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QUEENSLAND AGRICULTURAL JOURNAL

VOL. IX. JANUARY, 1918. PART 1.

Agriculture.

THE PROFITS OF COTTON-GROWING.

Mr. Daniel Jones, who is one of the oldest cotton-growers in the State, writing to the *Brisbane Courier* of 28th November, on the returns received for the crop of 1917, said:—

"If the returns appear dazzling, they do not reach what was won out of the black soils in the Ipswich districts fifty years ago. Neither have the prices paid equalled that which growers have realised for some varieties of cotton grown in the North during the past fifteen years.* *Re* cost of tillage, that has been reiterated by me until tired of doing it. Suffice it to say that anyone who elects to farm, and who cannot grow a crop of cotton to harvest for ½d. per lb., and pick it for another ¾d., had better not engage in farm pursuits. I have always urged that this vocation is a family one; hence no labour question comes into the arena.

"Cotton needs handling much as dairying, save that in the case of cotton it is not the drudgery, making, as a witness averred before the Interstate Commissioner lately, white slaves of the family. In my inquiries, growers state that 100 lb. to 150 lb. of fibre can be picked in a day.† This, at ¾d. per lb., whether it be juvenile or adult labour, means a fair wage.

* This was not Uplands; but the valuable Caravonica cotton evolved by Dr. Thomatis at Cairns.

† Until we can evolve a cotton which will, like wheat or maize, mature the bolls all at the same time, the first and last pickings will be comparatively small; but in the height of the season pickers can, in a day of eight hours, pick from 100 lb. and even up to 200 lb.—Editor, "Q.A.J."

"If the cotton industry were dependent on child labour, I would roundly condemn it. Cost of tillage and picking should not exceed £5 per acre; the balance is profit. In the instances quoted, the lowest return was for 2 acres, £10 17s. 1d. (an untilled plot); the highest, £24.

"In scrub areas cotton can be sown after a burn for 15s. an acre, as in most districts, during the first season, the undergrowth does not show, and no tillage is required. On forest areas 30s. an acre is sufficient to win a crop. This, with picking added, indicates the costs and profit, basing the price on last season's crop—viz., 3·58d. per lb.

"I have watched a picker gather 58 lb. of fibre in two hours. A smart hand, allowing an average of 1,000 lb. per acre, should control up to 12 to 14 acres without help in the season—about six months' work."

COTTON NOTES.

GIN HISTORY.

Under this caption B. L. Leach, in "Cotton and Cotton Oil News," Texas, U.S.A., 13th August, 1917, discusses the cost and returns of cotton-gin plants in localities where cotton is a mere "fill-in" crop, and states that it has been proved that they have been unprofitable investments from the fact that probably less than 25 per cent. of the plants so located are operated at a profit, operation being based on an average of years.

The variation of the cotton acreage from year to year, where diversified farming is the rule, is a problem which the ginowner cannot consistently combat.

This condition, or uncertainty of cotton acreage, is wholly responsible for the much too keen competition in the ginning industry.

It is unqualifiedly repeated that competition is the "life" of trade, but when applied to the ginning business in diversified farming regions, competition has proven to be the "death" of trade. This statement can be easily verified by a look around at the numerous idle gin plants which were constructed during the years of large cotton acreages, by persons foreign to the actual conditions.

The keen competition which now exists, coupled with the rapid deterioration of gin plants, the uncertainty of acreage, excessive insurance protection, the elevated prices of all necessities in connection with the operation of the gin, and the very short period of operation, constitute a condition which, in the end, will mean still greater financial losses to the ginning business unless the present prevailing charge for ginning cotton is materially increased.

The present charge (¼d. per lb.) for ginning and wrapping a bale of cotton is to the ginner as 7 cents per lb. is to the producer. The farmer can not afford to produce cotton for 7 cents per lb., and the ginner cannot continue in business and gin for 50 cents per 100.

The producer expects the ginner to begin operation at the time the "first bale" arrives, which, as a general rule, is the latter part of August, and as cotton-picking is not general before the latter part of September, the gin is operated the first month in the season at a considerable loss. This is also true of the last month of the season.

When we take into consideration that there are only three months in the year (October, November, and December) during which time the ginner can expect to operate at a profit, it is plain to be seen why gin plants, as a whole, are losing investments.

The cotton-producer expects the ginner to equip his gin with the latest machinery, keep the plant in the best of repair, and gin the cotton with as little delay as possible. He has a right to demand as much; yet, in exacting the best service, the farmer should not object to the ginner charging a price for that service that will afford him a legitimate profit on the investment.

The average gin plant represents an investment of approximately 8,000 dollars.* Eight or nine months of the year the plant is idle.

The average life of the gin is probably less than ten years, depending somewhat upon the conditions under which it is operated. Depreciation, therefore, is a very important factor and one that is not given the necessary consideration by many operators. Interest on the investment, taxes, and insurance are other very important fixed expenses, and the four fixed charges just mentioned are perpetual in their accumulation regardless of whether the plant is operated or standing idle.

The above expenses may be properly termed "incidental," since their accumulation is certain and must be provided for, even though the plant is not operated.

Let us now reduce these expenses to actual "experience" figures in order to more easily grasp their importance: Assuming the average gin plant to represent a valuation of 8,000 dollars we find the incidental expenses to be—

	Dollars.
Depreciation, at 10 per cent. per year	800
Interest, at 10 per cent. per year	800
Insurance, at 3 per cent. per year	240
Taxes, at 2 per cent. per year	160
Total incidental expenses	2,000

Again repeating, for the sake of emphasis, the ginner must provide for the above charge of 2,000 dollars regardless of whether or not he operates or allows his gin to stand idle.

We will now discuss, for sake of comparison, the source of the ginner's anticipated income.

The average ginner, in the locality under discussion, will probably gin in a season approximately 1,000 bales, yet the majority do not reach this figure.

	Dollars.
Received for ginning, 1,000 bales of cotton, average weight, 500 lb.	4,000
Less cost of bagging and ties, at 1 dollar 25 cents (1917 prices)	1,250
Gross profit from gin	2,750
300 tons seed purchased; average net profit 2 dollars ton	600
Total gross income for season	3,350

* To convert dollars into British currency roughly, divide the figures given by 5.

OPERATING EXPENSES.

	Dollars.
Manager's salary for year . .	1,200
Clerical and labour	1,000
Fuel, oils, &c.	750
Stationery and advertising . .	300
Repairs and general expense . .	300
Total operating expenses	3,350

While the above figures are estimated, yet they are based on actual experience. The fact which we wish to prove by them is that a gin will not pay more than actual operating expenses from ginning 1,000 bales of cotton.

The amount of seed handled by a gin will vary materially from year to year, depending on the market price and competition from street buyers, yet the net profit of 2 dollars per ton is approximately correct unless the ginner speculates in cotton-seed, in which event he will be in the hands of chance.

We believe the figures above will stand up under the assault of the severest critic; yet we are open for any concrete proof to the contrary.

COTTON AND MAIZE IN THE ROMA DISTRICT.

Our illustration shows a fine field of Russell's Big Boll Cotton, grown in November, 1916, by Mr. E. A. Thomas, of Llanelley, Orallo, Roma district, from seed supplied by the Department of Agriculture and Stock.

The second photograph shows a portion of a field of maize grown by Mr. Thomas, near Euthulla, along the proposed line to Injune Creek. The variety is Early Yellow Dent, the seed of which was also obtained from the Department.

"ONCE-OVER" TILLER.

PRACTICAL DEMONSTRATION.

At Miramar, Wellington, lately, a practical demonstration was given of the latest American invention in farm machinery. The "once-over" tiller, the invention in question, is manufactured in Minneapolis, and the machine exhibited was imported by Messrs. Hope Gibbons Sons and J. B. Clarkson, Ltd. The machine is quite a new affair, and was only seen in England for the first time in July last. At the demonstration there was quite a representative gathering. His Excellency the Governor-General and the Countess of Liverpool were present, as also were the Minister of Finance (Sir Joseph Ward), the Minister of Agriculture (the Hon. W. D. S. MacDonald), and representatives of leading business firms in touch with farmers, engineers, experienced farmers, and practical ploughmen.

The principle on which the "once-over" works is simple. It is a rotary tiller, and consists of a standard American sulky plough, horse-driven, and with a seat provided for the ploughman. Alongside the ploughshare is a vertical pulveriser—that is, a number of knives after the style of a sausage-mincer. As the plough turns up the soil it falls against the rotating knives which pulverise it. The pulveriser is worked by a motor machine, and the horses have merely to draw the plough along. For this new machine it is claimed that its operations are the equivalent of ploughing, cultivating, and harrowing the land in one operation. The pulveriser was hampered by the sods on grass land, but on stubble land it did excellent work. Sir Joseph Ward acted as ploughman for once round the paddock, and was filmed by the Picture Supplies Company.

PLATE 1.—COTTON GROWN BY MR. ERNEST A. THOMAS AT ORALLO, ROMA DISTRICT.

PLATE 2,—MAIZE GROWN BY MR. ERNEST THOMAS AT ORALLO, ROMA DISTRICT. HEIGHT, 11 FT. 6 IN.

ONION-GROWING IN NORTH QUEENSLAND.

We have received from Mrs. McDermott, Kinhora, St. Helens, which is situated half-way between Mackay and Proserpine, a sample, here illustrated, of a very fine onion, which appears to be of the same variety which was grown in large quantities at Oxley Creek in the sixties from seed imported from Spain by Mr. Martindale. At that time onions were worth from £60 to £80 per ton. This specimen weighed 1 lb. 5 oz. It would be interesting to know what the returns were per acre.

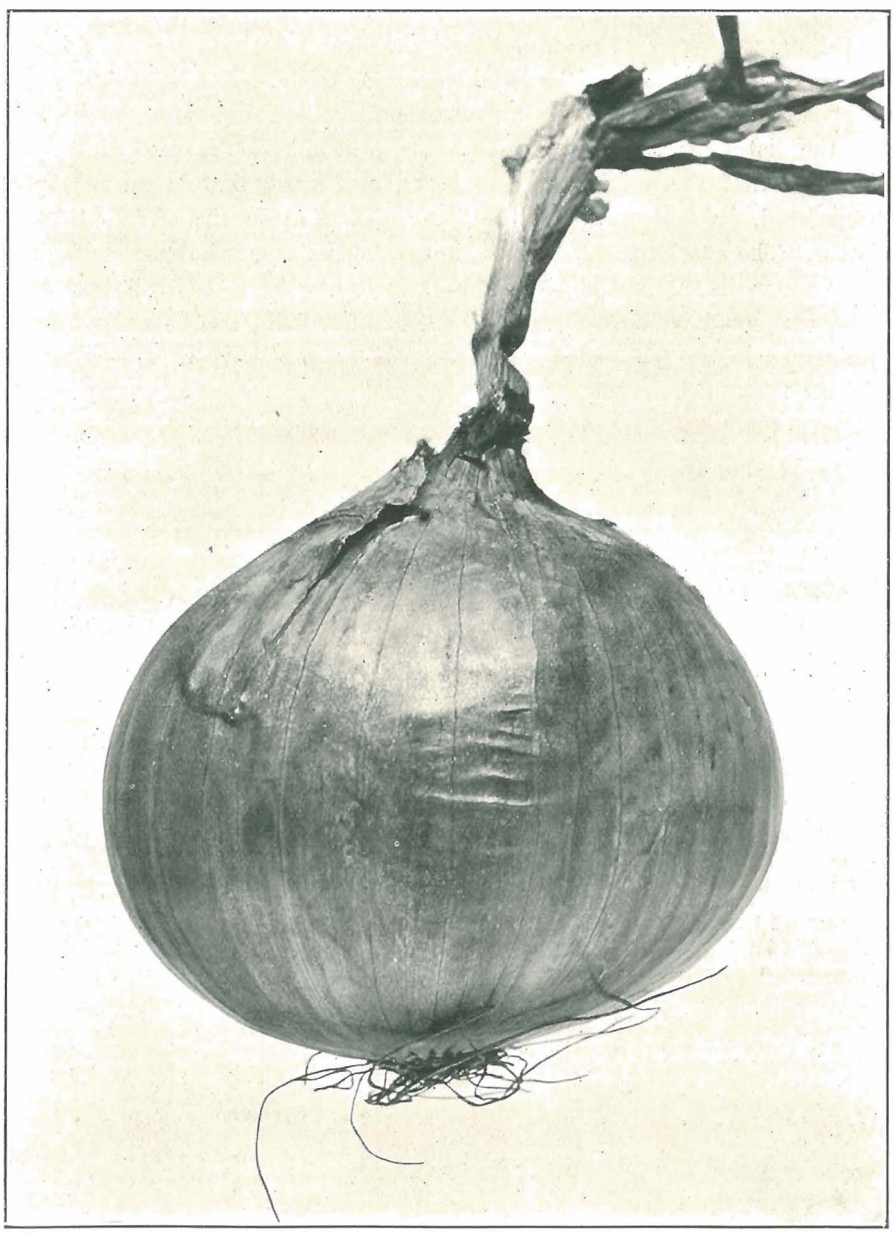

PLATE 3.—ONION GROWN BY MRS. MCDERMOTT, KINHORA, ST. HELENS, NEAR MACKAY. WEIGHT, 1 LB. 5 OZ.

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	9	37	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. F. Savage	Ramsay	1	12	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	1	2	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.

TO CONSTRUCT A WIRE BRIDGE.

"Osmiridium," writing to the "Papuan Courier," describes a method of building a wire bridge across a stream which, he says, combines many advantages over the old-fashioned plan, such as was some years ago thrown over the crossing of the North Pine River. His plan is cheaper, less wire is used, and anyone handy with tools can erect it. Also, the person using it would have no balancing to do, as he would simply be a "plumb-bob" under the wire. Following is the specification of material required for the bridge:—

Wire bridge for span of 100 ft.: Main §-in. wire rope to rest on "pig-stye" at each end and then go on to anchor frames at lower level than the bridge wire. Cage to be 4 ft. long, 2 ft. 6 in. wide, and 3 ft. deep, made of light timber and hardwood frame, set in two slings of either wire chain or iron, and suspended from hooks on two wheeled runner blocks on main wire. Cage to be operated by a small windlass fixed in cage to iron plummer blocks and the side of cage. Line for hauling cage across to be an endless ¼-in. wire rope running through 3-in. pulley-blocks at level of main wire and spragged at one end. The bottom end of endless wire takes two or three turns around windlass barrel in cage, and cage will work across on turning windlass handle. Hooks on traveller blocks should be of steel, and tested to half a ton. Main wire can be strained either with union screws or Spanish windlass on to anchor frames. Weight: 200 ft. §-in. steel wire rope, allowing a working strain of 3 tons, 120 lb.; endless rope for hauling cage, 200 ft., 20 lb.; two 3-in. pulley-blocks, 10 lb.; travelling blocks, 15 lb.; cage (estimated), 75 lb.; total weight material, if Spanish windlass used, 240 lb. If 200-ft. span required only 80 lb. extra weight would be necessary. Travelling blocks require two hooks (safety) on which to suspend cage, and they want to be 2 ft. apart from centre to prevent cage twisting.

Such a bridge would be very handy in flood times in Queensland, where travellers are often stuck up for days on the banks of a billabong owing to the depth and rush of water at the usual crossing-places, not to speak of the dangers of attempting to cross when big snags are being carried along the streams.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH OCTOBER TO 26TH NOVEMBER, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Sweet Meadows ...	Jersey ...	8 Aug., 1917	599	6·3	44·73	
Iron Plate	,, ...	14 Oct. ,,	889	4·1	42·82	
Nina	Shorthorn...	6 Sept. ,,	968	3·7	41·96	
Auntie's Lass ...	Ayrshire ...	5 July ,,	965	3·6	40·71	
College Damsel ...	Holstein ...	12 July ,,	956	3·6	40·33	
Lady Melba ...	,, ...	14 Feb. ,,	836	3·9	38·26	
Lilia	Ayrshire ...	11 July ,,	749	4·2	36·97	
Hedge's Dutchmaid	Holstein ...	9 Sept. ,,	926	3·4	36·80	
Miss Bell	Jersey ...	27 June ,,	599	5·2	36·79	
Violette's Peer's Girl	,, ...	26 Oct. ,,	589	5·1	35·47	
Netherton Belle ...	Ayrshire ...	17 July ,,	730	4·0	34·28	
College Bluebell ...	Jersey ...	28 June ,,	730	4·0	34·28	
Lady Dorset ...	Ayrshire ...	14 Aug. ,,	782	3·7	33·89	
Lady Annette ...	,, ...	19 Oct. ,,	711	4·0	33·39	
Burlesque	Jersey ...	8 Oct. ,,	518	5·4	33·07	
Netherhall Queen Kate	Ayrshire ...	30 June ,,	865	3·2	32·28	
Princess Kate ...	,, ...	28 June ,,	663	4·1	31·92	
Thornton Fairetta	Jersey ...	30 June ,,	512	5·2	31·45	
Songstress	Ayrshire ...	1 Oct. ,,	684	3·9	31·29	
Miss Betty ...	Jersey ...	27 Mar. ,,	556	4·7	30·80	
Lady Loch II. ...	Ayrshire ...	3 June ,,	698	3·7	30·25	
La Hurette Hope	Jersey ...	22 Aug. ,,	538	4·7	29·81	
Prim	Holstein ...	3 Aug. ,,	883	2·9	29·77	
Rosine	Ayrshire ...	21 June ,,	632	4·0	29·68	
Buttercup	Shorthorn...	2 June ,,	753	3·3	29·01	
Skylark	Ayrshire ...	24 May ,,	598	4·1	28·80	
Confidence ...	,, ...	25 June ,,	682	3·6	28·76	
College Mermaid...	Jersey ...	21 Aug. ,,	456	5·3	28·54	
Lady Mitchell ...	Holstein ...	26 Sept. ,,	743	3·0	25·93	
Leonie	Ayrshire ...	4 Sept. ,,	597	3·7	25·88	
Snowflake	Shorthorn...	17 May ,,	509	4·2	25·13	
Miss Edition ...	Jersey ...	25 Dec., 1916	540	3·9	24·71	
Miss Security ...	Ayrshire ...	27 Mar., 1917	551	3·8	24·54	
Windyhill Davidina	,, ...	2 July ,,	568	3·4	22·56	
Hedge's Madge ...	Holstein ...	22 Mar. ,,	488	3·9	22·32	

GOATS AND THEIR MANAGEMENT.

We have been asked by a correspondent to continue the subject of goat-keeping, which has already been dealt with in several issues of the Journal. The limits of this Journal will not permit of a very lengthy article on the matter, but the following are the main features of the business as laid down by H. S. Holmes-Pegler in an exhaustive article on the subject, published last year in "Live Stock on the Farm," edited by Professor C. Bryner Jones, M. Sc., F.H.A.S., London:—

SELECTION OF A BREED.

If utility is the one object apart from appearance, the Swiss (Toggenburg and Saanen) are to be preferred, also the Anglo-Swiss, which is a cross between the best breeds as regards quantity of milk. The next best cross to this would be the Anglo-Nubian-Swiss, which means further crossing with goats having "milking blood" in their veins, being generally that of animals which have made themselves conspicuous at shows as milkers. If price is an important matter, or appearance, the Anglo-Nubian will answer the purpose well. The chief merit of Swiss goats is the large quantity of milk they almost invariably yield.

CONDITIONS SUITABLE FOR GOAT-KEEPING.

The chief recommendation for goat-keeping is the facility with which goats may be accommodated, whilst the same benefits are derived, in a small way, as those obtained from dairy stock on the larger scale. In the first place, pasturage, though an advantage in some cases, is by no means necessary, and, unless it be extensive, is an absolute disadvantage, for goats kept long on this same grass without a change of herbage, in time, contract disease and die off. The goat, indeed, in spite of its propensity to roam, accommodates itself readily to the stall-feeding system, and, given the run of a yard, will often do better stall-fed than one that is pastured. In many instances, goats are kept to advantage without even this yard; but a garden is almost a *sine quâ non* if this animal is to be maintained economically. Hence, a mere shed—if nothing better is available—and a vegetable garden will enable anyone to keep a goat or a couple; and it is advisable to have two, for various reasons. In the first place, the supply of milk for a household can be continued for a longer period, providing that the two come into profit at different times; and secondly, they do better in company, being sociable animals, whilst the trouble of feeding and milking is not much more for two than for one.

THE GOAT HOUSE.

Although a mere shed is mentioned as sufficient in an emergency to start with, most people prefer to build a proper goat house. Any disused stable or cow house or some outbuilding, with very little arrangement of the interior, can be adapted to the wants of a goat. A needful accommodation is a raised bench, 3 feet long by 2 feet wide, which can be used for the goat to lie on, or on which it may stand to be milked. The latter is most necessary.

Goats have a dislike to damp in any form, and will always prefer a plain board or two, at a short elevation from the floor, to the most inviting bed of straw or other litter on the ground. A hay-rack is the next necessity, and here two important points should be observed. Goats are wasteful creatures in their food if they have facilities given them for being so, and they can destroy as much hay as a pony will eat if the hay-rack is not suitably constructed to counteract this. With this object, the bars of the rack must be placed 1½ inch apart, and the rack itself should be raised to such a height from the ground that the animal has to stand on its hind legs to reach the contents.

STABLES.

A loose box in a well-ventilated stable, where sunshine can enter, especially if a horse is kept under the same roof, makes capital accommodation. Goats like company, and will generally fraternise with other animals, especially horses and cows.

FEEDING AND CARE OF GOATS.

Goats are not always the hardy animals that they are popularly supposed to be, and this is greatly on account of the way they are fed. Like other stock, or, indeed human beings, the more highly they are fed the more liable they are to disease.

GARDEN PRODUCE AS FOOD.

Goats are capable of utilising and transferring into splendid milk a quantity of material which would, in most cases, be wasted. Garden produce is here chiefly referred to, although the kitchen can also furnish some portion of the ration, such as dried crusts of bread and peelings of vegetables, or even remnants of porridge and cooked potatoes.

Amongst the garden refuse are potatoes and pea haulms, the latter being stored and given dry, also clippings of trees at pruning time. Grass may be given, but it must be absolutely fresh, and must not be trampled on. Soiled grass no goat will touch—they will almost starve first. The tops or leaves of vegetable like carrots, parsnips, Jerusalem artichokes, and many weeds such as thistles, brambles, &c., are always acceptable. Goats are very fond of barking trees, and fresh-cut branches of suitable trees may be thrown into the yard.

For dry food, a moderate quantity of hay and corn should form part of the daily ration to maintain the milk supply. Oats should be preferred to maize, as the latter is not so digestible as the former, and is too heating. The guiding principle in feeding goats to get a good yield of milk is to give as great a change as possible. As these animals chew the cud, they require to have as much as is necessary to fill the stomach, and then to be left quiet for a time to masticate and digest it.

When goats are stall-fed, they should be fed four times a day, beginning at 7 in the morning, continuing at 11 and 4 p.m., and at 7 or 8 in the evening.

Goats rarely drink water except in very hot, dry weather. It should, however, be offered them twice a day when stall-fed. The water must be absolutely fresh, and given in a perfectly clean bucket. Salt is a necessary adjunct to food. Goats delight in licking a lump of rock salt.

COST OF FEEDING A GOAT.

In England, the cost of feeding a goat when supplies have to be bought is reckoned by the writer at 2¾d. per day, or at 2d. a day where there is a garden. The cost would, to some not very great extent, be higher in Queensland if everything in the way of food had to be bought; but the vegetable garden here, producing all the year round, would keep expenses down.

AGE FOR MATING.

Goats breed at a very early age. Good stock is often begotten by kids of six or seven months old; but it is better to wait for a year before mating.

MILKING A GOAT.

A goat should be milked twice a day at least after the kids are weaned. Regularity in the hours of milking is of great importance, for if a goat is milked at all hours, it is detrimental to the supply. Feed a goat when milking her. It keeps her attention fixed on her food instead of on the process that she is being subjected to, and she stands quieter in consequence. Milk her on a raised bench.

YIELDS OF MILK.

"What quantity of milk does a goat yield?" is a very common question. I may, on this point, take occasion to mention that it is not wise to accept as gospel all the statements that are made by goat-keepers, especially when a goat is offered for sale. In correspondence with an American on this point, I ventured to express the opinion on the statement that a certain goat in America was reputed to yield 6 quarts a day, which I regard as impossible for any goat to give. I suggested that possibly the quart in America was a smaller measure than that in England. To this, the American replied:—"It is true our quarts are not as large as your quarts, but we have the same-sized liars."

The ordinary supply from a common goat in full profit is from 2 to 3 pints a day—occasionally 4 pints. But numbers of goats in England have given over 1 gallon a day. In all show records weight and not measurement of milk is given, as the latter is deceptive on account of froth which can make a pint and a-half look like a quart when first drawn. Take, however, the following equivalents:—One gallon of milk is equal, roughly, to 10 lb.; therefore, 2 quarts will equal 5 lb.; 1 quart, 2½ lb.; and 1 pint, 1¼ lb. or 20 oz. This is actually the weight of water, whilst the specific gravity of milk is a fraction more, but 10 lb. is near enough for the purpose. Several goats in England gave from 8 lb. 4 oz. to 12 lb. 3 oz. per day; and one goat, "Leazes Eve," fifteen weeks after the birth of her kids, gave nearly half a ton of milk.

PROFIT IN GOAT-KEEPING.

Although the demand for goats is enormous in England, that for goat's milk is practically nil; consequently, until there is such a demand, goat-farming can never pay as a matter of business. But for household purposes there is much profit.

An ordinary goat will yield milk, on an average, for the first three months she is in profit at the rate of 3 pints daily, and during the next three about half this quantity; whilst in the last quarter she will only supply ¾ pint daily. This brings the total to 240 quarts. The value of this, at 4d. per quart (in England), is £4. If a Toggenburg Swiss, or the right kind of Anglo-Nubian be kept, however, the yield for the first quarter should be at the rate of 2 quarts daily; for the second, 3 pints; and for the third (though it may extend to another month), 1½ pint, giving a total of 384 quarts, which, at the same valuation, would be worth £6 8s. This is putting it at the lowest price for cow's milk—4d. per quart; but goat's milk is really worth 6d. per quart. The value of the milk of three goats, the number required to maintain enough milk for a household all the year round—two being common goats, and the third a superior animal—would be £14 8s.; and the cost of their keep should not be more than £9.

In addition to the actual monetary value of the return in milk, something has to be said for the advantage from a health-giving and economic point of view. Where there is a family of young children, the blessing of a good home supply of milk is inestimable.

REARING KIDS.

When the milk supply of a goat is much required for household use, it is doubtful whether it pays to rear her kids. As regards the males, it certainly does not, and even the females only when the dam is an exceptional milker. If one considers the value of the milk consumed by one of their youngsters by the time it is weaned, it will be found to have cost something like 16s. The kids may be weaned in about six weeks. For the first three days, it is well to let the kids suck in order to have the benefit of the "biesting," or first milk, which is especially adapted to the wants of

the newly-born, whilst unsuitable for domestic consumption. After this, it is better to milk the goat regularly and completely, and to feed the kids with it from a bottle, than to let the latter remain by the side of their dam, taking what milk they like until the time comes for weaning them. This system is practised on dairy farms with cows, and what applies with advantage to the larger animal is equally applicable to the smaller.

Previous articles on the "Milch Goat" appeared in the issues of this Journal for July and September, 1915, and January and June, 1916.

Mr. Mahoney, of the Queensland Department of Agriculture and Stock, who has kept milch goats for a long time, commenting on the foregoing, says that, of course, much of the matter contained in the article is not applicable to Queensland. Maize, he argues, it too heating. As to the cost of feeding, he puts it at 10s. per head per month in normal times. In this country bran, prime lucerne chaff, and crushed linseed meal form the main feed, a handful of oats being given at times. On the question of mating, he advises to wait for eighteen months. As to the yield of milk, his experience with a mongrel-bred goat has been that it gave 1½ quarts a day after being in milk for 16 months. It all depends on the feeding. The fodders mentioned by the writer of the English article, he does not consider of any value, as bran and lucerne are not included by the former. The goat abovementioned returned a value of about £12 in milk in twelve months.

HOW TO TIN IRON UTENSILS.

Some time ago we received a letter from a subscriber asking how to tin iron utensils. We were unable to answer the qustion. In the "Town and Country Journal" of 21st Novmber, 1917, we find the following instructions:—

"If the article is an old one, it must be put on the fire and allowed to get nearly red hot, which will get rid of all the grease. Then make a pickle of the following proportions:—Oil of vitriol, ½lb.; muriatic acid, ¼ lb.; water, 1 gallon. If the saucepan can be filled, so much the better; if not, keep the pickle flowing over it for, say, five minutes. Pour out, rinse with water, and scour well with sand or cork dust with a wisp of tow. Rinse well with water. If the pan is clean, it will be of a uniform grey colour, but if there are any red and black spots it must be pickled and scoured again till thoroughly cleaned. Have ready chloride of zinc, that is muriatic acid, in which some sheet zinc has been dissolved, some powdered sal ammoniac, some tow, about 18 inches of iron rod of about ¼ inch or ⅜ inch thick (one end flattened out and bent up a little and filed clean), and some bar tin. Dip a wisp of tow in the chloride of zinc, then into the powdered sal ammoniac, taking up a good quantity and rub well all over, the inside; this must be done directly after the scouring, for if allowed to stand it will oxidise. Put on the fire till hot enough to melt the tin, the end of the bar being brushed over the heated part till melted. Run down about half the bar, and with the flat end of the iron rod rub the tin well over the surface, taking care not to heat too large a surface at once, nor to let it get too hot; which may be known by the tin getting discolored, when some dry sal ammoniac must be thrown in. Having gone all over it, wipe lightly with a wisp of tow, made just warm enough that the tin does not stick to it. When cold, scour well with sand and tow, rinsing with plenty of water."

LUCERNE "DON'TS."

Professor Coburn in his "Book of Alfalfa," gives the following advice to lucerne-growers:—

"Don't sow any nurse crop. Don't sow in freshly-ploughed land, no matter how carefully prepared. Don't let weeds or grass grow over 6 inches high without mowing. Don't mow when the crop is wet with rain or dew. Don't let lucerne stand; if turning yellow, cut it. Don't sow old seed. Don't sow less than 20 lb. per acre, half each way. Don't pasture it. Don't let any water stand on it. Don't try to cut for hay until the lucerne takes the field. Don't let it go to a thin stand, but disc in more seed; don't be afraid you will kill it. Don't replough the land—disc it. Don't sow on land not well under-drained. Don't leave your land rough; use a roller to level and smooth it.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, NOVEMBER, 1917.

Broodies have been again exceedingly prevalent during the month of November. During the last week, 33 birds of the heavy breeds were placed in the broody coops. C. Knoblauch, A. H. Padman, and G. Williams have had 3 each out of their pens for broodiness in the light breed section. The weather has been very much against egg-production, the ground being saturated owing to the abnormal rainfall, which has been a great discomfort to the birds. Even with the adverse weather conditions, the health of the birds has been splendid. The total number of eggs laid during the month was 8,313. G. Chester and Kelvin Poultry Farm are equal for highest number of eggs laid in the light breeds with 141 eggs each; while R. Burns takes the first place in heavy breeds with 143 eggs. The following are the individual records:—

Competitors.	Breed.	Nov.	Total.
	LIGHT BREEDS.		
E. Chester	White Leghorns ...	139	1,086
G. Chester	Do.	141	967
*G. H. Turner	Do.	120	958
F. W. Leney	Do.	128	942
*J. M. Manson	Do.	138	941
W. Becker...	Do.	121	936
Oakland Poultry Farm	Do.	136	925
W. R. Crust	Do.	127	933
Chas. Porter	Do.	97	909
Kelvin Poultry Farm	Do.	141	909
T. A. Pettigrove, Victoria	Do.	114	896
T. Taylor	Do.	123	884
Moritz Bros., S.A.	Do.	117	883
*J. Zahl	Do.	122	880
*A. T. Coomber	Do.	135	874
*J. R. Wilson	Do.	125	869
Quinn's Post Poultry Farm	Do.	109	854
D. Fulton	Do.	122	854
A. Shillig	Do.	117	852
*Mrs. J. R. D. Munro	Do.	119	835
J. G. Richter	Do.	94	825
A. H. Padman, ...	Do.	113	825
T. B. Hawkins	Do.	104	820
*Dixie Egg Plant	Do.	131	819
*T. Fanning	Do.	126	805
J. L. Newton	Do.	131	803
Mars Poultry Farm	Do.	108	800
*A. W. Bailey	Do.	105	791
Mrs. W. D. Bradburne, N.S.W. ...	Do.	121	777
R. Holmes	Do.	109	776
F. Clayton, N.S.W.	Do.	112	775
C. Knoblauch	Do.	69	768
G. Howard	Do.	107	760
J. Holmes	Do.	122	758
L. G. Innes	Do.	106	757
Mrs. S. J. Sear	Do.	121	754
E. Cross	Do.	115	749
G. J. White	Do.	114	747
S. C. Chapman	Brown Leghorns... ...	118	744
C. P. Buchanan	White Leghorns... ...	133	741
C. H. Singer	Do.	128	739
G. Williams	Do.	98	738

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

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Nov.	Total.
LIGHT BREEDS—*continued.*			
*A. E. Walters	Do.	118	734
J. Ferguson	Do.	122	722
E. A. Smith	Do.	112	713
Miss M. Hinze	Do.	112	703
*C. C. Dennis	Do.	102	699
Mrs. J. Carruthers	Do.	100	688
*Dr. E. C. Jennings	Do.	115	660
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	143	1,027
*Mars Poultry Farm	Do.	129	945
W. Smith	Do.	153	941
A. E. Walters	Do.	103	917
W. S. Hanson, N.S.W.	Do.	106	861
*E. F. Dennis	Do.	106	857
F. A. Claussen	Rhode Island Reds ...	105	841
Mrs. J. H. Jobling, N.S.W.	Black Orpingtons ...	115	797
*E. A. Smith	Do.	139	785
D. Kenway, N.S.W.	Do.	103	773
Cowan Bros., N.S.W.	Do.	87	772
P. C. McDonnell, N.S.W.	Do.	98	769
H. Jobling, N.S.W.	Do.	114	768
*Miss M. Hinze	Do.	131	718
*Oakland Poultry Farm	Do.	96	717
King and Watson, N.S.W.	Do.	95	715
C. B. Bertelsmeier, S.A.	Do.	108	708
R. Burns	S. L. Wyandottes ...	107	684
E. Morris	Black Orpingtons ...	93	680
J. M. Manson	Do.	103	668
*Kelvin Poultry Farm	Plymouth Rocks ...	84	641
C. C. Dennis	White Wyandottes ...	98	641
F. Clayton, N.S.W.	Rhode Island Reds ...	57	575
*F. W. Leney	Do.	90	574
Totals	...	8,313	58,540

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

DETAILS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. H. Turner	144	144	174	173	149	174	958
J. M. Manson	163	161	134	152	154	177	941
J. Zahl	169	110	174	100	179	148	880
A. T. Coomber	152	91	169	155	151	156	874
J. R. Wilson	161	143	141	158	121	143	869
Mrs. Munro	181	129	120	131	110	164	835
Dixie Egg Plant	133	159	155	160	154	58	810
T. Fanning	107	141	151	137	118	151	805
A. W. Bailey	36	137	158	158	153	149	791
A. E. Walters	104	107	119	144	131	129	734
C. C. Dennis	137	89	68	129	135	141	699
Dr. E. C. Jennings	78	81	123	125	151	102	660

EGG-LAYING COMPETITION—*continued.*

DETAILS OF SINGLE HEN TESTS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
R. Burns	146	133	194	142	192	230	1,027
Mars Poultry Farm	146	178	149	161	162	149	945
E. F. Dennis	167	153	154	180	167	38	857
E. A. Smith	139	128	90	162	137	129	785
Miss M. Hinze	134	114	102	125	128	115	718
Oaklands Poultry Farm... ...	168	103	97	87	166	96	717
Kelvin Poultry Farm	96	109	103	155	74	113	641
F. W. Leney	98	106	73	88	113	96	574

Apiculture.

TO PREVENT BEES SWARMING.

From one of our South African exchanges, we take the following plan which corroborates the advice given by one of our Queensland successful apiarists:—

"Before danger of swarming begins, take an empty hive-body, and into this put all comb (with adhering bees) from colony to be worked, with the exception of one comb, preferably one with least brood. This comb (with the queen) is left in the old hive, which is filled with frames with full foundation, and excluder placed over frames. Bees and comb in other hive-body are placed above excluder, after careful examination has been made to make sure that no queen-cells are present, and a frame with full foundation inserted in vacant space. Beginners may note that under the least sense of isolation, in a hive for the queen, queen-cells will be built, and in this case, with full excluder between, queen-cells will in all probability be built in this upper story. A week after manipulation, examination for queen-cells should be made, and if found must be destroyed.

"And in this way does the bee need guidance more than in the matter of swarming. Our South African bees swarm at the least excuse, often apparently with no excuse; and just now, when the veldt, in many parts, shows a blaze of bloom, early swarming may be a trouble.

"Bad as our South African bees are in the matter of swarming, the instinct can almost entirely be bred out by tactfully worked swarm prevention carried out season after season, and—a most important point—by breeding from colonies which have shown little inclination to swarm. This has been proved. The result is well worth the trouble entailed."

PROSPECTS OF THE RICE INDUSTRY.

In the December issue of the Journal, in an article on Rice Culture, we mentioned Papua as a probable market for Queensland-grown rice. This prospect is confirmed by the following note and Government notices in the "Papuan Courier" of 5th October, 1917:—

Government Stores, Port Moresby,
18th September, 1917.

Tenders are invited and will be received at this office until noon on the 24th day of December, 1917, for the supply of 120 tons of "Undermilled" or "Unpolished" Siam rice.

2. The contract to cover a period of twelve months as from the first day of February, 1918.

4. A sample (weighing not less than 2 lb.) of the rice proposed to be supplied to accompany the tender.

Tenders are invited and will be received at this office until noon on the 24th day of December, 1917, for the supply of 240 tons No. 1 Siam Rice.

[It should be noted that rice is grown at one place only in the Territory—at the Catholic Mission on Yule Island—for local consumption.—Ed. "Q.A.J."]

The Orchard.

OLIVE-GROWING.

It can hardly be said that the olive has been grown commercially in Australia (says a Sydney paper). The most considerable plantations that have come under notice are at the Wagga Experiment Farm and at Minchinbury Vineyards, Rooty Hill. In either instance the area all told probably does not amount to more than 2 or 3 acres. Still, the trees have been shown to bear freely of a good class of fruit under such widely differing conditions as in the typical strong red soil of the wheat districts at Wagga, chocolate volcanic soil at Minchinbury, and the poor sandy soil at Hawkesbury Agricultural College. One of the effects of the war is to prompt a regret that the olive has not been more extensively cultivated. One has to find out how prices have advanced to an unprecedented level. This is due to the cutting off of supplies from France, Italy, and Spain, upon which the market formerly was chiefly dependent. Before the year is out the shortage is likely to become more acute.

As far as the Commonwealth is concerned South Australia is practically the only producing State, and the product is favourably known on this side.

The area devoted to olives in South Australia only totals about 1,000 acres. This includes young and bearing trees, and the annual production of oil has averaged in the vicinity of 15,000 gallons. The manufacturers in the Central State have this year paid £13 per ton for olives, which is the highest price ever known in Australia. The cost of picking is also high, the rate this year being £6 per ton, or as much as was paid for the berries in the earlier days of the industry.

Professor Perkins, the South Australian Director of Agriculture, is a strong advocate of the extension of olive-growing. In his own State he considers the area of olive groves could, with perfect safety, be extended to 15,000 or 20,000 acres, especially in the light rainfall farming districts in which the soil is adequately provided with lime. He has, for instance, arranged to plant 520 acres on one of the Government farms in the form of shelter-belts and windbreaks, consisting of four rows of trees, 40 ft. apart, surrounding each paddock.

State measures, Professor Perkins is satisfied, are essential to the development of the olive oil industry, and suggests that the Government should undertake that in any new district in which olive-planting is done on an appreciable scale the fruit, when available, would be taken over at full market rates for crushing in State factories, if the facilities provided by private enterprise should prove to be inadequate. Further, in districts in which the plantations happened to be distant from State or private factories, he is of the opinion that special railway concessions should be given in respect to the carriage of ripe olives. He also suggests that the Government should offer to new planters a yearly bonus of 10s. or 20s. an acre planted, until the trees attain their tenth year. Professor Perkins emphasises the desirableness of systematic planting of olive groves under State control, and indicates that such a scheme, in conjunction with private enterprise, would carry in its train a number of advantages, including the provision of employment, in times of need, for those out of work, the reduction to a minimum, in the planted areas, of applications for drought relief; that it would afford employment on a large scale for returned soldiers; and, finally, assist materially to promote closer settlement.

The Queensland climate and soil are said to be better adaptable for the cultivation of this useful olive fruit than either South Australia or New South Wales, and it has been proved beyond doubt that the olive thrives exceptionally well, even to great perfection, in various places in Queensland. (Olive oil made at the Penal Establishment at St. Helena, Queensland, readily sold at 10s. per gallon wholesale.—Ed.) And why it has received so little attention in this State is somewhat hard to understand. But that is no reason why its cultivation should be neglected so lamentably in the future. It would be a good scheme for the Government to give the olive business serious consideration by selecting a suitable place for its growth and placing a batch of returned soldiers on a few acres of land for the purpose. A lot worse can be done by the Government than this; it would prove the commercial value of the olive and probably be the means of creating a new industry for this State.

A recent discussion in the columns of a Sydney daily paper on the cultivation of the olive has drawn some exceedingly interesting information from Mr. Leo Buring, manager of the Minchinbury Vineyards,

PLATE 4.—OLIVE TREES AT WESTBROOK.

Rooty Hill, where the olive has flourished for many years. Mr. Buring has had practical experience in all phases of olive-growing, olive-marketing, olive-pickling, and olive-drying. He is not greatly impressed with the prospect for olive-growing for oil extraction in New South Wales, owing to the labour difficulties; but, nevertheless, he is a confirmed believer in the food value of the olive. Accordingly, he contends that the olive should be planted by everybody who has room for a few trees, and he expresses the hope that what has been said in this column will stir up sufficient interest to induce the planting of this useful tree to a greater extent than has so far been the case in New South Wales.

It is, he says, essentially a tree that should be grown on small holdings, as under existing conditions it would never pay to plant out large areas, the cost of gathering except by child and woman labour being prohibitive. The introduction of legislation which prevents children

from remaining away from school during any part of the year to carry out such work as gathering of olives does away with any chance of picking this fruit economically. Such legislation, no doubt, was aimed chiefly at stopping truancy amongst city children, but it has prevented country children from earning money by doing work which would not only be healthy, but also be the means of creating an industry that would be of immense value to the country, and no doubt the increased consumption of the oil would also benefit the general health of the community. But that by the way. Taking one season with another, he says, and stripping the olives by hand on to bagging or tarpaulins spread under the tree, an average of 1 cwt. per picker per day is all that can be gathered. He has had children and women do this, but when men have been put on the cost of picking alone in normal times amounted to £10 a ton, or more than the fruit is worth. Once the cost of picking is more than £4 per ton, there is, Mr. Buring says, no profit in growing olives (just now the price of oil is abnormal owing to the war). It was for this reason that after planting out 5 acres at Minchinbury most of the trees were taken up and sold, and only an avenue of trees in bearing remains.

Mr. Buring holds the view that with the numerous poultry-yards throughout the State—and particularly in the county of Cumberland, every producer should plant these trees, as they give splendid shelter, and the ripe fruit as it falls is largely devoured by the fowls, and the oil and mineral acids the fruit contains act as a medicine for the poultry. There is, in his experience, no more useful tree for this purpose. Again, he advises every person who has a plot of ground planted with fruit trees for home use to find room for an olive. He recommends the Verdale in preference to any other. The Verdale will grow in all extremes of climate, equally well on the coast as inland, at sea level or elevations up to 4,000 and 5,000 ft.; it will resist a temperature of 20 degrees below freezing-point. Its only drawback is that it does not yield a high percentage of oil in comparison with the weight of fruit.

Many people are fond of pickled olives, says Mr. Buring, and many more would acquire the taste with the opportunity. The curing of olives, he points out, is very easily done, and no variety lends itself better to this purpose than the Verdale. To obtain the best value with olives they should be cured when they contain a fair percentage of oil. The Verdale grows to a nice size, and when nearly ripe its colour is light green. It is not so bitter as other varieties, so does not require in the curing so severe lye as other sorts. Further, it is freestone, and when cured ripe does not go mushy or mouldy like most other varieties. When bottled, it has a nice appearance, and its flavour surpasses the Spanish olive beyond description.

The olive is generally considered to take many years before coming into bearing. Mr. Buring points out that if its growth is stimulated by artificial manuring and watering, it will bear four years after planting out. The Verdale does not grow into such a large tree as other varieties, so in an orchard does not require more room than other fruit trees. Besides pickling, olives can also be dried, and, as the oil does not evaporate, the dried olive retains its full feeding value. The method is to allow the olive to become fully ripe, then cut off the twigs bearing the fruit and hang them under cover on string lines in an airy place. The olives gradually shrivel and take on the appearance of miniature prunes. The bitter flavour of the fresh fruit disappears entirely, and the dried olive has a delicious oily taste.

Viticulture.

HINTS TO GRAPEGROWERS.

By C. A. GATTINO.

TREATMENT OF THE VINE TILL FRUIT-BEARING.

(Continued from October, 1917.)

After having properly planted the vines as previously described, whether cuttings or rooted plants, shorten the top, leaving only one bud above the earth.

At the second year cut them back to one or two buds, according to the vigour of the growth.

At the third season prune them from two to four buds, so as to prepare the shoots to become fruit-bearing and make the main stem strong.

There are many methods of training the vines during the first two years (which may do to follow in gardens or against walls), but the system of foundation pruning mentioned above, was followed by myself and gave the most satisfactory results for vineyard culture.

Everybody knows that vines cannot produce fruit unless from wood two years old. There are often bunches growing from cuttings during the first year planting, but the buds from which they shoot were formed in the previous year.

It is, therefore, necessary to produce each year new wood to supply the place of the one which was previously fruit-bearing, so as to get bunches for the following year.

This is the fundamental principle of yearly pruning.

During these two years the ground will have to be kept well cultivated and free from weeds, taking care to replace each year in the fall (when the leaves have dropped), all dead and unhealthy plants with new-rooted plants of the same age.

To assist growers, who start with small capital, I recommend to plant other crops between the rows of the vines. This would not affect the growth of the vines, especially if the rows were planted for this purpose, as in accordance with my previous notes on planting.

I believe that the most suitable crop to plant is maize: this, besides giving a profitable return, allows the vines to prosper normally. This crop is appropriate in vineyards planted with wide rows, but for other systems of viticulture with narrow rows, there is no better cultivation than the potato.

This vegetable has a limited root development and does not injure the vines, on the contrary, the foliage of the vine and the foliage of the potato are subject to similar diseases, hence, if spraying becomes necessary, the one operation benefits both, and potatoes are always a highly profitable crop.

By using the proper manure, a double result will be obtained—that is, a good crop of potatoes and a strengthened and prolific grape-bearing vine.

When the potatoes are dug, I advise as a good practice the burying of the tops in the holes from where the potatoes were dug, thus returning to the soil moisture and humus.

P.S.—In my next notes I will give some hints about pruning.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 12.

TWIGGY MULLEIN (VERBASCUM VIRGATUM, *With.*).

Description.—A tall stiff erect-growing glandular herbaceous plant of biennial duration. Stem simple or branched. Leaves oblong-lanceolate, toothed or crenate. The radical ones large and forming a rosette at the base of the stem, the upper ones alternate. Flowers yellow 1-1½ in. diam., solitary or in clusters of 2-5 in the axils of a bract and with two bracteoles at the base of each pedicel. Pedicels (flower-stalks) short. Stamens 5, filaments with long purplish hairs. Capsules globular. Seeds numerous, very small, rough, light brown or greyish in colour.

Distribution.—A native of the Mediterranean region and western Europe. Naturalised in the cooler parts of British India, the Pacific States of North America, and in Australia. In Queensland a common weed but not particularly aggressive; it is common on the Darling Downs, on the southern coastal areas, and in the Atherton tableland district in North Queensland. J. M. Black records it as a common naturalised alien in South Australia.

Notes on the Identity of the Species.—This plant has previously been recorded for Queensland under the name of *Verbascum Blattaria*, from which it differs in its very much shorter flowering and fruiting pedicels. *Celsia cretica*, a closely allied plant, has also been recorded as naturalised in Queensland. I have never, however, seen authentic material, all the specimens I have seen so labelled belonging to the plant now under notice. *Verbascum virgatum*, with its long racemes of large yellow flowers, is quite a handsome plant, and was no doubt introduced as a garden species.

SOAPSUDS AND SULPHUR FOR ROSES.

If people who have roses and love nice, clean foliage on the rose bushes would use a spray each wash day, applying the suds to the foliage, they need never be troubled with the rose pests.

In many localities there is a mildew on the rose foliage. Even this may be prevented by the use of the soapsuds with a little powdered sulphur added.

Try these remedies, and you will find them very valuable in preventing such troublesome pests in the rose garden.

APIARY NOTES.

Mr. Geo. Butler, hon. sec., Queensland Beekeepers' Association, in reply to several questions by an intending beekeeper, replies as follows:—

"The first essential, and one which is of the greatest importance, is to procure bees in standard hives. This will save you a lot of annoyance, and in case it becomes necessary to dispose of them at any time, you will not experience the same difficulty which would occur were the hives of different dimensions to those in general use. Do not purchase a great number at first. One or two is quite sufficient, and when you have become conversant with the habits of the bees, you may launch out with confidence. For your purpose I would advise you to use half supers. They are much easier to manipulate, and the bees are more readily driven out of the super. A few puffs of smoke will suffice to free the super of bees, which can then be taken away and the honey extracted. The cost of a colony of bees is about £2. It is advisable to purchase your colonies from an experienced beekeeper. He will give you good stock, and impart any information you may require."

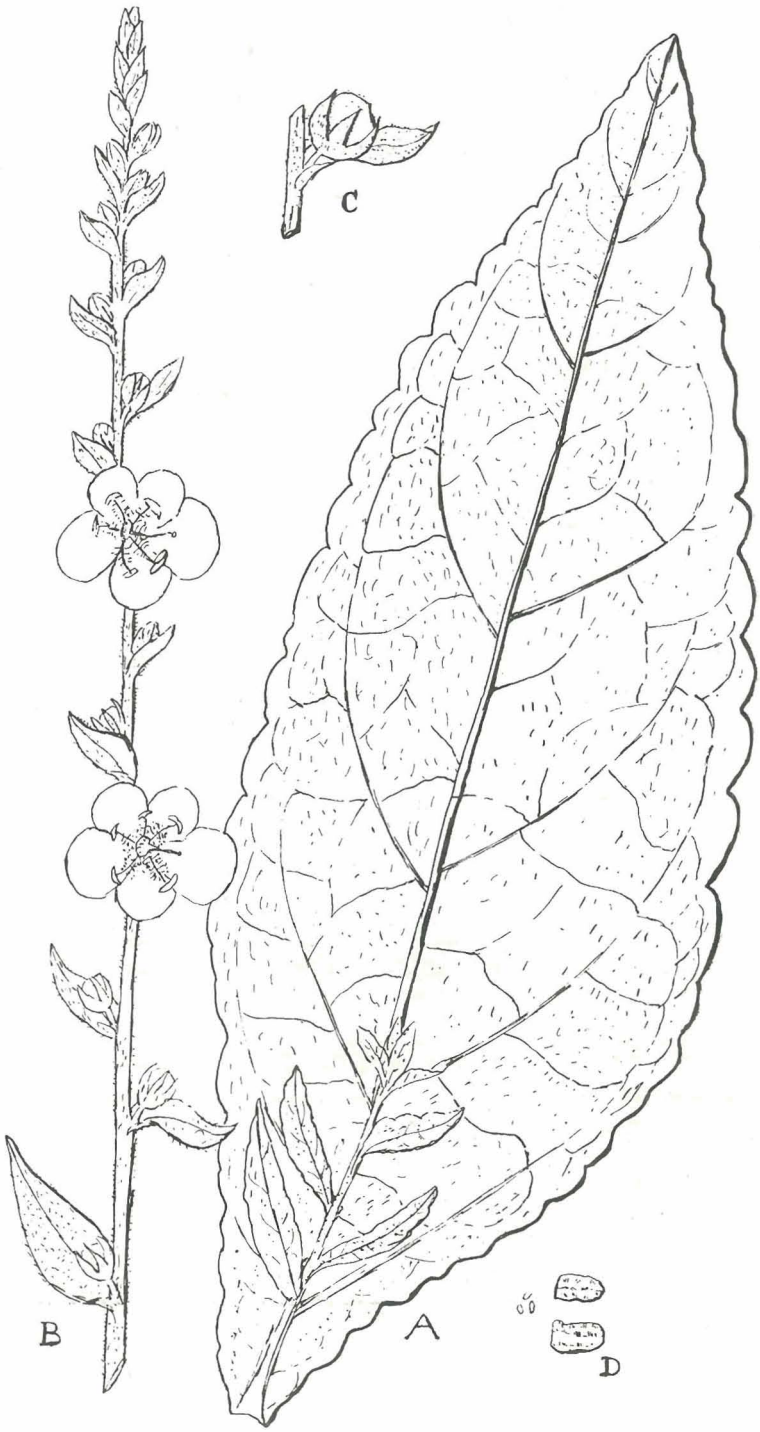

PLATE 5.—TWIGGY MULLEIN (*Verbascum virgatum*).

A Basal leaf with young axillary shoot. B Top portion of raceme. C Capsule.
D Seeds, natural size and enlarged.

Entomology.

CANE GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report on Cane Grub Investigation from the Entomologists at Gordonvale (Dr. J. F. Illingworth and Mr. E. Jarvis) :—

The heavy rains at the beginning of November have started the emergence of the grey-back cane beetles. Now is the time for everyone to be in harness, for it is only by co-operation that we shall have strength to successfully combat this terrible pest. The valuable information possessed by the growers, if collected and properly summarised, might enable us to complete our investigations several years earlier than if we were left to work out all the problems ourselves. Each one owes it to his own interest, as well as to the interest of the industry, to send in any information that he possesses along the line of the questions published on page 383 of the September "Sugar Journal." We are placing considerable faith in cultural methods, and desire all possible evidence. However, there must be no let-up to the collection of both beetles and grubs for the present, or, at least, until we discover a more economical method of control. I cannot urge this collecting too strongly, for there appears to be a lack of interest among growers now that a new Entomologist is appointed to handle the problem. Of course it is a well-understood fact that every female beetle destroyed within two weeks after emergence destroys all her progeny; and it is really an economical procedure if we can get them at this time.

As I have indicated before, we can place little dependence upon parasites for these native pests; and other control measures must be worked out. Though collecting the beetles and grubs is expensive, the expense is not prohibitive, and we know that by this method the pests are destroyed.

USE OF FIRES AND LIGHT-TRAPS.

Mr. Jarvis's experiments last season certainly showed that our common cane beetles are greatly attracted to lights, and this line of experiments is worth following up, for it is a subject that lends itself to extensive application. Numerous light-traps should be rigged up at the first appearance of the beetles. A trap can be made by simply suspending a lantern over a tub of water with a little kerosene on the surface. The trap should be sufficiently elevated to have the light visible from every direction. The flying beetles bump against the glass and fall into the kerosene-covered water, where they are quickly killed.

Recent experiments with small fires are encouraging; and undoubtedly vast numbers of the beetles, during their flight, succumb in the fires of the cane-fields. Anyway, we are continuing investigation of this important matter, and advocate small fires, started just at dark and kept up for about an hour, every evening during the flight of the beetles.

Where a large field of trash is to be burnt at this time, it would be well to conserve it by separating it into small blocks, and burn a little each evening. It may be profitable to save up rubbish of all kinds for fires at this time.

LEPIDIOTA FRENCHI AT MERINGA.

This grass-feeding species, recently described in detail by Mr. Jarvis, is becoming a serious pest of sugar-cane at Meringa. In one field of first ratoons, the grubs have gradually worked back from the grassy roadside, completely destroying patches of the cane by eating off all the roots. In digging up the dying stools, we found from six to ten large Stage III. grubs of this species. These same grubs, in their younger stages, did considerable damage to the plant-cane last year; and now, in their final stage, they are cleaning up some of the ratoons entirely. The owner of this field is treating the infested area, at our suggestion, with carbon bisulphide, in the hope of destroying these centres of infestation, which are evidently spreading to the surrounding healthy cane. The grubs, if left alone, would feed for several months yet, and emerge as beetles next year, since they have a two-year life cycle. Large grubs ploughed up at this season in grass-land are very apt to belong to this species; for all grubs of the common grey-back cockchafer changed to beetles, far below the reach of the plough, several months ago.

There is an excellent crop of cane on the half-acre plot treated with arsenic last season by Mr. Jarvis. Unfortunately, the experiment is not conclusive, because the owner treated the surrounding cane with carbon bisulphide without leaving the necessary check-plots. However, though the grubs were evidently not very bad in this locality last season, a few untreated rows left at the far end of the field became somewhat infested, so that a part of the cane fell over. Walking through the field, it is evident that the part treated with arsenic is just as vigorous as that treated with carbon bisulphide, and certainly the cost of the arsenic is considerably less.

Our 10-acre block at Meringa has all of the weedy-trash ploughed in, and a part of it is covered with a heavy growth of Mauritius bean. Since we were unable to get labour to put this land in shape for October planting, we are now planning to leave the part covered with bean and work the balance through the flight of the beetles, getting all of the 15 plots ready for March-planting.

Mr. Warner's co-operation with our department at Greenhills is going to be a mutual benefit. We shall have about a dozen plots, of an acre or more each, demonstrating principally cultural methods and the effects of poisons, fertilisers, &c.

MUSCARDINE FUNGUS.

Experiments started in August last with the green Muscardine fungus have shown that *Lepidiota frenchi* (Black) is victimised by this vegetable parasite.

Second-stage grubs of the above beetle were placed in cages containing infected soil of various degrees of moisture, with the result that those kept in very damp earth died in from 19 to 49 days, while

the percentage attacked by the fungus in drier soil was smaller and extended over a longer period. Judging by the results of another experiment with *frenchi* grubs, it seems probable that high soil temperatures do not favour the development of the fungus, since 75 per cent. of the grubs confined in cages kept at about 70 degrees Fahr. succumbed within a month, whereas those subjected to higher soil temperatures remained unaffected. We propose carrying out further experiments along these lines, in order to determine the action of this fungus on newly hatched first-stage grubs of our grey-back beetle. In this connection it may be mentioned that a bacterial disease of white grubs in America is engaging the attention of entomologists, and possibly if introduced into Queensland might prove beneficial. Grubs attacked by this organism, which is a species of *Micrococcus,* are characterised by a blackening of the affected parts.

Excessive wet apparently favours its development, so that our climate here, during the wet season, should afford suitable conditions for infection in the field, since at that time of year (January to March) grubs of *Albohirta* are doing the most damage.

The *Bacterium* in question is able to exist for over a year under artificial conditions, and has been successfully reproduced in healthy grubs by making an incision in the skin and placing them in infected soil.

Research work dealing with the economy of digger-wasps and other parasites is well in hand.

The life-cycle of *Campsomeris radula,* Fab., a scoliid wasp that preys on several kinds of cane beetles, is being successfully traced from eggs laid by this parasite at our Insectary.

Certain species of Dexiidæ, the maggots of which subsist on larvae of cockchafers, are also receiving attention, and it is hoped that further study in this direction may result in discoveries of economic value.

Our general collection of insects has been added to as opportunity offered. Several interesting species of Dexiidæ, Sarcophagidæ, and other Diptera, hitherto uncollected, have been obtained from scrub land.

As the hot weather advances, numerous fresh species of all kinds of insect life make their appearance, some of which are intimately associated with various pests of sugar-cane.

SCALE-FEEDING HABITS OF A PORTO RICAN MILLIPEDE.

RHINOCRICUS ARBOREUS, Saussure.

The journal of the Department of Agriculture of Porto Rico, U.S.A., July, 1917, contains an interesting note on the abovementioned millipede by R. T. Cotton, Assistant Entomologist, Insular Experiment Station. He says:—

"While investigating the feeding-habits of some of the common millipedes of the island, to ascertain whether or not they were injurious to truck crops, I was surprised to find that one of the species had the very interesting habit of feeding on the purple scale of citrus—*Lepidosaphes beckii.*

" This millipede is a large, dark reddish-brown form about 8 m.m. long (8-25 inch). It was identified by Dr. R. V. Chamberlin, of the Museum of Comparative Zoology, Cambridge, Massachusetts, as *Rhinocrinus arboreus,* who stated that it is known in several other West Indian islands.

" It was while walking through a citrus grove at Rio Piedras, P.R., that my attention was attracted by seeing several specimens of this millipede among the branches of a grape-fruit tree that was heavily infested with the purple scale. Pausing to watch them for a few minutes, I noticed that they were feeding voraciously on the scale, and smooth, clean patches on the scale-infested branches indicated where they had been at work. Transferring them to the laboratory, I placed them on grape-fruit twigs that were completely covered with scales, and in a very short time the twigs were cleaned off. Some idea of the voracity of this millipede may be gained from the fact that one specimen, by actual count, consumed two thousand scales in a period of three hours, and, after a short rest, continued feeding."

Mr. Cotton decided to try and entirely clear an infested tree of the scale by them. He captured a number and placed about a dozen in each of several badly-infested grape-fruit trees. They at once began feeding on the scales, and at the end of two weeks the trees were perfectly clean, free from scales, and the bark took on a fresh green colour.

We submitted Mr. Cotton's note on the *Rhinocricus arboreus,* to Mr. H. Tryon, Government Entomologist in this State, and he has commented upon it as follows:—

" It is usually held that all millipedes favour, or exclusively affect, a vegetable diet. This, indeed, is the opinion of F. G. Sinclair, the author of the animal division—' Myriapova,' for the Cambridge Natural History. Thus he writes (*Op. cit.,* p. 30):—' We have the Chilognatha or millipedes distinguished (from the Chilapoda or Centipedes) by their slow movements and vegetable diet.'

"The habits of some of the arboreal members of the group occurring in Queensland are, however, scarcely consistent with this position.

" This remark may or may not apply to our species of *Rhinocricus,* since in their case the feeding habits have not been made a matter of observation, either by myself or by anyone with whom I am acquainted; and Queensland, I may add, possesses several different kinds in its fauna —e.g., *R. brevipes,* Karsch; *R. crepidatus,* Karsch; and *R. opulentus,* Silvestri.

" But Mr. Cotton's statements are, however, sufficiently interesting to justify one in inquiring, and by way of experiment, how far the habits of the Porto Rican *Rhinocricus arboreus*—the subject of his note—are shared by any of these or other of our representatives of its genus; and especially so, seeing that the scale insect (*Lepidosaphes bechii*), that he has found it will devour with such avidity, is, too, one of the more notorious of our plant pests.

" He fails—it may be remarked—to distinguish, in anything that he has written, between habits evinced under special circumstances and

those generally displayed in feeding; and, obviously, it cannot be contended, with any regard to truth, that *R. arboreus* devours generally, much less commonly, the insect that he has found it to be so injuriously related to: much less, that it partakes of it exclusively. But, of course, this is a very important point in deciding the measure of its usefulness.

"Recently, I observed a native bird—the common leather head (*Philemon corniculatus*)—removing examples of a particular scale insect (*teroplastes cerifera*), one by one, from a tree that the latter had infested; and seeing it at work I had no doubt that were I to confine bird and tree in a common enclosure the former would soon completely rid the latter of its insect enemy. Now I do not propose to advance this observation as embracing the whole of the facts regarding the bird's dietary. This applies to the Porto Rican Millipede in question. Wherefore, we must not read into Mr. Cotton's statement of facts more than he intends us to imply."

RICE BRAN.

In feeding horses with rice bran, substitute the same weight—not measure—as the corn superseded. A quart of corn weighs 1 lb. 14 oz.; a quart of rice bran 1 lb., so it does not do to feed by measure, unless the weight is taken into account.

In feeding cows, give one-fifth more of rice bran in place of wheat bran, add salt in order to induce the beasts to take it. Some beasts accustomed to certain foods will not readily take to others.

It will be interesting to those who are interested in food for stock to peruse the following analyses of common foodstuffs for stock as made by the Director of Agriculture in Mauritius, which we take from the West India Circular:—

——	Digestible Fibre or Cellulose.	Digestible Fats or Oils.	Digestible Proteins or Albuminoids.	Digestible Non-albuminoids Carbohydrates.	Albuminoid Ratio.	Starch Equivalent.
Rice Bran	6·2	6·1	7·8	33·5	6·9	72
Wheat Bran ..	6·8	2·6	10·0	35·0	4·7	71
Maize Seeds (Corn) ..	1·1	4·0	8·9	45·4	6·0	75
Oats (Grains) ..	7·2	4·3	9·3	40·7	6·2	79

HOME-MADE NIGHTLIGHT.

A glass of water, by a simple arrangement, can be turned into a useful candlestick. Fill a tumbler three-quarters full of water. Take a piece of ordinary wax candle and stick a nail into its lower end in the same line with the body of the candle. The nail is for ballast; be careful in choosing it that it is of the right thickness and weight to cause the candle to float with only a quarter of an inch above the water. If properly balanced, the candle will burn steadily down to the bottom. The sides of the tumbler prevent air currents reaching the flame, and if the glass stands on a firm substance the water will not flow over the edge of the candle, for as the flame burns and the candle gets shorter it becomes at the same time lighter, and rises. The flame really burns more steadily than if the candle were in an ordinary candlestick, for not only are there no air currents to blow the flame about, but the water keeps the outside of the candle cool, so that the flame works out a kind of cup for itself in the wax. The next time you want a nightlight try this simple experiment.—"Farmers' Union Advocate," New Zealand.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR DECEMBER, 1917.

Article.		DECEMBER. Prices.
Bacon	lb.	9½d. to 10d.
Barley	bush.	2s. 6d. to 3s.
Bran	ton	£5 10s.
Broom Millet	(no supplies)	£22 to £25
Butter	cwt.	149s. 4d.
Chaff, Mixed	ton	£2 10s. to £4 10s.
Chaff, Oaten	"	£4 to £6
Chaff, Lucerne	"	£2 15s. to £3 15s.
Chaff, Wheaten	"	£2 10s. to £5
Cheese (wholesale)	lb.	9d.
Cheese (retail)	"	1s.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 6d.
Hay, Oaten	ton	£7 10s.
Hay, Lucerne	"	£2 to £2 6s. 8d.
Honey	lb.	2½d. to 3d.
Maize	bush.	4s. 4d.
Oats	"	1s. 6d. to 2s. 6d.
Onions	ton	£12 to £14
Peanuts	lb.	4d. to 6d.
Pollard	ton	£6 12s. 6d.
Potatoes	"	£12 to £14 10s.
Potatoes (Sweet)	cwt.	£2 10s. to £3 10s.
Pumpkins (Cattle)	ton	£4 to £6
Eggs	doz.	8½d. to 1s. 3d.
Fowls	per pair	4s. to 7s. 8d.
Ducks, English	"	3s. 10d.
Ducks, Muscovy	"	7s. to 9s.
Geese	"	11s. 6d. to 20s.
Turkeys (Hens)	"	15s.
Turkeys (Gobblers)	"	15s. to 28s.
Wheat	bush.	4s. to 5s. 3d.

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	6s. to 12s.
Cabbages, per dozen	1s. to 3s.
Cauliflowers, per dozen	...
Chocos, per dozen	1s. 6d. to 2s.
Beans, per sugar bag	4d. to 1s. 9d.
Peas, per sugar bag	3s. to 5s. 6d.
Carrots, per dozen bunches	4d. to 9d.
Beetroot, per dozen bunches	6d. to 9d.
Lettuce, per dozen	1s. to 1s. 6d.
Parsnips, per dozen bundles	6d. to 1s.
Sweet Potatoes, per cwt.	2s. 6d. to 3s.
Table Pumpkins, per dozen	3s. to 6s.
Marrows, per dozen	1s.
Tomatoes, per case	2s. to 3s. 6d.
Cucumbers, per dozen	4d. to 9d.

SOUTHERN FRUIT MARKETS.

Article.	DECEMBER. Prices.
Bananas (Queensland), per crate	8s. to 11s.
Bananas (Tweed River), per crate	11s. to 13s.
Bananas (Fiji), per crate	...
Bananas (G.M.), per crate	...
Mangoes, per case	4s. to 5s.
Oranges (Navel), per case	10s. to 14s.
Oranges (Seville), per bushel case	...
Oranges (other), per case	6s. to 7s.
Papaw Apples, per half-bushel case	7s. to 10s.
Passion Fruit, per half case	8s. to 11s.
Pineapples (Queens), per double case	10s. to 12s.
Pineapples (Ripleys), per double case	7s. to 10s.
Pineapples (Common), per double case	7s. to 10s.
Tomatoes (Queensland), per half-bushel case	4s. to 5s.
Cucumbers, per bushel case	6s. to 8s.
Strawberries, per lb.	5d. to 6d.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	DECEMBER Prices.
Apples, Eating, per bushel case	20s. to 28s.
Apples, Cooking, per bushel case	15s. to 16s.
Apricots, per case	7s. 6d. to 11s.
Bananas (Cavendish), per dozen	1d. to $4\frac{3}{4}$d.
Bananas (Sugar), per dozen	$1\frac{1}{2}$d. to $3\frac{3}{4}$d.
Cape Gooseberries, per quarter-case	6s. to 9s.
Cherries, per case	4s. to 7s.
Citrons, per hundredweight	11s.
Cocoanuts, per sack	12s. to 15s.
Cumquats, per quarter-case	...
Lemons (Lisbon), per case	8s. 6d. to 15s.
Mandarins, per case	10s. to 15s.
Mangoes, per case	3s. to 6s.
Oranges (Navel), per case	17s. 6d.
Oranges (Seville), per hundredweight	3s. 6d. to 10s.
Oranges (other), per case	6s. to 12s.
Papaw Apples, per quarter-case	1s. to 3s.
Passion Fruit, per quarter-case	6s. to 10s. 6d.
Peaches, per quarter-case	1s. to 5s. 6d.
Pears, per quarter-case	12s. 6d. to 18s. 6d.
Peanuts, per lb.	4d. to 6d.
Pineapples (Ripleys), per dozen	2s. 6d to 6s.
Pineapples (Rough), per dozen	2s. to 6s. 3d.
Pineapples (Smooth), per dozen	2s. to 5s. 6d.
Plums, per case	2s. to 5s.
Rockmelons, per dozen	7s. to 10s.
Strawberries, per dozen boxes	4s. to 10s.
Tomatoes, per case	2s. to 3s. 6d.
Watermelons, per dozen	6s. to 12s.

TOP PRICES, ENOGGERA YARDS, NOVEMBER, 1917.

Animal.	NOVEMBER. Prices.
Bullocks	£20 12s. 6d. to £25 2s. 6d.
Bullocks (Single)	£29 5s.
Cows	£13 5s. to £17
Cows (Single)	...
Merino Wethers	47s. 3d.
Crossbred Wethers	39s. 9d.
Merino Ewes	35s. 6d.
Crossbred Ewes	39s. 9d.
Lambs	41s. 6d.
Pigs (Bacon)	...
Pigs (Porkers)	69s.
Pigs (Suckers)	.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF NOVEMBER 1917, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING NOVEMBER, 1917 AND 1916, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Nov.	No. of Years' Records.	Nov., 1917.	Nov., 1916.		Nov.	No. of Years' Records.	Nov., 1917.	Nov., 1916.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	1·90	15	6·33	5·21	Nambour	3·44	20	14·63	4·21
Cairns	4·22	34	7·24	2·13	Nanango	2·39	34	8·56	7·34
Cardwell	4·20	44	11·44	4·46	Rockhampton	2·08	29	5·61	3·33
Cooktown	2·97	40	3·77	1·06	Woodford	2·92	29	10·43	5·53
Herberton	2·45	29	3·87	2·39					
Ingham	3·84	24	10·80	5·25					
Innisfail	6·55	35	9·34	2·23	*Darling Downs.*				
Mossman	15·78	5	13·26	2·36					
Townsville	1·63	45	13·17	3·75	Dalby	2·47	46	5·63	7·59
					Emu Vale	2·38	20	4·62	4·85
Central Coast.					Jimbour	2·30	28	5·91	5·74
					Miles	2·27	31	9·94	7·28
Ayr	1·35	29	12·50	5·14	Stanthorpe	2·74	43	4·84	2·89
Bowen	1·25	45	6·34	1·58	Toowoomba	3·13	44	8·98	7·48
Charters Towers	1·51	34	4·70	2·89	Warwick	2·48	29	5·11	5·22
Mackay	2·90	45	6·57	3·93					
Proserpine	3·13	13	8·09	2·42					
St. Lawrence	2·27	45	8·01	1·93	*Maranoa.*				
					Roma	2·04	42	2·26	6·42
South Coast.									
					State Farms, &c.				
Biggenden	2·32	17	10·91	4·93					
Bundaberg	2·51	33	6·48	6·17					
Brisbane	3·73	66	12·41	6·17	Bungeworgorai	2·16	4	...	6·84
Childers	2·55	21	7·96	6·66	Gatton College	2·41	17	7·60	4·96
Crohamhurst	4·25	23	12·31	6·38	Gindie	1·79	17	7·11	4·90
Esk	2·96	29	7·54	5·43	Hermitage	2·16	10	5·25	5·60
Gayndah	2·75	45	7·18	5·76	Kairi	2·15	5	2·49	5·64
Gympie	3·07	46	9·81	3·80	Kamerunga	3·02	26	7·87	2·55
Glasshouse M'tains	3·44	8	12·96	2·28	Sugar Experiment Station, Mackay	2·44	19	5·97	...
Kilkivan	2·51	37	4·97	3·44	Warren	3·75	5	6·81	8·27
Maryborough	3·02	45	7·93	6·60					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for November this year and for the same period of 1916, 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.

1918.	JANUARY.		FEBRUARY.		MARCH.		APRIL.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	4·57	6·46	5·21	6·41	5·41	6·19	5·58	5·46
2	4·58	6·46	5·22	6·41	5·41	6·18	5·59	5·45
3	4 59	6·46	5·23	6·40	5·42	6·17	5·59	5·44
4	4 59	6·46	5·24	6·40	5·43	6·16	6·0	5·43
5	5·0	6·46	5·25	6 39	5·44	6·15	6·0	5·42
6	5·1	6·47	5·25	6·39	5·45	6·14	6·1	5·41
7	5·2	6·47	5·26	6·38	5·45	6·13	6·1	5·39
8	5·3	6·47	5·27	6·37	5·46	6·12	6·2	5·38
9	5·3	6·47	5·28	6 36	5·46	6·11	6·2	5·37
10	5·4	6·48	5·29	6·35	5·47	6·10	6·3	5·36
11	5·5	6·48	5·29	6·35	5·47	6·9	6·3	5·35
12	5·6	6·47	5·30	6·34	5·48	6·8	6·4	5·34
13	5·6	6·47	5·31	6·33	5·48	6·7	6·4	5·33
14	5·7	6·47	5·32	6·32	5·49	6·6	6·5	5·32
15	5·8	6·47	5.32	6 32	5·49	6·5	6·5	5·31
16	5 9	6·47	5·33	6·31	5·50	6·3	6·6	5·30
17	5·9	6·47	5·34	6·30	5·50	6·2	6·6	5·29
18	5·10	6·47	5·35	6·29	5·51	6·1	6·7	5·28
19	5·11	6·47	5·35	6·28	5·51	6·0	6·7	5·27
20	5·12	6·46	5.36	6·28	5·52	5·59	6·8	5·26
21	5·13	6·46	5·37	6·27	5·52	5·58	6·8	5 25
22	5·13	6·46	5·37	6·26	5·53	5·57	6·8	5·24
23	5·14	6·45	5·38	6·25	5·53	5·56	6 9	5·23
24	5·15	6 45	5·38	6·24	5 54	5·55	6 9	5·23
25	5·16	6·45	5·39	6·23	5·54	5·54	6·10	5·22
26	5·16	6·44	5·39	6·22	5·55	5·52	6·10	5·21
27	5·17	6·44	5·40	6·21	5·55	5·51	6·11	5·20
28	5·18	6·43	5·40	6·20	5·56	5·50	6·11	5·19
29	5·19	6·43	...	...	5·57	5·49	6·12	5·18
30	5·19	6·42	...	..	5·57	5·48	6·12	5·18
31	5·20	6·42	...	...	5·58	5·47	...	...

PHASES OF THE MOON.

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

			H.	M.	
5 Jan.	☽	Last Quarter	9	49	p.m.
13 ,,	●	New Moon	8	36	a.m.
20 ,,	☾	First Quarter	12	38	,,
27 ,,	○	Full Moon	1	14	p.m.

The Moon will be at Perigee on 15th, Apogee on 3rd and 31st.

4 Feb.	☽	Last Quarter	5	52	p.m.
11 ,,	●	New Moon	8	5	,,
18 ,,	☾	First Quarter	10	57	a.m.
26 ,,	○	Full Moon	7	35	p.m.

The Moon will be at Perigee on 12th, Apogee on 28th.

6 Mar.	☽	Last Quarter	10	44	a.m.
13 ,,	●	New Moon	5	52	p.m.
19 ,,	☾	First Quarter	11	30	,,
28 ,,	○	Full Moon	1	33	,,

The Moon will be at Perigee on 13th, Apogee on 27th.

4 April	☽	Last Quarter	11	33	p.m.
11 ,,	●	New Moon	2	34	,,
18 ,,	☾	First Quarter	2	8	,,
26 ,,	○	Full Moon	6	5	,,

The Moon will be at Perigee on 10th, Apogee on 23rd.

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 Roma the times of sunrise and sunset may be roughly arrived at by adding 17 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.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

For the sunrise and sunset at Rockhampton, Townsville, Cairns, and other places in Queensland, readers may be referred to the "Queenslander" to which newspaper monthly astronomical notes will be supplied.—D.E.

Farm and Garden Notes for February.

FIELD.—The land intended for potatoes should now be ready for planting. Plant sound small potatoes, well shot, without cutting them. If large potatoes are cut into setts, there is a risk of their rotting, as the usual wet weather may be expected, with a hot, muggy atmosphere. Weeds will be very troublesome, and for that reason the sowing of lucerne should be deferred till later. Sow lucerne in deep rich soil, thoroughly worked and deeply ploughed. Cape barley, panicum, kafir corn, imphee, sorghum, and vetches may be sown; but it is risky to plant maize for a late crop, as early frosts would destroy the ripening grain. For an early winter crop, sow swede turnips and mangel wurtzels. Pick cotton as the bolls burst. Do not pick until the dew has dried off the bolls. Expose the picked cotton for a couple of hours to sun heat.

KITCHEN GARDEN.—Make preparations for good crops of vegetables for the early winter by ploughing or digging all unoccupied land, supplying well-rotted manure if needed. Chicken guano is also an excellent fertiliser, if prepared as follows:—

Spread a layer of black soil on the ground. Dump the fowl manure on to this, and pound it fine with the back of a spade; add hardwood ashes, so that the compound shall contain—Soil, 3 bushels; fowl manure, 2 bushels; ashes, 1 bushel. Mix thoroughly, and a little before planting moisten the heap with water, or, better still, with urine; cover with old mats, and let it lie till needed.

Most market gardeners will have cabbages and cauliflowers ready for transplanting. Do this during the month. In the pamphlet on "Market Gardening" issued by the Department, it is recommended to sow the seed from the middle of January to the middle of March, arranging the time, however, to suit early and late districts. For winter crops, the Drumhead type, of which Flat Dutch and Queensland or Florida Headen are good examples, are the most profitable. The Savoy cabbage does well here. The best cauliflowers to grow are the Large Asiatic, Eclipse, Early Dwarf, and Le Normand. If the aphis appears, spray with tobacco solution.

Sow French beans, butter beans, beet, carrot, turnip, radish, cabbage, cauliflower, cress, peas. Should the weather prove dry after the January rains, give the plants a good soaking with water. Gather all fruit of cucumbers, melons, French and other beans, and tomatoes as they ripen, to ensure the continued production of the vines and plants.

FLOWER GARDEN.—Thin out and tie up dahlias. Keep the weeds down, and never allow them to seed. Sow hardy annuals. This is the best month for sowing, as you will be able to keep up a succession of bloom during the succeeding months of autumn and winter. To ensure this, sow phlox, pansy, daisy, stocks, aster, nasturtium, hollyhock, candytuft, mignonette, sweet peas, dianthus, carnations, cornflower, summer chrysanthemum, verbenas, petunias, pentstamons, &c. Dianthus, sown now and planted out in March, will bloom during the whole year, if the dead stalks and blooms are regularly cut away.

Do not sow flower seeds too deep, as on the depth will depend greatly what results you will have as regards the seed germinating. It is easy to remember that seeds should be covered with fine soil to a depth equal to their own size; for instance, a pea is about one-eighth of an inch in diameter, therefore, cover it with one-eighth of an inch of soil.

Orchard Notes for February.

In order that the series of monthly notes that have appeared for some years past in the "Agricultural Journal" might be rendered of more value to our fruitgrowers, advantage was taken of the commencement of the new year to revise them and bring them up to date. At the same time, the notes have been somewhat altered, as, instead of making them of a general nature, applicable to the whole of the State, they are, to a certain extent, localised, as, although the general principles of cultivation, manuring, pruning, treatment of fruit pests, as well as of the handling and marketing of the fruit, are applicable to the State as a whole, there are many

matters that are of interest to individual parts of the State rather than to the whole State; and, further, notes that are applicable to the Southern part of the State for one month are not always applicable to the North for the same month.

In order to carry out this idea the State has been divided as follows:—

1. The Southern Coast Districts, south of the Tropic of Capricorn;
2. The Tropical Coast Districts;
3. The Southern and Central Tablelands.

This plan has met with such general approval during the past year that the notes will henceforth be published in accordance therewith.

THE SOUTHERN COAST DISTRICTS.

The earlier summer fruits, including grapes, will be pretty well over, but pineapples, mangoes, and bananas are in full fruit. The bulk of the main summer crop of pines ripens during the month, and growers are in consequence kept very busy sending them to both our local markets and canneries, and to the Southern States. The planting of all kinds of tropical fruits can be continued where necessary, though earlier planting of both pines and bananas is to be recommended. Still, if the land is thoroughly prepared—viz., well and deeply-worked—they can be planted with safety, and will become well established before winter. The month is usually a wet one, and both tree and weed growth is excessive. If unable to get on the land with horses to keep down weed growth, use the scythe freely in the orchard before weeds seed, as by doing so you will form a good mulch that will tend to prevent the soil washing, and that when ploughed in later on will add a considerable quantity of organic matter to the soil, thus tending to improve its mechanical condition, its power of absorbing and retaining moisture, as well as to increase its nitrogen contents.

This is the best month of the year in which to bud mangoes in the Brisbane district. The bark of the stock to be budded must run very freely, and the scion, when placed in position, must be tied very firmly. The bark of the scion should be slightly thicker than the bark of the stock, so that the material used to tie it keeps it firmly in its place. As soon as the bud is tied, ringbark the stock just above the bud, so as to force the sap of the stock into scion, so that a union will take place quickly.

Where cyaniding of citrus and other trees has not been concluded it may be continued during the month, as fruit treated now will probably keep clean and free from scale insects till gathered. If the trees have been treated with Bordeaux mixture, do not cyanide, as cyaniding should always be done previous to spraying with Bordeaux mixture.

If Maori is showing, spray with the sulphide of soda wash. Look out for Black Brand and also for the Yellow Peach Moth towards the end of the month in the earlier districts. Spraying with Bordeaux mixture is advisable in the case of both of these pests.

Get land ready for strawberry planting, so as to be ready to set out runners next month. Some growers set out plants as early as the end of February, but March is to be preferred. Citrus and deciduous trees can still be budded during the month. Young trees in nursery should be kept clean and attended to; ties should be cut where necessary, and the young trees trained to a straight single stem.

THE TROPICAL COAST DISTRICTS.

As the month is usually a very wet one in this part of the State, very little work can be done in the orchard other than keeping down excessive weed growth by means of a scythe. When citrus trees are making excessive growth and throwing out large numbers of water-shoots, the latter should be cut away, otherwise they are apt to rob the rest of the tree, and thus injure it considerably. Many of the citrus trees will come into a second blossoming during the month, and this will produce a crop of fruit ripening towards the end of winter and during the following spring. The main crop, where same has set in spring, will be ripening towards the end of the month, but as a rule insect life of all kinds is so prevalent at this time of year that the bulk of the fruit is destroyed. Where there is sound fruit, however, it will pay to look after. If the weather is wet is should be artificially dried before packing; but if there are periods of sunshine, then the fruit can be cut and laid out on boards or slabs in the sun, so that the extra moisture of the skin can be dried out. Care will have to be taken not to sun-scald the fruit, or to dry it too much; all that is required is to evaporate the surplus moisture from the skin, so that the fruit will not speck when packed.

Tropical fruits of all sorts can be planted during the month. Budding of mangoes and other fruits can be continued. Bananas must be kept netted, as fly is always bad at this time of year.

THE SOUTHERN AND CENTRAL TABLELANDS.

The marketing of later varieties of apples, pears, plums, peaches, and nectarines will occupy the attention of the Stanthorpe growers. The grape harvest will also extend right through the month. Every care should be taken to see that the fruit fly and codling moth are not allowed to spread, although the best work in fighting these pests has to be done during the months of December and January, as on the action then taken, if carried out systematically, the freedom of the later fruits from infestation mainly depends.

Handle the fruit carefully, and see that no fly or codling moth infested fruit leaves the district. The grapes, ripening as they do when this fruit is over in the earlier parts of the State, should be sent not only to Brisbane, but to all other parts of the State. For long shipment nothing can beat crates holding 6-lb. baskets. The fruit should be gathered some hours before packing, and be placed in the sun, so as to become thoroughly dry, and to allow the stems to become wilted, as this causes the fruit to hang on the bunch much better, and consequently to reach its destination in better order.

If parrots and flying foxes are troublesome, organised shooting parties or poisoning with strychnine are the best means of dealing with those pests.

The crop of grapes will be about over in the Roma and other inland districts. Citrus trees, when infested by Red Scale, should be cyanided. The orchard should be kept well cultivated after every rain, and when there is no rain, but water is available for irrigation, if the soil requires it, the trees should get a good soaking, which, if followed by thorough cultivation, will carry the trees on till the fruit is ripe.

TO PICKLE CHILLIES.

Take large green capsicums and slit them sufficiently to remove the seeds. Then make a brine of salt and water of sufficient density to float an egg. Place the chillies in this when the brine is cold, and let them remain there for twenty-four hours, then drain again, rinsing in cold water; then place in wide-mouthed stone or glass jars. Now take vinegar and water in the proportion of one quart of vinegar and one quart of water to every thirty chillies. Heat to boiling point and pour it over the peppers in the jars; leave it to stand till cold, then drain off this vinegar and water and throw it away. Heat fresh vinegar now without water, and pour it over the peppers boiling hot. Cover the jars tightly and set in a cool place.

We find many recipes which must commend themselves to dwellers in a hot country in the excellent "Journal of the Jamaica Agricultural Society." The chilli pickle is one; another is—

TO MAKE CHILLI SAUCE.

Take 1 dozen large tomatoes, 2 large onions, and 4 green chillies; peel the tomatoes and onions, and chop them up fine, also chop the green chillies fine. Keep them all separate till chopped, then mix and stir all together, adding two table spoonfuls of salt, two table spoons of sugar, one of cinnamon, and three tea cups of vinegar. Boil the whole steadily and slowly about an hour and a-half, stirring well all the time. Then bottle.

TO MAKE CHILLI VINEGAR.

Take, say 50 chillies to 1 pint of vinegar. Mash the chillies, then place them in a close jar or wide bottle, adding the vinegar, then cover tightly. At the end of four weeks uncover, strain, and bottle.

CREOLE PICKLES.

Ingredients.—3 or 4 cucumbers, 8 or 10 onions, 1 or 2 young spadices of cabbage palm, 1 or 2 green pawpaws, a few cut open peppers, a little whole allspice, Coleman's mustard, 2d.; curry powder, 2d.; turmeric, 1d.; black pepper and salt in proportion, and enough vinegar to cover the whole. Mode.—Cut up the cucumbers and onions, and soak in salt and water the day before, cut up the pawpaw and cabbage and boil each one in salt and water, but only until they break easily. Put the vinegar into a saucepan, and when it boils put in the cabbage and pawpaw and add, in a little while, the cucumber and onion, spices, and ground black pepper. Mix the mustard, curry, and turmeric with some cold vinegar, and add this to the boiling vinegar, and let all boil for a few minutes. Bottle and cork tightly when cold. N.B.—This quantity will make from 6 to 10 bottles.