also be used. It is quite harmless, and a valuable constituent for all animals. Medical men prescribe iron in one of its severest forms as a tonic. One pound of chloride of iron (2d. per lb.) will clarify 1,000 to 2,500 gallons of muddy water, and much reduce the bacterial contents.

The Horse.

THE WAR AND THE OUTLOOK FOR LIVE STOCK.

The influence of the great European war on land and live stock has in a great measure confirmed the experiences of the past, for it has quickened demand and hardened prices, and incidentally at this time made some beneficial adjustments, where in the world-wide competition which British farming had to meet, prices had been unduly reduced, until the margin of profit had well-nigh disappeared. After a year of war it will be generally admitted that the trade for practically all classes of live stock has been much better than could have been anticipated. There has been a brisk and growing demand, and that at enhanced prices, yielding a fair margin of profit. A notable feature of the period has been the trade in purebred stock as mirrored in the public and private sales which have taken place. With the South American ports now reopened, the growing cry for fresh blood from U.S.A., and the great quantities of meat procured from abroad for war rations, which will entail a corresponding call for breeding stock for grading-up purposes, our British breeds will continue to be in great and increasing demand abroad and in the colonies; while it needs no spirit of prophecy to predict that the close of the war will see one of the greatest booms in purebred stock that has ever been experienced in this country. Breeders will therefore do well to so increase their stocks as to be ready to meet the call when it comes. There is every reason to believe that the trade for commercial stock will also be well maintained, and that at profitable rates. The new order respecting the slaughter of calves should also be helpful in increasing supplies. Meat and milk requirements are increasing, and the war has helped to equalise some of the growing disadvantages in the way of low prices, from which the producers have undeniably suffered. With so many men taken from the land by the war, including experts in breeding and feeding and many members of the veterinary profession, it is more than ever necessary that careful attention should be given to the health and well-being of stock, as it is only by maintaining animals in a thoroughly healthy condition that the best and most profitable results can be secured. This will be particularly necessary during the autumn and winter months, when climatic conditions, coupled with the necessary changes in rations, tend to produce ailments which a little foresight might have prevented. If disease is combated in its early stages it can more easily be dealt with, whereas, if neglected, the delay will certainly lead to further expense and trouble, and in many instances to the loss of valuable animals. The landed industry has already rendered magnificent service to the country in the large number of men it has contributed to His Majesty's forces. Those who must remain at home will render no less valuable aid by helping to maintain and increase the yield from the land and from our farm live stock.—"Live Stock Journal."

State Farms.

STATE FARM, BUNGEWORGORAI.

The manager reports for the month of January:—

Meteorological.—The only change in these conditions is an increase in temperature during the last week, the thermometer on one occasion reaching 108. The rainfall during the month ending the 12th was 87 points, making a total of 662 points for the twelve months.

Crops (summer).—As is to be expected, these are in a very unsatisfactory condition—that is, those which have not succumbed.

Vineyard.—The crop in this department has been harvested. Owing to the unfavourable conditions and the depredations of the birds, very little indeed was fit for marketing. For the most part, the vines themselves look well.

Orchard.—There is nothing fresh to report here, excepting that the trees look a little better than they did last month, a certain amount of relief having been obtained from the 87 points of rain.

Stock, considering all things, are looking well, but are a source of anxiety, more especially the horses, on this sandy country.

PASPALUM FOR ENSILAGE.

From the Director of the Queensland Government Intelligence and Tourist Bureau, Sydney, Mr. A. Meston, we have received the following extract from the Sydney "Daily Telegraph" of 20th December, on the utilisation of paspalum grass for the production of silage:—

"The manager of the Berry Experiment Farm, Mr. P. Quirk, in his annual report, remarks:—'The most outstanding feature of the farm is the object-lesson in converting paspalum into stack silage. There is no grass on the coast discussed more than paspalum, with divided opinions; many farmers are strong advocates of the grass, while others condemn it as worthless. This being a year (1914-15) of great grass growth, paspalum was plentiful, standing 4 ft. high, and we conserved it in the form of stack silage, about 250 tons, at a cost of 2s. 3d. per ton for extra labour. The silage is turning out well, and stock of all kinds are eating it readily. This is proving of great interest to the farmers, as it is the first year paspalum silage has been attempted. Many of the farmers eagerly awaited results, as thousands of tons of silage might easily have been made at a nominal expediture.'"

The Orchard.

AUSTRALIAN CITRUS FRUIT IN CANADA.

"Fruit World," Victoria, publishes the following communication from Mr. B. J. Hansen, agent for the Victorian Government in Canada:—

"There arrived in Vancouver at the end of August, by the 'Makura,' a consignment of fruit from the Department of Agriculture, N.S.W., comprising 123 cases of lemons and 48 cases of oranges, sent as a trial shipment testing the market, and I am forwarding some particulars as to what favour the shipment met with on this side.

"My first man to interview was Mr. J. Cunningham, Inspector of Fruit Pests, who was very enthusiastic regarding the consignment. He immediately wanted to know why the Australian growers did not ship in large quantities, as supplies from California about this time of the year have always been very small. Mr. Cunningham says that the fruit can be brought into Vancouver during the months of August, September, October, November, and December, and compete well with any other fruit arriving from elsewhere.

"The oranges shipped were Valencia and Navels. The former arrived in splendid condition, the latter not so well, being a little dried, but all found a ready market, and sold on an average of 19s. 9d. per case. The lemons sold at 17s. 8d., but the market is not so good for lemons as oranges.

"I had the pleasure of being shown the whole shipment by the wholesale fruit merchant who was disposing of same for the broker. He also informed me that oranges, in particular, will always have a ready market in the last five months of the year, and any that can be shipped to arrive here for the Christmas trade will be sure of selling at a very good figure. The fruit, if anything, arrived in a badly graded condition for this market. The buyers want fruit packed in sizes of 96, 112, 126, 150, 176, 200, 250.

"The fruit was shipped partly in cold storage and partly as ordinary cargo. The former arrived in the better condition by far.

"I shall be glad of the opportunity of sending information to any of the Victorian fruitgrowers concerning this market, at any time they choose to write me."

PINEAPPLE CULTURE.

BEERWAH AND GLASS HOUSE MOUNTAINS.

Glass House Mountains has long been known as a citrus centre, though only a few orangeries have been established. The same may also be said of Beerwah, but during the past few years new settlers have happened along, and the area under citrus fruits has been added to. Some four or five years ago Mr. Frank Gowen and his sons laid out three areas for pineapples, and these have made good headway and given good returns. Messrs. C. R. Wilson, T. McWilliam, W. H. Lister, —. Beate, G. Markwell, and Herring and Simpson followed, and to-day there are about 80 acres of pineapples around the Glass House Mountains, and some forty near Beerwah.

The soil on the ridges is of a volcanic nature and is splendidly adapted for pines, because of the gradual slopes, and its nature is such that it is easily worked and kept clean. Truly, like most soils, fertilising has to be undertaken after a few years in order to replenish the soil, but, as in all other cases where this plan is adopted, it pays.

We have been favoured at various times during the past few years with a few of the pineapples from this district, and they are of good size and shape and most assuredly of excellent flavour, whilst we may mention that the oranges we have had from Glass House Mountains are as fine a sample as we have ever had the pleasure of tasting.

The district has some beautiful mountain scenery, and in years to come (when the fifty or more farmers now clearing and establishing citrus orchards and pineapple plantations add to the scenic beauty) it will be an attraction for city folk to spend week-ends and holidays.

THE MACGREGOR PINEAPPLE.

We have received from Mr. E. Smallman, Campsie Fruit Farm, Ormiston, the accompanying photograph of that portion of his orchard which is devoted to the cultivation of a special variety of pineapple which he obtained ten or eleven years ago from what was known as Skyring's Farm, Bulimba. The plants are most prolific bearers, as will be seen by the illustration, which shows them in full bearing just before Christmas. These were only planted in September, 1914, and a single quarter acre yielded 2,500 pines, averaging about 4½ lb. each in weight. One of the special good qualities of the fruit is that it keeps well, and never develops "black heart." A case of the fruit was sent to Sir William MacGregor, late Governor of Queensland, twelve months ago, and he expressed his unqualified opinion of the pines, as the finest in flavour and texture that had come under his notice when in Queensland. Mr. Smallman brought two very fine specimens to this office, each of which went over 4½ lb. and not picked samples. They were quite ripe, but very firm in the flesh, and their flavour quite deserved all that Sir William MacGregor said of them. There having been only one plant originally obtained, it took several years planting of "nibs" and tops before the present area was fully planted and bearing.

PLATE 5.—MCWILLIAMS' PINEAPPLE PLANTATION, "BEANDEM," BEERWAH.

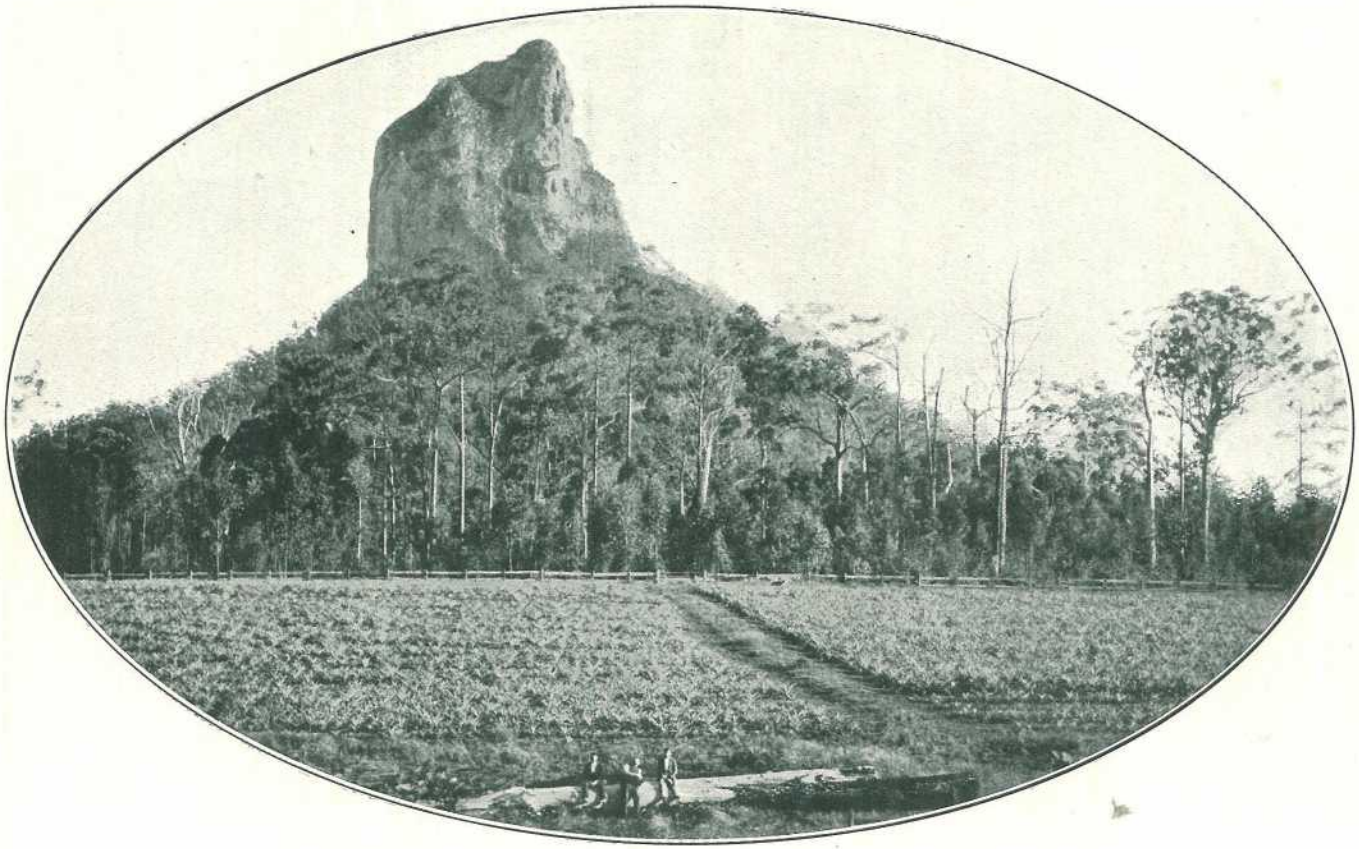


PLATE 6.—LISTER'S PINEAPPLE PLANTATION, "COONOWRIN" (CROOK NECK), GLASS HOUSE MOUNTAINS.

PLATE 7.—THE MACGREGOR PINEAPPLE AT CAMPSIE FRUIT FARM, ORMISTON

Horticulture.

JADOO FIBRE.—No. 1.

The English papers are publishing a description of a process by which the vitality of plants has been enormously increased. The following description of what has been accomplished in this direction brings to our recollection a series of articles which appeared in this Journal so far back as 1898 and up to 1909 on a remarkable discovery made by Colonel Halford Thompson, F.R.H.S., Eastcliffe, Teignmouth, England, resulting in the invention of Jadoo fibre. Mr. W. R. Virgoe, Brighton, Victoria, was, in 1899, appointed sole agent for this substance for Australasia. In view of the revival of what appears to us to be the material then known as Jadoo fibre, now said to have been discovered by Professor R. Bottomley, we shall reprint all the articles on this discovery which we have published since 1898, but first we will record what the latest London papers say about it:—

"In a wooden box filled with moss, on the roof of King's College, in the Strand, potatoes are in full growth in October.

"Some weeks previously a box, 16 in. long, 6 in. wide, and 4 in. deep, was filled with moss and planted with four potatoes. Once every week the moss was watered with an extract from the bacterised peat, the discovery of which Professor W. B. Bottomley recently described to the British Association. The box, after eight weeks' growth, was as full as it could be of fine new potatoes. Given a little sun, there is no reason, he says, why these vegetables should not be grown in a similar way, not only on the roof, but in one's room, if necessary, almost all the year round.

"In many cases the size of plants has been doubled and trebled by this treatment. Radishes and tomatoes have even been grown in pure sand watered with the peat extract. Seventy-two cucumbers, weighing a pound each, have been cut from eighteen treated plants after a twenty days' growth, and sold at Covent Garden before those grown in the ordinary way were ready to cut. Sixteen pounds of tomatoes have been taken from one tomato plant. Similar examples of extraordinary growth could be multiplied by the score.

"Some time ago Professor Bottomley began these experiments in promoting plant growth by inoculating the soil with the culture of bacteria obtained from the root nodules of leguminous plants. It was found that in soil so treated more nodules were produced in the roots, and that the nitrogenous material in the earth was greatly increased. If the cultures contained humus—that is to say, the black, decaying matter that is found in the soil, they did better still.

" ' What we then wanted,' Professor Bottomley said, ' was a source of soluble humus, and we discovered it in peat. We found that by treating peat with special bacteria it was rendered soluble and formed an excellent medium for the growth of nitrogen-fixation organisms.'

" An important question is whether the discovery can be used for greatly increasing our home-grown food supply. We have seen what it does for vegetables. Will it do as much for wheat?

" ' There is no reason why it should not,' was Professor Bottomley's reply to this question, ' if the discovery is taken up and organised on a sufficiently large and authoritative basis. With a definite agricultural policy on the part of the Government, for example, home-grown crops would reap an enormous benefit.

" ' The whole point is this,' he explained. ' There are thousands of acres of poor land which could produce plentifully if provided with plant food, and there are, in Yorkshire, in Somersetshire, in Devonshire, and in Ireland, thousands of acres of peat now practically useless, which by bacterial treatment could be converted into a rich manure, capable, as experiments have shown, at least of doubling the productiveness of the soil.

" Incidentally, it would give Ireland a new industry, for with its practically inexhaustible supplies of peat that country could provide all that would be required for the whole of the rest of the United Kingdom. I am told of one bog alone of 800 acres, where the annual charge is only £20, from which as much peat as one wanted could be obtained.

" Besides the value of peat that has been shown by these experiments there is the fact that ordinary stable manure has been trebled in price in the last two years, and that it is difficult to obtain.

" The Government, it is interesting to add, are apparently alive to the importance of the discovery, for they have made a grant to King's College for the purpose of further investigation. Time, however, will be lost if the years are allowed to pass in experiment. The present is the moment for definite action."

The first account we received about Jadoo fibre was in October, 1898, when, under this singular name, a new and wonderful plant food was introduced in 1896 by Mr. W. R. Virgoe, proprietor of the Old Chatsworth Nursery, at Brighton, near Melbourne. To judge by the encomiums passed on the article by many leading horticulturists and fruitgrowers in the colonies, in England, and in America, it would appear that Jadoo, both in the form of fibre and as a liquid fertiliser, is worthy of attention. Neither of these can be called a manure. They do not " force" anything, but induce a wonderful growth of " fibrous roots," which enable the plant to absorb so much more nourishment that it grows quicker and stronger, and healthier in every way, than it can possibly do in soil alone. The fibre is imported in bales containing six bushels each, hydraulically compressed into a space of 5 cubic feet. For use, the fibre must be thoroughly disintegrated by rubbing it on a washboard or between the hands. When required for open ground for trees, plants,

vines, &c., or for potting plants, it should be moistened with water until a bushel weighs about 35 lb. For potting plants, pots should be used two sizes smaller than is required for soil, and then proceed exactly as with soil, but pot more firmly in all cases. If Jadoo and soil are used together, then a pot one size smaller may be used. It must then be thoroughly watered.

When sowing seeds, rough portions of Jadoo are placed over the usual crocks, and the pot is then filled up with fibre pressed firmly and thoroughly watered. The seed is then sown thinly and covered to about its own depth with a little silver sand. After-watering must not be overdone. When Jadoo and soil are used together, they must be thoroughly mixed. To apply the fibre to old vines, the earth is scraped away as near the principal roots as possible, and the Jadoo is placed about 6 in. below the surface and covered with earth. The object of this is to cause fresh roots to form *in* the Jadoo. It is most important that the fibre be moist. In planting out young vines, a gallon of Jadoo fibre is used both above and below the roots. Jadoo liquid, diluted 20 to 1, helps on the crop greatly, if given when vines are first "breaking" and when the fruit begins to colour.

If Jadoo is placed in the furrow in which vegetable seeds are sown, it is claimed that the crop will come to maturity at least a fortnight sooner than usual.

Potatoes are early matured by placing them in 2 in. of fibre.

In the "Gardener's Chronicle" it is stated that some potatoes were grown in Colonel Halford Thompson's garden at Eastcliffe, Teignmouth, England, which had been grown in Jadoo fibre. The sets were planted over a thin layer of Jadoo, and about 2 or 3 in. over and around them. They were then covered with earth in the usual manner. The crop yielded 5 lb. 2 oz. per plant, being in the proportion of 22 tons to 25 tons per acre of marketable tubers.

Jadoo can be used many times over; in fact, it has not yet been ascertained when it becomes exhausted. This is a great point in its favour, and tends materially to reduce its original cost. When taken from a pot, all that is necessary is to spread out the fibre in a box and expose it to the air for a few days to sweeten it; then water it with liquid Jadoo at a strength of 1 to 20 of water until sufficient moisture has been absorbed to restore it to its original weight (about 35 lb. per bushel). It may then be used as at first.

What Jadoo really is, we know no more than the reader. We merely make mention of it, as we do of many new ideas, in the hope that some enterprising person will make experiments for the benefit of others.

In February, 1899, we received a letter from Mr. Virgoe, in which he gave the following account of the ingredients entering into the composition of Jadoo. He wrote:—

"In your article on Jadoo, you say 'you do not know what Jadoo really is.' I did not until this last month, but I am now in possession

of the detail of the process of manufacture, which I now give for your information, omitting the exact proportions of the ingredients, which, however, I am willing to also furnish, if desired. Jadoo (pronounced Jah-doo) is, I understand, an Indian word, meaning ' magic.'

" Now, as to its *not being a manure*, owing to my assertion to that effect, I have great difficulties with the Customs in South Australia and Western Australia, as on that ground they have imposed a 15s. duty, which I am trying hard to get removed, and, as you will see by the particulars herein, I think it must be deemed a manure. At any rate, I shall for the future call it a fertiliser.

" The foundation of the Jadoo fibre is absorbent peat moss, a small sample of which I send you under separate cover.

" In a large boiler partly filled with water the following ingredients are put in various proportions:—

" Soot, pink gypsum, bone meal, phosphoric acid, potash, nitrate of soda, sugar.

" The boiler is then filled up with the peat moss in a dry state, and the whole is kept at boiling-point for thirty minutes.

" The mass is then taken out and stacked. To it is added yeast, and the mass is fermented, and kept in that state, and at a certain temperature for a month or five weeks, when it is fit for use.

" The Jadoo liquid is made in the same way, but without the use of the peat moss.

" The Jadoo Company admit that Jadoo is still only in its infancy, and that scientific research may vastly improve it."

The accompanying illustration is from a photograph taken on a tobacco plantation in the United States, on which Jadoo was used as a soil and fertilising medium. We are indebted to Mr. Reg. E. Finlay, London, late manager of the Queensland Investment Company, for the photograph.

Following is the substance of a lecture delivered before the Vine and Fruitgrowers' Association of Worthing, England, by the inventor of the above fertilising agent, Colonel Halford Thompson, F.R.H.S.:—

" Take the case of a greenhouse. As a rule, the way in which pests of any kind find their way into a greenhouse is by getting into the soil. Now, Jadoo has been kept at the boiling point for thirty minutes, and upon that depends much of its success, for whatever living organisms may have been in the material must, in this way, be destroyed. Jadoo will have no effect at all on the tap-root, but an enormous effect on the fibrous roots near the surface. Look at this (exhibiting a picture of a *Tacsonia*). That shows you something of its effect on the fibrous roots. It is a photograph of a *Tacsonia* that I had in a large stone bed in a conservatory. It was flowering very badly. I took off the top 3 in. of earth, laid bare the roots, put a layer of Jadoo round them, and covered it with a board. In less than six weeks, that Jadoo was simply a mass

PLATE 8.—TOBACCO GROWN WITH JADOO.

of fibrous roots; the whole 3 in. were full of roots, and the plant flowered grandly. In the case of fruit trees, I have found that Jadoo enormously increases the crop of fruit. One of the greatest advantages is, that Jadoo prevents flagging. When you plant out a tree, put a small quantity of Jadoo above and below—above only, if economy has to be considered —and that tree will never flag. You are certain then that you will not lose it. We have had lately some very strong certificates from the Government Forest Department at a place in Denmark, and they say that they have attained extraordinary results by planting out in this way, and also by sowing in the Jadoo mixed with earth. The Agricultural Society of India recently sent some certificates showing the difference that Jadoo makes in the time that seed takes to germinate. In the case of tea, it was eleven days for Jadoo against thirty-seven for earth; in the case of coffee, it was rooted in one-half the time it took in earth. Every kind of thing they put into Jadoo always rooted in at least half of the usual time. And that brings me back to the old point—*Jadoo encourages fibrous rooting.* That is what you want. If you are using Jadoo, you are attracting out surface roots. You have the whole thing under your hand, and you are putting in something of which you certainly do not lose the effects in any reasonable period. You are improving the soil; the peat moss of which the Jadoo is largely composed remains, and is almost imperishable, so that whenever you give food afterwards, you have a medium there that will store it and convey it to the plant."

The "Fruitgrowers' Newspaper," London, referring to the use of Jadoo fibre, wrote at the time as follows on

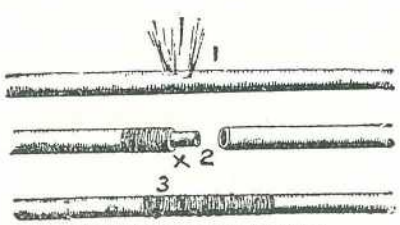
FORCED PEACHES.

"Of the many tests made during the past year none is more instructive or important than our experiments with peaches under glass. This fruit, provided it is handled in a proper manner, can be made exceedingly profitable, and the result we secured passed all expectations. We found that our hint to ensure a cool root, or the roots resting in cool surroundings, was a good one. . . . Now, the great thing was to ensure these cool root conditions to best advantage, and this we found could readily be done by the aid of Jadoo fibre, which we had already used with such good results on our pot tomato crop. We emphasise this point. . . . As these tests as regards forced peaches have been made in our experimental house on growing crops, of which a strict daily account has been kept, they are reliable, and of the utmost value to fruit-growers. In potting the trees the roots rested in a mass of Jadoo fibre, care being taken that it was all covered well with soil to prevent drying out. It is useless to put Jadoo on the top of the pot on that account, and if this point is observed then its effect will be exceedingly beneficial. A good soil was used, the roots were well firmed in the earth, and the drainage conditions were all that could be desired. A water-logged soil or a moisture-laden atmosphere without a free circulation of warm air is injurious to the peach, and must be avoided. As the Jadoo fibre keeps the roots in cool condition, water must not be supplied too freely, this

being regulated by the actual wants of the trees, which are easily observable. We used good turfy loam and a sprinkling of sand. A good thing to ensure at starting is a low temperature; the more gradual the start is made the better, 40 degrees F. being ample. Then great care is needed not to have too high a temperature when the fruit buds show—in fact, not until the fruit sets—as too high a temperature will result in the loss of fruit. If a temperature of first 40 degrees at night, increasing to 50 degrees after the fruit is well set, and after the stoning period of 55 or 60 degrees by night, and 70 to 80 degrees by sun heat, is ensured, things will be satisfactory. Then, after the fruits are half-grown, a higher temperature accompanied by free supplies of moisture and foliage syringing will bring the crop on in good condition. When the fruit is colouring ample supplies of sun heat are needful, and plenty of light and air also tend to the production of perfect fruit. . . . There can be no doubt that the heavy crop and the fine quality and colour of the fruit was due to the cool condition of the roots, ensured by the free use of Jadoo fibre; consequently, this test proves the great value of this material in peach culture, either under glass or in the open air.''

MENDING A LEAKY HOSE.

Not many people, especially amateur gardeners, understand how to repair a leaky hose. Often, finding that binding the leaky spot with various materials has no effect, they discard the old hose and buy a new one. The *New Zealand Farmer* (January, 1916) shows how a hose, leaking in many places, can be repaired in a very simple manner. ''Nothing'' (says that journal) ''is so disagreeable in the garden as having to use a hose that is discharging water at about a dozen places at once. Now, our illustration shows how a leak can be mended satisfac-



MENDING A LEAKY HOSE

torily, or two pieces of hose joined together. Fig. 1 represents a piece of leaky hose. Fig. 2 is the same cut asunder and a piece of bamboo or metal pipe (diameter according to the inside measurement of the hose) inserted in one end and tied. Old brass picture rods or curtain poles, or the light iron piping that is used for carrying electric wires in a house, all make good material for this job; the only point is that it must fit inside the hose. Fig. 3 shows the other end slipped on and securely tied. If this work is done well the hose will be as good as new, and can be made to last for several seasons longer than it otherwise would.''

Forestry.

FELLING TREES.

So many regrettable accidents have lately occurred, resulting in some cases in the loss of valuable lives of those engaged in scrub felling and timber-getting, that a few suggestions, as follow, by one who has been engaged in both occupations may be considered worthy of noting.

Felling a tree scientifically is an art gained by long practice. We are dealing now with saw work. The first thing to be done is to ring the tree, removing a ring of bark about 6 in. wide all round, exposing the sap wood. The saw is then entered on the leaning side. If the tree be absolutely perpendicular, a survey of the branches above will clearly indicate to which side the tree will incline when falling. It will naturally fall on the side of the heaviest limbs. In such a case the cut is begun on that side. To ensure a perfectly horizontal cut, the saw must be held horizontally, care being taken to keep the back up, as it tends to sag downwards, until it has entered far enough to rest on the lower side of the cut. But still the back must be kept up, for, if cutting proceeds with the back resting, the cut will naturally take an upward direction.

Having entered the saw to a depth not further than nor even quite so far as the centre of the tree, withdraw the saw. Here I may remark that when a tree has a considerable lean, the saw should be withdrawn as soon as it is in the least pinched by the coming together of the two parts of the cut. Cases have occurred in which the saw has moved fairly freely, and yet could not be withdrawn owing to the cut having closed behind it. In such a case nothing remains to be done but to chop the saw out, unless it has a removable eye, and then, of course, it can be withdrawn through the cut, so long as it has motion at all. Having now entered the saw as deeply as the hang of the tree will allow, or, in the case of a perpendicular tree, almost to the centre (although to one-third of the diameter is preferable), the sawyers go to the opposite side of the tree and again enter the saw. Now it is that great care and nicety are required. If the new cut is begun too low, either there will be a great labour in wedging the tree off at the last, or it may fall towards the lower cut, and loss of life may ensue. If the cut be too high, over half the first log will be some inches longer than the remainder, and as a consequence the rails, posts, or whatever is to be split from it will be of unequal length and form a "job lot," entailing extra work on the fencer.

I have known men to hit the first (or belly cut) so exactly with the back cut that, except for the unavoidable splintering of the last fibres of wood holding the tree up, none could have told that the two were not a single cut. I had a mate who always drew a charcoal line round the butt of the tree, and worked to that line so truly that we rarely had a difference in the stuff split from the butt log.

Now come some of the niceties of felling, which are adopted to ensure the safety of the timber-getter and also the soundness of the log. Many a tree has split up before being two-thirds cut through by badly managing the final cutting, especially in a high wind. But I would not advise anyone to attempt to fell heavy timber during a gale of wind. I have tried it on two or three occasions, and always with loss.

The usual result is what is technically known as a "kick up."

This is caused in the following manner:—The tree is a slightly leaning one; a heavy breeze is blowing; a deep belly cut has been put in. The back cut has got well in, and the tree is a free running one. Each pull of the saw weakens the remaining wood. Suddenly a gust of wind seizes the top of the tree, which leans over and splits from the depth of the back cut to a length of perhaps 15 ft. Then one of two things happens. Either the back half of the tree, breaking off from the lower half, makes a wild flight into the air and comes down suddenly with terrific force, some distance to the right or left of the stump, or else it does not break right away, but remains suspended. In either case the tree is useless to the splitter. I shall presently show the great danger which exists in this and other cases to human life. Meanwhile I will proceed to fell the tree which has been waiting for us. Having got the saw in to a little over its own depth (in a tree 3 ft. in diameter, say) in the back cut, if you hear no cracking sound you may go on sawing till you reach a depth of 15 or 16 in. Now, without withdrawing the saw, move round to one side gradually, continuing to cut as you go. This is cutting out the "quarters." You do this on both sides till your quarter cuts join the belly cut. The quarters must be deeply cut in, as it is this work which prevents the tree, if a free one, from kicking up and splitting. Now you go back to the back cut, and as there is now plenty of room behind the saw you insert one or more wedges.

Although the time to decide where a tree shall fall is before commencing to cut (the belly cut always being put in on the falling side), yet the needful direction can be given by the judicious use of wedges. Another great help is to cut a notch out of the stump, leaving the butt projecting about 3 in.

This notch serves a double purpose. It leads the tree in the direction in which it is to fall, and it quite prevents the tree from slipping back on the stump (as often occurs), and rushing backwards over it for many feet like a battering-ram. I have known men killed by a tree doing this, and I saw a most miraculous escape of a mate of mine when we were felling an enormous ironbark at the Pimpama, at Ormeau. This tree was nearly 6 ft. in diameter, and rose perfectly perpendicular to a height of about 50 ft. to the first branch. We cut this tree completely through, so that it actually spun on the wedges, which would take no effect on it. We, of course, stood at the stump waiting till it should begin to fall, when we would step back quietly. Suddenly the tree, probably acted upon by a light puff of air up aloft, turned slightly and began to fall in the direction in which we were standing. It then slipped over the stump. My mate, instead of standing his ground coolly, became panic-stricken,

and ran right in the track the huge tree was shooting along, supported on the stump. Just as the butt reached him he fell, and I saw that enormous tree rear up 20 ft. in the air and come down with a crash within a foot or so of the fallen man. At Indooroopilly a man was jammed 3 ft. into the earth by a big tree acting in like manner. It not only killed, but actually dug his grave and buried him.

However, we shall never get our tree down at this rate. We have made the belly cut, the back and quarter cuts; we have notched our stump, and now you may put your wedges in. If you wish the tree to fall towards the right a little, hammer up your left-hand wedge with the maul, and keep on pounding until the maul rebounds with a dull thud. That is a sign that the wedge will go no further till the wood is further cut. Now go to work with the saw again. Cut well in at the quarters; then cut out the back wood. Keep hammering up your wedges. Now when you hear the tree begin to crack, you must keep your nerve and stick to the saw. Saw as hard and as quickly as you can, so as to cut the last inch, if possible, before the final separation takes place. As the tree gracefully bows its head for the crash, *on no account run away*. Stand fast, even with your hand on the falling giant, till you are quite sure that it is going clear on to the spot you decided on. *Then* step well clear, for a tree on striking the ground often rears up its butt like a dying whale its tail, and brings it down with a flop, perhaps 6 ft. to either side, but you have, meanwhile, quickly got 6 ft. away from danger. Running away is the most dangerous thing a man can do when felling a tree with the saw. When felling with an axe there is no need to run, for the tree in falling jumps forward clear of the stump and never "goes back on you."

When timber-getting in a scrub, the timber-getter runs the gauntlet of several dangers. First, the head of the chosen tree is often out of sight. Next, it is usually bound to hundreds of other trees by stout lianas or vines; vegetable ropes that hold it up, even when cut through, and cause it to defy any attempts at directing its fall. Then the sawyer is surrounded and hampered by thick-growing brushwood and young saplings, interspersed with "lawyer" and other troublesome vines. Perhaps, at the foot of the tree, where the foot would rest in working the saw, there is a large jumper ants' nest, and not unfrequently a fine snake comes crawling along to see how matters stand. So that the sawyer has to look into the air, on to the ground, and watch his work at the same time. The first thing to do here is, of course, to provide an avenue of escape, by clearing away vines and undergrowth, if not all round, at least to the width of a clear track.

Should a gust of wind suddenly force the tree towards the back cut, the saw will inevitably be jammed. If the tree refuses to answer to wedges and gets a decidedly wrong lean, it is useless to try and release the saw. Wrenching at it will only result in "buckling" it. Besides, in such a case, the tree is liable to fall at any moment, and in any direction except the right one. The best thing to do is to let go the saw and await developments. The tree *may* go back if the breeze dies away. When this happens, ram in your wedges as quickly as possible, and go on sawing.

I once saw a marvellous escape from death, resulting from such an accident as I have described. My mate and I were timber-getting above the Seventeen-mile Rocks, on the Brisbane River, in 1863. We got the saw jammed by a gust of wind. He stuck to the saw whilst the tree was groaning and cracking. I called to him to let go. Instead of doing so, he actually got in front of the tree, and caught the saw on both sides protruding from the cut, to try and work it out. Suddenly the tree fell. He just had time to throw himself at full length alongside a dead log. I saw the big tree crashing down across the log, which looked old and rotten. If it were crushed, then I would have to pick up what was left of my mate and hold a private inquest. He sang out: "Good-bye, lad; I'm done." But he was anything but done. The log was solid. His first move on crawling out was towards his beloved saw. "There! I knew it would be buckled." Not a word about his wonderful escape, which seemed to him but an ordinary circumstance.

Now, one word about working the saw. Some inexperienced men, in fact all, think that by laying their weight into it they are doing good work. This is their mistake. The saw should run easily, no violent pressure being placed on it. Especially in felling a tree is it essential that each man should give to the other. If one man keeps digging the saw in, he drags the other after him. I have sometimes allowed a new chum to pull me round from the back to the belly cut, and he has wondered how it happened. It is the same when cross-cutting. The saw should run easily, working by its own weight. No undue pressure is required.

It is not a bad idea, when felling a tree, to lay a couple of small logs at about 10 ft. apart, and let the tree fall on them. This raises the butt from the ground and admits of easy cross-cutting without any more wedging than is necessary to keep the cut open to allow of the free running of the saw.

GUAVA VINEGAR.

In November last we were asked to give a recipe for making mango vinegar. We were not able to answer this question at the time, but we have now found a recipe given in the "Journal of the Jamaica Agricultural Society" for making guava vinegar. Possibly this might be applicable to mangoes. The fruit should be well ripened. Wash, and cut in halves, cover with plenty of water and simmer for two hours, strain through a colander, and then strain the juice through a bag. Bottle, and then tie muslin over the tops of the bottles. It requires about five months to turn into strong vinegar. In filling jars or bottles with juice which is to make vinegar, remember that it is well to leave space for plenty of air and only fill the receptacles about two-thirds.

Tropical Industries.

COTTON IN TEXAS, U.S.A.

Our readers, especially those interested in cotton-growing, will remember that in May, 1914, a gentleman from Texas, U.S.A., Mr. E. E. Wood, paid a visit to Queensland with the object of ascertaining the possibilities of growing cotton in this State. Mr. Wood visited several districts where cotton had been, and was at the time being, grown here. He was so much impressed with the excellence of the cotton grown on Queensland farms that he announced his intention to come over and bring with him several American cotton-growers, to settle in this country. He obtained samples of our Uplands cotton, which, he said, could not be surpassed as to quality and returns per acre in the best cotton-growing districts of the United States. In April, 1915, he contributed the following notes on the industry to this Journal:—

"Under separate cover I am sending you some papers that you may get a fair idea of conditions here." With these came a photograph of Mr. Wood's ginnery at Childress, Texas, in which were depicted an American cotton-grower and his five sons, all of whom, as well as Mr. Wood himself, would have come to settle in Queensland, had it not been for the outbreak of the European war, were it not that they were tied to property that then, as now, could not be changed for money or paper currency. Notwithstanding the then low price of cotton, the farmers in the cotton-growing States were in an easy condition, although the drop in the price of cotton in 1914 from 13 cents to 7 and 6½ cents (6½d. to 3½d. and 3¼d.) was a sore disappointment to the grower.

"For cotton ginners it was a very profitable season, also for pickers. My plant has ginned 1,450 bales to 18th December—eighty days' operation=18 bales a day.

"We have had bad weather since for ginning, the ground being covered with snow, and it looks like it will be March or April before the remainder (about 20 per cent.) of crop will be in.

"I believe I will be able to dispose of my gin property as it has shown to be a good money earner. My other property, land and city property (should I leave), would be unsold. War conditions have stopped investments in real estate, and money is available only for keeping business going. However, prospects are good (some say for boom) for better times ahead, but you know the majority of Americans are optimists.

"I started a cable to your Under Secretary for Agriculture in October, offering some good cotton seed cheap, but it was turned back at New York by the censor. Also it would have cost more money to take it through London. They only wanted 25 dollars! Cotton seed has more than doubled in price since, and it would now take from 1·25 (5s. 2d.) to 2·00 dollars (8s. 4d.) per bushel to get good seed. Gin-run seed about 40 cents (1s. 8d.) bushel. Queer these war lords can't read! By this time, I suppose, Australians have got over the shock and excitement of war and settled down to make a clean job of it.

"I enclose you letter received from chance acquaintance I made on train from 'Frisco home; he got the Australian fever from me. I wrote him back the war could not stop the world from going on, and that after it was over there would be millions of Europeans shifting to get

away from after-war burdens, which are likely to be more unbearable than war itself.

"Should the Queensland Government organise and promote immigration along the lines of some of the large land companies (adding the cost of the service to land sold), there could be a good business from America.

"Cotton lands, no better than Darling or Peak Downs, are selling in Texas at 75·00 dollars (£15) to 150·00 dollars (£30) per acre. And there are thousands of tenants looking for the opportunity your country offers, but are too timid or not able to make the move. I hear of some scattered Australian travellers who would be glad to get back home."

The letter referred to by Mr. Wood was received from a large stock breeder in the United States (Mo.) who became very much interested in the former gentleman's enthusiastic account of the splendid stock-raising capabilities of Queensland, who would probably have been here now but for the war, which he thinks "will ruin the possibilities of Australia for a good few years to come."

During his stay in Queensland, Mr. Wood informed himself on the subject of cotton-picking by hand, and was surprised to hear that pickers in Queensland rarely reached 200 lb. a day. He sent us the picking records in Texas, which show what can be done in this line by boys and girls in that State, where the cost of picking, as with us in Queensland, amounts to about ½d. per lb.

Reports, he said, of good picking by the boys are coming in right along. Dennis Sherrell, the eleven-year-old son of D. W. Sherrell, of Tell, picked 350 lb. of cotton in one day. Cotton is fine in every neighbourhood, and the ones who get up and go after it have no trouble in getting the big weighings.

Claudie Scarlet, a ten-year-old girl, picking cotton on J. H. Andrews's farm in Garden Valley, picked 506 lb. of cotton Monday. Miss Claudie weighs only 67 lb. This is a record hard to beat, and one the boys will have to work hard to overcome.

Here in the South our chief fear now is that the European savages will quit wearing clothes.

Pickers are paid one half-penny per pound. At this rate, a family of four pickers like Miss Scarlet could earn £4 6s. per day, whilst eleven-year-old Sherrell would add 14s. 7d. per day to the family income."

Yet, notwithstanding all the evidence we have of the adaptability of over two-thirds of Queensland to cotton-growing, we find that the farmers prefer to grow crops such as wheat, &c., which fail, as did the crop of 1915, during a drought, to planting a drought-resisting plant like cotton. Had the hundreds of acres under wheat in 1915, which did not return a bushel of grain per acre, been under cotton, they would have yielded from 1,000 to 2,000 lb. of cotton worth 2d. to 3d. per lb. in the seed, or 7½d. per lb. ginned. But it is, as is natural, hard to induce the established farmer to adopt a new system or a new crop. It was the same in the old sugar days. Farmers then could not realise what money there was in sugar-growing, even when raw sugar in the sixties and seventies, was selling at £70 per ton, and a sugar-mill could be erected for from £1,500 to £2,000.

There appears to be some move in the direction of cotton-growing in this State, and this is being fostered by the Department of Agriculture and Stock by supplying cotton seed gratis, and undertaking to take all

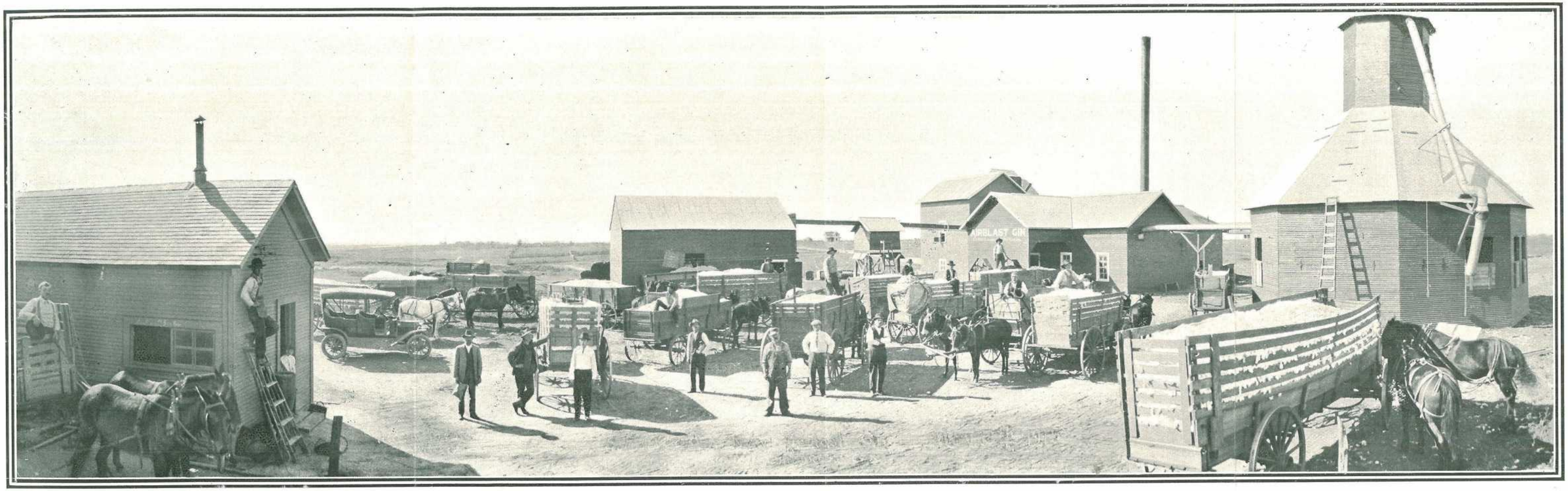


Plate 9.—Mr. E. E. Wood's Cotton Ginnery, Childress, Texas, U.S.A.

the cotton grown, paying the farmer a preliminary 1¾d. per lb., and, further, all profit over and above ginning, freight, &c., charges, after receipt of account sales from England. In December last we received the accompanying illustration of Mr. Wood's ginning establishment at Childress. We cannot give any particulars of this apparently extensive establishment, as no letter accompanied it.

In a late communication to the editor of this Journal, Mr. Wood wrote:—

"Conditions are very unsettled here (in the United States), people and business trying to fit new conditions brought on by the war. We have passed over the worst, and are now looking for largest good to come from the war. Wheat is high and cotton is 10 dollars (a little over £2) per bale above the low point, due to an open outlet for the staple. News from Australia is very scarce in this country, and I am curious to know how the war is affecting your country. I am interesting some oil men in oil and gas prospects in the Roma district, which prospect I, as a layman, consider equal to or better than a great many wild-cat propositions in this country, and for people that chances appeal to it would look good. In this country, when gas is found, there is sure to be oil in the neighbourhood in paying quantities. Oil in Australia would be equal to Mount Morgan for profit. Men in different lines of business are waking up to the fact that there is a country as large as U.S. in a virgin state and full of opportunities for men of the right stamp."

[The conditions under which prospecting for oil in Queensland may be undertaken have altered since Mr. Wood was in the Roma district.—Ed. "Q.A.J."]

In a letter from Mr. Wood, dated 10th December, we have the following information as to the position of the cotton industry in the United States. He states that it is still his intention to come to Queensland, when war conditions are favourable.

" From a ginner's point of view, this season has been a disappointment, as the crop is about half as large as last year. Cotton-seed has been very high, bringing $35.00 (£7) to $45.00 (£9) per ton. Lint cotton has been selling at 11 cents (5½d.) to 13 cents (6½d.) per lb. A 600-lb. bale has been giving the farmer a return of about $100 (£20) per bale, including seed.

" I am anxious to know what success your people have had since I was in your country, with cotton.

" My intentions are still what they were, but with the war on, I feel your country would handicap one who is looking to do something.

" However, I am getting business in shape to go when the favourable time comes.

" Last year, at this time, the cotton-grower was badly disappointed. This year it is the reverse, and I am looking forward to planting a full crop and expecting a fair price next season. With the activity of the boll weevil, and shortage of fertilisers in the eastern belt, it is not probable that a large crop will be raised. For this year the Government is out with an estimate of the total crop of the United States at 11,100,000 bales (besides linters*) of 500 lb. each."

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* Linters are the short cotton left on the seed after ginning, and this is recovered by special machinery. Value, 3s. per cwt.—Ed. Q.A.J.

NEW SYSTEM OF COTTON CULTIVATION.

The system which is here described and recommended has been successfully tested in several localities of the United States, both by the Bureau of Plant Industry of the Department of Agriculture and by practical farmers.

The way to secure an early short-season crop of cotton is to thin the plants later and leave them closer together in the rows than is now customary. Neither of these policies is advisable if used alone, but they give a real advantage when properly combined. Keeping the plants closer together during the early stages of growth restricts the formation of vegetative branches and induces an earlier development of fruiting branches.

The spacing of the plants and stages at which thinning should be done will depend upon local conditions and will have to be determined experimentally in every case.

So long as the plants are close together they do not form vegetative branches; hence by thinning them when the stalks have grown beyond the stage in which vegetative branches are produced, the latter are controlled or suppressed. This makes it possible to leave more plants in the rows than is now customary and yet avoid injurious crowding.

The control or suppression of the vegetative branches also permits an earlier development of fruiting branches and leads to the production of an earlier crop. In regions where the period of crop production is limited either by short seasons or by the presence of the boll weevil, increased earliness is a means of securing larger yields. Hitherto no other way has been suggested whereby it is possible for the farmer to gain such direct control of the behaviour of his crop and to ensure larger yields in short seasons. The danger of weevil injury is greatest under conditions that favour the luxuriant growth of the young plants and induce the formation of large numbers of vegetative sterile branches, and it is under such conditions that the control of the formation of branches becomes most effective as a method of weevil resistance.—BULLETIN INT. INST. OF AGRIC.

QUEENSLAND-GROWN COPRA.

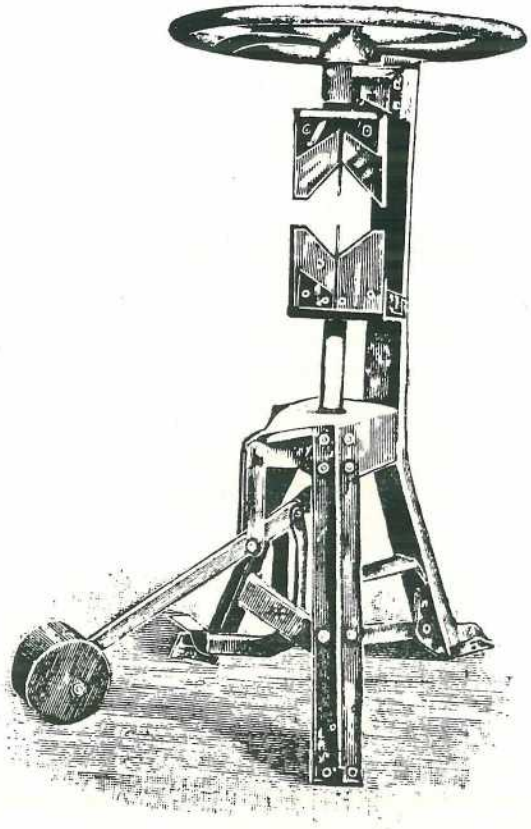
In the last issue of the "Journal" (January, 1916) we published the results of an analysis of copra made from coconuts grown at the Kamerunga State Nursery, Cairns, which showed that the Queensland product compares very favourably as to the oil contents with copra from the West Indies, Mauritius, Cuba, the Philippines, &c. Since then, a communication has been received by His Excellency the Governor, Sir Hamilton J. Goold-Adams, G.C.M.G., C.B., from the Imperial Institute, London, dated 5th November, 1915, in which further valuable information is given in connection with a sample of Queensland copra, which was forwarded to the Imperial Institute by His Excellency on the 12th July last. This despatch was handed to the Minister for Agriculture and Stock, and we have been permitted to make the following extract therefrom:—

"It was supposed by some that the Queensland coconuts do not contain sufficient oil to be of commercial value, and this sample was therefore sent in order to test the point. It was produced at the Kamerunga State Nursery, near Cairns. By analysis, it was found to contain 4·4 per cent. of moisture, and yielded 64·6 per cent. of oil, equi-

valent to 67·6 per cent. of the dry copra. The oil possessed the usual character of coconut oil, and was of good quality, acidity being very low. The yield of oil was quite equal to the amount furnished by other varieties of copra. Kiln-dried copra is stated to yield from 62 to 65 per cent. of fat, while, dried in hot air, a higher yield, often to 74 per cent., is recorded. There is no doubt that copra containing 67·6 per cent. of oil in the dry material would meet with a ready sale if placed on the market in good condition.

"The sample was submitted for valuation to a firm of oil-seed crushers, who also treat copra, and also to a broker. The former reported very favourably on the quality of the copra, pointing out that it would be very desirable to reduce the amount of moisture from 4·4 per cent. to about 3 per cent. The sample was valued at £25 per ton, c.i.f., London (11th October, 1915). A little extra drying, and breaking the copra into smaller pieces, would increase the value by about 10s. per ton. The broker described it as a good sun-dried copra, and valued it at £24 15s. per ton. For comparison of valuations of the chief commercial varieties of copra in London, a list of quotations is appended to the despatch, in which Malabar (on 13th October, 1915) headed the list with £26 15s. per ton, the lowest being Zanzibar and South Sea, valued respectively at £24 5s. and £23 15s. per ton.

"The results of the investigation show that Queensland copra contains a normal amount of oil, and that commercial shipments would be readily saleable in London at good prices, especially if care were taken to dry the copra, so that it contain not more than 3 per cent. of moisture."



ANALYTICAL TESTS MADE AT THE LABORATORY OF THE CENTRAL SUGAR EXPERIMENT STATION, AT MACKAY, FOR THE PURPOSE OF DETERMINING THE RELATIVE RICHNESS OF H.Q. 426, BADILA, GORU, CHERIBON, MALABAR, AND OTAMITE.

It will be remembered that last year we published tables supplied by the Bureau of Sugar Experiment Stations, showing the average per cent. of pure obtainable cane sugar and the quotient of purity of the varieties known as H.Q. 426, Badila, and Goru, *versus* Cheribon, Malabar, and Otamite. These concerned the plant crop which comprised early and late planting—viz., March and August, 1913. In those tables it was shown that, for an average of seven months, the first three canes were much superior to the latter. Those findings have been confirmed by the tests of the first ratoon crops of these varieties made from June to December, 1915. For the purpose of comparison, we give the results of the plant and first ratoon crops side by side:—

Variety.	Plant Crop. Average, 7 Months' Analyses.		1st Ratoon Crop. Average, 7 Months' Analyses.	
	Early Planting. P.O.C.S.	Late Planting. P.O.C.S.	Early Planting. P.O.C.S.	Late Planting. P.O.C.S.
	%	%	%	%
H. Q. 426	16·0	16·6	18·4	18·8
Badila	15·1	16·6	19·8	18·7
Goru	13·2	13·9	17·0	16·4
Cheribon	12·6	12·6	15·6	15·5
Malabar	11·8	11·8	15·0	15·3
Otamite	11·0	11·4	15·0	15·0

In the above table it will be noted that the general results from the first ratoon crop are a good deal higher than from the plant crop. This was no doubt caused by the dryness of the season, which had a marked effect in increasing the density of the cane in almost every sugar district.

From the tables presented below, the superiority of the first three varieties over the Cheribon, Malabar, and Otamite for the whole seven months is plainly seen. As in the results of last year, the latter varieties do not begin to show up till September. For the last three months of the year they are fairly good. H.Q. 426, as pointed out last year, appears to lose sugar after October, thus bearing out its character as an early maturing cane. These experiments, we are informed by the General Superintendent of Sugar Experiment Stations, were instituted at the request of the Mackay Manufacturers' Association of Mackay, and they are of more interest to that district, because scarcely any of the varieties known as Cheribon and Otamite are grown in other sugar districts, whereas in Mackay they form a large proportion of the crop. The figures, however, are interesting to all growers of cane, particularly in view of the investigations of the cane prices boards.

ANALYTICAL TESTS OF 1ST RATOON CANE FROM EARLY PLANTING IN MARCH, 1913.

Variety.	June (8 months).		July (9 months).		August (10 months).		September (11 months).		October (12 months).		November (13 months).		December (14 months).	
	Purity.	P.O.C.S.	Purity.	P.O.C.S.	Purity.	P.O.C.S.	Purity.	P.O.C.S.	Purity.	P.O.C.S.	Purity.	P.O.C.S.	Purity.	P.O.C.S.
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
H. Q. 426 ..	89·5	13·8	89·1	15·0	92·4	15·8	92·7	17·3	93·2	18·3	92·3	15·6	91·3	15·0
Badila ..	93·7	15·1	93·4	16·3	93·9	18·0	92·3	18·0	91·8	17·9	91·8	16·9	93·1	17·1
Goru ..	85·8	10·6	87·3	13·4	91·2	15·2	92·2	16·2	92·1	17·4	92·7	15·3	92·3	14·1
Cheribon ..	79·5	9·5	84·0	11·5	84·9	11·9	88·1	14·4	90·0	15·1	92·6	15·5	92·8	16·1
Malabar ..	69·1	7·2	85·5	12·4	84·7	13·2	87·5	13·8	86·7	14·4	90·6	14·3	90·3	15·1
Otamite ..	67·2	7·1	81·8	10·9	88·4	13·8	87·0	14·1	90·4	14·7	90·0	14·3	91·7	15·1

ANALYTICAL TESTS OF 1ST RATOON CANE FROM LATE PLANTING IN AUGUST, 1913

H. Q. 426 ..	87·9	13·2	92·1	15·2	93·6	16·6	92·7	17·6	94·4	17·4	93·0	16·5	94·0	16·5
Badila ..	88·1	13·5	92·4	15·7	90·0	14·3	92·4	17·4	93·2	18·4	91·0	16·8	93·3	16·2
Goru ..	78·6	9·6	86·0	12·2	89·2	13·4	92·4	16·9	92·3	16·1	92·0	16·0	92·2	14·3
Cheribon ..	78·1	8·9	82·8	11·1	79·9	12·2	86·8	14·2	90·1	15·5	91·7	15·9	91·5	15·6
Malabar ..	76·5	8·8	82·8	11·9	89·5	14·3	86·5	13·2	89·9	15·6	89·5	14·1	89·8	14·4
Otamite ..	78·6	9·4	80·0	10·2	89·3	14·4	88·2	13·9	92·7	14·4	88·9	13·9	89·7	14·3

Entomology.

COMBATING THE CANE BEETLE.

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

I have to submit the following progress report for November, 1915:—

An inch of rain was recorded by the Mulgrave Mill during this month, the fall, however, varying in different localities and being insufficient to establish soil conditions suitable for a general emergence of the "Grey-back Cockchafer" (*Lepidiota albohirta* Watern.). Two root-eating scarabaeid beetles of minor economic importance, belonging to the genera Dasygnathus and Anomala, made their appearance in the canefields about the 15th instant.

It has been deemed advisable to commence a study of the topography of Gordonvale in order to determine as far as possible the relation of topographical conditions to influences arising from the operation of various methods of agricultural and natural control.

The importance of this branch of research cannot be over-estimated, since it affords a means whereby we may arrive at a feasible solution of such questions as the following:—

(1) Why did our "grey-back" cane-beetle attack sugar-cane in the first instance?

(2) Why do certain localities, such as Greenhills, &c., continue to be seriously grub-infested, while others are either unaffected or comparatively free from attack?

(3) Why are canefields in certain limited areas free from grubs, but adjoining plantations either permanently affected or liable to gross infestation for a few seasons followed by long intervals of freedom from the pest?

A detailed account of observations in this connection will form matter for special report later on, but it may not be out of place at present to allude very briefly to a few significant phases of the question.

Referring, for example, to the destruction of feeding trees as a means of repression against the adult beetle, I find that the success of this method of procedure depends to a very great extent on such factors as the geographical position of an affected area, its surrounding soil conditions, and the character, disposition, and relative abundance of timber

in the vicinity. This being so, it follows that, although of supreme importance as a practical remedy, the indiscriminate cutting down of all trees—even when including food-plants of the beetle—is not to be recommended in every case.

Such action, indeed, instead of affording relief may in some instances even tend to aggravate the evil. I am indebted to the courtesy of the manager of Mulgrave Mill and various residents and growers in the district for information respecting degrees of infestation in different canefields, and other details more or less helpful. Preliminary investigations relating to this important side of the question have already resulted in discoveries of more or less economic value, further mention of which, however, would not only be premature in a report of this kind, but necessitate reference to specially prepared topographical maps which cannot be given here, but which will, it is hoped, serve to illustrate a pamphlet dealing with this subject in the near future.

The following interesting circumstance regarding the effect of drought conditions on beetles unable to tunnel through dry ground has just been brought under my notice. It appears that whilst preparing volcanic soil for plant-cane at the "Carrah" Estate, Gordonvale, on or about 28th November, dozens of dead grey-back cockchafers were turned up in the drills, no living ones being observed. The depth of ploughing on this occasion was one foot, in ground fairly loose near the surface but very dry. As previously reported, the above species assumed the adult form about the middle of September, from which we may infer that in certain soils this beetle is probably unable to remain alive during dry weather longer than about ten weeks. Further details in connection with this matter will appear in my next report.

TREATMENT FOR LUMBAGO.

A writer in the "British Medical Journal" advocates the following method of curing lumbago in its acute stage without its being allowed to become chronic:—

(1) Deep thumbing of the lumbar (loin) muscles, during which a painful area is usually found either in the middle line or to one or other side; (2) fixing the part of the vertebral column below this painful region by firm pressure of the thumb on each side of the spine; and (3) making the patient perform movements of flexion, acute dorsiflexion, lateral flexion, and rotation. The result is that the patient is able to at once return to his work, and in no case has the writer had to repeat the process.

Science.

THE TANNIN CONTENTS OF SOME QUEENSLAND BARKS.

BY J. C. BRÜNNICH, F.I.C., AND A. T. JEFFERIS.

The extensive importation to this State of barks and tannin extracts has suggested the advisability of thoroughly investigating our native resources in this respect.

Some years ago a series of analyses were conducted by this Department and published in the "Agricultural Journal" of August, 1911, under the title "Some Queensland Mangrove Barks and other Tanning Materials," by J. C. Brünnich and F. Smith. Some high percentages of tannin were noted, but the difficulty of obtaining extracts in which the amount of colouring was not too high for the production of good leather mitigated against the adoption of these barks for tanning.

With the improvement, however, in decolourising processes, such bark will undoubtedly become of economic value.

With the view of commencing a general survey of Queensland barks, we have analysed a number, particularly from those woods which are valuable for timber, as, should the bark of such be found to contain fair percentages of tannin, a valuable by-product of the timber industry might be saved and utilised.

We are indebted to N. W. Jolly, Director of Forests, for the collection and description of the majority of samples, also to the Assistant Government Botanist (C. White), for the supply and identification of certain samples.

As will be seen, the results in the majority of cases were negative. Certain samples, however, yielded a fair percentage of tannin.

The results were tabulated in three divisions:—

No. 1.—Barks containing over 20 per cent. of tannin. Such should have direct value as tanning material.

No. 2.—Barks containing between 10 per cent. and 20 per cent. of tannin. These might become of value for the making of extracts, particularly where the bark occurs on large trees which are felled for timber.

No. 3.—Barks containing 10 per cent. of tannin. These are probably valueless, though some of the higher ones might be of use for extracts.

As regards Acacias, *A. implexa* is rich in tannin and should be of value.

The "Black Wattle" we were, unfortunately, unable to identify, the bark only being supplied.

"Brigalow," *A. harpophylla,* is of considerable interest, being widely distributed throughout the near West and common on our pear-infested land. It is used locally for tanning purposes, especially the inner bark.

"Tallow-wood," *E. microcorys,* is a coastal tree, but is becoming rather scarce.

"White" or "Scrubby Gum," *E. haemastoma,* occurs on poor dry ridges in our South Coast districts, and is used largely for fencing and firewood.

Gympie "Messmate," *E. Cloeziana,* occurs fairly abundantly in the neighbourhood of Gympie. The tree is large and yields a useful hardwood. Though the bark as a whole is not very high in tannin, it will be seen that the inside bark, which is approximately one-half the total thickness, contains considerably over 20 per cent., and might be of considerable value.

The following are the analyses of samples collected:—

No. 1 Division—Over 20 Per Cent. Tannin.

Name.	Local Name.	Per Cent. Moisture.	Per Cent. Soluble Solids.	Per Cent. Non Tannin.	Per Cent. Tannin.
Acacia sp.	Black Wattle ..	9·38	34·60	9·72	24·88
A. implexa	..	6·50	30·30	8·02	22·28
Eucalyptus Cloeziana (inside bark)	Gympie Messmate	7·42	31.50	8·02	23·48

No. 2 Division—Over 10 Per Cent. Tannin.

Acacia Cunninghamii ..	..	3·05	22·98	5·36	17·62
A. arundelliana	..	5·50	25·78	8·32	17·46
A. neriifolia	..	5·15	22·65	11·30	11·35
A. harpophylla	Brigalow	5·24	30·24	14·10	16·14
Eucalyptus paniculata ..	..	10·35	23·16	8·63	14·53
E. microcorys	..	8·13	29·44	11·78	17·66
E. haemastoma	..	9·45	21·92	9·95	11·97
E. Cloeziana (whole bark)	Gum-topped Ironbark	6·30	18·55	6·40	11·95
Alphitonia excelsa ..	Red Ash	8·00	15·62	4·48	11·14
	White Pine ..	..	..	..	11·50

NO. 3 DIVISION—UNDER 10 PER CENT. TANNIN.

Name.	Local Name	Per cent. Tannin.
Acacia Cunninghamii (Young)	..	8·07
Acacia sp.	Scrub Wattle	8·50
Acacia sp.	Narrow-leaf Wattle ..	3·30
Eucalyptus maculata	..	5·82
E. acmenioides	..	3·36
E. propinqua	..	7·54
E. corymbosa	Bloodwood	3·20
Melaleuca	..	·8
E. tereticornis	Blue Gum	4·0
E. eugenioides	Yellow Stringy Bark ..	3·64
Litsea ferruginea	Bally Gum	2·1
E. citriodora	Scented Gum	3·3
Eucalyptus sp.	Ironbark	6·7
Callitris parlatorei	..	·80
Tristania suaveolens	..	4·10
Syncarpia laurifolia	Turpentine	4·0
Endiandra insignis	Boombun	·79
Dysoxylon cerebriforme	Braintree	1·36
	Rosewood	·62
Carnaevonia aralaefolia	Red Oak	1·6
Tarrietia argyrodendron	Crowfoot Elm	4·0
Gmelina fasciculiflora	White Beech	0·40
	Sarsaparilla	3·33
Castanospernum australe	Bean Tree	·57
	Nettlewood	1·3
Eucalyptus pellita	Forest Mahogany ..	1·0
Podocarpus pendunculata	Black Pine	8·3
Melaleuca sp.	Tea-tree	·31
Casuarina Cunninghamii	River Oak	4·3
	White Silky Oak	2·7
Flindersia pubescens	Ash	·70
Aleurites moluccana	Candlenut	2·3
Embothrium Wickhamii	Pink Silky Oak	·8
Sterculia sp.	Kurragong	4·9
Myristica insipida	Nutmeg	·5
Cardwellia sublimis	Bull Oak	5·0
Flindersia Chatawaiana	Red Beech	4·5
	Ribbonwood	·7
Eugenia sp.	Scrub Mahogany ..	8·3
Melia composita	White Cedar	2·5
Dysoxylon Pettigrewianum	Satinwood	1·1
Cryptocarya Palmerstonii	Black Walnut	2·8
Amoora nitidula	Jimmy-Jimmy	2·8
Daphnandra aromatica	Sassafras	3·0
	Box	1·1
	Blackbutt	5·2
Dysoxylon Muelleri	Miva	trace
	Tallowwood	4·1
Elaeocarpus grandis	Quondong	5·7

General Notes.

THE BRITISH DYEING INDUSTRY.

Shortly after the outbreak of the war the Government appointed a committee to examine the prospects of the British dyeing industry, one of its most promising members being Professor Arthur Green, the head of the dyeing department at Leeds. The work of this committee was directed to the twofold object of supplying immediate needs and of placing the British dye industry upon a firm footing for the future. Even more important than the establishment of a national dye company is the research work instigated by the committee, by means of a grant, at Leeds University. The Leeds laboratories are admirably equipped for work of this kind. Here, under the direction of Professor A. G. Perkin, the son of the founder of the artificial dyestuffs industry, and of Professor Green himself, a number of chemists are hard at work upon researches into the nature of the intermediate products from which synthetic dyes are made. Among them is Dr. Oesch, a Swiss subject, who has studied at several of the principal German factories. The results, we are told, have already been striking. A number of important intermediate products have been worked out which were previously only known to German manufacturers. Among them may be mentioned the product from which the dye known as "indanthrene" is made. This is a well-known blue, familiar in curtains such as the "Sundown." It is the fastest blue known, faster even than indigo. Many of the other researches are of too technical a nature to be described here, but among them may be mentioned a successful investigation of the composition of "Stilbene," an important product from which many useful yellows and oranges are derived. It is one of the most important of the dyes used upon cotton. It was in the Leeds laboratory that the constitution of the famous "aniline black" was first brought to light—a problem which had long baffled chemists in all parts of the world, including Germany. It is added that the authorities, not content with the variety of shades of khaki which have been in use during the last year, are now insisting upon exact conformity to the standard. This has brought a number of urgent technical problems into prominence. For instance, there is the difficulty of blending worsted so as to avoid colour bars in weft. This is due to the fact that the worsted trade—unlike the woollen—endeavours to preserve the length of the thread instead of dividing it, and it is difficult to do this in the blending process described above. A number of worsted firms, however, have now solved this difficulty, and the result is a khaki of standard shade which will wear for ever. There is, therefore, no reason why worsted should not be used equally with wool for clothing our soldiers. Such, at least, is the opinion of Mr. Howard Priestman, a member of the staff of the Textile Department at Leeds University, who is engaged in testing khaki cloths for the Government.—"Manchester Guardian."

WATERPROOFING UNIFORMS.

The French Army authorities, says "Popular Science Siftings," were faced with the necessity of providing an inexpensive and effective means of waterproofing the uniforms of their soldiers. A chemist has come to their rescue with the information that the fat extracted from wool while in the process of cleaning it for manufacture will serve their purpose. Experiments prove that the chemist is right. The waterproofing is done by reducing the wool fat to a liquid by the use of a solvent and diluting it with benzine or naphtha. The garment is soaked in this solution for a few minutes. It dries in a short time. Neither the colour of the article nor the fabric is impaired by the treatment.

DESTRUCTION OF RATS.

We are very frequently appealed to for advice as to how to get rid of rats on the farm, the sugar plantation, and the suburban house. The following notes on the various means adopted for the destruction of these rodents embody all that we have been able to collate on the subject. In future, if our correspondents will apply for a leaflet on rat-traps and poisons, they will receive one which will give the advice contained in the following suggestions:—

RAT POISONS.

1.—Any effective means of destroying the rats which are so destructive in our canefields will be welcomed, and not only by cane-growers, but by townspeople all over the State. Amongst the poisons recommended by the "Hawaiian Forester" are the following:—

Barium Carbonate.—One of the cheapest and most effective poisons for rats and mice, without taste or smell, and in the small quantities used in poisoning rats and mice is harmless to larger animals. Its action is slow but sure, and has the further advantage that the animal, before dying, if exit be possible, usually leaves the premises in search of water.

The poison may be spread on bread and butter, or more conveniently in ordinary oatmeal made into a stiff dough with one-eighth of its bulk of barytes.

OTHER POISONS.

2.—(1.) Arsenic, 2½ lb.; cooked rice, 6 lb.; powdered glass, 2 lb.; toasted cocoanut, 2 lb.

(2.) Arsenic, 2½ lb.; cooked rice, 6 lb.; brown sugar, 2 lb.; powdered glass, 2 lb.; toasted cocoanut, 2 lb.

When these baits were tried in a ricefield, the rats entirely disappeared after six days of continuous application.

(3.) *Ratin.*—The Ratin Laboratory, Gracechurch street, London, England, has put on the market a remedy which, whilst being deadly to rats and mice, is quite harmless to all domestic animals. The success Ratin has met with is remarkable. Recently all the rats on the island of Little Cumbrae were absolutely eradicated, the island being formerly

simply overrun by vermin. Equally good results have been noted in Grenada, Java, India, &c.

There are two kinds, the Ratin No. 1, which sets up a highly contagious disease, and which should, therefore, be used over large areas, and the No. 2, which is quicker acting, and which should be used where the vermin is congregated together, or after the use of the No. 1, where perhaps a few rats remain.

The poison is sold in tins of 6 oz., price 3s.; 2 lb. 3⅕ oz., 12s. 6d. The 6-oz. tin of No. 2 Ratin costs 3s. 6d., and the larger tin 15s. For mice, Ratin is sold in bottles containing 2⅗ oz., price 2s. 6d.

OTHER METHODS.

3.—Take a large earthen jar and set it in the ground near a building frequented by rats. The top should not be more than an inch or two above the surface of the ground. Fill this to within about 5 in. of the top with bran. Place boards over it, but leave a crack wide enough for a rat to easily enter. Let this set for several days and nights, until the rats have got into the habit of visiting it. Then take out the bran and fill with water to within 6 in. of the top, and on this sprinkle a covering of bran about 2 in. thick. Cover as at first, and every rat that has been in the habit of visiting the jar will unhesitatingly jump in, and once in there is no escape for him. He sinks, and the floating bran hides him from sight of the next victim. By once more filling the jar with bran and leaving it for several days before filling again with water, suspicion will be diverted. If there is no convenient place for setting the jar in the ground where it will not be disturbed, good results may be secured by placing a board in such a position that the rats can easily climb into the jar.

4.—A Florida farmer entirely got rid of rats in the following manner:—On some pieces of shingles he put about a teaspoonful of molasses, and on that a small quantity of concentrated lye. He placed these about the corn cribs. Next morning he found forty dead rats and the rest had left the farm for parts unknown. He said he had never known this remedy to fail.

The lye is made of caustic soda. Mix it with the molasses to the consistency of a paste. Smear on a board or shingle and place the board near a rat hole. All that is needed is for the rats to run over the smeared surface. The lye sticks to their feet and burns them. Then they lick their feet, after which performance they will cease to trouble you.

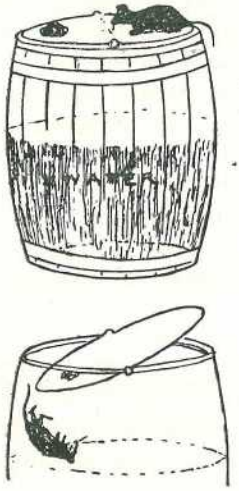
5.—We have been asked to suggest a plan for destroying rats, which often cause havoc amongst the sugar-cane. Some years ago (1899) the late Mr. E. Long, of Habana Plantation, Mackay, adopted with much success the following plan:—As soon as the crop was off (as nothing can be done amongst full-grown cane) great slaughter was caused by laying baits of ripe cane; the cane being split into two or more pieces, 6 in. long, and saturated by dipping in a 2 per cent. solution of strychnine. As long as there was little new cane to be got, these baits proved an irresistible attraction to the rats; after the cane was up the rats were

not so keen, and a new medium of bait had to be tried. The following was the most successful:—Green sweet potatoes sliced up into small pieces (the small tubers were mostly used), allowed to dry for twenty-four hours, and then, as with the cane bait, dipped in a 2 per cent. solution of strychnine. These were freely taken by the rats, of which large numbers were destroyed.

6.—Another simple plan, said to be very effective, is worthy of trial: Dress plenty of bits of straw with strong birdlime, and spread these thickly on the ground around the burrows. Amongst the straws throw some attractive bait—barley or malt sprinkled with oil of carraway is a good draw. Next morning the straws will be found gathered up in little bundles, and in the centre of each will be found a rat, dead or alive.

THE BARREL TRAP.

7.—The device shown is one that has been frequently used to trap native cats and other vermin. In London at the present time it is the means of destroying thousands of rats in large cellars and warehouses.

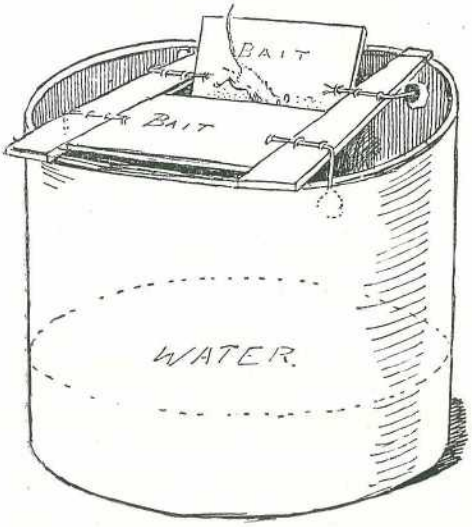


The barrel should be let in so that the swinging door is about level with the floor, but, if this it not practicable, spars or boards should be placed from the walls or the floor to the edge of the barrel, so that the rats can run along to the bait. The swinging cover must work easily, so that when the rat's weight is felt it tips instantly, and does not give the rat a chance to jump for the edge. With a piece of toasted cheese firmly fixed on the cover, a number of rats can be induced to "walk the plank" in a single night. At present it would be wise to put fluid or disinfectant in the water. The water should be deep enough to drown the rats, but not high enough up to allow them to climb up.

ANOTHER INGENIOUS TRAP.

8.—Take a common earthenware pot with, say, 4 in. of water at the bottom. Fix two boards across it as shown in the figure, and connect these by a transverse board divided in the middle, fixing each half by wire

hinges at the cross, and weighting it at each end with lead. The whole surface is now level, and the board is spread with bait. Now the rat steps forward, pop goes the trap door, down goes ratty, and the door adjusts itself to receive more, like a collecting box.



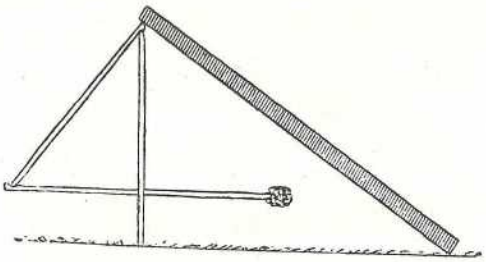
The uneducated rat of early summer is easily enough caught in any sort of trap, but as time goes on the young rats have learned the smell of the human animal, and detect it on the well-baited trap which has been too much handled in getting that fine adjustment which is essential to springing it easily.

Scent to Use.—This being so, it is desirable to employ some strong scent that will both mask the human odour and prove attractive to rats. At the head of these stands oil of rhodium, but it has the objection of being too expensive for any but the professional rat-catcher. Next in point of attractiveness is oil of aniseed. Bruised valerian root is liked by most rodents, but it has the great objection of mustering all the cats in the district, and even if you do not mind their late concerts, you do not want them to be caught in clams, or spring your trap to no purpose. Oil of aniseed is not too expensive if used with reasonable care, and seldom fails to draw. As proof of the scent of rats, a linseed cake was handled on three sides and not on the fourth, and then placed where rats came nightly, and they refused to touch the handled sides while eating the other.

AN EFFECTIVE TRAP.

9.—The "Dead Fall" is another homely trap which costs nothing and often does more execution than expensive engines purchased from the ironmonger. The lid of a box or a stout piece of planking, 15 to 20 inches long, and about the same width, should be set up for a night or two, supported at one end by a stick and a brick or two, to ensure its not falling while the rats make their supper under and around the innocent-

looking object. Meantime, three slips of wood, no stouter than will just support the board with a heavy stone on top, should be prepared. The



cut above will show how a figure 4 is made to act as a support until the movement of the bait acts as a lever, and down comes the weighted board on the animal beneath.

INTOXICATING RATS.

The following remedy may, we think, be taken with a large grain of salt:—

An American farmer tried all sorts of plans to get rid of rats, which played havoc with his corn, wheat, &c. Finally, he soaked a large amount of corn in whisky, placing it in a barrel where the rats could get at it. The plan was, according to his statement, a great success, and eighty-two of the rodents were killed owing to their abandonment of temperance principles.

SUGAR NOTES.

Replying to some questions which have reached us from Durban, South Africa, on yields of sugar from cane and beets, Mr. H. T. Easterby, General Superintendent of Sugar Experiment Stations, writes:—

1. The total amount of sugar in a ton of beets of good quality grown from pedigreed seed would be about 360 lb. The amount of total sugar in a ton of "Uba" containing, say, 14 per cent., would be about 313 lb. In a first-class variety of cane such as " Badila" it would run up to the same or even higher than the amount given for beet.

2. Density represents the total solids in the juice of the cane or beet, and is equivalent to its specific gravity. A good sugar-cane juice should contain on the average about 19 or 20 per cent. of total solids, including sugar. This would be stated in sugar parlance as 19 or 20 degrees Brix, and is equivalent to 10·5 or 11·1 degrees Beaume.

3. The expression ·5 is surely an error. Even 5 degrees Beaume would represent a very poor juice, and it would probably take considerably over 20 tons of cane of this quality to make 1 ton of sugar.

4. The cost of a sugar-making plant for cane or beet would be approximately equal.

Answers to Correspondents.

CARAVONICA COTTON SEED.

The cotton seed placed in our hands for gratuitous distribution has been already sent to applicants, and none is now available.

FERTILITY OF EGGS.

A. S. NORRIS, Humphery-Gradule.

Eggs should become fertile three or four days after the hens are placed with the rooster if the hens are laying. They will be fertile for ten to fourteen days after the rooster has been removed.

SHEEP NOTES.

J.H.T., Deeford—

Your questions were referred to Mr. W. G. Brown, Instructor in Sheep and Wool, who furnishes the following replies:—

"1. I would recommend for the Dawson Valley country Romney Marsh or Border-Leicester rams. If you can purchase crossbred ewes, on which to put them, then you would have a good, hardy, profitable cross for both mutton and wool.

"2. How to tell the age of a sheep. At twelve to fifteen months, the lamb teeth fall and two central teeth appear; at twenty to twenty-six months, two others come; at thirty to thirty-six months, two more; at forty to forty-eight months, two more, making eight incisors or cutting teeth.

"3. There must be wire netting to keep crossbred sheep in a paddock.

"4. Rhodes grass is a good sheep grass, even in winter.

"5. Spear grass, when not too rank, or in seed, is an excellent sheep fodder, but in seed it is death to sheep.

"It is impossible in the short space of a letter to give the whole business of sheep-breeding, but the pamphlets I send will give some insight into it, and common sense will give more. Experience is best of all. Try a few—say, fifty—ewes and watch them."

[Mr. Brown will be pleased to give any information required on the subject.]

PANAMA CANAL TRAFFIC FROM 15TH AUGUST, 1914, TO 14TH AUGUST, 1915.

"INTERESTED"—

The following information is published in the "Board of Trade Journal," London, 4th November, 1915:—

Ocean-going vessels passed through ..	1,317
Total gross tonnage of these vessels ..	6,534,853 tons.
Vessels passed from the Atlantic to the Pacific	656
Aggregate gross tonnage	3,307,096 tons.
Vessels passed from the Pacific to the Atlantic	661
Aggregate gross tonnage	3,227,757 tons.
Tolls earned during the year	5,216,149 dols. (£1,043,229 16s. 8d.)
Excess of earnings above expenses ..	230,833 dols. (£46,166 12s. 6d.)

The above figures, however, do not take into consideration the depreciation of plant, except in a few cases of minor importance, nor do they allow for interest on the money invested, nor for a charge to amortize the debt. A considerable amount of tolls will also be refunded on account of the ruling of the Attorney-General of the United States that the tolls shall not be greater than the equivalent of 1 dol. 25 cents (5s. 1¼d.) per net ton on the basis of measurements for registry in the United States. For the net tonnage, roughly, 1,000,000 tons may be deducted from the gross as given above.

NATIONALITIES USING THE CANAL.

	Number of Vessels.		Number of Vessels.
British	568	Danish	31
American	544	Swedish	27
Norwegian	53	Japanese	13
Chilian	41		

Besides 10 vessels belonging to France, Russia, Peru, Argentina, Holland, Italy, Honduras, Panama, Nicaragua.

PANAMA LANDSLIDES.

"This last slide of earth is the largest since the Panama Canal was opened to traffic. It is difficult to say how long it will be before it is ready for shipping.

"I am sending all the dredgers up to the Gaillard cut, where most of the sliding occurred. They will be kept busy night and day."

Colonel Goethals made this statement at Balboa.

Albert F. Pilsbury, the Minneapolis flour magnate, declared that it would be months before traffic could be resumed.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JANUARY, 1916.

Article.		JANUARY. Prices.
Bacon	lb.	1s. 3½d. to 1s. 4½d.
Bran	ton	£9 15s.
Broom Millet	"	£37
Butter	cwt.	125s.
Chaff, Mixed	ton	£12
Chaff, Oaten	"	£6 10s. to £7 10s.
Chaff, Lucerne	"	£13 15s. to £15
Chaff, Wheaten	"	£6 10s. to £7 10s.
Cheese	lb.	11d. to 11½d.
Flour	ton	...
Hams	lb.	1s. 3d.
Hay, Oaten (Victorian)	ton	£6 10s.
Hay, Lucerne	"	£9 15s. to £10
Honey	lb.	3½d. to 3¾d.
Maize	bush.	7s. 1d.
Oats	bush.	4s. 9d.
Onions	ton	£6 to £6 10s.
Peanuts	lb.	3½d. to 5d.
Pollard	ton	£11 10s.
Potatoes	"	£16 10s. to £18
Potatoes (Sweet)	cwt.	10s. 6d.
Pumpkins	ton	£11
Eggs	doz.	1s. 3d. to 1s. 5d.
Fowls	pair	4s. to 6s.
Ducks, English	"	4s. to 4s. 9d.
Ducks, Muscovy	"	7s. to 8s.
Geese	"	10s. to 11s.
Turkeys (Hens)	"	10s. to 12s.
Turkeys (Gobblers)	"	20s to 35s.
Wheat	bush.	5s. 9d.

VEGETABLES—TURBOT STREET MARKETS.

Cabbages, per dozen	4s. to 8s. 6d.
Beans, per sugar bag	4s. to 8s.
Beetroot, per dozen bunches	9d. to 1s. 3d.
Carrots, per dozen bunches	1s. to 1s. 3d.
Chocos, per quarter-case	...
Cucumbers, per dozen	6d. to 1s.
Custard Marrows, per dozen	2s. to 4s.
Vegetable Marrows, per dozen	2s. to 4s.
Peas, per sugar bag	5s. to 12s.
Parsnips, per dozen bunches	...
Celery, per dozen bunches	...
Sweet Potatoes, per cwt.	10s. 6d.
Table Pumpkins, per dozen	4s. to 7s. 6d.
Tomatoes, per quarter-case	3s. to 6s 6d.
Turnips, per dozen bunches	...
Rhubarb, per dozen bundles	...

SOUTHERN FRUIT MARKETS.

Article.	JANUARY. Prices.
Bananas (Queensland), per case	10s. to 14s.
Bananas (Fiji), per case	21s. to 23s.
Bananas (G.M.), per case	...
Bananas (G.M.), per bunch	24s. to 25s.
Cucumbers, per case	6d. to 1s.
Granadillas, per double case	11s. to 12s.
Lemons (Local), per bushel case	4s. to 8s.
Mangoes, per case	2s. to 5s.
Oranges (Navel), per case	...
Oranges (other), per case	...
Passion Fruit, per half-bushel case	2s. to 6s.
Papaw Apples, per double-case	2s. 6d. to 4s.
Pineapples (Queens), per case	9s. to 12s.
Pineapples (Ripleys), per case	4s. 6d. to 7s.
Pineapples (Common), per case	4s. to 5s.
Rockmelons (Queensland), per case	12s. to 14s.
Strawberries (Queensland) per tray	...
Tomatoes, per quarter-case	3s. to 4s. 9d.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JANUARY. Prices.
Apples (American), per case	11s. to 12s.
Apples, Cooking, per case	7s. to 8s. 6d.
Apricots, per quarter-case	...
Bananas (Cavendish), per dozen	4½d. to 5½d.
Bananas (Sugar), per dozen	2d. to 4d.
Cherries, per case	...
Cocoanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	...
Granadillas, per quarter-case	...
Lemons (Lisbon), per case	4s. to 6s.
Limes, per quarter-case	...
Mandarins, per half-case	...
Mangoes, per case	2s. to 5s.
Nectarines, per case	4s. to 6s. 6d.
Oranges (Navel), per case	...
Oranges (other), per case	..
Papaw Apples, per quarter-case	2s. 3d. to 3s.
Passion Fruit, per quarter-case	3s. to 5s.
Peaches, per case	4s. to 7s.
Peanuts, per pound	3½d. to 5d.
Plums, per quarter-case	4s. to 6s.
Pineapples (Ripley's), per dozen	2s. to 4s.
Pineapples (Rough), per dozen	1s. to 2s. 9d.
Pineapples (Smooth), per dozen	2s. to 3s. 6d.
Rockmelons, per dozen	1s. to 8s.
Rosellas, per sugar bag	...
Strawberries, per dozen pint boxes	4s. to 6s.
Strawberries, per tray	...
Tomatoes, per quarter-case	2s. 6d. to 5s. 6d.
Watermelons, per dozen	1s. 6d. to 6s. 6d.

TOP PRICES, ENOGGERA YARDS, DECEMBER, 1915.

Animal.	NOVEMBER. Prices.
Bullocks	£25 to £29
Bullocks (Single)	...
Cows	£17 2s. 6d. to £22 12s. 6d.
Merino Wethers	47s. 3d.
Crossbred Wethers	60s.
Merino Ewes	38s. 3d.
Crossbred Ewes	56s. 9d.
Lambs	41s. 6d.
Pigs (Porkers)	50s.

LONDON QUOTATIONS.

LONDON, 8th January.—The market for frozen rabbits is dull, owing to the large supplies. New South Wales blues, ex store, are quoted at 23s. per crate.

Jute, January-February shipment from Calcutta, £20 5s. per ton.

Hemp, March-May shipment, £41.

Rubber, fine hard Para, 4s. 0½d. per lb.; plantation first latex crepe, 4s. 3d.; smoked sheet, 4s. 3d.

Copra, South Sea, January-February shipment, £32 5s. per ton.

Raw linseed oil, spot pipes, £43 15s. per ton.

The Liverpool quotation for middling American cotton is 7·95½d. per lb.

Comparing these prices with the London quotations for the past three months, it will be seen that a very considerable advance has taken place in the prices of hemp, rubber, cotton, and copra, whilst jute has fallen from £25 15s. to £20 5s. per ton.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Dec.	No. of Years' Records.	Dec., 1915.	Dec., 1914.		Dec.	No. of Years' Records.	Dec., 1915.	Dec., 1914.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	7·19	13	9·15	3·86					
Cairns	7·60	27	16·09	4·09	Nanango	3·57	27	4·05	3·67
Cardwell	8·78	27	8·64	3·58	Rockhampton ...	4·39	27	2·03	5·07
Cooktown	6·06	27	8·01	6·50	Woodford	5·44	27	1·33	4·02
Herberton	5·29	27	8·56	3·67	Yandina	6·89	21	2·79	4·81
Ingham	6·36	22	9·07	1·75					
Innisfail	12·39	27	18·81	2·78	*Darling Downs.*				
Mossman	11·55	5	14·00	5·40					
Townsville	5·34	30	3·22	4·26	Dalby	3·23	27	2·18	2·80
					Emu Vale	3·19	17	4·22	7·38
Central Coast.					Jimbour	3·45	24	2·26	2·46
					Miles	2·70	27	1·46	0·97
Ayr	3·65	27	1·88	2·92	Stanthorpe ...	3·44	27	3·15	3·00
Bowen	3·75	27	1·23	5·61	Toowoomba ...	4·10	27	4·55	7·89
Charters Towers ...	3·08	27	5·06	4·80	Warwick	3·46	27	3·92	3·07
Mackay	6·69	27	7·40	3·44					
Proserpine	7·77	11	7·89	7·99					
St. Lawrence ...	3·91	27	4·18	4·67	*Maranoa.*				
					Roma	2·57	25	1·30	2·65
South Coast.									
					State Farms, &c.				
Biggenden	5·11	14	2·39	1·80					
Bundaberg	4·52	27	2·41	2·13					
Brisbane	5·01	64	1·33	4·93	Gatton College ...	3·18	14	1·37	7·66
Childers	5·44	19	3·72	2·30	Gindie	2·76	13	1·15	0·64
Crohamhurst ...	7·08	22	2·52	5·77	Kamerunga Nurs'y	5·94	23	7·85	5·71
Esk	4·45	27	1·85	3·92	Kairi	6·50	3	8·06	3·65
Gayndah	4·06	27	2·77	4·17	Sugar Experiment				
Gympie	6·48	27	7·57	2·52	Station, Mackay	7·92	16	8·47	2·47
Glasshouse M'tains	7·41	6	1·39	7·22	Bungeworgorai ...	1·78	3	0·91	2·77
Kilkivan	4·46	27	3·58	1·25	Warren	...	...	1·72	3·77
Maryborough ...	4·40	27	2·37	1·89	Hermitage ...	2·12	7	3·57	3·68

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for December 1915, and for the same period of 1914, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE AND SUNSET AT BRISBANE AND THE PHASES OF THE MOON FOR THE FIRST FOUR MONTHS OF 1916.

Date.	JANUARY.		FEBRUARY.		MARCH.		APRIL.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	4·57	6·45	5·21	6·42	5·42	6·19	5·58	5·46
2	4·57	6·45	5·21	6·42	5·42	6·18	5·59	5·45
3	4·58	6·45	5·22	6·41	5 43	6·17	5·59	5·44
4	4·58	6·45	5·22	6·41	5·43	6·16	6·0	5·43
5	4·59	6·45	5·23	6·40	5·44	6·15	6·0	5·42
6	5·0	6·46	5·23	6 39	5·45	6·14	6·1	5·40
7	5 0	6·46	5·24	6·39	5·45	6·13	6·1	5·39
8	5·1	6·46	5·25	6·38	5·46	6·12	6·2	5·38
9	5·1	6·46	5·26	6·37	5·46	6·11	6·2	5·37
10	5·2	6·46	5·27	6·37	5·47	6·10	6·3	5·36
11	5·3	6·46	5·27	6·36	5·47	6·9	6·3	5·35
12	5·4	6·46	5·28	6·35	5·48	6·8	6·4	5·34
13	5·5	6·46	5·29	6·35	5·48	6·7	6·4	5·33
14	5·6	6 46	5·30	6·34	5·49	6·6	6·5	5·32
15	5·7	6·46	5·30	6·33	5·49	6·5	6·5	5·31
16	5·8	6·46	5·31	6·32	5·50	6·4	6·6	5·30
17	5·8	6·47	5·32	6·31	5·50	6·2	6·6	5·29
18	5·9	6·47	5·32	6·31	5·51	6·1	6·7	5·28
19	5·9	6·47	5·33	6·30	5·51	6·0	6·7	5·27
20	5·10	6·47	5·34	6·29	5·52	5·59	6·8	5·26
21	5·11	6·46	5·34	6·28	5·52	5·58	6·8	5·25
22	5·12	6·46	5·35	6·27	5·53	5·57	6·8	5·24
23	5·13	6·45	5·36	6·26	5·53	5·56	6·9	5·24
24	5·13	6·45	5·37	6·25	5·54	5·55	6 9	5·23
25	5·14	6·45	5·38	6·24	5·54	5·53	6·10	5·22
26	5·15	6·45	5·38	6·23	5·55	5·52	6·10	5·21
27	5·16	6·44	5·39	6·22	5·55	5·51	6·11	5·20
28	5·17	6·44	5·40	6·21	5·56	5·50	6·11	5·19
29	5·18	6·44	5·41	6·20	5·57	5·49	6·12	5·18
30	5·19	6·43	...	...	5·57	5·48	6·12	5·18
31	5·20	6·43	...	...	5·58	5·47	...	...

The Phases of the Moon commence at the times stated on or near the 150th Meridian, East Longitude.

			H.	M.	
5	Jan.	● New Moon	2	45	p.m.
12	,,	☾ First Quarter	1	38	,,
20	,,	○ Full Moon	6	29	,,
28	,,	☽ Last Quarter	10	35	a.m.

The moon will be partially eclipsed between 6 p.m. and 7·24 p.m. on January 20th. It will be at its nearest to the earth on the 4th at midnight, and at its greatest distance on the 17th at 3 p.m.

4	Feb.	● New Moon	2	6	a.m.
11	,,	☾ First Quarter	8	20	a.m.
19	,,	○ Full Moon	12	29	p.m.
26	,,	☽ Last Quarter	7	24	p.m.

The moon will be at its nearest to the earth on the 2nd at 10 a.m., and at its farthest on the 14th at 7 a.m. It will pass very close to the Pleiades on the 11th about midnight.

4	Mar.	● New Moon	1	58	p.m.
12	,,	☾ First Quarter	4	33	a.m.
20	,,	○ Full Moon	3	27	,,
27	,,	☽ Last Quarter	2	22	,,

The moon will be farthest from the earth on the 13 h at 3 a.m., and nearest on the 26th at 11 p.m. It will pass over and occult the bright star, Antares, on the 25th between 4 a.m. and 5 a.m.

3	Apr.	● New Moon	2	21	a.m.
11	,,	☾ First Quarter	12	36	a.m.
18	,,	○ Full Moon	3	7	p.m.
25	,,	☽ Last Quarter	8	38	a.m.

The moon will be farthest from the earth on the 9th at about midnight, and at its nearest on the 21st at 9·36 p.m. It will be near the planet Neptune on the 11th at 7·30 p.m., but a good glass will be necessary to see the planet which will be rather more than the width of the moon to the south.

A total Eclipse of the Sun will occur on Feb. 3rd, visible in parts of Central and South America, in parts of the Pacific and Atlantic Oceans, and partially only in Great Britain, France, Spain, &c.

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 would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 17 m., 28 m., 36 m., and 47 minutes, respectively, later than at Brisbane at this time of the year.

At Roma 15 minutes may be added to the Brisbane times for January and February, and about 17 minutes for March and April.

The moonlight nights for 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 the moon 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 generally 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.

Farm and Garden Notes for March.

FIELD.—Take every opportunity of turning up the ground in readiness for sowing and planting winter crops. The main crop of potatoes should at once be planted. As the growth of weeds will now be slackening off, lucerne may be sown on deeply cultivated soil. The latter should be rich and friable, with a porous subsoil. The land should be thoroughly pulverised. Do not waste time and money in trying to grow lucerne on land with a stiff clay subsoil. Prepare the land a couple of months before sowing, care being taken to cross plough and harrow before the weeds have gone to seed. This ensures a clean field. Sow either broadcast or in drills. In the former case, 20 lb. of seed will be required; in the latter, 10 lb. A good stand of lucerne has been obtained with less quantities. Lucerne seed is worth from £5 10s. to £6 10s. per cwt. Should weeds make their appearance before the plants have sent down their tap roots, mow the field. Before they can again make headway enough to do any damage, the lucerne will be strong enough to hold its own against them. Harrow and roll the land after mowing. Gather all ripe corn. It is now too late to sow maize, even 90-Day, with any certainty of harvesting a crop of grain. Rye grass, prairie grass, oats, barley (in some districts, wheat), sorghum, vetches, carrots, mangolds, and Swede turnips may be sown. In Northern Queensland, sow tobacco seed, cowpea, carob beans, sweet potatoes, opium poppy, &c. Sow anatto, jack fruit, and plant kola-nut cuttings. Some temperate-zone vegetables may be planted, such as egg plant, potatoes, &c. Coffee-planting may be continued. Harvest kafir corn and paddy.

FLOWER GARDEN.—Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety. Amongst the many are—Amaryllis, anemone, arum, babiana, crinum, crocus, freesia, ranunculus, jonquils, iris, ixias, gladiolus, narcissus, Jacobean, lilies, tigridia, tritonia.

All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould. Herbaceous plants and annuals which it is intended to raise from seed should be sown this month. Such are antirrhinums (snapdragon), asters, cornflowers, dianthus, larkspurs, daisies, cosmea, candytuft, lupins, gaillardias, godetia, mignonette, poppies, pansies, phlox, sweet peas. Cannas now planted will require plenty of food in the shape of liquid manure. Put in cuttings of

carnations. Chrysanthemums require attention in the way of disbudding, staking, watering with liquid manure, &c. Growers for exhibition will thin out to a few buds and protect the flowers from rain and sun. Dahlias should be looking well. To secure fine blooms, disbudding should be done.

Now, as to climbers which may now be planted. These are—*Allamanda Schotii* (beautiful yellow), *Antigonon leptopus*, a charming cerise-coloured climber; *Aristolochia elegans*, handsome as an orchid and easily grown; *Aristolochia ornithocephala* (Dutchman's Pipe), very curious, large, always attracts attention; *Asparagus plumosa* grows in any shady place; *Beaumontia grandiflora*, splendid white flower, grand for a fence, will grow 50 ft. high; Bignonias of several kinds; Bougainvilleas, with their splendid leafy pink and purple flowers, rapidly clothe a fence or unsightly shed with a blaze of blossom; *Quisqualis indica*, a fine creeper, flowers pink, changing to white; Wistaria, purple and white. Most beautiful is the *Bauhinia scandens*, rarely seen about Brisbane. We grew a plant of this climber at Nundah, and it soon closed in the front of the veranda for a distance of over 80 ft. The leaves are very small, and in the flowering season it presents almost a solid mass of beautiful round bunches of blossoms, something like the hawthorn bloom —pink and white. It seeds freely, but the seeds are difficult to germinate, and when they have produced a plant it is still more difficult to rear it. A rooted sucker from the main stem will in all probability grow.

KITCHEN GARDEN.—During this month a very large variety of vegetable seeds may be sown in readiness for planting out where necessary in the autumn, which begins on the 20th of March. All unoccupied land should be roughly dug, and, where required, add well-decomposed manure. Transplant cabbage, cauliflower, celery, &c. Sow French beans, beet, carrot, turnips, radish, cabbage, cauliflower, cress, peas, mustard, &c. Former sowings should be thinned out and kept clear of weeds. Mulch round melon and cucumber beds with a good dressing of long stable manure, as it assists in keeping the fruit clean and free from damp. Cucumbers, melons, French beans, and tomatoes should be looked for every day and gathered, whether required or not, for, if left on the vines to perfect their seeds, the plants will soon cease to be productive, or will form inferior, ill-shaped, and hence unsaleable fruit.

Orchard Notes for March.

THE SOUTHERN COAST DISTRICTS.

The marketing of the main crop of pineapples will continue to occupy the attention of growers; and as it is probable that the plantations have been allowed to get somewhat dirty during the previous month, they should be cleaned up as soon as ever the crop has been got off. The fruit of the new crop of citrus fruit will be showing signs of ripening towards the end of the month; and as the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps should be taken to prevent loss arising from this cause as far as possible.

Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on a barn floor, and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths, but also the fruit-flies. The moths will be found clustered round the trap-fruits in large numbers, and can then be easily caught and destroyed. Fruit-fly will also puncture such fruit; and if the fruit is destroyed before the larvæ reach maturity, a later crop of these insects is prevented from hatching out. Fruit-flies may also be caught in large numbers by means of such artificially ripened fruits. The fruits are smeared with tanglefoot, and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house-flies on specially prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit-flies.

The yellow peach-moth that does such damage to peaches in spring, and that attacks corn, sorghum, cotton bolls, custard apples, and many other plants and fruits, often does a lot of damage to citrus fruits. It acts in a very similar manner to the second and later generations of the Codling moth of pomaceous fruits, in that it lays its eggs where two fruits touch, under the shelter of a leaf on the fruit, at the stem end of the fruit, and, in the case of navel oranges, in the navel itself; in fact, anywhere that there is a likelihood of the egg not being disturbed. The

egg hatches out into a small spotted caterpillar, which eats its way into the fruit, causing it to ripen prematurely, and fall off. Where two fruits touch, it often eats into and destroys both, and it frequently leaves one fruit to go and destroy a second. It is a very difficult insect to deal with, owing to the number of fruits and plants on which it lives; but, as far as citrus fruits are concerned, the best remedy is undoubtedly to spray the fruit with a remedy that will destroy the young insect when it starts to eat the skin of the fruit. Bordeaux mixture has been found efficacious, but I am of opinion that spraying with Paris green and lime, Kedzie's mixture, or arsenite of lead, will also have good results. The latter poison is, in my opinion, well worth giving a thorough test, as it sticks to the fruit and leaves for a long time. Bordeaux mixture, either alone or in conjunction with Paris green or Kedzie's mixture, is, however, a good remedy, as not only will it destroy the larvæ or prevent the moth from attacking the tree, but it is also the best remedy for black brand or melanose, as well as tending to keep all other fungus pests in check. Fight fruit-fly systematically—both by means of the sticky fruit already recommended and by gathering all fly-infested fruit, such as guavas, late mangoes, kumquats, &c., as well as any oranges or mandarins that may have been infested, as if kept in check now there will be little loss throughout the season. A little fruit will be marketed towards the end of the month. See that it is gathered and sweated for seven days before marketing, and don't gather it too immature. Beauty of Glen Retreat mandarins are often gathered and marketed as soon as they show signs of colouring. They are then as sour as a lemon, and anyone who is unlucky enough to buy them will steer off mandarins for some time to come. This variety should not be gathered till thoroughly ripe, as when marketed in an immature state it spoils the market, as it puts people off eating citrus fruit.

Clean up the orchard after the summer rains, and have everything ready for the marketing of the crop. See that there is a good supply of clean, dry case timber on hand, as one of the greatest sources of loss in shipment is packing fruit in green cases.

Strawberry planting can be done throughout the month. Plant such berries as Federation on the lowest ground, and Aurie, Anetta, Trollop's Victoria, and Glenfield Beauty on warm, well-drained soils. Prepare the land thoroughly, so that it is in perfect tilth, and in a fit state to retain moisture well; as on this, as much as anything, the success of the crop depends. Where new orchards are to be planted, get the land ready—not the clearing, which should have been done months ago, but the working of the land, as it is advisable to get it thoroughly sweetened before putting the trees in.

THE TROPICAL COAST DISTRICTS.

The Notes for February apply equally to March. See that bananas are netted—keep down weed growth, and market any sound citrus fruits. Clean up the orchards as well as possible, and keep pines clean. Get land ready where new orchards are to be set out, as tree-planting can be done during April and May. Pines and bananas can still be planted, as they will become well established before winter.

THE SOUTHERN AND CENTRAL TABLELANDS.

Finish the gathering of the later varieties of deciduous fruits, as well as grapes. Clean up the orchard, and get ready for winter. Get new land ready for planting; and where there are old, dead, or useless trees to be removed, dig them out and leave the ground to sweeten, so that when a new tree is planted to replace them the ground will be in good order.

In the drier parts, where citrus trees are grown, keep the land well worked, and water where necessary.