QUEENSLAND AGRICULTURAL JOURNAL

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Agriculture.

MOLASSES AS A MANURE FOR CANE CROPS.

While on a recent visit to Mackay, the General Superintendent of Sugar Experiment Stations was afforded the opportunity of inspecting one of the most up-to-date cane farms in the district—that of Mr. W. Jackson, of North Eton. For many years past Mr. Jackson has been an ardent enthusiast in the use of sugar-mill refuse such as filter-press cake, wood ashes, and molasses, and the results obtained by him amply justify their employment. Any farmer living close to a mill would be well advised in carting away mill refuse and applying it to the land, as the cost of cartage in such cases is not prohibitive. Molasses is applied by Mr. Jackson at the rate of nearly 3,000 gallons per acre direct to the young cane and also to the ratoons over the trash. The results obtained by him are certainly surprising, the cane being of a rich green colour and far more vigorous and healthy and higher than that which received no molasses. A 200-gallon iron tank on a dray is used for distributing, and the work is cheaply and quickly done. At the same time it is well to remember that failures have occurred in some instances where the direct application of molasses has been made, and it is generally preferred to treat the soil with this substance about six months before it is proposed to plant cane. Mr. Jackson's success is no doubt due to the high ratio of lime in his soil, and a good lime content can be maintained by applying several loads of filter-press refuse. Unfortunately for growers this article is now fast disappearing from our mills, due to new processes eliminating the filter-presses. Lime, however, should be supplied in cheaper forms than it is at present for agricultural purposes, and if this could be done a large demand for same would be made.

QUEENSLAND STATE PRODUCE AGENCY.

Realising that primary production is the mainstay of all new countries, that agriculture is not only a prime factor in development but is at the present time vital to national safety, the Government, determined to do everything possible for the man on the land, has decided to establish an Agency for the sale and distribution of his produce without the intervention of a third party.

For long the farmer has aimed at this and attained some degree of success with butter, cheese, and sugar, but has been unable to overcome the difficulties of establishing closer relations with the consumer for all his other produce, and the State Government will endeavour, on behalf of the producer and consumer alike, to eliminate the middleman's profits; and, in order that this may be brought about, an agency is now established, entitled "The State Produce Agency of Queensland," with State, interstate, and oversea activities, prepared in a few weeks' time (which will be duly advertised in the daily papers) to handle, in any quantity, consignments of cereals, grain, vegetables, potatoes, fruit, hay, chaff, poultry, eggs, bran and pollard, dairy produce, honey, &c., as agent for the producer or owner thereof.

Where an opening is presented, this agency will market in the other States of the Commonwealth and oversea.

The Act establishing it specifically limits commission charges to what is fair and reasonable, abolishing exorbitant profits.

This ensures to the farmer the full value of the produce of his farm.

You will be entitled to see when, where, and to whom your consignment went, and what it realised; and you will receive a prompt, clear, clean account of sales. Your produce will be handled by experts (not novices); consequently, your consignment will realise full value, and you stand no risk of being unable to collect its proceeds, payment being assured and guaranteed by the Government.

This Agency cannot make a profit for anyone but the consignor, so it is really your business—a farmer's co-operative effort in scientific distribution, State-organised. It is a necessary complement to your farm to which good selling is essential, equal in importance to good planting and good harvesting. It will market the produce for you independent of the system which enables outsiders to make more profit out of your farm than you do yourself.

It will secure for you the best returns possible, and also a true and open market for your produce—one not to be deflated or inflated at the will of interested manipulators and operators. No consignment on any account will be taken over and used by this Agency for the purpose of making a general profit. Its one aim and object is to serve, realise, and give satisfaction to each individual consignor.

You are invited to at once open up communication with this Agency. Every possible information on the above subjects will be afforded you, and your correspondence appreciated and promptly attended to, and the records of your transactions with the Agency at all times open to your inspection; and the inclusion of your name as a foundation consignor is sought and will be valued.

WM. E. HOWES, Manager.

THE TREATMENT OF DAMAGED GRAIN.

The serious plague of mice which occurred last season in New South Wales, Victoria, and South Australia resulted in considerable damage to the wheat stored at inland centres. Whilst a certain proportion of the wheat was devoured by the rodents, a considerable quantity was damaged or tainted. Some stored wheat was also damaged owing to rain and the attacks of weevils. The treatment of damaged grain was also dealt with by the Executive Committee as follows:—

The problem arose as to the best method for treating such damaged grain to prevent further deterioration, and, if possible, to purify it so that it could be utilised for food purposes. In July, 1917, the Executive Committee of the Commonwealth Advisory Council of Science and Industry had an interview with Mr. A. O. Barrett, who has had considerable experience with grain in bag stacks, and he outlined a scheme whereby wheat should be stored in special silos after mixing with quicklime. He claimed that this lime treatment has the following advantages:—

1. It dries ordinary f.a.q. wheat, thus rendering it less liable to attacks of weevils, and at the same time improving its milling qualities.
2. It destroys the smell of mouse-tainted or smutty wheat, and sterilises the outside of the grain.
3. It removes the smell of damp, musty wheat and arrests further deterioration by fungus pests.
4. It inhibits the growth of weevils in wheat already infested and prevents them from developing.

These statements were supported by the exhibition of samples of damaged wheat which had been purified in the manner indicated, on a laboratory scale.

The Executive Committee thereupon appointed Professor D. Orme Masson, F.R.S., Professor of Chemistry; Dr. W. Heber Green, Lecturer in Agricultural Chemistry; and Dr. W. J. Bull, Lecturer in Bacteriology in the University of Melbourne, together with Professor T. R. Lyle, F.R.S., to carry out tests of the effects of quicklime on damaged grain on a larger scale, and gratefully accepted Mr. Barrett's offer to allow experiments to be undertaken at the firm's maltings at Richmond. The report on these experiments forms the main part of Bulletin No. 5, recently issued by the Advisory Council of Science and Industry.

Various samples of wheat (including (1) good, (2) weevily, (3) tainted, (4) damp and damaged, and (5) mousey) were treated first by passing each lot through a small-sized Eureka wheat-cleaning machine. The cleaned wheat was then weighed and mixed with 1 per cent. of its weight of quicklime, and then stored for about fourteen days. The good wheat f.a.q. (Federation type) parted with a considerable amount of moisture, and the general effect was that the addition of quicklime to sound grain is in no way harmful, and may be expected to produce some slight improvement. All weevils in the adult stage and practically all grain attacked were removed upon screening the weevily wheat, but the weevils were not killed; it is only by adding lime at a high temperature under the conditions of Mr. Barrett's scheme that this is effected. The tainted wheat lost nearly 20 per cent. upon being screened, and the pronounced mousey and musty odour was considerably reduced, but before the work of the lime could be completed it would require to be applied fresh and hot and left in contact for some months. The damp wheat, although not so bad as the previous wheat, was yet incapable of being converted into a wholesome article, though the lime had materially reduced the smell and bacteria present. The mousey wheat was treated with freshly ignited lime, and the results proved very satisfactory, showing conclusively that the lime, to be effective, must be applied hot. The bacteriological and chemical examinations made of the lime-treated wheat clearly indicate that considerable improvement has been effected.

The bulletin, which gives full details of these experiments, may be obtained post-free from the Secretary of the Advisory Council, 314 Albert street, East Melbourne.

COST OF COTTON-GROWING PER ACRE IN TEXAS, U.S.A.

As the cost of producing cotton will no doubt be frequently inquired about during the next month or two, we (''Commerce and Finance'') take occasion here to refer to some figures adduced by W. B. Yeary, Assistant Director of the Bureau of Markets of the State Department of Agriculture at Austin, Texas. In a long discussion of the subject, published in a Houston paper, he gives the following

statement of the per acre cost of cultivating 1,080 acres of land on the Taft Ranch in 1912, when the yield was 300 lb. of lint cotton per acre:—

	Per Acre. Dollars.
Labour for cultivation, picking, ginning, &c.	12.87
Feed for mules, in addition to that grown on the farm ..	4.15
Supplies and repairs	.68
Poison	.74
Fertiliser (on small portion as experiment)	.15
Depreciation on stock and equipment	1.90
Seed for planting	.20
Overhead expenses, taxes, supervision, &c.	1.50
Total	22.19

These figures represent the cost of producing 300 lb. of lint cotton and 600 lb. of seed (900 lb. of seed cotton). Assuming that the seed sold for 20 dollars per ton, or 6 dollars, the cost of producing 300 lb. of lint cotton would have been 16.19 dollars, or 5.40 cents per lb. As the cost of ginning and the interest on the value of the land is not included, it may perhaps be proper to add an allowance of 1 cent per lb. to cover these items, which would bring the total cost of producing lint cotton on the Taft Ranch in the year 1912 to 6.40 cents per lb. . . . . It is true that a yield of 300 lb. per acre is exceptional.

In 1912 the average production was 200 lb. per acre, and the Taft Ranch figures (plus 1 cent per lb. for ginning, interest and incidentals) applied to the whole area would indicate an average cost of 10.09 cents per lb.

The average advance in the price of all commodities other than cotton since 1912 has been about 80 per cent. On this basis the present cost of producing cotton as expressed in terms of other commodities was about 18 cents per lb.

That this figure is somewhere near the equitable value of cotton under present conditions is the conclusion to which most economists are coming. It may prove to be considerably above its market value if spinners' takings and exports continue to decrease at the present rate.

THE ETTERSBURG STRAWBERRY.

During the late strawberry season, a specimen of a strawberry was brought to this office, the fruit of which was produced on a tall stem. This was called by the grower, a "tree" strawberry. In the April issue of "Garden and Field," Adelaide, S.A., an apparently similar strawberry is described as the "Ettersburg." The information was derived from the Victorian Department of Agriculture, and is as follows:—

This is the so-called "tree" strawberry that was freely advertised last season, and sold at 1s. per plant. It is certainly not a "tree" strawberry—that name is quite a misnomer, and the term "bush" strawberry would certainly have been a better one.

The foliage has grown very vigorously, the leaves are strong, and altogether it may be described as an exceedingly robust and vigorous grower. The "tree" habit which has been ascribed to the plant occurs in the form of strong, rather long and upright flowering stems, which throw the flowers far above the foliage, and taller than any other strawberry so far grown here. Both the main stalk and the individual stems are long, and the flowers are usually well developed.

The first crop of fruit was not generally good, the second being heavier. The berries of the earlier crop were the larger. But neither the early nor the late crop produced berries of large dessert size, although the plants were grown under favourable conditions. The second crop quantity was good, the berries were well coloured, firm, and very well flavoured. So that, judging from the first season's results, it would seem that the Ettersburg strawberry suited the requirements as a jam factory berry, being sweet, solid, and prolific. But it has not proved itself worthy of being placed on the list of strawberries grown for dessert or table. It would be well if the term "tree" were abandoned in favour of a more descriptive name.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towleston," Kingsthorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	4	38	Ayrshire Herd Book of Queensland
		..	2	Ayrshire Herd Book of Scotland
		2	9	Holstein-Friesian Herd Book of Australia
		2	31	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	12	47	Holstein-Friesian Herd Book of Australia
R. Conochie	Brooklands, Tingoora	9	21	Queensland Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Friesian Herd Book of Australia
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Australian Hereford Herd Book
W. T. Savage	Ramsay	2	22	Illawarra Herd Book of Queensland
Tindal and Son ..	Gunyan, Inglewood	50	400	Australian Hereford Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Queensland Jersey Herd Book
J. H. Fairfax	Marinya, Cambooya (2)	9	55	Ayrshire Herd Book of Queensland
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
J. Holmes	"Longlands," Pittsworth	6	20	Ayrshire Herd Book of Queensland
P. Biddles	Home Park, Netherby	1	20	Illawarra Dairy Cattle Association
A. Rodgers	Torran's Vale, Lanefield	1	9	Milking Shorthorn Herd Book
R. S. Alexander ..	Glenlomond Farm, Coolumboola	1	..	Holstein-Friesian Herd Book of Queensland
		2	..	Holstein-Friesian Herd Book of Australia
State Farm	Warren	3	83	Ayrshire Herd Book of Queensland
S. H. Hosking.. ..	Toogooloowah ..	2	15	Holstein Cattle Club Herd Book
W. J. H. Austin ..	Hadleigh Jersey Herd, Boonah	2	11	Queensland Jersey Herd Book
Ditto	ditto	..	6	Commonwealth Standard Herd Book
H. M. Hart	Glen Heath Stud, Yalangur	7	21	Ayrshire Herd Book of Queensland
C. Behrendorff ..	Inavale Stud Farm, Boonah	3	9	Holstein-Friesian Herd Book of Queensland
F. A. Stimpson ..	Ayrshire Stud Farm, Fairfield, South Brisbane	25	77	Ayrshire Herd Book of Queensland
M. L. Cochrane ..	Paringa Farm, near Cairns	5	21	Ayrshire Herd Book of Australia

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
Albert Cook	"Greenmount," Mackay	1	8	A.-A. Stud Book, New Zealand
Thomas Brown ..	"Bellgrove," Kingaroy	1	14	Do.
Higgins Bros. ..	Sandy Creek, Leslie, Q.	6	2	Do.
Calcino Bros. .. :	"Summariva," Charleville	3	4	Do.
W. M. McKelvie ..	"Undulla," Miles ..	5	4	Do.
James Connors ..	"Glen Erin," Nanango	1	2	Do.
J. A. Mackintosh ..	"Yundah," Warwick	2	8	Do.
M. J. Luff	Kaimkillenbun ..	1	1	Do.
A. Spencer	Brisbane	2	1	Do.
Beak Pastoral Co. ..	Rockhampton ..	2	10	Do.
W. Jackson	Central Farm, Savannah, Mackay	1	1	Do.
E. Swayne, M.L.A. ..	West Plane Creek ..	1	2	Holstein-Friesian Herd Book of Queensland
Godfrey Morgan ..	"Arubial," Condamine	3	6	Queensland Shorthorn Herd Book
John Anderson ..	"Fairview," Southbrook	7	34	Ayrshire Herd Book of Queensland
James Strong ..	"Woodlands," Gatton	6	23	Queensland Jersey Herd Book

TICK RESISTANT CATTLE.

BY DR. T. HARVEY JOHNSTON and MISS M. J. BANCROFT, B.Sc., Biology Department, University, Brisbane.

The subject of tick resistance of cattle has, in this State during the past few years, been associated with the name of Mr. Munro Hull, of Eumundi, on the North Coast Railway Line, and is at present being investigated by us.

The vital importance of the tick problem (as distinct from the subject of "tick fever" or "redwater") is brought home to every cattleman by the depreciation in value of an animal caused by "tick worry" and the trouble and expense incurred in the erection and maintenance of dips. The established fact that Mr. Munro Hull has had now for several years a large number of animals, which have become tick-resistant and have remained practically free from ticks, though running in ticky paddocks where control animals become heavily infested, and that these resistant cattle are never dipped or sprayed or treated in any way for ticks, alone warrants some attention being paid to the subject and to the possibilities of spreading the peculiarity.

In view of the fact that one or more tick-resistant animals occur in very many herds and the utter impossibility of examining more than a small fraction of the total number, all who are interested in the subject are invited to send to either of the abovenamed any observations they have made, or may make, which may help in the solution of the problem. It is felt that the experience and opinions of the many observant dairy farmers and cattle-raisers throughout the State would be extremely valuable.

Correspondents are particularly asked to note that the investigators are not at present concerned with the subject of "cattle-tick fever." It is hardly necessary to state that only facts are desired, uncertain statements being devoid of scientific value.

Authentic observations under the following headings as regards tick-resistant animals would be useful:—

1. Are these animals more usually of any particular breed?
2. The length and texture of the hair.
3. The colour, texture, and oiliness of the skin.
4. The general condition and stamina of the beasts.
5. The length of time the animals have been resistant. Have they possessed the resistance from birth, or have they acquired the peculiarity later in life?
6. The transmission of this resistance to progeny.
7. The nature of the country on which the animals are running.
8. Influence (if any) of food.
9. The effect (if any) of dipping upon such resistant animals.
10. Whether the exudate described below has ever been noticed on these cattle.

EXUDATE FOUND ON CERTAIN TICK-RESISTANT COWS.

This exudate or so-called serum has on many occasions been referred to by Mr. Munro Hull, who was, as far as we know, the first to bring it under public notice in Australia.

It consists of drops of a clear yellow fluid which appear on the skin on various parts of the body, notably on the escutcheon, where it is more evident owing to the shortness of the hair. These drops become thick and sticky, ultimately forming little granular masses or thin flat yellow scabs, according to the size of the original drop. These are readily flaked off, leaving a patch of clean, smooth skin below. Blood is sometimes present, in which case the resultant scab is discoloured. There is no evidence that each patch of exudate is caused by the bite of the tick. Very occasionally larval ticks have been found attached to a dry scab, owing, no doubt, to their having become entangled in the sticky fluid. The affected area is irritable, the cows showing a great desire to lick or rub the part. The condition is apparently more or less dependent on the weather, being more usually seen on a hot, muggy day.

There are certain conditions which may be confused with this exudation, *e.g.*, "tick sores." The only kind of tick sore which is likely to be mistaken for it is that in which the scab appears as a dark blood-stained centre to which a tick is often seen attached, surrounded by a ring of clear, yellow material. Beneath the discoloured centre is a little plug of blood and pus, while, when the scab is removed, a corresponding pit is seen in the skin.

The presence of a depression (often pus-filled) beneath the scab distinguishes a tick sore from the scab formed from the "serous" exudate. The presence of a tick or a depression where the mouth parts of a tick have been inserted is also a marked difference.

Thick whitish scurfy scabs occur especially at the butt of the tail and in the ears of some animals, but no cattle-owner is likely to confuse these with any of the conditions abovementioned.

MEASURING LOG TIMBER.

There are five systems of measurement in use for the purpose of ascertaining the cubic and superficial content of log timber in various countries, known as the "Die Square," "Calliope Measure," "True Contents," "Board Measure," and "Quarter Girth." The latter system—"Quarter Girth"—is that in use in British countries, and is generally approved, as it distributes the waste between the vendor and the purchaser. The Rule is:—

Multiply the length of the log in feet by the square of the quarter of the girth in inches in the centre of the log, and divide by 144, which gives the cubic contents in feet, or multiply this by 12 and the superficial feet area is obtained at 1 inch thick.

TO OBTAIN THE APPROXIMATE YIELD OF 1-INCH BOARDING IN A LOG.

Divide the mean girth in inches by 5 for the number of equivalent boards (b); multiply the result by the length (l) multiplied into the diameter (in feet to the nearest decimal) (d) for the yield in superficial feet (f). An example may be given thus—

Mean girth of log, 80 inches; length of log, 30 feet.

Then, $b \times l \times d = f = \frac{80}{5} \times 30 \times 2.1 = 1{,}008$ feet.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 26TH FEBRUARY TO 29TH MARCH, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Margaret ...	Ayrshire ...	28 Dec., 1917	742	4·5	39·52	
Mistress Bee ...	Jersey ...	23 Jan., 1918	681	4·6	36·90	
Lady Spec... ...	Ayrshire ...	19 Feb. ,,	884	3·4	34·88	
Sweet Meadows ...	Jersey ...	8 Aug., 1917	444	6·6	34·75	
Miss Edith... ...	,, ...	23 Dec. ,,	658	4·1	31·68	
Burlesque	,, ...	27 Mar. ,,	381	7·0	31·65	
Leading Lady ...	,, ...	26 Dec. ,,	579	4·6	31·37	
Belinda	Ayrshire ...	14 Jan., 1918	767	3·5	31·37	
Miss Bell	Jersey ...	27 June, 1917	489	5·4	31·19	
Miss Edition ...	,, ...	12 Nov. ,,	588	4·4	30·45	
Jeannie	Ayrshire ...	13 Dec. ,,	716	3·6	30·18	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	730	3·5	29·84	
Netherton Belle ...	Ayrshire ...	17 July, 1917	487	5·0	28·73	
Violette's Peer's Girl	Jersey ...	27 June ,,	470	5·0	27·73	
College Ma Petite	,, ...	19 Nov. ,,	470	5·0	27·73	
College Cold Iron	,, ..	7 Dec. ,,	478	4·8	27·05	
Lady Dorset ...	Ayrshire ...	14 Aug. ,,	516	4·2	25·47	
Thornton Fairetta	Jersey ...	30 June ,,	315	6·8	25·41	
Hedge's Dutchmaid	Holstein ...	7 Sept. ,,	597	3·6	25·19	
Comedienne ...	Jersey ...	13 Dec. ,,	426	5·0	25·13	
College Mermaid...	,, ...	21 Aug. ,,	424	5·0	25·01	
Miss Betty ...	,, ...	27 Mar. ,,	319	6·6	24·81	
Songstress	Ayrshire ...	1 Oct. ,,	448	4·4	24·20	
Hedge's Madge ...	Holstein ...	22 Mar. ,,	442	4·6	23·94	
College Damsel ...	,, ...	12 July ,,	674	4·2	23·41	
Lilia	Ayrshire ...	11 July ,,	471	4·2	23·23	
Iron Plate	Jersey ...	28 June ,,	671	4·2	23·11	
Lady Annette ...	Ayrshire ...	19 Oct. ,,	425	4·6	23·03	
College St. Margaret	Jersey ...	9 Nov. ,,	461	4·2	22·74	
Prim	Holstein ...	3 Aug. ,,	552	3·4	21·92	
Skylark	Ayrshire ...	24 May ,,	409	5·2	21·18	
La Hurette Hope	Jersey ...	22 Aug. ,,	377	4·7	20·87	
College Bluebell ...	,, ...	28 June ,,	391	4·3	20·65	
Netherhall Queen Kate	Ayrshire ...	30 June ,,	476	3·7	20·63	
Charity	Jersey ...	26 June ,,	267	6·4	20·24	

INBREEDING OF DAIRY CATTLE.

It cannot be too prominently kept before dairymen that the only available way to increase the production from their cows is to grade up from what they possess with a purebred dairy bull from a herd with no doubtful blood in it, and it is a well-known fact that we have many such herds in this State. We have dairy bulls to choose from that have Australian records behind them for fifty years, and British another fifty years behind that, and whose offspring at two years old have been going begging for some years before the war for buyers at £10 to £12 per head, finding only few purchasers. And a two-year-old bull will last a farmer ten years, because the surest way of improvement is to use the same bull on his own progeny for as long as he lives. Out-breeding has been the curse of cattle-breeding for the dairy in some States all along. Mr. McNab, Tasmania, in 1900, mentioned a small dairy herd of twelve cows bred up from Shorthorn dams with an Ayrshire bull, a really grand lot, which were being put to an Alderney at the time of his visit; and had the owner started with an Alderney he would probably have had as good a lot; but the case shows the manner in which stock gets mongrelled up by out-breeding. The two herds specially noted by Mr. McNab as being desirably graded up were already in a fair way to being obliterated, as far as uniformity of type goes.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MARCH, 1918.

The fourteenth egg-laying competition held at the College was brought to a close on 31st March. In order to complete the full year (the competition commenced on 3rd April, 1917), the birds owned by Messrs. E. Chester and R. Burns were kept in the pens until the evening of 2nd April, with the result that the former pen increased its score by 9 eggs, making a grand total for the 365 days of 1,661. Mr. Burns's bird laid one more egg, making her total for the full year 335. A full report on the whole competition will be issued later. The following are the individual records:—

Competitors.	Breed.	March.	Total.
	LIGHT BREEDS.		
E. Chester	White Leghorns ...	138	1,652
G. Chester	Do.	78	1,366
W. Becker...	Do.	107	1,366
*G. H. Turner	Do.	99	1,366
*J. M. Manson	Do.	104	1,348
W. R. Crust	Do.	79	1,343
Oaklands Poultry Farm	Do.	73	1,343
T. Taylor	Do.	108	1,316
F. W. Leney	Do.	67	1,304
D. Fulton	Do.	103	1,301
Kelvin Poultry Farm	Do.	78	1,295
*J. R. Wilson	Do.	112	1,277
*A. T. Coomber	Do.	79	1,258
Chris. Porter	Do.	102	1,251
T. A. Pettigrove, Victoria	Do.	84	1,246
*J. Zahl	Do.	88	1,231
Moritz Bros., S.A.	Do.	75	1,207
J. G. Richter	Do.	58	1,186
T. B. Hawkins	Do.	77	1,180
*Dixie Egg Plant	Do.	107	1,178
C. Knoblauch	Do.	91	1,178
Mrs. S. J. Sear	Do.	96	1,164
*Mrs. J. R. D. Munro	Do.	63	1,164
Quinn's Post Poultry Farm	Do.	53	1,164
Mrs. W. D. Bradburne, N.S.W. ...	Do.	69	1,157
C. H. Singer	Do.	106	1,156
J. L. Newton	Do.	66	1,154
A. Shillig	Do.	66	1,142
J. Holmes	Do.	67	1,132
L. G. Innes	Do.	87	1,130
A. H. Padman, S.A.	Do.	54	1.124
*A. W. Bailey	Do.	75	1,121
Mars Poultry Farm	Do.	49	1,093
C. P. Buchanan	Do.	62	1,081
S. C. Chapman	Brown Leghorns... ...	59	1,079
F. Clayton, N.S.W.	White Leghorns... ...	57	1,079
E. Cross	Do.	48	1,076
*T. Fanning	Do.	75	1,074
G. J. White	Do.	37	1,074
E. A. Smith	Do.	73	1,069
Miss M. Hinze	Do.	75	1,062
J. Ferguson	Do.	74	1,059

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	March.	Total.
LIGHT BREEDS—*continued.*			
R. Holmes	White Leghorns ...	77	1,054
G. Howard	Do.	78	1,046
Mrs. J. Carruthers	Do.	79	1,034
Geo. Williams	Do.	46	1,028
*A. E. Walters	Do.	48	1,004
*Dr. E. C. Jennings	Do.	62	997
*C. C. Dennis	Do.	0	822
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	120	1,470
*Mars Poultry Farm	Do.	120	1,428
W. Smith	Do.	99	1,303
A. E. Walters	Do.	90	1,277
*E. F. Dennis	Do.	74	1,217
W. P. Hanson, N.S.W.	Do.	65	1,183
P. C. McDonnell, N.S.W.	Do.	58	1,173
*E. A. Smith	Do.	95	1,168
F. A. Claussen	Rhode Island Reds ...	61	1,161
D. Kenway, N.S.W.	Black Orpingtons ...	98	1,138
Mrs. J. H. Jobling, N.S.W.	Do.	39	1,130
H. Jobling, N.S.W.	Do.	70	1,104
C. B. Bertelsmeier, S.A.	Do.	94	1,082
Cowan Bros., N.S.W.	Do.	79	1,073
King and Watson, N.S.W.	Do.	81	1,063
J. M. Manson	Do.	90	1,021
*Oaklands Poultry Farm	Do.	42	1,001
R. Burns	S. L. Wyandottes ...	63	1,001
*Miss M. Hinze	Black Orpingtons ...	30	987
E. Morris	Do.	86	976
C. C. Dennis	White Wyandottes ...	88	975
*Kelvin Poultry Farm	Plymouth Rocks ...	48	934
*F. W. Leney	Rhode Island Reds ...	30	778
F. Clayton, N.S.W.	Do.	42	769
Totals	...	5,488	83,968

* Indicates that the birds are engaged in single hen test.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	178	210	248	262	221	247	1,366
J. M. Manson	229	243	186	178	240	272	1,348
J. R. Wilson	229	203	193	219	209	224	1,277
A. T. Coomber	206	160	250	237	205	200	1,258
J. Zahl	243	110	247	149	247	235	1,231
Dixie Egg Plant	195	217	178	239	127	222	1,178
Mrs. J. R. D. Munro	264	197	144	153	162	244	1,164
A. W. Bailey	36	213	229	227	227	189	1,121
T. Fanning	157	209	187	146	157	218	1,074
A. E. Walters	120	130	182	222	176	174	1,004
Dr. Jennings	129	118	207	189	220	134	997
C. C. Dennis	176	89	77	154	162	164	822

EGG-LAYING COMPETITION—*continued.*

DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	204	195	267	193	277	334	1,470
Mars Poultry Farm	220	255	232	234	249	238	1,428
E. F. Dennis	233	231	201	277	239	36	1,217
E. A. Smith	193	201	171	218	196	187	1,166
Oaklands Poultry Farm... ...	220	136	144	124	233	144	1,001
Miss M. Hinze	161	136	130	181	185	194	987
Kelvin Poultry Farm	137	143	160	211	106	177	934
F. W. Leney	133	165	118	115	114	133	778

NON-PRODUCTIVE HENS.

Mr. R. T. G. Carey, of Pindora Poultry Farm, Beerwah, whose article on trap-nests for poultry appeared in the March issue of this Journal, sends us a further instructive paper on unproductive hens, which will probably be of interest to those of our readers who are entering on the poultry industry. Mr. Carey writes:—

"One of the essential points in poultry farming not to be overlooked, is that relating to the hen which does not lay eggs. The expense incurred for the keep of such hens, and the room that they occupy upon the perch, afford no corresponding renumeration. Hence, should there be ten such ladies in a flock, each eats from 3½ to 4 oz. of feed daily, and in a week those hens would devour 17 lb. 2 oz. of food, and a month's supply would amount to 68 lb. 8 oz. of feed. That cost incurred, with present-day prices, shows how expensive it is to stock such hens. With bran and pollard at 1s. 8d. per bushel, wheat 5s. 3d. per bushed, and maize 5s. per bushel, which is approximately their respective value at the time of writing, the 68 lb. 8 oz. of feed would cost 7s. 6d. per month, or £4 4s. for a year's maintanence. What a foolish idea it is, then, to keep such unprofitable hens, thus courting failure quickly. But that is not all. We have not estimated the daily visits to the yards for eggs that were not there, the labour of carrying water for drink, the cleaning up of manure and other refuse, which make them a source of tremendous expenditure and swamps up all the profits of the productice fowls. The elimination of non-productive hens helps to minimise the expense, and prompt culling reduces the grain bill from 20 to 25 per cent., without affecting the egg yield, thus revealing that the non-laying hen is absolutely worthless and that to sell her at market value is the best course. One naturally asks: How can you tell a non-productive hen among a flock of fowls when all look alike? The daily visits and your careful observance of each individual bird becomes part of your instinct, enabling you to note at a glance many points, such as faulty shape of the face, crow-face, ugly or unnatural comb and wattles, wrong-coloured eyes, under-projection of beak, wry tail, hunch back, bow legs, five toes where there should be only four, or *vice versâ*, and a host of other defects, which denote points for culling and the lessons to study.

"The visible signs which indicate the non-productive hen are easily recognised. Upon every fowl of the lighter breeds, the pigmentation upon the legs, beak, vent, and hide shows up strongly at an early age, but when the laying season is fully on, all that colouration disappears and a bluish hue appears; the bird's feathers are ragged and tail and wing feathers become bare, resembling points of wire, while she is lean and extremely active. This is the layer. Should a number of fowls appear to have bright-yellow colouration upon their legs, beak, and earlobes when the laying

season is at its height, and their feathers neat and clean, body plump, very particular about her food, that is her ladyship, the non-productive hen, and that is the ocular test as you walk through the flock.

"The scientific test is made by placing three or four fingers between the pin bones near the vent; should there not be sufficient space to admit of the three fingers, then the passage is too small, hence the small egg; but should there be great depth with good width at the business end of a hen, and the feathers fluffy, while the abdomen is pliable, that is the large egg-layer. Again, the length of back is also a good sign of a productive layer. Show birds are picked upon points of attractiveness, their laying abilities not being studied.

"Professor Kirkpatrick, of the Connecticut Agricultural College Poultry Department, U.S.A., reports on the results of culling of flocks: 'Every flock, small or large, should be rigidly examined and deeply culled, so as to gain profits from all the productive fowls and save the waste entailed by the upkeep of the non-productive hen.' That statement and the action of deeply culling form the base of all profitable poultry farming. If the latter be performed, then there would be no lack of egg production, and the financial success of every individual owner of flocks of hens and pullets would be assured.

"Surely, with the laying capabilities of our Australian hens, and the ideal climatic conditions, in an ideal country, to enlarge the capacity of our poultry plants, and with such a ready market at hand, to get rid of unpromising poultry, nothing but the very best of stock should remain. But that is not all. Amongst all the latest inventions for incubation the newest, a 'Cabinette Mammoth,' of 2,400-egg capacity, occupying a space of only 5 square feet, with electric fan chambers, no cooling, and a host of other labour-saving devices, indicates how easily the broods can be hatched out. Then the giant colony brooders for 500 to 1,000 chicks to foster-mother them has relieved mankind of a huge amount of worry, time, and labour, and hurries on the breeding with amazingly light work, so that the whole of the old slow-hatching methods of our foreparents has been completely modernised to a branch of science, and the whole outcome of chicken-raising has been brought down to a limitation of months, and even to days, instead of years. Hence the study and careful examination of the embryo of the fertile and unfertile eggs, deformity, weaklings, and other defects well known to breeders has taught them to begin at the early stage to sort out the undesirable; and as age creeps on over the great hatches, and maturity approaches, the sickle of culling must be carried into effect. Then, what is the result? A perfect-looking flock and one of promise; and one says: 'Ah, well done; I'm right now; all's well.' But no; we have not finished yet. Now comes the laying period, and here is another problem confronting us. That pullet ought to lay but does not. Those pullets of fine carriage, splendid plumage, delicate and ladylike are the particular ones for observation, and require an excursion trip to some profitable market, and so ends her career—space, feed, labour, all saved, and still room left for the worker.

"The United States Government estimates that, since the war, the herds of Europe have been reduced by 115,000,000 meat animals—*i.e.*, 28,000,000 cattle, 54,000,000 sheep, and 32,000,000 hogs—the reduction still being advanced each day. Therefore, with such a huge decrease of meat-producing stock, what a great opportunity awaits poultry-breeders to hatch in big quantities. Poultry is the shortest, quickest, and most profitable source of increase in a limited period of half-yearly instalments of a nutritious food. It therefore behoves Australian poultry-breeders to raise the quantity (for the demand is sure to flow in our direction) to meet that great meat shortage. This is where the great culling gains, and reward for the produce becomes renumerative, the non-productive hens add to the cockerels' quota, and farmers have got the egg-supplying and prolific breeding stock left for good purposes. When the war terminates, those stricken areas must have stud stock to rebuild up their poultry-yards, and Australian breeders should be prepared to meet the demand, as the expansion of the poultry industry is looming ahead, and it is the productive fowls that will build up this noble enterprise and not the non-productive hen."

Viticulture.

HINTS TO GRAPEGROWERS.

BY C. A. GATTINO.

MANURING.

Although the virgin soils of this country do not need any, or at least very little, manuring for several years after being planted, there comes a time when it is required, so that the vine will give a plentiful crop.

The yearly production of grapes and new wood take away each year considerable quantities of matters which form the fertility of the soil. Therefore, to continue and improve such production, we must give back to the soil, under artificial form, the fertile substances given by nature. The substances which generally need replacing are potash (phosphoric acid), nitrogen, and organic matter.

A good, cheap manure may be obtained by digging in all leaves, grapes residues, green-fodder crops, &c.; the town's sweepings and a little stable-yard manure are also good fertilisers for vines. Generally the manures are applied by turning in with the plough or the hoe as soon as they are spread. For soils poor of lime it is a good practice to spread lime at intervals of about ten years.

Hereunder are some practical rules for the manuring of the vines:—

1. For calcareous soils: Ashes, decomposed branches and leaves of the same vines, and maize stocks well chopped.
2. For pebbly soils: Turning under green lupine or trefoil, the spreading of lime, ashes, and fresh surface soil from the woods containing plenty of humus.
3. For clayey soils: First place small stones at the bottom of the holes where the vine is to be planted, and then sand, charcoal, dry vine branches, &c.; put in the soil residues of grapevine branches; also lime or ashes not containing any lye.

With this system you will loosen the soil, improve the natural drainage, and enrich it with materials required by the vine.

(TO BE CONTINUED.)

PRACTICAL HINTS IN ESTABLISHING A VINEYARD.

BY P. MAHONEY.

The most practical method under which to establish a vineyard for commercial purposes, on a small or large, extensive scale, is: First and foremost to plough the land thoroughly to the depth of about 9 in. in February or March (whether virgin land or otherwise). Then harrow it level, but not fine, so as to give the light and air full access in and around the soil, to perform the duties of sweetening and liberating plant-food. Then get the square of the block, more particularly if the vines are not going to be trellised, so as to facilitate cross-cultivation. For without squaring the piece to be planted, the rows will not run straight or parallel both ways, thus debarring cross-cultivation, which is most essential for numerous reasons, viz.:—For the saving of hoe work in keeping down weeds, &c., and conserving of moisture, which is most important, and preventing the ground from becoming baked and hard between the plants during dry spells. Then after the square has been secured and pegs put in on the top and bottom of the land to the distance at which the vines are to be planted, get two steady, strong horses and a plough. Then plough four furrows 9 or 10 in. deep, two one way and two in the opposite direction, leaving no land uncut. These four furrows are to be cut in a straight line between a peg on the top and one on the bottom of the land, leaving the open furrow in a direct line between the pegs. After the whole block has been treated in this fashion—that is, only ploughed between the pegs—the subsoiler is to be brought into action. An ordinary plough, with the mould-board removed, makes a good subsoiler. Set it at as great a depth as the horses can pull it. Three horses are rightly needed on it, but two will do good work. Run it in the bottom of the open furrows (centres) in each score. Now, this being done, the land is left in that state until it rains. If a heavy rain occurs before the time comes for the filling in of the furrows, it would be advisable to run up the furrows once more with the subsoiler, since if the rain should have been heavy it would have a tendency to run the soil together again, but otherwise it is not required. To get the best results, this should be completed not later than March. Now, when these conditions have been complied with, it is necessary to let the furrows lie open until rain occurs. Then, immediately after the rain, run through each furrow with a Planet Junior cultivator (one horse), having it set just a little wider than the open furrow, so as to assist aerating and sweetening. In the case of no rain occurring for about six weeks, the cultivator should be run through the furrows in their dry state. This should be continued until about the end of June or July, when it is deemed satisfactory that the last serviceable rain has fallen before planting season has arrived. After the abovementioned rain the land will have to be ploughed back into the centre, first starting by ploughing two furrows on each row, throwing them towards each other. Do this to the whole block. This will leave two open furrows in each row, of which the subsoiler is to be run in them the same as the first one. Then two more furrows are to be thrown up as with the previous two, and also subsoiled. This having been done, the ground will be left in a mound, which can be levelled with a harrow or disc cultivator, and should be kept in good buckle for planting through the assistance of cultivator and harrows. Now the pegs on the top and bottom sides should be replaced, as probably they were disturbed. Then a line can be drawn from peg to peg with pieces of tape or cloth indicating where vines are to be planted. Later on, during the growing season, more subsoiling can be done—that is, if the growth of the vine warrants it; if not, it can be left until the following season. It is not advisable to subsoil all the land, for in a country such as this, where the rainfall is great, it would have a tendency to run together before the roots derived any advantage from the subsoiling. Undoubtedly subsoiling pays a hundredfold, for it encourages the plant to root deep and also spread without any check. Subsoiling in this way is more satisfactory than trenching or explosives, for it can be done as the plant is growing, thus encouraging the roots, without any fight in the plant's infancy, to spread and go deep, which means everything during dry spells, &c.

(TO BE CONTINUED.)

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 13.

MOSSMAN RIVER GRASS (*CENCHRUS ECHINATUS*, LINN.)

Description.—An erect annual grass, 1-3 feet high, the lower parts of the stem occasionally prostrate and rooting at the nodes. Leaves rather long, flat, glabrous or scabrous-pubescent. Spikes dense, cylindrical, 1-4 inches long; the "burrs" are 3-4 lines in diameter and consist of an involucre of hardened spines connate below and forming a bristly cup at the base, and contain several (usually 2-4) spikelets.

Distribution.—Found in most tropical countries, said to be a native of tropical America; elsewhere probably naturalised. In Queensland it is represented in the Government Herbarium from the following localities:—Johnstone River (*Dr. T. L. Bancroft* and *Rev. N. Michael*), Nelson (*A. A. Girault*), Townsville (*W. Weston*), and Atherton Tableland (*C. T. White*).

I have also received specimens for identification from Fiji (hab., Lautoka, *W. Greenwood*) and New Guinea (hab., Duke of York Islands, *W. Bradtke*).

The reason that it has been passed over previously is that it has been confused with the two other Queensland species (*Cenchrus australis* and *C. elymoides*). It is probably naturalised in Queensland though it has been here for over thirty years.

We also have in our herbarium Papuan specimens collected at Boku by Mrs. H. P. Schlencker. These were recorded as Papuan, as *Pennisetum cenchroides* by F. M. Bailey (*Queensland Agricultural Journal*, Vol. 23, p. 220).

Ewart and Davies record the allied species *Cenchrus tribuloides*, as a naturalised alien in the Northern Territory.

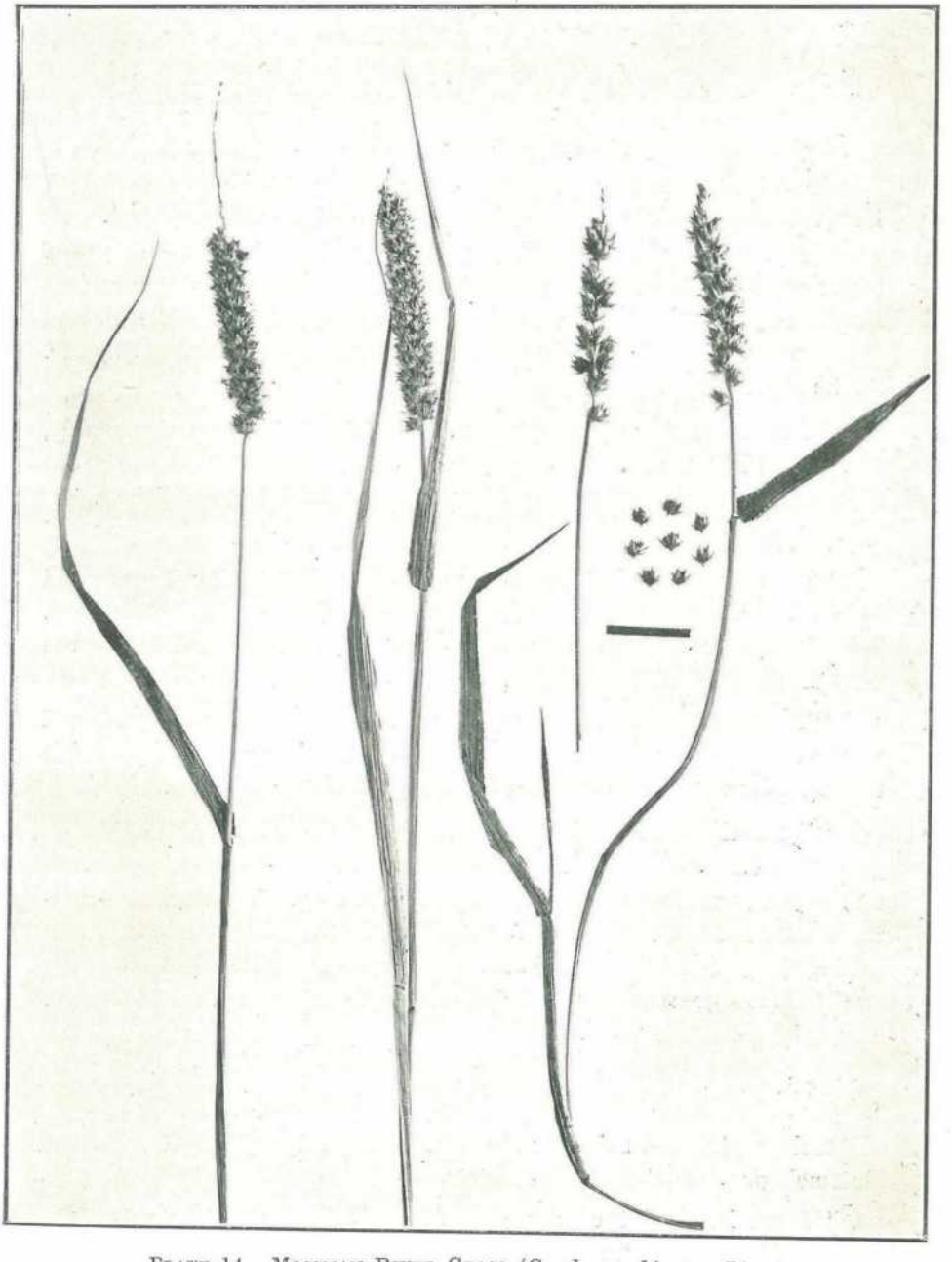


PLATE 14.—MOSSMAN RIVER GRASS (*Cenchrus echinatus*, Linn.).

Entomology.

EXPERIMENTS IN TRAPPING THE QUEENSLAND FRUIT-FLY (*BACTROCERA TRYONI*).

In order to definitely prove the value of certain fruit-fly lures which have recently been discovered by private persons, numerous experiments have been conducted by this Department during the past two years. These experiments have shown that the male fly can be attracted in large numbers by a lure which is apparently a sex lure, and that both male and female flies can be attracted by means of a food lure discovered by Mr. A. W. Harvey, a nurseryman of Clayfield.

In order to demonstrate the value of the latter lure thoroughly, Mr. James Mitchell, of this Department, was instructed to carry out a practical trial on the 25th of March, under strict test conditions.

Mr. Mitchell has submitted the following report:—

"I have to state that in compliance with your instructions I proceeded to Mr. A. W. Harvey's nursery, at Clayfield, yesterday, the 25th instant. I obtained a trap from Mr. Harvey, baited with his lure, and placed the trap under a Solanum at 9 a.m.

"The trap was left in this place for an hour and a-half, when I removed it to the property of Mrs. Hutton, at Albion, where I placed it under another Solanum at 11 a.m. and kept it there till 5 p.m.

"I remained with the trap throughout the day, and do hereby guarantee that all the flies submitted herewith were attracted by the lure on the trap, and were caught and held by the trap. The weather conditions were not too favourable for the test, as the wind was gusty, and during the period of fully an hour no flies were caught on account of the smoke from a grass fire in the neighbourhood, which enveloped the trap. The greater number of flies were caught during the earlier part of the day, and after 3 p.m. During the middle of the day few flies were caught."

This report was submitted to Mr. Henry Tryon, the Government Entomologist, who reported as follows:—

"I am in receipt of a parcel of fruit-flies referred to by Mr. Inspector James Mitchell in his communication of even date (26th March, 1918) as having been captured by him in the course of an experiment carried out yesterday, in which a trap and lure furnished by Mr. A. W. Harvey were used.

"I have now to add that it is found, on examination of the said parcel of fruit-flies, that it comprises 231 examples of *Bactrocera Tryoni*, the common fruit-fly of Queensland, and that of this number 138 are male individuals and 93 females.

"Of these female flies, eight were dissected by my assistant, in order to ascertain the condition of their ovaries; with the result that two were found to be filled with ova—one containing thirty nearly mature eggs, and the other many immature ones."

The result of the trial is therefore considered satisfactory, as it has definitely proved that both male and female Queensland fruit-flies can be attracted by the lure and caught by a specially constructed trap which has been invented and patented by Mr. A. W. Harvey.

A very interesting point is revealed by the latter portion of Mr. Tryon's report, which shows that the flies were evidently caught before they had done any damage.

This is a very important point, as each female fly is capable of laying as many as 200 eggs and, consequently, of destroying a large number of individual fruits.

THE NORIT PROCESS OF MANUFACTURING WHITE SUGAR.

The "International Sugar Journal" published, in 1915, a lecture by Dr. A. Wijnberg on "The Norit Process of Manufacturing White Sugar." In this process it is claimed that the colouring matter of the juice is removed by means of so-called "decolourising carbon" (manufactured under the name of Norit), in the same manner that this is effected by animal charcoal in the sugar refinery. This substance has already been successfully employed for bleaching purposes in various industries, but hitherto has not been used in sugar-works, partly on account of its cost and partly because a method of regenerating was not known. It was now found that the decolourising colour of Norit can be largely restored by boiling for fifteen minutes with a 3 per cent. solution of caustic soda.

Norit is stated to exert its decolourising action on slightly acid sugar solutions, the colour being only slightly or not at all removed when the solution is alkaline. The author explains this action by reference to the properties of colloids of the nature of pectin which are transformed into larger molecular groupings in feebly acid solutions, but into smaller ones in alkaline. The large molecular groups are held by the decolourising carbon, while the smaller ones are not.

It is claimed that the decolourising power of Norit is about seventy-five times greater than granular animal charcoal. Its decolourising power is relatively greater in dilute sugar solutions as compared with concentrated ones; hence it is recommended to use Norit to bleach the juice rather than syrup. Norit is stated to possess the advantage of removing pectins and gums from sugar solutions, so that juice decolourised by this means is more easily filtered.

A continuation of the article was promised in which the practical results obtained in certain factories and refineries would be considered. These results have not reached us. (Ed. *Q.A.J.*)

Animal Pathology.

PROTECTION FROM WEEVILS.

The problems affecting wheat storage or, as it might be more accurately described, wheat preservation are of extreme urgency in view of the prospect of a serious shortage in the food supply of the world as one of the results of the war, and it is obviously a matter of exceptional importance to prevent, as far as possible, the destruction and loss of grain in store through the ravages of pests.

Recognising this, the British Government asked the Royal Society of London to arrange an investigation into the damage done by insects to grain in store throughout the Empire.

The Executive Committee of the Commonwealth Advisory Council of Science and Industry received, through the Prime Minister's Department, in October, 1916, a request from the Royal Society that a committee should be appointed in Australia to co-operate with similar committees in England and Canada in this investigation. Reports were obtained from the Government Entomologists of each State, and it was shown that considerable losses were caused annually in Australia from grain weevils and other pests. The Executive Committee thereupon appointed a special committee to make further investigations.

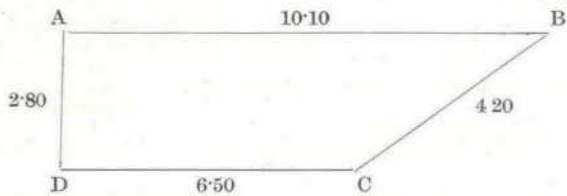
This special committee included Mr. Leo Russell, representing the Milling Industry; Professor W. A. Haswell, F.R.S., Professor of Zoology in the University of Sydney; and Mr. W. W. Froggatt, Government Entomologist, New South Wales. Mr. F. B. Guthrie, Chemist to the Department of Agriculture of New South Wales subsequently joined the committee. The progress report prepared by this special committee has now been published in Bulletin No. 5 of the Advisory Council, and can be obtained post free from the Secretary, 314 Albert street, East Melbourne. The report indicates that only the two grain weevils (*Calandra granaria* and *C. oryzae*) demand special measures on account of their destructive effects on stored grain, that the development of weevils in wheat and their increase in number may be checked by not using old bags which may be weevil-infested or storing in buildings likewise infested, and that bags of weevil-infested wheat should not be brought into contact or near that which is sound, for before wheat can become infested there must be a female to lay her eggs in the grains of wheat. It is only when the perfect insect, after going through the various stages of its larval existence, emerges through a tiny hole in the grain that the damage is evident, and except during the pupating state destruction is going on during the whole life of the insect. Under suitable conditions it takes from nineteen to twenty-two days from the egg to the adult beetle, and in three months in one experiment 40 weevils produced 3,056 descendants. Under the present system of handling wheat the destruction of weevil, once it has gained access to the bagged grain, seems hopeless; many methods of fumigating grain have been tried, and so far the most effective is that of poisoning with the fumes of carbon dioxide, but with bagged wheat this is not applicable save at a prohibitive cost. Sun-dried wheat contains only 4.7 per cent. of moisture. Neither in this nor in wheat as it emerges from the thresher with a moisture content up to 6.7 per cent. will weevil breed. With 8 per cent. of moisture they died in six weeks without breeding, at 9 per cent. they remained dormant, but with anything above the latter, provided they had free air, they became active and bred. It would thus appear that dry wheat stored in airtight bins is immune from the attack of weevils. Wheat when first bagged does not, under ordinary circumstances, contain sufficient moisture to enable weevils to breed, therefore, unless moisture is added from without, the grain remains weevil-proof. Thus, if stored in a fairly dry climate, completely protected from the weather, it is certain that wheat may be stored for an indefinite period without any damage from weevil.

General Notes.

TO MEASURE LAND WITHOUT THE AID OF INSTRUMENTS.

In the case of a four-sided field, each of the sides being of unequal length, a surveyor would commence by running a line which would divide the field into two triangles, and would then calculate their area by a mathematical process, unintelligible to most working farmers. Any man, however, who can add and multiply, may reckon up the number of acres in any four-sided field without recourse to either surveyor, theodolite, or trigonometry.

Suppose a field, whose four sides are, respectively, 4.20 ($4\frac{1}{5}$), 6.50 ($6\frac{1}{2}$), 10.10 ($10\frac{1}{10}$), and 2.80 ($2\frac{4}{5}$) chains in length, as shown in the diagram:—



First, add the two opposite sides together, and divide by 2, thus:—

$$AB + CD = 10.10 + 6.50 = 16.60 \div 2 = 8.30$$
$$AD + BC = 2.80 + 4.20 = 7 \div 2 = 3.50$$

Now multiply these two results together—

$$8.30 \times 3.50 = 2.90500$$

Cut off five figures from the right. (Note that in ordinary decimal multiplication four figures would be cut off.)
You now have:—

2.90500 or 2 acres and a fraction.

To find the roods, multiply the decimals (not the 2) by 4, and cut off five figures.

(2.) $.90500 \times 4 = 3.62000$, or 3 roods and a fraction. To find the perches, multiply the decimal figures by 40, and cut off the five decimals.

(3.) $.62000 \times 40 = 24.80000$, or 24 perches and a fraction. If the square yards are required, multiply by 30.75, and cut off seven figures.

(24.) $.80000 \times 30.75 = 9.2250000$, or 9 square yards. And for the square feet, multiply the decimals by 9 and cut off seven figures.

(9.) $.2250000 \times 9 = 2.0250000$, or 2 square feet. Thus the field is found to contain—

2 acres 3 roods 24 perches 9 square yards 2 square feet.

SOCIETIES, SHOW DATES, ETC.

Gladstone—Port Curtis Agricultural, Pastoral, and Mining Association: Show dates: 11th and 12th June.

Minehan's Siding, *viâ* Townsville—Haughton River Farmer's Association, R. Walton, Secretary.

Childers—Isis Primary Producers' and Canegrowers' Association, John R. Wrench, Secretary.

Hughenden—North-Western Queensland Pastoral and Agricultural Association. Show dates: 20th and 21st May.

EXPERIMENTS TO DETERMINE THE KEEPING QUALITIES OF ENSILAGE.

The Director of Agriculture states that any process in normal seasons which will satisfactorily conserve fodder in a succulent form at a relatively low cost and maintain it in satisfactory condition, for a term of years if necessary, until the inevitable swing of the pendulum ushers in the never-to-be-forgotten drought, should commend itself to the stockowner as a solution of a very serious problem. However, turn where one will in the rural districts, the silo is the exception rather than the rule! Those who have used ensilage always want more of it; cattle, horses, sheep, and even swine, will eat it readily, and there is no better basis for a ration than this succulent for assisting to maintain animals of all kinds in sleek, healthy condition, particularly when pastures dry out and green feed is not available. It is not possible at this juncture to do more than touch on the importance of the question, but if our State is to keep up a well-earned reputation for its stock products and maintain rich and important associated industries, then the time is more than ripe for a forward move in silo construction. I am confident there is no better asset on a farm and no better stock-insurance can be found than a silo filled with palatable fodder.

In drought-time prices for hay, chaff, and other stock-foods have a habit of soaring up to a figure which hitherto has brought too many people to the verge of bankruptcy in an attempt even to simply keep their stock alive. How to overcome the difficulty of providing the equivalent of green feed, in a form which would keep in fresh condition and carry to any distance, is a matter to which some attention has been given. For the last five years we have been experimenting to ascertain the keeping and carrying qualities of ensilage, taken from slios and stacks. It is a well-known fact that within forty-eight hours after a surface of ensilage is exposed to the air, some signs of deterioration (mould) begin to take place, and to obviate this the usual practice in the silo is to lightly rake over the face of a mass of chaffed fodder, about twice a day, to gather enough food on each occasion for a given number of animals. Different ways of putting up conserved fodder to carry it to a distance, without deterioration, have been tried. We now have satisfactory proof that ensilage taken fresh from a silo or stack, placed in kerosene tins and soldered up, will keep for years; different kinds made from maize, sorghums, panicum, and lucerne have been tried, and in every instance the results conclusively show that an hermetically sealed receptacle is all that is required to keep fodder in sound, wholesome condition almost indefinitely. The life of any form of galvanised iron is, of course, limited, and it was found some years ago that timber-framed silos covered on the inside face with this material required a Portland cement lining to check the corrosive action of the silage juices. Although the kerosene tins used for holding the ensilage experimented with in this way were not dressed with a non-corrosive mixture, they lasted in two instances for four years and eight months, and the contained fodder opened out in fresh palatable condition. We haven't had any precedent to work on in connection with this system, but I feel optimistic concerning the application of the principle, which in drought-time should do much to obviate stock losses and provide fodder at a moderate cost.

TO PROTECT PLANTS FROM SHELL-COVERED SNAILS.

"South African Gardening," replying to the request for a remedy against snails and mealie bug, gives the following as effective remedies:—

For Snails.—Sprinkle powdered alum round their haunts and also round plants or beds of plants to be protected; if this is persisted for a few nights a marked difference will be found. The alum does not appear to hurt vegetation.

For Mealie Bug.—Sprinkle the soil of the pots with naphthaline and just turning it in, say, half a teaspoonful to a 6-in. pot; a little may also be sprinkled on the crown of the plant. In some cases this is a deterrent more than an exterminator.

A PRINCELY CONTRIBUTION.

The London "Times" of 4th February states: A fund opened by the British Minister at Bangkok for relief of the sufferers in the flood disaster at Mackay, in Queensland, has produced over £128,000, including £5,000 from each of the Malay States.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR APRIL, 1918.

Article.		APRIL. Prices.
Bacon	lb.	9d. to 10d.
Barley	bush.	2s. 6d. to 3s.
Bran	ton	£5 10s.
Broom Millet	,,	£33 to £38
,, ,, Sydney Market	,,	£75
Butter (First Grade)	cwt.	149s. 4d.
Chaff, Mixed	ton	£3 to £5 10s.
Chaff, Oaten	,,	£7
Chaff, Lucerne	,,	£6 to £7 15s.
Chaff, Wheaten	,,	...
Cheese	lb.	9½d. to 10½d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 10d.
Hay, Oaten	ton	...
Hay, Lucerne	,,	£4 15s. to £5.
Hay, Wheaten	,,	...
Honey	lb.	3½d. to 4d.
Maize	bush.	4s. 2d. to 4s. 3d.
Oats	,,	5s. 4d.
Onions	ton	£6 10s. to £8 10s.
Peanuts	lb.	3d. to 5d.
Pollard	ton	£7 5s.
Potatoes	,,	£6 to £7
Potatoes (Sweet)	,,	£2 15s.
Pumpkins (Cattle)	,,	£3 to £4
Eggs	doz.	1s. 9d. to 2s. 1d.
Fowls	per pair	2s. 3d. to 7s.
Ducks, English	,,	3s. to 3s. 6d.
Ducks, Muscovy	,,	3s. 6d. to 5s.
Geese	,,	6s. to 7s.
Turkeys (Hens)	,,	8s. to 9s. 6d.
Turkeys (Gobblers)	,,	15s. 6d. to 21s.
Wheat (Milling)	bush.	4s.

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...
Cabbages, per dozen	2s. to 4s.
Cauliflowers (small), per dozen	1s. 6d. to 2s. 3d.
Beans, per sugar-bag	2s. 6d. to 5s.
Peas, per sugar-bag	4s. to 9s.
Carrots, per sugar-bag	2s. 6d. to 5s.
Chokos, per case	1s. 10d. to 2s. 3d.
Beetroot, per dozen bunches	6d. to 9d.
Lettuce, per dozen	1s. to 1s. 6d.
Parsnips, per dozen bunches	6d. to 1s.
Sweet Potatoes, per sugar-bag	1s. to 1s. 3d.
Table Pumpkins, per sack	5s. to 7s.
Marrows, per dozen	2s. to 2s. 9d.
Tomatoes, per quarter-case	2s. to 5s.
Cucumbers, per dozen	...

SOUTHERN FRUIT MARKETS.

Article.	APRIL. Prices.
Bananas (Queensland), per case	9s. to 15s.
Bananas (Fiji), per bunch	8s. 6d.
Bananas (G.M.), per bunch	8s. 6d.
Bananas (Tweed River), per bunch	10s. 0d.
Custard Apples, per tray	4s. to 6s.
Lemons (local), per bushel-case	8s. 0d.
Mangoes, per case	...
Mandarins, per case	...
Oranges (Navel), per case	...
Oranges, per bushel-case	7s. to 8s.
Passion Fruit, per half-bushel case	8s. to 11s.
Persimmons, per half-bushel case	1s. 6d. to 3s. 6d.
Pineapples (Queens), per double-case	...
Pineapples (Common), per double-case	...
Quinces, per bushel-case	3s. to 6s.
Tomatoes (Queensland), per quarter case	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	APRIL. Prices.
Apples, Eating, per case	4s. to 7s. 6d.
Apples, Cooking, per case	5s. to 6s. 6d.
Apricots, per case	...
Bananas (Cavendish), per dozen	1½d. to 5d.
Bananas (Sugar), per dozen	4½d. to 5½d.
Cape Gooseberries, per small box	5s. to 6s.
Cherries, per box	...
Citrons, per hundredweight	9s.
Cocoanuts, per sack	15s. to 25s.
Cumquats, per quarter-case	3s. to 3s. 6d.
Custard Apples, per tray	2s. 6d. to 5s.
Lemons (Lisbon), per quarter-case	4s. to 5s. 6d.
Mandarins, per case	7s. to 10s.
Mangoes, per quarter-case	...
Oranges (Navel), per case	...
Oranges (Seville), per hundredweight	...
Oranges, per case	3s. 6d. to 7s.
Papaw Apples, per quarter-case	3s. to 3s. 6d.
Passion Fruit, per half-bushel case	5s. to 7s.
Peaches, per quarter-case	...
Pears, per half-bushel case	15s. to 16s.
Peanuts, per lb.	4d. to 5d.
Persimmons, per quarter-case	...
Pineapples (Ripley), per dozen	1s. 6d. to 2s. 6d
Pineapples (Rough), per dozen	1s. to 2s. 6d.
Pineapples (Smooth), per dozen	1s. 6d. to 4s.
Plums, per quarter-case	...
Rockmelons, per dozen	...
Strawberries, per dozen boxes	...
Tomatoes, per quarter-case	2s. to 5s.
Watermelons, per dozen	...

TOP PRICES, ENOGGERA YARDS, MARCH, 1918.

Animal.	MARCH. Prices.
Bullocks	£18 7s. 6d. to £24
Cows	£14 15s. to £17
Cows (Single)	...
Merino Wethers	40s. 3d.
Crossbred Wethers	39s.
Merino Ewes	28s.
Crossbred Ewes	46s.
Lambs	38s. 3d.
Pigs (Baconers)	...
Pigs (Porkers)	...
Pigs (Slips)	...

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MARCH, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MARCH, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	Average Rainfall. Mar.	Average Rainfall. No. of Years' Records.	Total Rainfall. Mar., 1918.	Total Rainfall. Mar., 1917.
North Coast.	In.		In.	In.
Atherton	8·72	17	9·88	6·59
Cairns	18·67	36	11·18	11·71
Cardwell	16·65	46	26·71	12·35
Cooktown	15·28	42	9·60	10·13
Herberton	8·43	31	7·39	9·98
Ingham	16·48	26	28·95	13·44
Innisfail	26·00	37	24·04	16·34
Mossman	20·99	10	10·08	24·25
Townsville	8·36	47	2·54	9·31
Central Coast.				
Ayr	7·95	31	0·48	4·91
Bowen	6·15	47	0·77	6·27
Charters Towers	3·75	36	2·28	3·70
Mackay	12·79	47	7·26	16·91
Proserpine	13·14	15	5·38	13·10
St. Lawrence	6·39	47	1·40	8·90
South Coast.				
Biggenden	4·64	...	2·80	5·04
Bundaberg	5·80	35	3·08	10·71
Brisbane	5·92	67	3·05	2·79
Childers	5·50	23	2·43	6·63
Crohamhurst	12·30	25	10·79	8·71
Esk	5·06	31	1·82	4·02
Gayndah	3·31	47	1·65	2·22
Gympie	6·50	48	3·17	4·05
Glasshouse M'tains	9·21	10	8·59	8·64
Kilkivan	4·22	39	1·35	2·92
Maryborough	6·59	47	4·04	6·04
South Coast—continued:				
Nambour	9·88	22	10·13	9·12
Nanango	3·41	36	2·24	3·10
Rockhampton	5·39	31	1·80	8·57
Woodford	8·55	31	6·15	5·78
Darling Downs.				
Dalby	2·91	48	0·69	2·57
Emu Vale	2·79	...	0·42	0·96
Jimbour	2·80	...	0·23	2·35
Miles	2·97	33	0·45	5·09
Stanthorpe	2·81	45	0·35	1·04
Toowoomba	4·02	46	1·12	3·42
Warwick	2·97	31	0·26	0·88
Maranoa.				
Roma	3·01	44	0·24	3·57
State Farms, &c.				
Bungeworgorai	2·39	4	0·52	3·96
Gatton College	3·70	...	0·54	2·97
Gindie	3·30	...	0·65	10·65
Hermitage	2·83	...	0·57	0·80
Kairi	5·12	4	...	6·01
Kamerunga	17·22	...	12·64	8·81
Sugar Experiment Station, Mackay	12·42	...	7·14	11·25
Warren	3·16	4	2·12	5·49

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for March this year, and for the same period of 1918, having been compiled from telegraphic reports, are subject to revision.

J. H. HARTSHORN, Divisional Officer.

Farm and Garden Notes for June.

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

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

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

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

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

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

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

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

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

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

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

To grow these plants successfully, it is only necessary to thoroughly dig the ground over to a depth of not less than 12 in., and incorporate with it a good dressing of well-decayed manure, which is most effectively done by a second digging; the surface should then be raked over smoothly, so as to remove all stones and clods, thus reducing it to a fine tilth. The seed can then be sown in lines or patches as desired, the greatest care being taken not to cover deeply; a covering of not more than three times the diameter of larger seeds, and a light sprinkling of fine soil over small seeds, being all that is necessary. A slight mulching of well-decayed manure and a watering with a fine-rosed can will complete the operation. If the weather prove favourable, the young seedlings will usually make their appearance in a week or ten days; thin out so as to leave each plant (if in the border) as least 4 to 6 in. apart.

Orchard Notes for June.

THE SOUTHERN COAST DISTRICTS.

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

Keep the orchard clean, and work the land to retain moisture. The handling of the citrus crop is the main work in many orchards, but where slowly acting manures are to be given their application should not be later than this month. They should be well mixed with the soil, so that when the Spring comes and the trees start a fresh growth a certain percentage of plant food will be available for the trees' use. Heavy pruning should be done now, whilst the trees are dormant. All large limbs should be cut off close to the main stem; the edges of the cuts should be carefully trimmed, and the whole wound, if of large size, covered with paint or grafting wax, so that it will not start to decay but soon grow over. When the soil of the orchard is becoming deficient in organic matter, the growing of a Winter green crop, such as mustard or rape, is well worth a trial. Clear the crop of fruit

from the part of the orchard to be so treated. Plough the land well; work the soil down fine so as to get a good seed bed, and broadcast the mustard or rape. A manuring of 4 cwt. of meatworks manure and 1 cwt. of sulphate of potash per acre will produce a very heavy crop of green manure, and the plant food not required for the production of such crop will be still available for the trees' use in Spring.

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

THE TROPICAL COAST DISTRICTS.

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

THE SOUTHERN AND CENTRAL TABLELANDS.

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

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

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

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

ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	MAY.		JUNE.		JULY.		AUGUST.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·13	5·17	6·30	5·0	6·39	5·3	6·30	5·18
2	6·14	5 16	6·30	5·0	6·39	5·3	6·30	5·18
3	6·14	5·15	6·31	5·0	6·39	5 4	6·29	5·19
4	6·15	5·14	6·31	5·0	6·39	5·4	6·29	5·19
5	6·15	5·13	6·32	5·0	6·39	5·4	6·28	5·20
6	6·16	5·13	6 32	5·0	6·39	5·5	6·27	5·20
7	6·16	5·12	6·33	5·0	6·39	5·5	6·27	5·21
8	6·17	5·11	6·33	5·0	6·39	5·6	6·26	5·21
9	6·17	5·11	6·34	5·0	6·39	5·6	6·25	5·22
10	6·18	5·10	6·34	4·59	6·39	5·7	6·24	5·22
11	6 19	5 9	6·35	4·59	6·39	5·7	6·23	5·23
12	6·19	5 9	6·35	4·59	6·39	5·8	6·22	5 24
13	6·20	5·8	6 36	4·59	6·38	5·8	6·21	5·24
14	6·20	5·8	6·36	4·59	6·38	5·9	6·20	5·25
15	6·21	5·7	6·36	5·0	6·38	5·9	6·19	5·26
16	6·21	5·6	6·37	5·0	6·38	5·10	6·19	5·26
17	6·22	5·6	6·37	5·0	6·37	5·10	6·18	5·27
18	6·23	5·5	6·37	5.0	6·37	5·11	6·17	5·27
19	6·23	5·5	6·38	5·0	6·37	5·11	6·16	5·28
20	6·24	5·4	6·38	5·0	6·36	5·12	6 15	5·28
21	6·24	5·4	6·38	5·1	6·36	5·12	6·14	5·29
22	6·25	5·3	6·39	5·1	6·36	5·13	6·13	5·29
23	6·25	5·3	6·39	5·1	6·35	5·13	6·12	5·30
24	6·26	5·3	6·39	5·1	6·35	5·14	6·11	5·30
25	6·26	5·2	6·39	5.1	6·34	5·14	6·10	5·30
26	6·27	5·2	6·39	5·2	6·34	5·15	6 9	5·31
27	6·27	5·2	6·39	5·2	6·33	5·15	6 8	5·31
28	6·28	5·1	6·39	5·2	6·33	5·16	6·7	5·32
29	6·28	5·1	6 39	5·2	6·32	5·16	6·6	5·32
30	6·29	5·1	6 39	5·3	6·32	5·17	6·5	5·33
31	6·29	5·0	...	...	6·31	5·17	6·4	5·33

PHASES OF THE MOON.

The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.

			H.	M.	
4 May	☽	Last Quarter	8	26	a.m.
10 „	●	New Moon	11	1	p.m.
18 „	☾	First Quarter	6	14	a.m.
26 „	○	Full Moon	8	32	a.m.

The Moon will be nearest the earth on the 8th, and farthest from it on the 20th.

2 June	☽	Last Quarter	2	20	p.m.
9 „	●	New Moon	8	3	a.m.
16 „	☾	First Quarter	11	12	p.m.
24 „	○	Full Moon	8	38	p.m.

The Moon will be nearest the earth on the 5th, and farthest from it on the 17th. It will be 12 times its diam. north of the planet Uranus on the 1st at 7·30 p.m.

There will be a very partial Eclipse of the Moon on the 24th June, commencing about 7·46 p.m. and ending about 9 10 p.m.

1 July	☽	Last Quarter	6	43	p.m.
8 „	●	New Moon	6	22	p.m.
16 „	☾	First Quarter	4	25	p.m.
24 „	○	Full Moon	6	35	a.m.
30 „	☽	Last Quarter	10	14	p.m.

The Moon will be farthest from the earth on the 15th, and nearest on the 27th.

7 Aug.	●	New Moon	6	30	a.m.
15 „	☾	First Quarter	8	16	a.m.
22 „	○	Full Moon	3	2	p.m.
29 „	☽	Last Quarter	5	27	a.m.

The Moon will be farthest from the earth on the 12th, and nearest to it on the 24th.

*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 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

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

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.