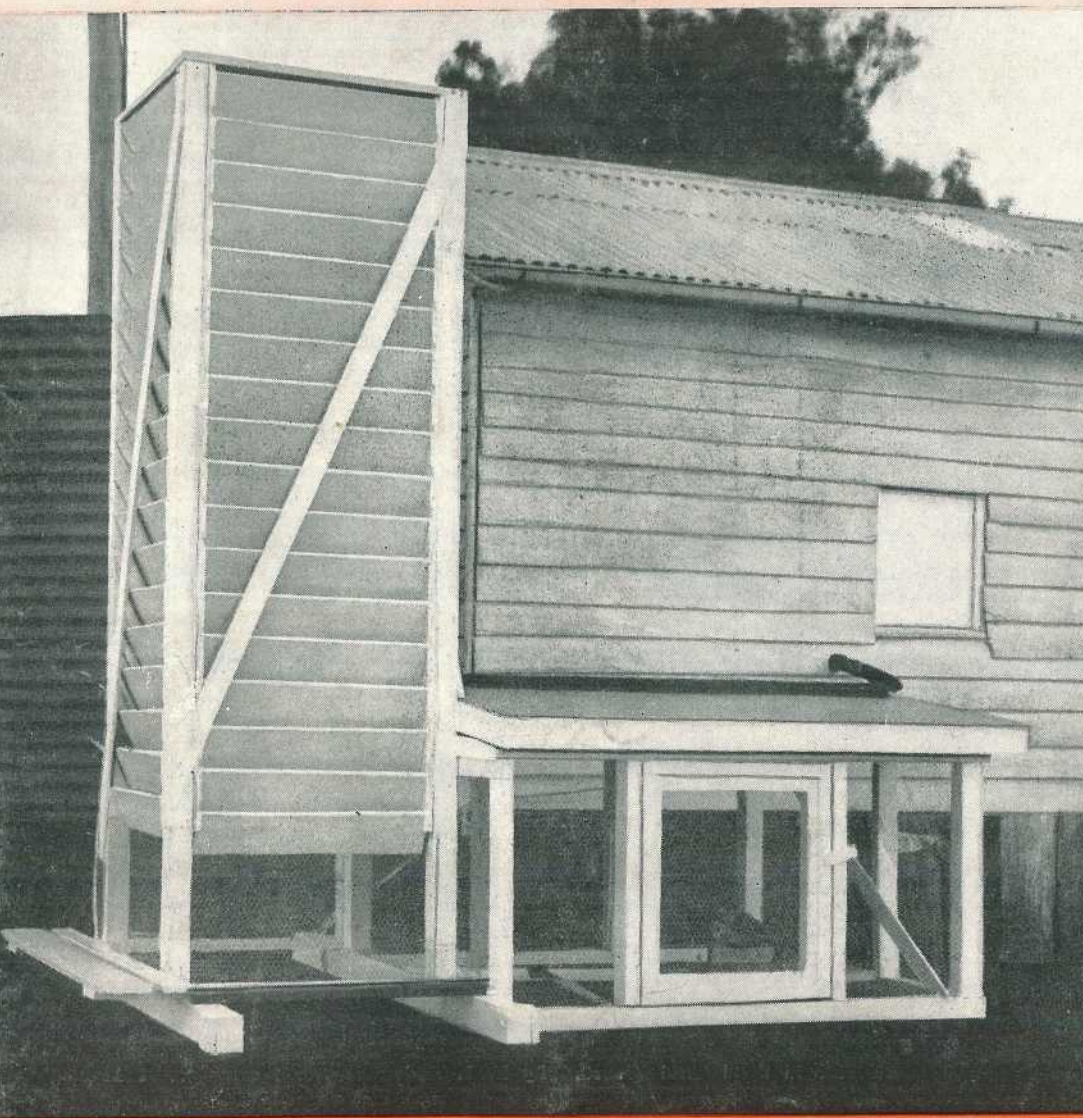
Queensland AGRICULTURAL JOURNAL



A WATER-COOLING TOWER WITH A PIT EXTENSION FOR STORING CREAM.

Vol. 83 APRIL, 1957 No. 4

Registered at the General Post Office, Brisbane, for transmission by Post as a Newspaper.

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O. J. Horton, "Manneum Brae" Stud, Manneum, Kingaroy.
B. F. Jensen, Rosevale
Dr. B. J. Butcher and A. J. Parnwell, 684 Logan road, Greenslopes, Brisbane
R. Kennard, Collar Stud, Warwick
A. C. H. Gibbons, Mt. Glorious

Tamworth.

D. F. L. Skerman, "Waverley" Stud, Kaimkillenbun
A. C. Fletcher, "Myola" Stud, Jimbour
Salvation Army Home for Boys, "Canaan" Stud, Riverview
Department of Agriculture and Stock, Regional Experiment Station, Kairi
E. C. Phillips, "Sunny View," M.S. 90, Kingaroy
F. N. Hales, Kerry road, Beaudesert
T. A. Stephen, "Withcott," Helidon
W. F. Kajewski, "Glenroy" Stud, Glencoe
A. Herbst, "Hillbanside" Stud, Bahr Scrub, *via* Beenleigh
F. Thomas, "Rosevale" Stud, M. S. 373, Beaudesert
H. J. Armstrong, "Alhambra," Crownthorpe, Murgon
R. H. Coller, Tallegalla, *via* Rosewood
A. J. Potter, "Woodlands," Inglewood
D. V. and P. V. Campbell, "Lawn Hill," Lamington
S. Kanowski, "Miecho" Stud, Pinelands
N. R. Potter, "Actonvale" Stud, Wellcamp

Wessex Saddleback.

W. S. Douglas, "Greylight" Stud, Goombungee
C. R. Smith, "Belton Park" Stud, Nara
D. T. Law, "Rossvill" Stud, Trouts road, Aspley
J. B. Dunlop, "Kurrawyn" Stud, Acacia road, Kuraby
R. A. Collings, "Rutholme" Stud, Waterford
M. Nielsen, "Cressbrook" Stud, Goomburra
G. J. Cooper, "Cedar Glen" Stud, Yarraman
"Wattledale Stud," 492 Beenleigh road, Sunnybank
Kruger and Sons, "Greyhurst," Goombungee
A. Scott, "Wanstead" Stud, Grantham
G. C. Burnett, "Rathburnie," Linville

British Large Black.

H. W. Naumann, "Parkdale" Stud, Kalbar

Tuberculosis-Free Cattle Herds.

The studs listed below have fulfilled the conditions of the Department's Tuberculosis-free Herd Scheme to 31st March, 1957.

Breed.	Owner's Name and Address.
A.I.S.	M. E. & E. Scott, "Wattlebrae" A.I.S. Stud, Kingaroy
	F. B. Sullivan, "Fermanagh," Pittsworth
	D. Sullivan, "Bantry" Stud, Rossvale, *via* Pittsworth
	W. Henschell, "Yarranvale," Yarranlea
	Con. O'Sullivan, "Navillus" Stud, Greenmount
	H. V. Littleton, "Wongalea" Stud, Hillview, Crow's Nest
	J. Phillips and Sons, "Sunny View," Benair, *via* Kingaroy
	Sullivan Bros., "Valera" Stud, Pittsworth
	Reushle Bros., "Reubydale" Stud, Ravensbourne
	H. F. Marquardt, "Chelmer" Stud, Wondai
	A. C. and C. R. Marquardt, "Cedar Valley," Wondai
	A. H. Sokoll, "Sunny Crest" Stud, Wondai
	W. and A. G. Scott, "Welena" A.I.S. Stud, Blackbutt
	G. Sperling, "Kooravale" Stud, Kooralgin, *via* Cooyar
	C. J. Schloss, "Shady Glen," Rocky Creek, Yarraman
	W. H. Thompson, "Alfa Vale," Nanango
	S. R. Moore, Sunnyside, West Wooroolin
	H.M. State Farm, Numinbah
	D. G. Neale, "Grovely," Greenmount
	Edwards Bros., "Spring Valley" A.I.S. Stud, Kingaroy
	A. W. Wieland, "Milhaven" A.I.S. Stud, Milford, *via* Boonah
	W. D. Davis, "Wamba," Stud, Chinchilla
	Queensland Agricultural High School and College, Lawes
	C. K. Roche, Freestone, Warwick
	Mrs. K. Henry, Greenmount
	D. B. Green, "Deloraine" Stud, Durong, Proston
	E. Evans, Wootha, Maleny
	T. L. and L. M. J. Cox, "Seafield Farm," Wallumbilla
	J. Crookey, "Arolla" A.I.S. Stud, Fairview, Allora
	M. F. Power, "Barfield" Kapaldo
	A. H. Webster, "Millievale," Derrymore
	W. H. Sanderson, "Sunlit Farm," Mulgildie
	R. A. and N. K. Shelton, "Vuegon" A.I.S. Stud, Hivesville, via Murgon
	R. R. Radel & Sons, "Happy Valley." Coalstoun Lakes
Ayrshire	L. Holmes, "Benbecula," Yarranlea
	J. N. Scott, "Auchen Eden," Camp Mountain
	E. Mathie and Son, "Ainslie" Ayrshire Stud, Maleny
	C. E. R. Dudgeon, "Marionville" Ayrshire Stud, Landsborough
	G. F. H. Zerner, "Pineville," Pie Creek, Box 5, P.O., Gympie
	T. F. Dunn, Alanbank, Gleneagle
Friesian	C. H. Naumann, "Yarrabine" Stud, Yarraman
	D. J. Pender, "Camelot," Lytton road, Lindum
	S. E. G. Macdonald, "Freshfields," Marburg
Guernsey	C. D. Holmes, "Springview," Yarraman
	A. B. Fletcher, Cossart Vale, Boonah
	W. H. Doss, Degilbo, *via* Biggenden
	A. C. Swendson, Coolabunia, Box 26, Kingaroy
	C. Scott, "Coralgrae," Din Din Road, Nanango
	R. J. Wissemann, "Robnea," Headington Hill, Clifton
	G. L. Johnson, "Old Cannindah," Monto
	A. Ruge & Sons, Woowoonga, *via* Biggenden
	G. Miller, Armagh Guernsey Stud, Armagh, M. S. 428 Grantham
	N. H. Sanderson, "Eden Valley," Monto
Jersey	Queensland Agricultural High School and College, Lawes
	J. S. McCarthy, "Glen Erin" Jersey Stud, Greenmount
	J. F. Lau, "Rosallen" Jersey Stud, Goombungee
	G. Harley, Hopewell, M.S. 189, Kingaroy
	Toowoomba Mental Hospital, Willowburn
	Farm Home for Boys, Westbrook
	P. J. L. Bygrave, "The Craigan Farm," Aspley
	R. J. Crawford, "Inverlaw" Jersey Stud, Inverlaw, Kingaroy
	P. H. F. Gregory, "Carlton," Rosevale, *via* Rosewood
	E. A. Matthews, "Yarradale," Yarraman
	A. L. Semgreen, "Tecoma," Coolabunia
	L. E. Meier, "Ardath" Stud, Boonah
	A. M. and L. J. Noone, "Winbirra" Stud, Mt. Esk Pocket, Esk
	W. S. Conochie and Sons, "Brookland" Stud, Sherwood road, Sherwood
	Estate of J. A. Scott, "Kiaora," Manumbar road, Nanango
	F. W. Verrall, "Coleburn," Walloon
	C. Beckingham, Trouts road, Everton Park
	W. E. O. Meir and Son, "Kingsford" Stud, Alberton, *via* Yatala
	G. H. Ralph, "Ryecombe," Ravensbourne
	Mrs. I. L. M. Borchert, "Willowbank" Jersey Stud, Kingaroy
	W. and C. E. Tudor, "Boree" Jersey Stud, M.S. 498, Gayndah
	Weldon Bros., "Gleneden" Jersey Stud, Upper Yarraman
	D. R. Hutton, "Bellgarth," Cunningham, *via* Warwick
	J. W. Carpenter, Flagstone Creek, Helidon
	H. G. Johnson, "Windsor" Jersey Stud, Beaudesert
	W. S. Kirby, Tinana, Maryborough
	S. A. Cramb, Bridge St., Wilsonton, *via* Toowoomba
	G. & V. Beattie, "Beauvern," Antigua, Maryborough
	J. A. & E. E. Smith, "Heatherlea" Jersey Stud, Chinchilla
	W. C. M. Birt, "Pine Hill" Jersey Stud, Gundiah
	T. Nock, Dallarnil
	P. Fowler & Sons, "Northlea," Coalstoun Lakes
	F. Porter, Conondale
	H. M. State Farm, Palen Creek
Poll Hereford	W. Maller, "Boreview," Pickanjinnie
	J. H. Anderson, "Inverary," Yandilla
	D. R. and M. E. Hutton, "Bellgarth," Cunningham, *via* Warwick
	E. W. G. McCamley, Eulogie Park, Dululu
	Wilson and McDouall, Calliope Station, Calliope

Trends in Fruit Growing in Queensland

By Dr. S. A. TROUT, Director of Horticulture.

Queensland is essentially a tropical fruit-growing State and the status of horticulture can only be maintained and developed by creating a consumer demand for tropical fruits, particularly in southern States, and by improving production and distribution methods.

In the past, proximity to available markets rather than soil type and climate has tended to restrict tropical fruit production to areas near the larger centres of population. Now, with better transport, and the establishment of new canneries, land in other parts of Queensland is being used more extensively.

Returns from fruit growing depend just as much on efficient distribution as on efficient production and preparation for market. Production costs are being reduced through the application of chemical weedicides and power spraying equipment, while methods of preparation are being modified to enable produce to be placed on distant markets in the best condition possible. Distribution within the State, however, leaves much to be desired, for, although technical progress in recent years has probably been greater in Queensland than in any other State, commercial developments are being hampered by the widespread but unfounded belief that fruit breaks down rapidly after removal from the refrigerated wagon.

The basic fact is that consignments carried in non-refrigerated wagons deteriorate about 20 times faster under summer conditions than those carried by refrigerated transport; refrigeration, in itself, is not a primary cause of breakdown.

Air transport is being used extensively for interstate consignments of strawberries which have the dual advantage of being packed in a light-weight container and yielding a high market return. The volume of fruits likely to be transported by air in Queensland cannot be assessed merely in terms of freight differences which now exist between air-borne and surface-borne goods. Radical changes in aeroplane design and the development of light-weight fibreboard containers are taking place so rapidly that the present disparity in freight charges between the two methods of transport could quickly disappear. Experience has shown that the consumer will gladly pay a premium for quality, and this applies to any method of transport which reduces wastage and retains quality.

In recent years, the establishment of new canneries has had a tremendous impact on the development of certain fruit industries, and during the 12 months ending June 30, 1956, Queensland canneries handled 61,302 tons of pineapples, 2,387 tons of papaws and 544 tons of strawberries. The present status of the canned fruit industry largely depends upon the United Kingdom market, which absorbs about 80 per cent. of the annual pack. Any change in overseas markets which favoured other competitors could affect the relative importance in the pineapple industry of the several producing centres, and place a greater dependence on the local market for

the disposal of the crop. Plant improvement research now in progress should establish the future of the papaw and strawberry industries, the production of which fails to meet existing fresh fruit and processing requirements.

demonstrated that even longer storage is possible by picking fruit at the correct stage of maturity and storing it in an atmosphere containing more carbon dioxide and less oxygen than are present in air. In other fruits, severe competition must be expected

A Crop of Pineapples in Full Fruit.

The avocado, custard apple, macadamia nut and mango, all of which are essentially Queensland fruits, should develop into sizeable industries when consumer demand has been built up and production methods are established.

The market can absorb the deciduous fruit crop, which has expanded very rapidly during the past decade, particularly in apple production. Parallel with this development has been the erection of cool stores for holding the surplus production until the end of October. Experimental research has

from southern States and the remedy lies in developing frost-free areas for bringing crops to maturity when they are out of season in other States and in producing strains and varieties which do particularly well in Queensland.

Future trends in any industry are often difficult to forecast, but processing and distribution should play an important part in the development of horticulture in Queensland, provided, of course, methods of production and preparation for market are maintained at high efficiency.

There's More to Grain Sorghum than Grain

By L. T. F. CURRAN, Adviser in Agriculture.

Don't write your grain sorghum paddock off as soon as the heading has been completed. There may be plenty of good feed left—feed which will fatten cattle and sheep.

That is the experience of many growers in Central Queensland, but will not necessarily hold in districts in which the stubble is liable to heavy frosts.

In good seasons in the Central Highlands the carrying capacity of sorghum regrowth is more than double that of the native pasture. It provides useful feed in the spring and early summer as well as during the "wet season."

Mr. O. P. Bell, of "Little Zealand," a typical property in the Capella district, has kept a record of his recent farming operations. His figures show that an area of 260 acres produced 5,580 bus. of grain and carried more than two sheep to the acre for 12 months. Native pastures on similar country at "Little Zealand" carry a sheep to 2½ acres.

Sorghum Planting.

The area in question was previously virgin country. It was first ploughed in August 1954 and planted to Alpha grain sorghum on January 25, 1955.

Owing to severe ant damage, an area of 110 acres was replanted with seed which had been treated with a 20 per cent. BHC dust; the replanted area was then rolled with a tyre roller. Germination was successful following this treatment, but the replanted area was severely waterlogged during February and March.

Grain Yields.

Harvesting commenced on June 15, 1955. The grain yield averaged 18½ bus. per acre, made up as shown in Table 1.

TABLE 1.

GRAIN YIELDS FROM THREE SECTIONS.

Section.	Acres.	Yield (bus.).	Average Yield (bus. per acre).
A	110	990	9
B	110	2,970	27
C	40	840	21
Total ..	260	4,800	18·5

In this table, section A is the one which had to be replanted and was later waterlogged.

Following this harvest the area was grazed as shown below. However, portion of the area was allowed to ratoon after grazing, and this gave an additional grain harvest of 780 bus. on December 15. This increased the total yield of grain from the area to 5,580 bus.

Grazing the Stubble.

Grazing of the stubble commenced as soon as the harvest was completed. On June 20, 43 steers aged between 14 and 17 months were put on to the sorghum paddock. These steers were sold on August 10 at the then exceptional price of £23 per head.

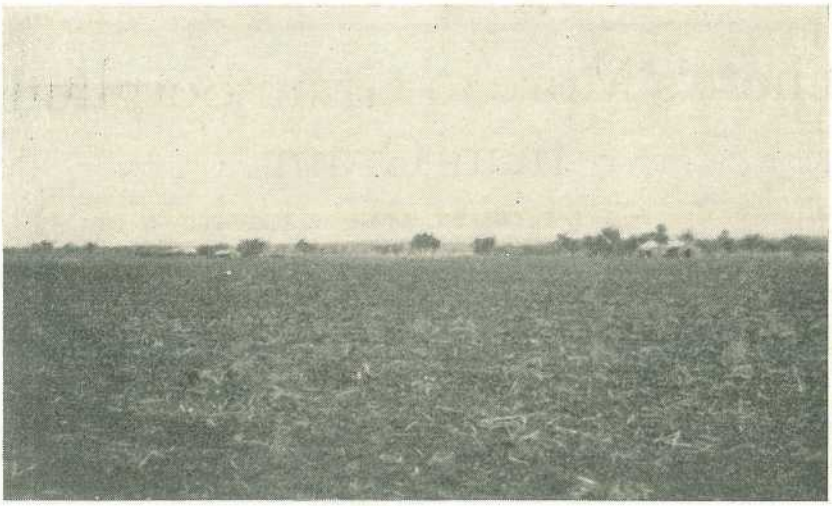

Plate 1.

Portion of the Sorghum Paddock at "Little Zealand" at the Conclusion of Stubble Grazing.—The area is now being prepared for another crop. In the background are station buildings.

Sheep were then introduced, and the area was still being grazed by sheep when the survey was completed on June 1, 1956.

The total grazing over the period 20/6/55 to 1/6/56 is summarised in Table 2. In this table, the various groups overlap to a considerable extent. The stubble was rotationally grazed, and the area was completely spelled for short periods in November and January-February (wet season).

TABLE 2.

GRAZING FIGURES FOR 260 ACRES OF SORGHUM STUBBLE BETWEEN 20/6/55 AND 1/6/56.

Number of Sheep.	Days Grazed.	Sheep-Days.
258 (equiv. of 43 steers)	51	13,158
670 ewes ..	158	105,860
30 rams ..	158	4,740
1,200 wethers ..	10	12,000
150 wethers ..	6	900
1,100 wethers ..	40	44,000
200 wethers ..	72	14,400
130 wethers ..	11	1,430
Total ..	..	196,488

For the period of grazing by steers, each of these beasts has been regarded as equivalent to six sheep.

This total of 196,488 sheep-grazing-days on a 260-acre paddock gives 756 sheep-grazing-days per acre. This equals a carrying capacity of 2.2 sheep per acre over the actual period of grazing.

If the total grazing is spread over 12 months, the rate still works out at better than 2 sheep per acre.

It may be argued that the carrying rate should be calculated from the period of commencement of cultivation, that is from August 1954. It is not reasonable to include the whole of this time, since part at least of the preparation period must be a charge against the grain crop.

However, even if the grain crop is ignored and the total period from commencement of land preparation is used, the carrying capacity for the 22 months involved is over 1.1 sheep per acre. As has been indicated earlier, the carrying rate for this

class of country under unimproved pasture is one sheep to 2½ acres (or 0.4 sheep per acre).

Breeding Sheep.

Lambing commenced on April 8. The breeding ewes had previously had some months of stubble grazing, and were returned to the stubble a week after the commencement of lambing.

On April 18, 385 lambs were marked, but this does not represent the total drop from the 670 ewes, as all late lambs were unmarked. Thus these ewes were both "in lamb" and feeding lambs during their periods of stubble grazing.

Grazing Management.

The sorghum area was subdivided, using temporary fences made of steel posts and ringlock wire. This fence was very effective and had the advantage of being simple to erect.

Sheep were rotated to new ground every three weeks.

Rainfall at "Little Zealand."

Table 3 gives the monthly rainfall records for "Little Zealand" from the beginning of 1954 to the end of May 1956. The rainfalls are given in inches.

TABLE 3.

RAINFALL AT "LITTLE ZEALAND."

Month.	1954.	1955.	1956.
Jan. ..	5·16	3·59	4·40
Feb. ..	18·69	10·48	9·31
Mar. ..	2·83	9·21	5·93
April ..	1·87	1·99	4·00
May ..	0·00	5·85	0·00
June ..	0·47	0·00	
July ..	2·25	1·63	
Aug. ..	1·33	0·00	
Sep. ..	0·00	0·92	
Oct. ..	2·01	1·35	
Nov. ..	0·00	0·65	
Dec. ..	2·08	2·62	
Total ..	36·69	38·29	

The average annual rainfall for the area is about 26 in. At first view, therefore, the period covered appears to have been one of excessively high rainfall. A closer examination shows that in the period from August 1954 to May 1956 the annual "wet seasons" have been far more bountiful than average. Otherwise the seasons have not been particularly favourable.

Plate 2.

Hereford Steers Grazing Sorghum Stubble at "Little Zealand," Capella. The picture was taken in October 1956, when the sorghum regrowth was 6-9 in. high.

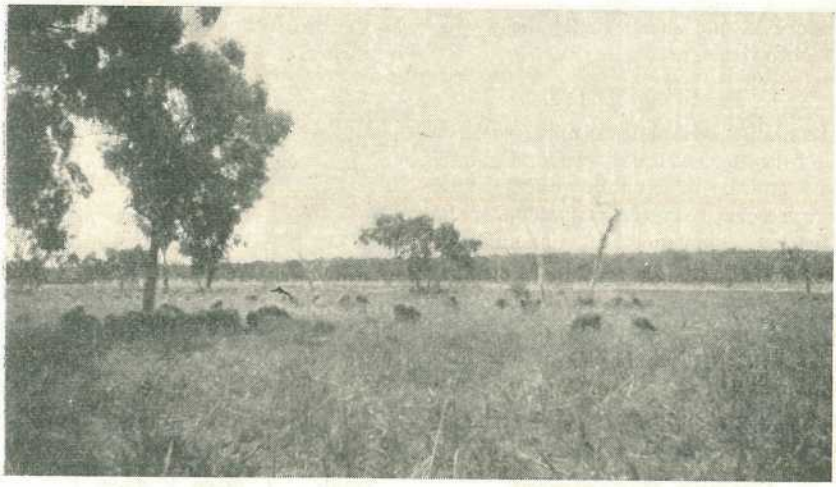

Plate 3.

Ewes Grazing Sorghum Stubble on "Little Zealand." The soil type here is reddish brown, with scattered timber.

In less favourable seasons the carrying capacity would no doubt have been lower. However, it has been shown that even in seasons in which the grain crop fails, a valuable fodder reserve remains. Moreover, this reserve is available during the winter and spring months, a period in which the native pastures are normally lowest in bulk and quality.

Summary and Conclusions.

During the period under review, the 260 acres produced 5,580 bus. of sorghum grain. At the same time the carrying capacity of the land was more than doubled. During the whole of the grazing period the feed available on the cropped area was in excess of stock requirements. At the end of the period (31/5/56) there was still ample feed in the paddock, but frosts could reasonably be expected to cut this back severely before midwinter.

The grazing of sorghum stubble and ratoon growth has been shown to be a good proposition in the Central Highlands in years of good rainfall. Further records of this nature would be required before the same claims could be made for years of average or below-average rain.

The excellent results could not have been achieved without rotational grazing. This helped considerably in parasite control, and also enabled the sorghum crop to make repeated regrowth.

Factors which need to be taken into consideration in using grain sorghum stubble as a grazing crop are:—

(1) *The risk of plant poisoning.*—Although prussic acid poisoning from sorghum grazing is rare in the Central Highlands, the risk should always be recognised and all possible precautions taken.

(2) *The risk of breeding up sorghum pests by ratooning the crop.*—To date the results appear to more than compensate for this risk. Records show that sorghum midge caused no measurable damage to the 1955-56 season's crop on "Little Zealand."

Propping Methods in the Banana Plantation

By J. A. MOBBS, Adviser in Horticulture.

Propping the bunches forms an essential part of the management programme in a well-run banana plantation.

The semi-tall Mons Mari (Plate 1) requires propping soon after the bunches are thrown. It yields heavily when grown in suitable localities, and bunch weights of 100 lb. or more are not uncommon in a good season.

The dwarf Cavendish is also noted for its large bunches, and although the plant has a shorter and sturdier pseudostem than the Mons Mari, it frequently requires propping to avoid loss of fruit during the summer months.

The third important commercial variety, the Lady Finger, has a very strong root system and bears medium-sized bunches which rarely require any support.

Reasons for Propping.

The objects of propping plants which are carrying bunches may be summarised as follows:—

(1) Bananas are very susceptible to frost injury and hillside planting is therefore practised to reduce the risk of damage. Suitable land on easterly and north-easterly slopes is now less easily obtained for the crop than it was some years ago and many plantations are established on slopes with little or no natural protection from strong winds.

(2) The pseudostem of the banana plant is, as its name implies, a false stem consisting merely of overlapping leaf stalks; the true stem, commonly known as the corm, is situated under the ground. Should weather conditions be abnormally dry, the bunch stalk in the centre of the relatively weak pseudostem becomes brittle and if not supported breaks under the weight of the maturing bunch (Plate 2). The bunch then "falls" out. Losses of this type are most pronounced in the Mons Mari variety.

(3) On hillside plantations, a heavy bunch tends to pull the plant down the slope from its natural upright position. If the soil is wet and strong winds blow, the shallow fleshy root system may not provide adequate support for the plant, which then collapses. When this happens, a young bunch is a complete loss while a bunch which is approaching maturity does not fill properly and the fruit, even if marketable, is of inferior quality.

(4) The object of good plantation management is maximum production of fruit per acre. In the banana crop, high yields per acre are associated with bunch weights of 50 lb. or more which result from regular applications of fertilizer and systematic desuckering. Propping is therefore indispensable in the more productive plantations.

Double Props.

The safest and most effective prop consists of two pieces of timber of approximately the same length and fastened together (preferably by a bolt) about nine inches from the ends (Plate 3). The "feet" of

Plate 1.

The Mons Mari Banana. An important commercial variety which needs support when carrying the bunch.

the prop are either pointed or sawn to a bevel edge to minimise the risk of slipping after it is placed in position and carries the weight of the bunch. When the legs of the prop are spread out, the portions above the bolt form a V, which is placed under the bunch stalk, the legs being "edged" towards the base of the plant until the prop supports the bunch.

The length of the prop depends on the height of the pseudostem and the gradient of the slope on which the bananas are grown. Props should not be cut too short; when the legs have

a wide spread on the ground, the prop gives maximum support to the bunch and is unlikely to cause any damage to the fruit on the inner side of the bunch.

Sawn hardwood is required for constructing props. Props up to approximately 9 ft. in length can be made from 2 in. x 1 in. timber, but where longer props are needed, stouter timber should be used. Hardwood props will last for an indefinite period if they are oiled occasionally and stacked under cover when not in use.

Another method of double propping is to attach a short piece of No. 10 gauge fencing wire to two lengths of 2 x 1 hardwood at about 9 in. from the end. The wire should be sufficiently long to leave a space of 8-9 in. between the legs of the prop. The wire is placed under the bunch stalk and the legs are set in position to support the bunch. The short lengths of timber above the wire form an inverted V above the bunch stalk. Although some friction and plant movement occur with this type of prop, the bunches are reasonably well supported.

Other Methods of Propping.

Single pointed props which press into the pseudostem of the plant are still in common use. They are far from satisfactory. During strong winds, when the plants sway from side to side, this type of prop is frequently dislodged. Further, the single prop can only be placed either directly under or alongside the bunch; in this position the prop rubs against the developing fruit and sometimes causes serious damage. Frequently, too, the pointed end of the prop is forced so far into the pseudostem

Plate 2.

Cavendish Banana. The pseudostem has collapsed under the weight of the bunch. Even if protected from sunburn, the fruit seldom fills properly and may not be fit for market.

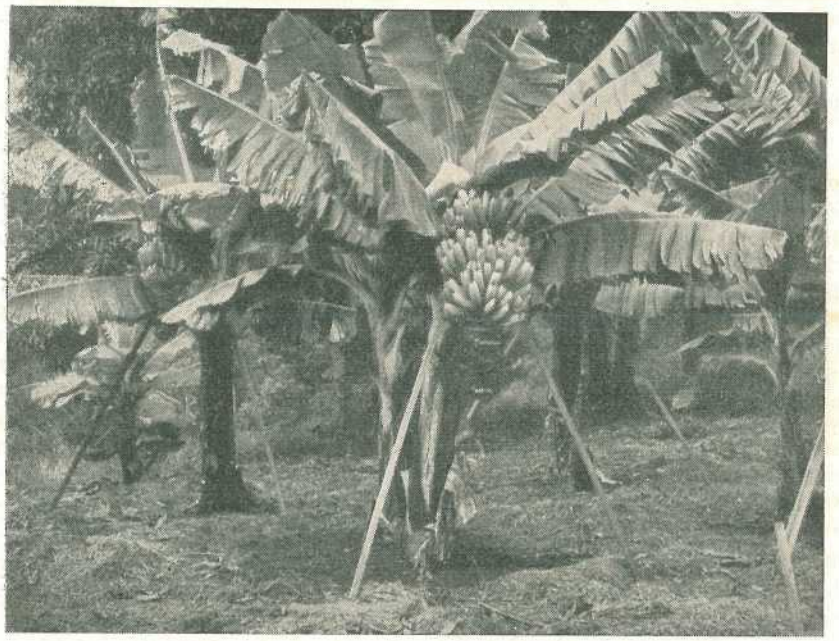

Plate 3.

Double Props in Position on Cavendish Bananas.

that the bunch stalk inside it is injured and snaps before the bunch is fully mature.

Cyclones are a recurrent hazard in banana growing areas, and when gale force winds blow considerable damage occurs even in well-propped plantations. Some growers with plantations on level ground near the coast have devised a somewhat expensive but nevertheless effective method of safeguarding their crops from damage in all but extremely high winds. The bananas are planted in blocks with a maximum row length of about three chains. At the end of each row, a stout post 15 ft. long is set at an angle into the ground to a depth of about 4 ft. A single strand of fencing wire is tied to the tops of the posts at the ends of each row. As soon as each bunch is thrown, a rope is looped round the stalk and tied to the wire. Intermediate supports are placed in position as and when necessary. Under this system of management, the bunch has a limited amount of movement, but it is not sufficient, even in high winds, to affect the stability of the plant.

Are Strawberry Yields Declining?

By K. M. WARD (Senior Horticulturist) and C. N. MORGAN (Senior Adviser in Horticulture).

The Queensland strawberry crop annually amounts to more than 1,200 tons of fruit and returns about £500,000 to the growers. About 380 acres are planted each autumn.

Yields per acre vary a great deal from farm to farm and from season to season. This has been ascribed to degeneration in the variety Phenomenal, but a recent survey indicates that faulty horticultural practices are much more important. The survey has focussed attention on a number of factors which affect yields. These can best be discussed in terms of soil type, time of planting, and type of planting material.

Soil Type.

The greater part of the strawberry crop is produced in the Metropolitan District, mainly on the red-brown loams and sandy loams of Redlands and Sunnybank respectively. These soils are among the best available and normally produce good crops at moderate cost.

In the last five or six years, small-crop farming has extended to the podsolic soils in these districts. They consist mainly of grey sands and sandy loams which are poorly supplied with plant nutrients, highly acid and deficient in organic matter and some trace elements. Quite often, the amount of water available

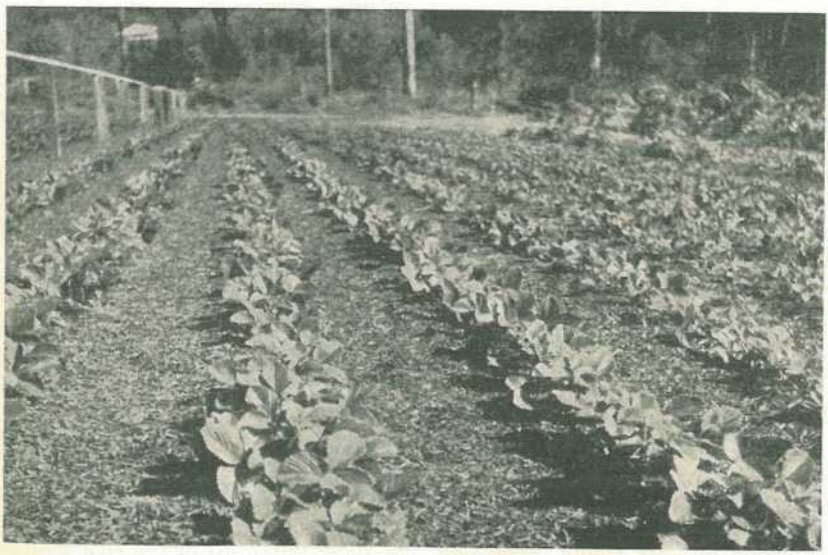

Plate 1.

Young Strawberry Plants. The land has been mulched to prevent the soil from drying out. Mulching also keeps the berries clean at harvesting.

for irrigation is very limited. Strawberry production on these soils is neither simple nor cheap.

Most of the strawberry crops grown on the podsolic soils are produced by men to whom farming is a new occupation. Some are New Australians. Many do not appreciate the need to fertilize heavily, the benefits derived from surface mulches (Plate 1) and the necessity for adding organic matter to the soil. On these soils, too, occasional applications of lime are needed to control excessive acidity.

Strawberry production under these conditions requires greater skill and knowledge than it does on the more fertile red-brown loams and sandy loams.

Time of Planting.

It is the aim of the strawberry grower to market his crop between late June and the end of November. To do this he must plant runners during a very limited period in March—preferably during the first two weeks of the month.

Runners planted at this time of the year develop into moderately vigorous, open types of plant with the capacity to produce a large crop. Harvesting may begin as early as late June. During the ensuing 2-3 months, large berries are produced and these are highly profitable when sold on the fresh fruit market. As the plants are open, the berries are easy to pick and suffer very little from grey mould. Cropping may continue until mid-December.

Plants set out in February tend to be vegetative in habit. They produce a large amount of foliage, which makes picking difficult and renders the berries very susceptible to infection by grey mould. Strangely enough, these vigorous plants are late in flowering and slow to develop their fruit; picking does not begin until late July. Though the plant is large and flowering is prolific in spring, the fruit is consistently small in size.

Strawberry crops planted between the end of March and mid-April seldom give good results. Runners planted at this time of the year produce small plants which bear only light crops of early fruit. In spring, plant growth is much better but the harvest consists almost entirely of undersized berries which are difficult to pick.

It is evident, therefore, that the strawberry crop must be planted during the first two weeks of March to get the best results. The survey disclosed that some growers begin planting in January and continue until the end of April.

Planting Material.

The idea that the Phenomenal variety, which provides more than 90 per cent. of the Queensland crop, has "degenerated" is an inference from the fact that weak, low-yielding plants occur in most strawberry crops. Strictly speaking, the term "degeneration" refers to the gradual deterioration in successive crops which is brought about by inherent weaknesses in the parental material used for establishing them. The strawberry industry in Queensland, however, is not greatly affected by this phenomenon.

Where declining yields have been recorded and cultural practices are otherwise sound, they are due, in the main, to the use of faulty planting material. In the first place, crop failures can be serious if the grower fails to recognise and cull out all plants affected by the virus diseases, yellow-edge and crinkle. The first of these shows up in the cool weather of autumn and winter, while the second is more commonly seen in summer. Both can be introduced to

Plate 2.

Irrigating the Strawberry Crop. Frequent irrigation is essential for the production of high yields.

and distributed through the farm in runners taken from infected plants. If unchecked, these two diseases could easily destroy the industry and their control is, therefore, a matter of prime importance. The use of disease-free planting material is therefore a fundamental requirement for continuous high production.

In the second place, weak runners, even though free from virus diseases, are unsuitable as planting material. They are usually derived from plants that have suffered from poor cultural conditions during the previous year or have been neglected in the runner bed.

It follows, therefore, that runners should be taken only from mother plants that are vigorous and have produced a good crop during the previous season (Plate 2).

High Yields Can Be Achieved.

Under good cultural conditions, yields of quality strawberries are high and show a marked upward trend. Production may range up to 21 oz. per plant. This is, of course, exceptional, but an average yield of about 12 oz. per plant is a reasonable basis for commercial purposes. This represents 10,000–16,000 lb. of fruit per acre, depending on the plant spacing in the crop.

When crop yields fall below these levels, the grower should critically examine his production programme, define the weak points in it and take steps to improve his output per acre in the following year.

Better Farming Pays

By R. FANNING, Dairy Officer.

The adoption of a balanced farm programme is essential for successful dairyfarming. The available labour force must be used to maximum advantage.

Through this balance of labour coupled with the use of improved techniques, butterfat production was increased in two years from 161 lb. per cow in 1953-54 to 218 lb. in 1955-56 on a property at Theebine.

After the war, in 1946, Mr. R. Sexton, a former R.A.A.F. pilot, commenced dairying in the Theebine area, and the steady improvement which he has brought to his property emphasises the value of a progressive farm programme.

This 168-acre farm at Kanyan was divided into only two paddocks when Mr. Sexton first settled in the area. The sole feed was a mixture of Rhodes grass and natural forest grasses, and there was no cultivation available for supplementary feed. The property carried 60 head of cattle and there was a high incidence of mastitis and vaginitis in the herd.

HERD IMPROVEMENT.

To develop the farm to its full potential the first step was to join the Miva-Theebine Herd Recording Group. By this step it was possible to gain much knowledge and information on the individual cows in his herd. This was in 1948, and at the end of the lactation the recording showed his herd of 49 cows averaged 116 lb. butterfat.

The next step was to cull the old cows, the crossbreds, and those with disease. They were replaced with four lines of heifers. Of these four lines, two lines proved to be very good.

A new purebred bull, Mayfair Monty, was also purchased. This bull originally came from the well-known Jersey stud of Mr. J. Carpenter at Helidon. The owner considers that this bull has been a herd improver, and the low producers of the original herd were gradually culled as heifers of his own breeding from the best producing cows became available for replacements.

Within a few years, with the exception of a few cows, an entirely new herd was built up. Since then, line breeding with Mayfair blood has been adopted.

At the end of three years' herd recording, herd numbers had increased from only 49 to 51 cows. The main reason for this was that he had culled heavily.

Average butterfat production for a herd of 62 cows in the 1954-55 season was 185 lb., and average production for 59 cows during the 1955-56 recording year increased to 218 lb. per cow. This represented a financial gain of £7 7s. 6d. per cow in one year.

Total production increased from 5,684 lb. of butterfat in 1948-49 to 12,862 lb. of butterfat in 1955-56.

ADEQUATE FEEDING.

It is Mr. Sexton's contention that to maintain a good herd and increase production it is necessary to adopt a policy whereby the herd can be adequately fed.

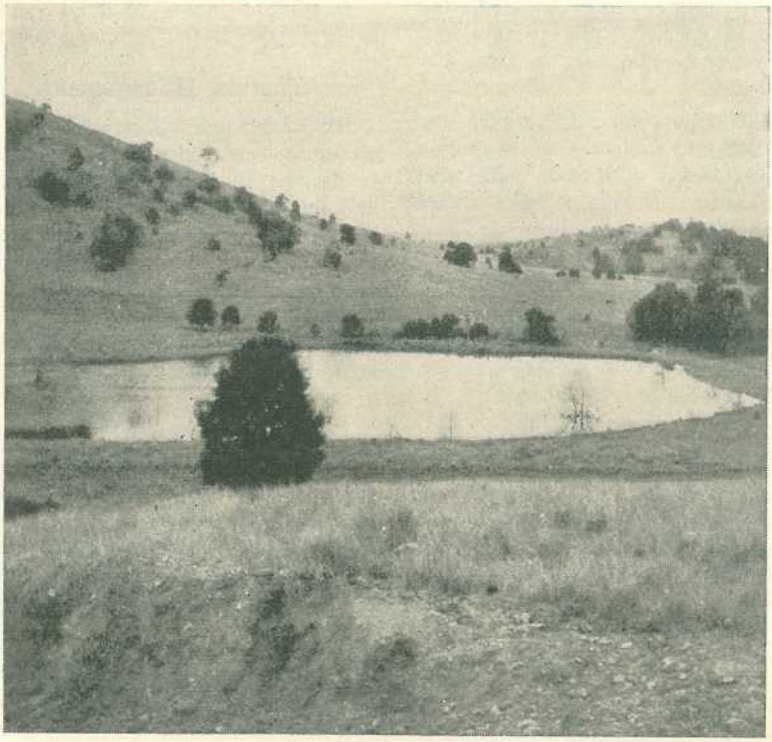

Plate 1.
Dam Holding Over Five Million Gallons.

In 1952, pastures were mown to control weed growth and to enable paspalum, a suitable species of summer grass, to become established. The two original paddocks were subdivided so that rotational grazing could be practised.

A further improvement was to develop pastures by irrigation. To do this, a dam was prepared in 1954 with a Fordson tractor and a ⅜ yd. scoop. This dam holds approximately 5½–6 million gallons of water. Total time taken to excavate it was approximately 500 hours.

Equipment used to irrigate pastures comprises—

(*a*) One 2-2½ in. Kelly and Lewis centrifugal pump.

(*b*) Mains of 3 in. aluminium piping.

(*c*) Spray lines of aluminium piping (10 chains).

(*d*) Ames couplings with Buchner 720 sprays (delivery 700-800 g.p.h.).

Total cost of this equipment was £600.

Improved Pasture.

In early 1955, 2½ acres of land were ripped and fertilized with superphosphate at the rate of 1 bag per acre. This area was sown with the following mixture:—

8 lb. H1 ryegrass
8 lb. phalaris
4 lb. Hunter River lucerne
2 lb. New Zealand white clover
3 lb. Ladino white clover
4 lb. New Zealand Cowgrass red clover.

Good results were obtained, but due to inexperience the pasture was badly burnt by the heat in December 1955.

At the same time a sod-seeder was purchased and 6½ acres of paspalum were sod-seeded with red, white and subterranean clovers. The seed mixture used on this area was:—

2 lb. New Zealand Cowgrass red clover
2 lb. New Zealand white clover
3 lb. Ladino white clover.
2 lb. Dwalganup sub-clover.

As an experiment this area was fertilized with different mixtures such as superphosphate, superphosphate and molybdenum, superphosphate and lime and sulphate of ammonia, but no noticeable difference in the pasture resulted.

Another 6 acres of land is now being prepared for irrigated pasture.

Pasture Management.

By using an electric fence the pastures were strip-grazed by a herd of between 20 cows (in August 1955) and 60 cows (in January 1956). As each strip was grazed the mower was run over to cut any long feed that had been left. Attached to and behind the mower was a set of diamond harrows on their back for spreading manure.

Conservation of Fodder.

In 1953, the first pit silo was put down. This was filled with 20-30 tons of maize and grass. This pit was opened for feeding-out in November 1956, and the silage was in a sound, satisfactory condition.

Plate 2.
Improved Pasture Under Irrigation.

By the end of January 1956, a good body of natural pasture was available in the paddocks. This was grazed and the improved pasture reserved for making silage.

Another pit silo was made in February, and with the help of Mr. A. Shapland, a neighbour, the pasture was mown and the pit filled with 50 tons of Rhodes grass, paspalum and clover by means of buckrakes.

A second silo has been made. It is hoped to fill this one with approximately 50 tons of chaffed maize.

Dimensions of this pit silo were:— 52 ft. long, 14 ft. wide (equal to the width of two buckrakes) and 6 ft. deep at the lowest point. Because of hard, stony sub-soil, some building up above ground level was necessary to obtain the depth of 6 ft. Construction time to excavate this pit was 2 hours with a D4 bulldozer costing £3 per hour.

Feeding stalls were built in 1955 for the purpose of feeding chaffed cane and concentrates in the winter of that year.

DAIRY PREMISES.

Modern dairy premises have been erected recently. Ideal features of these buildings are the concreted inner holding yard to minimise dust, a suitable metal can-draining rack, adequate rain water storage in two tanks, and a steam sterilizer. Ventilation is provided in the milk and wash-up room by means of a louvred wall and the buildings have been ceiled to maintain conditions as cool as possible during the hot summer months.

Provision is made for feeding the herd in the bails. Milking machine cups are doubled-up.

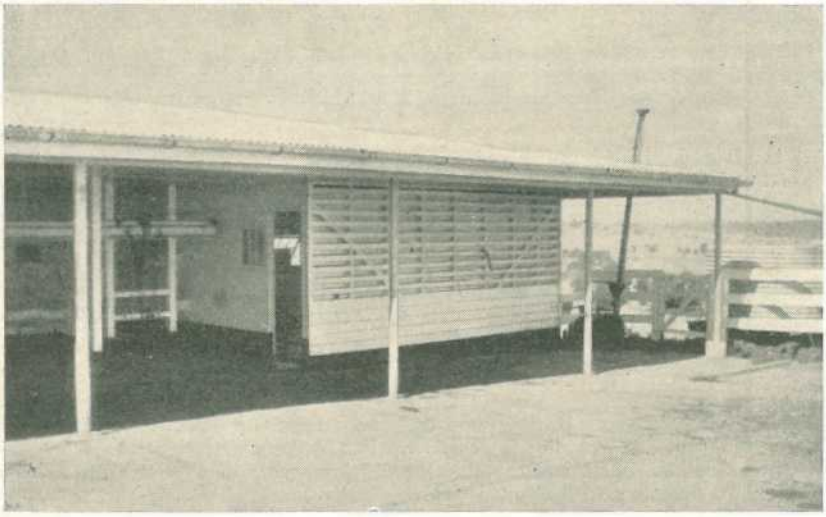

Plate 3.

Recently Constructed Dairy Premises.

MACHINERY.

Farm machinery available on this farm comprises—

1 Fordson Major tractor (rubber-tyred)

1 I.H.C. 6H power mower

1 spring-tine cultivator

1 Northmead seed and fertilizer box with attachment for sod-seeding.

1 ripper (2-tine)

1 2/3 yard scoop

1 post-hole digger

1 chaff-cutter

SECRET OF SUCCESS.

Mr. Sexton attributes his successful operations to the adoption of improved farming practices. Seasonal calving, culling of animals due to low production, udder troubles and age, non-stripping and the selection of heifers from the best producing cows have been possible through herd recording. He has also adopted the practice of selecting heifers from cow families. Line breeding is an established practice.

Management and improvement of pastures have been achieved with great success, although initial failures were encountered due to inexperience. Good use of pasture growth has been obtained by subdivision, regular mowing to prevent weed growth and to give better species of grass a chance to become established, avoidance of burning off pastures, rotational grazing by means of an electric fence, spreading of manure after grazing, conservation of surplus growth, and irrigation.

IRRIGATION SCHOOL FOR FARMERS.

A special school on irrigation methods will be held for Darling Downs farmers later this year, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) said recently. It is the first irrigation school for farmers to be conducted by the Department.

During the three-day school at the Regional Experiment Station, Gatton, farmers will study irrigation under Queensland conditions in both theory and practice. Lectures and demonstrations will be given by irrigation officers of the Department.

It is planned to hold the school during August or September. These months are usually dry and irrigation demand is fairly constant at this time. Because considerable individual instruction will be given, the number of farmers attending the school will be limited to 12 men who are either practising irrigation or are about to develop irrigation facilities.

Lectures will be given on the principles of irrigation, methods of irrigation, land preparation, and water requirements of irrigated crops. These sessions are to be followed by practical demonstrations. It is proposed to include an inspection of a water harvesting project at Marburg and of irrigation farms in the Lockyer Valley.

Mr. Collins said many Darling Downs farmers are interested in irrigation, but may not have had either training or practical experience in irrigation techniques. Those attending the school will examine the different methods of water distribution in order to be able to select suitable watering programmes for their farms.

The school is expected to assist the development of irrigation on the Darling Downs and to help particularly those farmers who are about to instal irrigation plants. It should also serve to stimulate interest in water harvesting in the area.

Practical Procedures in Dairy Farm Valuation

By J. J. SULLIVAN, Senior Adviser, Cattle Husbandry Branch.

Gross errors in farm valuation often arise as a result of an unbusinesslike approach to the vital matter of farm purchase. These errors may cause heavy financial loss, great hardship, and sometimes permanent financial crippling of the farming enterprise.

The farmer who buys at a price out of proportion to the earning capacity of the farm is handicapped from the start. Many dairymen are in a serious financial plight because of their initial failure to pay only a realistic price for their purchase.

The prospective purchaser must not lose sight of the fact that farming is a business, subject to the same economic laws as any other business enterprise, and in its operation must show a reasonable net profit on the capital invested.

Many men who seek to purchase farms have not had any formal training in land valuation. This, however, does not necessarily prevent them from applying some of the principles of farm valuation. By doing so in a systematic way they are able to arrive at a realistic market value for the particular farm.

It might be said that the prospective purchaser without the basic knowledge to form a sound opinion on the worth of a farm should enlist the aid of someone who has. This is, of course, self-evident, but most of us would elect to rely on our judgment to some extent. With the object of helping those who lack basic knowledge of farm valuation procedure, this article is offered.

Market Value.

Consider first the factors, both direct and indirect, which combine in determining the price at which a farm changes ownership.

The market value of a farm has been defined as "the amount of money the farm would bring in the open market by voluntary bargaining between the vendor and the purchaser, both willing to trade, but neither of them so eager to do so that they would overlook any ordinary business consideration."

The conventional basis for farm valuation in any locality is a comparison with recent sales of similar farms in the same locality. It should be remembered, however, that there may have been some factor or factors attendant upon the transactions which would invalidate them as a basis for a reasonable market value. Enquiries should therefore be made with a view to discovering whether this was so.

For any transaction to constitute a sound basis for market valuation, it must be one in which both parties are perfectly acquainted with the land and aware of all the circumstances which would affect its value. It must be one in which there is freedom from excessive influence of personal factors.

Personal Factors.

There are factors arising from personal bias, rather than from economic value, which have a significant influence on farm sales. For example, an experienced and established farmer will often pay above

reasonable market value for a neighbouring farm on which to set up his son or to work in combination with the home farm. Again, illness, infirmity or age may cause a man to sell out at a low figure to effect a quick sale. Finally, property transactions occasionally take place between relatives at what amounts to a special price, although the effect of gift duty limits this.

Analysing Recent Sales.

In order to draw comparisons the sale prices may be analysed as follows:—

(*a*) Price per acre.
(*b*) Price per unit of carrying capacity.
(*c*) Gross returns on purchase price.
(*d*) Trading profit (or loss).

In looking to recent property sales for guidance the prospective purchaser must consider all the foregoing factors, which can play such a decisive part in influencing the economic aspect of such sales.

For a property sale to qualify as "recent" it should have taken place within the preceding two to three years, so that only one, or at most, two financial years have passed. The average trading figures over a period of say five years would quite possibly not truly represent the latest or current position.

Some inconsistencies in prices paid for seven comparable dairy farms in the Central Burnett during the years 1953-54 are shown in Table 1.

The price per unit of carrying capacity is obtained by dividing the capital value by the reasonable carrying capacity of the respective farms. The figure is of considerable interest, for obviously the higher it is, the higher must be the returns obtained from the herd in order to make a success of the venture. From Table 1 it will be seen that Farms D and G have the highest figure for "price per unit of carrying capacity" but Farm D offers only about half the net return given by Farm A and G even less.

The returns are for the first financial year after purchase of the farms and so in most cases are likely to be less than what will be obtained in later years—at all events by a good farmer.

It is apparent that such figures do not constitute a good guide to the economic price of comparable farms in the area. Therefore it is recommended that the prospective purchaser carry out the following practical procedures which will enable him to arrive at a valuation based on sound economic considerations.

TABLE 1.

Comparison of Sales of Seven Central Burnett Dairy Farms.

	Farms.						
	A.	B.	C.	D.	E.	F.	G.
Price per acre (£) ..	6	10	10	15·65	16	19	21·5
Price per unit of carrying capacity (£)	91	70	85	120	85	41·5	120
Gross return on purchase price (%)	31·3	26·7	4·8	23	14·8	12	27·4
Net return for financial year (%)	18·3	4·6	0·1	9·3	1	0·02 loss	6·6

Relation to Locality.

In general, in every locality, economic farm size lies within a certain range. If the subject farm is much smaller than the average it may not constitute a living area under the prevailing system of management, and in all probability will be in a run-down condition brought about by over-stocking in an endeavour to force it into being an economic unit. In such a case the practicability and cost of more intensive management methods must be considered.

On the other hand, if the area is much greater than the average the tenure may not be secure, and reversion of portion of the property to the Crown may be pending. In some cases developmental conditions are attached to a Crown lease, such as additional clearing or cultivation of land, the provision of more water facilities, and fencing. If there are unfulfilled conditions attaching to the lease the transfer of the property may be held up until some arrangement, approved by the Department of Public Lands, is made in regard to their fulfilment, and invariably the incoming tenant must accept full responsibility.

Other factors to be considered are—

Distance from butter or cheese factory and shopping centre.

Stock marketing facilities.

Farm produce transport facilities.

School facilities.

Access roads (in all weather).

The possible future development of the area should be well considered. New land may be in the process of more intensive development, electric power may be extending over the area, the establishment of a new industry may be on the way. Such things bring more people and better facilities to a locality and hence increase the value of land.

Economic Factors in Valuation.

The price of a walk-in-walk-out farm may be related to the value of the following:—

(1) The land.

(2) The permanent improvements.

(3) Plant and machinery.

(4) Livestock.

In order that each of these factors receives due consideration practical procedures should be directed towards ascertaining—

(*a*) The present productivity of the land and the cost of maintaining that level of productivity, both in money and in labour.

(*b*) Potential productivity and the cost of reaching that potential in terms of time, money and labour to be expended.

(*c*) The present or depreciated value of the permanent improvements, plant and machinery.

(*d*) The composition, quality, health and productive potential of the livestock.

Proceed Systematically.

The procedures should be carried out in such a way that not only is a comprehensive overall picture of the whole farm enterprise built up, but a complete record of each phase is obtained for subsequent thought and study, and if necessary for submission to the Bank Manager.

In carrying out the inspection, the purchaser should not allow himself to be hurried or his relevant questions parried. An authentic map of the property should be obtained and careful notes made. By the judicious use of these the required farm details can be accurately recorded.

The Inspection.

The inspection of the farm should be made with all the senses alert. First impressions count for a good

deal. At first approach the farm should be compared with the properties passed on the way. Is there any appreciable change of topography, soil type or vegetation? The manner and general attitude of the owner will serve to indicate what may be expected as negotiations proceed.

If the property is a mixed fattening and dairying proposition and relatively large, a horseback inspection may be necessary. The use of a pocket compass and watch will assist in plotting on the map the course taken during the ride. The average horse walks at the rate of about three miles per hour. The time taken will enable the distance between various points to be estimated. With the help of the compass the relative positions of the various topographical features, water facilities, fence lines, &c., can be estimated and marked on the map with a fair degree of accuracy.

The Land and Water Supply.

Note should be made of the general topography. The degree and the aspect of slopes are important in relation to shelter for stock and stability of soil. If soil erosion is obvious, an attempt should be made to gauge its extent and severity. The soil types should be keenly observed and their degree of productivity estimated. An inadequate water supply is the factor limiting production on many farms. There must be no doubt about the permanency of the water supply, its suitability for stock, and its adequate distribution throughout the farm. Permanent natural water is highly desirable. Where there is an absence of surface water, a thorough test of the wells or bores should be insisted upon.

Pasture and Weeds.

A note should be made of the composition, quality and yield of the native and sown pastures (if any). Particular note should be made of the presence or absence of legumes. Also, note if there is infestation by noxious weeds or aggressive weeds and shrubs.

If there is an appreciable amount of an unknown plant growing on the property, a specimen should be submitted to the Government Botanist, Department of Agriculture and Stock, Brisbane, for checking as to its noxious properties.

Study the Farm Management.

Every aspect of crop production, rotation and utilisation as practised on the farm should, as far as possible, be ascertained, bearing in mind that the farm potential may well be determined by past programmes.

Unproductive Land.

Should the farm contain any extent of unproductive land every attempt should be made to find out why it is unproductive, and if there is a practical way to bring it into economic production. The soil may be too poor to support continued production at a profitable level. On the other hand, it may need only better management. In some cases changes in techniques can remove obstacles which were formerly apparently insurmountable. However, time and money have to be spent in developing the land before it begins to yield a substantial return. This angle is one requiring a great deal of thought. The cost of bringing virgin land into production may be very considerable. It is advisable not to spread labour or capital too thinly. It is safer to rely on a small intensive area than to attempt to develop more acres than can be effectively managed.

Permanent Improvements.

The permanent improvements on a property comprise all the farm buildings, yards, fences, water facilities, timber treatment, &c. It is the

adequacy of the permanent improvements, and their design and layout, which decide the efficiency with which the farm can be managed. This aspect of the farm should be assessed in the knowledge that bad farm design will prevent the efficient working of an otherwise good farm.

The permanent improvements should be judged from the following points of view:—

(1) Their suitability for the purposes which they should serve.

(2) Their soundness, their state of preservation and their probable effective life.

Plant and Machinery.

A thorough inspection should be made of the plant and machinery on the farm. Any man who is not mechanically minded should, if possible, be accompanied by a friend who is so experienced. An inventory should be made in which every item is listed. The movable plant and machinery is the most fertile source of argument and disagreement in that it is not uncommon for some units seen on the farm at time of inspection to be found missing after entering into possession of the property. It should be definitely decided at the time of inspection what items are sold with the farm and what are withheld. The complete list of items included in the sale should be signed by the prospective purchaser and vendor.

The inspection of the plant and machinery should be made with a view to supplying answers to the following:—

(1) Is there sufficient plant of the right type for the efficient working of the farm?

(2) Do the plant and machinery appear to have received reasonable maintenance, and are they now in good working order?

(3) What amount of material and machinery is simply junk?

The prospective purchaser may consider that there is a deficiency of some essential plant or machinery which will have to be made good, and the cost of this must be taken into account when considering the purchase price of the farm.

Valuing Improvements and Plant.

Some attempt must be made to assess the value of the permanent improvements and the plant. In this matter, there is no substitute for practical knowledge and experience, but it is a great advantage to know how these values stand under the application of the accepted rules of depreciation.

Depreciation may be regarded as that proportion of value used up in producing the farm income. There are two methods of calculating depreciation. These are:—

(*a*) The prime cost method.

(*b*) The diminishing value method.

Take the example of depreciation on a tractor, which is reckoned at 10 per cent. per year. Under the prime cost method, on a tractor costing 1,000 the depreciation would be £100 per year. If three years old, the value of this tractor would be—

£1,000 less £100 x 3, or £1,000 less £300.

So under the prime cost method the current value of the tractor would be £700.

Using the diminishing value method, the depreciation, after the first year, is calculated not on the original cost but on the diminished book value. Taking the tractor example again:—

1st year—£1,000 less 10 per cent. (£1,000 less £100), value £900.

2nd year—£900 less 10 per cent. (£900 less £90), value £810.

3rd year—£810 less 10 per cent. (£810 less £81), value £729.

The diminishing value method is more accurate in that it takes into account the fact that depreciation is higher in the first years of "life" than in the later years, but it becomes difficult to calculate. The prime cost method is simpler and is sufficiently accurate. Because of this it is recommended for prospective buyers estimating the depreciated value of assets.

It must be remembered, however, that depreciation on machinery is a very variable thing and a valuation by a skilled mechanic is the desirable basis on which to work.

The following is a guide to the normal rates of depreciation on some common items of dairy farm plant:—

10 per cent.—Tractors; agricultural implements; boring plant; galvanised iron tanks for bore water.

5 per cent.—Windmills; power equipment in dairies; galvanised iron tanks for rainwater.

3 per cent.—Barns and stables made of wood and galvanised iron; galvanised iron grain silos.

2 per cent.—Barns and stables made of cement, brick or stone; concrete dips.

The cost of building has increased considerably in the last 10 years and due allowance should be made for this in valuing sheds, bails, &c.

Current Costs of Improvements.

In contrast to the depreciated value of standing improvements, all repairs, replacements and additions that might be required will have to be considered in the light of current costs. These are rather variable and now stand at the following approximate levels:—

Homestead, £160-£220 per 100 square feet.

Haysheds, barns, dairies, £30-£60 per 100 square feet.

Cattle yards, £5-£7 per panel.

Cattle fencing, £160-£200 per mile.

Water boring costs, 30s. to £2 per ft.

Bore casing, 11s. per ft.

Earth tanks, 3s. to 4s. per cubic yard.

The equipment of a water facility with pipe, 12 ft. windmill, 5,000 gallon tank and 12 ft. of troughing would cost £250-£300.

There is a great variation in the cost of farm improvements. It varies according to the cost of transport, the availability of timber to be used for structural purposes, the building design, and the cost and efficiency of the available labour.

The Herd.

The herd is to the farm what the heart is to the body. Just as humans are dependent on a sound heart for normal activity, so a dairy farm must have a sound herd for normal production. The quality of the herd is the deciding factor between profit and loss on all dairy farm activity. All effort expended in obtaining a clear picture of the herd is well worth while; any neglect in this matter may be deeply regretted later. The following should be checked in a comprehensive way:—

(1) The number of animals in the herd.

(2) The composition of the herd.

(3) The health of the herd.

(4) The sires used and the breeding programme.

(5) The production of the individual cows and the conditions under which the production was obtained.

The number of animals in the herd must be considered in relation to the carrying capacity of the farm. The economic production number may be higher or lower; this would involve buying or selling stock.

In checking *the composition of the herd,* note should be made of the number of cows nearing the end of their productive life and the availability of heifers to replace them. If the numbers in the various age groups show inconsistencies, it may indicate breeding trouble, and a check should be made.

The importance of *the health of the herd* does not need stressing. It must be the object of a strict investigation. All information possible should be obtained on the history of the herd. It is important, from the disease angle, to know whether the vendor breeds all his herd replacements or is in the habit of buying through saleyards; in the latter case the possibility of disease introduction into the herd is very great. Also, animals bought in saleyards are likely to be another man's culls. If the owner's policy had been to buy through saleyards, it would indicate that the purchaser would, in all probability, have to implement a herd-building programme, with its accompaniment of heavy culling.

A check should be made of the fertility record of the herd. If this is unsatisfactory, or if it is incomplete, one should expect the worst. Infertility in the herd, whatever its cause, will disrupt the whole farm programme.

If it is not possible to make an inspection of the herd at milking time, the cattle should be mustered from the paddocks and yarded. The animals should be keenly observed all the time. Normal healthy animals will be bright and alert, but unexcited; they will walk easily at a steady gait. A watch should be kept for any animal which tends to lag behind or tries to leave the mob, and for anything unusual in the way of gait, behaviour, condition, conformation, appearance of coat, or bodily discharge.

In the yard one should move among the animals, observing them closely from all angles. Particular attention should be paid to the udder and teats of the cows, and any unusual discharge from the vagina. Where there is any indication of abnormality, a close examination should be made. In the case of the udder it should include handling to disclose hardness or lumps. An attempt should be made to find the cause of any abnormal discharge. Where anything is found to be amiss, the cow should be marked down as a reject.

The degree to which information on sires and individual cow production can be obtained will depend upon the completeness and accuracy of the records kept. If the farmer is a member of a Herd Recording Group, a good deal of relevant information will be readily to hand. It will, for example, be possible to determine with a good deal of accuracy the average annual production of the herd. This, together with a consideration of the conditions under which the herd has been fed and managed, is of the utmost value. The figure can for one thing be related to the State and district averages and a ready assessment of the quality of the herd arrived at on that basis.

If the owner is not a member of a Group, factory returns, accounts of sales and purchases and income tax returns should be studied.

The difficulty with such records of course is that they are sometimes incomplete and may be unreliable or difficult to interpret.

The rainfall figures should be noted in relation to the yearly farm income. Income tax returns will show the amounts claimed for fodder purchased.

Other Sources of Information.

There are other sources from which a prospective purchaser may obtain useful information, such as local bank managers and dairy factory managers. Local officers of the Department of Agriculture and Stock and the Public Lands Department could advise on the potential of the district generally. Also, a point should be made of trying to have discussions with neighbouring farmers.

How to Use the Information.

When all the information on the farm and the herd has been collected, some time must be spent in correlating and digesting it, so that correct inferences may be drawn.

The information must be used to find the maximum figure which will constitute an economic price for the farm. In order to be on the safe side, all figures should be based on the current conditions on the farm, and not on its estimated potential, which may not be realised.

The following procedure should now be adopted:—

Calculate the likely receipts and the likely expenses for the first year. Subtraction gives the likely net profit. From this figure is subtracted the salary which is considered reasonable for personal labour and management, the remainder being the likely return on capital.

Having decided the rate of interest you should receive for your investment, capitalise the figure for the likely return at this rate, and so obtain the maximum price which you should pay for the farm.

In making this calculation, expenses should be estimated on the high side and receipts on the low side.

Just as the cost of farm improvements shows great variation, so farm working costs vary greatly according to the location, the soil type, the type of machinery used, and the managing and organising ability of the farmer concerned. Only the individual can be the judge in this matter. However, with all due regard for this, there will be a proportion of the expenditure which will be outside the control of the owner. They are the fixed charges, the most important of which are—

Rents and rates.

Insurance.

Depreciation.

Bank interest (where applicable).

Among items of varying expenditure some fluctuate according to seasonal conditions. As a guide in making the calculation a list is given of the more important items of varying expenditure:—

Wages.

Maintenance of farm improvements.

Maintenance and running of vehicles and machinery.

Production of fodder crops and/or grain.

Fodder conservation.

Animal health charges, including dipping and drenching of animals, possible vaccinations, inoculations, drugs and perhaps veterinary treatment, and unforeseen expenditure.

In calculating the above costs it is advised that the prospective purchaser have recourse to those local sources of information previously mentioned.

Can You Afford the Farm?

You can afford to buy the farm if the following conditions can be satisfied:—

(1) You have followed the procedures set out, point by point.

(2) Reasonable satisfaction has been obtained on all points.

(3) Not more than the maximum economic price is to be paid.

(4) You can start with an adequate reasonable reserve of capital to meet working expenses, living expenses and emergencies until sufficient money is obtained from the sale of produce.

In the final analysis the essentials of a stable farming enterprise are the production of a reasonable net profit at the same time as good management and wise expenditure are maintaining a steady rate of farm improvement. This thought should be in the minds of every one who hopes to succeed in the business of farming and enjoy a full life from the nation's most precious asset—its soil.

GRAIN MAY HEAT IN STORAGE.

Grain of a moisture content about or above 15 per cent. is liable to heat, due to the growth of moulds living under the skin of the grain and others on the grain surface.

Hot spots from this cause may develop in the grain bulk and extend as the extra moisture produced by this heating raises the moisture content of the surrounding grain to a dangerous level. In a bulk of grain stored at a moisture content mostly close below the danger level, hot spots developing in pockets of moister grain may extend and envelop the whole mass of grain. If the hot spots represent isolated "wet" spots in a generally "dry" grain mass, damage may not extend far from the original "wet" spot.

The whole mass may heat simultaneously when the moisture content is above 15 per cent.

High grain temperatures also encourage the growth of insects and mites. The additional heat produced by these insects and mites may in turn start off moist grain heating.

It is obvious from the above that the cooler and the drier the grain is when it goes into bulk storage, the better the chances are of safe storage.

Heating in a grain bulk may be detected by the use of thermocouples installed throughout the grain mass, or by dial thermometers with capillary tubes penetrating various parts of the grain mass, or by straight-stem thermometers mounted on wooden rods and thrust into the grain.

Control of moist grain heating can only be effected by drying the grain to a safe moisture content. Turning is most ineffective, giving at best a temporary reduction in temperature. Isolated hot spots may be cured if the grain is dug out, and spread out to dry.

Forced ventilation, designed to keep grain from heating, should provide for an air flow of 0.2 volumes of air per unit volume of grain per minute (that is, 9-10 cubic feet per ton per minute).

The air pressure needed to maintain this air flow will increase more than proportionately to depth. It is normally advantageous to avoid great depths in storage bins intended for forced ventilation. Overseas experience favours a depth of grain no greater than 8 feet.

From "Handling and Storing Cereal Grains," Advisory Leaflet No. 423 of the Department of Agriculture and Stock.

WHAT EVERY DAIRY FARMER SHOULD KNOW ABOUT STRAIN 19.

(1) Strain 19 is a vaccine used to protect cattle against brucellosis (contagious abortion).

(2) It has been in use for that purpose for a good many years and is universally accepted as effective. Strain 19 has the unqualified support of the Queensland Department of Agriculture and Stock.

(3) Following the use of Strain 19, abortions are reduced to one-sixth of their former numbers and there is a corresponding lift in the number of live calves born. Milk production improves and there is very much less trouble from sickness and infertility in the herd.

(4) Vaccinations are carried out only by veterinary surgeons and certain officers of the Department who have been given special training.* The vaccinations should be restricted to heifer calves 4-12 months old but the main consideration is that the animal to be vaccinated be not pregnant at the time of vaccination.

(5) One vaccination gives the calf adequate protection for virtually the whole of its productive lifetime. Re-vaccination is not necessary but it is essential that the vaccine be used each and every year on the new season's calves.

(6) Cost of vaccination varies, depending on circumstances. The man who practices seasonal calving can get a whole year's calf crop vaccinated at a single visit from the veterinarian—usually during the period February-April. Otherwise two visits are necessary and this may increase the cost a little.

Vaccination of calves on a group basis in a given area helps greatly to keep down costs.

In general the cost is in the vicinity of five shillings.

(7) Act now and arrange to vaccinate your heifer calves.

*This is so largely because the vaccine is dangerous to man, but also because it must be transported and stored under rather special conditions if its immunizing power is to be kept at a high level.

Review of the Marketing Situation in 1955-56

By OFFICERS OF THE DIVISION OF MARKETING.

Falling prices, increasing costs, the growing importance of "import savers," and export difficulties due to competition and freight increases were the main features of the rural economy in 1955-56.

We are all aware of how conditions have changed since the war. The immediate post-war years saw a rapid expansion in agriculture; although costs were rising, prices were rising faster and markets presented no problems. In more recent years prices of farm products have tended to fall, but costs have continued to rise. Emphasis has shifted from distribution to production.

Efficiency and cost reduction now loom large in the grower's mind.

The balance of payments position is always hanging over our heads, and continued efforts are necessary to increase exports and reduce our dependence on imports. In 1955-56 Australia had an unfavourable balance on commodity trade of more than £45 million, and when invisible items are added, the total unfavourable balance was over £220 million.

In other words, more than one-third of our total imports were not paid for by exports.

In 1954-55 Queensland still had a favourable balance on commodity trade of about £10 million, but this was £31 million less than in the previous year. Our direct overseas exports declined by more than £10 million, with a further fall in 1955-56.

So far as the overseas situation is concerned, our rural industries may be divided into two groups. Group A includes the export industries such as wool, meat, dairying, sugar, wheat and fruit. Group B includes the "import savers" such as tobacco, cotton and linseed.

THE EXPORT MARKET.

The problem with the export crops is to increase exports, which is not always the same thing as increasing production. For example, in 1955-56 and in the previous two years, Australia had a large surplus of wheat but found some difficulty in selling it. Now the position has changed radically due to lower production in Australia and to crop failure on the Continent. This year Queensland will become an importer.

Although Australia as a whole found selling difficult in the past three years, this did not apply to Queensland. Our quality wheat commanded a ready market even under these conditions.

Quality, presentation of uniform samples, high standards of purity, control of insect damage, are as important as production, production costs and price.

The downward trend in 1954-55 in export prices for wheat and wool continued in 1955-56. Lower prices for wool resulted in realisations being £15 million less, in spite of increased production and exports. Recent wool sales have continued the firmer trend which was apparent at the end of the year.

The United Kingdom is the chief export market for most of our agricultural products and increased competition on that market comes not only from other exporters but also from the United Kingdom farmers.

Meat.

In the case of beef and veal, United Kingdom home production in 1955 was 63 per cent. of total requirements, compared with less than 50 per cent. in 1938, and this has affected prices of imports from Australia. The 15-year Meat Agreement has given our beef industry a measure of security which it did not enjoy pre-war. Nevertheless, increased home supplies and the British housewife's preference for home-killed meat have narrowed the market for imported meat. This narrower market results in more intense competition from Argentina and New Zealand, which can only be met by increased exports of chilled meat and improved quality and presentation of frozen meat.

As in the case of wool, meat exports were larger than in the previous year but values were lower, and deficiency payments were again made under the Agreement.

Butter.

During the war, long-term contracts were made with the United Kingdom Ministry of Food and in the case of dairy products these expired on June 30, 1955. Competitive trader-to-trader marketing now prevails.

At the beginning of the year Australian butter was in good demand and prices rose to as high as 400s. per cwt. Increased supplies in the second half of the year resulted in lower prices, and Australian choice fell as low as 287s. per cwt. Recently prices have fallen still further and in January reached a low of 258s. per cwt.

However, in spite of this fall in price the aggregate return to producers in 1955-56 increased. Quantities exported were greater than in 1954-55, reflecting good seasonal conditions. Producers of butter and cheese also benefited by the Dairy Industry Act of 1952, which guarantees a minimum return on home sales plus 20 per cent. of this quantity exported.

Eggs.

The egg market in the United Kingdom was firm due to decreased imports from other countries and to the diversion of Australian cargoes to Western Germany. The return to the Australian Egg Board of 4s. 0.559d. per dozen eggs was 9d. per dozen more than in the previous year.

Exports from the 1956-57 season met a very weak market, in spite of much smaller shipments from Australia, and average realisations are about 37½ per cent. below the 1955-56 season. As in the case of meat, home production has increased, and the United Kingdom farmer now produces 95 per cent. of United Kingdom requirements.

Sugar.

Sugar, our largest agricultural industry, enjoys a guaranteed but strictly limited market under the Commonwealth Sugar. Agreement, now extended to 1964. Increased production and stocks inside and outside the British Commonwealth, and the restrictions of the International Sugar Agreement, effectively prevent any major increase in sugar exports to help overcome balance of payments problems.

Fruit.

Queensland's exports of fruit, practically confined to canned pineapple products, totalled some £3 million, about the same as in 1954-55. The United Kingdom continues to be the main market, taking about 80 per cent. of the export pack.

Grains.

There is a continuing tendency among importing countries towards self-sufficiency.

This tendency is likely to persist with the present world-wide problems

of foreign exchange, internal employment and security. Particularly is this so in the case of wheat. The drastic cuts in wheat acreage reflect the difficulties and lower prices Australian grain farmers are encountering in the export market. Farmers' costs and internal marketing charges continue to rise. High shipping freights militate against profitable sales on the traditional U.K.-Continental markets.

We can meet this increasing competition by paying more attention to quality and the maintenance of high standards for export grains.

Our wheat and barley industries are succeeding in this respect. Queensland wheat is now selling at a premium overseas; our barley is accepted as of malting quality whereas until a year or so ago all our export sales were made as "feed." Mainly because of higher freight charges to the U.K.-Continent, nearly all our export surplus of barley from the 1955-56 crop, amounting to over 2,000,000 bushels, was sold to Japan.

Australia is a party to the International Wheat Agreement which will continue until 1958-59, and our quota is just under 30 million bushels. All major exporters are signatories to the Agreement, but the largest importer, the United Kingdom, is again not a participant. The success of the Agreement will depend largely on the willingness and ability of the major exporters to hold stocks.

Under the recently arranged wheat agreement with the United Kingdom, Australia is assured of a market in the United Kingdom for 750,000 tons (28,000,000 bushels) annually for five years.

A feature of the grain trade in Queensland in recent years has been the decided swing towards canary seed, french millet and panicum. This has been due to the steady overseas demand for these bird seeds. These seeds, particularly canary seed, have a high value relative to weight, and are less affected by rising freights. This is in contrast to wheat, barley, grain sorghum and maize.

IMPORT SAVING INDUSTRIES.

So much for the export group; let us now look at what we call "import savers". These are of particular interest to us, as Queensland offers the best prospects for their future development.

Oils.

In Australia we import annually about £2 million worth of vegetable oils, for both edible and industrial use. Linseed and the dual-purpose crops, peanuts and cotton, can help to lessen this dependency on imports. The Linseed Crushers' Association has offered a price of £70 per ton, and under this stimulus linseed acreages have doubled in each of the last four years. There is a notable tendency to switch from wheat to linseed growing.

The peanut industry has been adversely affected by rising costs and falling prices. Application has been made to the Tariff Board for increased protection on both nuts and oil.

Cotton.

The chief concern of the cotton growing industry is the production of fibre, and cottonseed oil is a by-product. Heavy mechanisation is a prerequisite to expansion and to this end some long-term guarantee is required by the growers. Plantings in 1955 were lower, due partly to unfavourable weather conditions but chiefly to economic uncertainty. Under the Cotton Bounty Act of 1955, growers are guaranteed 14d. per lb., until the end of 1958, for all grades above strict good ordinary. Even so, the industry is seeking a longer guarantee and a higher price.

Tobacco.

Probably the greatest scope as an "import saver" is in the field of tobacco.

Queensland offers the best prospects. Present and planned irrigation facilities should ensure rapid development if the economic incentive is there. Growers, manufacturers and the Commonwealth Government have provided funds for work on production and quality problems. Agreement on grading and grade schedules has been reached between our Marketing Board and the manufacturers, but there still remains the question of price.

WHAT ARE THE IMPLICATIONS ?

All these developments must turn our thoughts towards ways and means of improving farm efficiency. Consequently we are finding a fast growing awareness of the need for right information on the economic aspects of farming.

Sometimes the economic problem and its solution stand out clear and stark, but very often even a clear definition of the problem is lacking.

So there comes a demand for facts. "Does this pay?" becomes a crucial question. There is no longer a liberal margin within which to work.

A farmer wants to use all his resources—land, labour, machinery, and capital—to the best advantage, to waste nothing.

It is to meet this demand that we are developing an economics unit within the Division of Marketing. The object will be to establish guideposts that might help the farmer in his day-to-day decisions.

Farm survey and management research in Australia is of comparatively recent origin. We are still developing a theoretical framework and methodology suitable for Australian conditions. Much of the work now being done in the Division is therefore of an experimental nature.

The market situation is throwing out a challenge that can only be met by more attention to detail. This applies right through from the management of the farm until the consumer is reached.

The outline given above points to this challenge without any ambiguity. As far as can be seen at present, the pattern is not likely to change in the immediate future.

QUEENSLAND SHOW DATES, 1957.

MAY

Roma, April 30 to May 2
Monto, 1-2
Millmerran, 1-2
Murgon, 2-4
Crows Nest, 3-4
Theodore, 3-4
Goondiwindi, 4-6
Eidsvold, 6-7
Longreach, 7-9
Mitchell, 8-9
Mundubbera, 9-10
Thangool, 9-10
Marburg, 10-11
Goomeri, 10-11
Charleville, 14-16
Barcaldine, 15-16
Springsure, 15-16
Ipswich, 15-16
Gayndah, 15-16
Biloela, 16-18
Kilkivan, 17-18
Dirranbandi, 17-18
Biggenden, 21-22
St. George, 21-22
Cunnamulla, 23-25
Gympie, 23-25
Blackall, 22-23
Wowan, 23-24
Kalbar, 25
Maryborough, 29 to June 1
Winton, 31 and June 1
Boonah, 31 and June 1
Woodford, 31 and June 1

JUNE

Maryborough, May 29 to June 1
Winton, May 31 and June 1
Boonah, May 31 and June 1
Woodford, May 31 and June 1
Blackbutt, 1
Childers, 3-4
Hughenden, 5-6
Bundaberg, 6-8
Mt. Morgan, 6-8
Lowood, 7-8
Caboolture, 7-8
Emerald, 7-8
Gin Gin, 10-11
Gladstone, 12-15
Toogoolawah, 14-15
Clermont, 14-15
Rockhampton, 19-22
Kilcoy, 21-22
Laidley, 21-22
Mackay, 24-27
Proserpine, 28-29
Esk, 28-29
Mt. Larcom, 28-29

Management of Beef Cattle in Far North Queensland

By W. F. MAWSON, Senior Adviser in Cattle Husbandry.

This article is based principally on observations made in the grazing country of the Cairns hinterland. However, the conditions described and the changes in management recommended are applicable to most other grazing country in far north Queensland.

Most properties in the area breed all their requirements. The general practice is to leave bulls in the herd continuously, with the result that there is no controlled mating. Most calves are born in spring and early summer. The time of mating is largely governed by pastoral conditions, which in turn depend on rainfall.

Some weaning is done on most properties, although owing to the varying ages of the calves at any one time not all calves are weaned.

In most cases heifers are allowed to mate as soon as they will accept service. Males and females are rarely segregated until the bullocks are at least two years old. In many cases, segregation does not occur until the bullocks are taken out for marketing.

There is little selection of breeding stock, mainly because there are often only sufficient females to maintain the number of breeders. A little spaying is done on some properties.

Almost all the turn-off comprises fat bullocks, which are sold to meatworks and local butchers northwards from Bowen. In general, the enviroment does not allow the production of young, first grade fat bullocks. When cattle are bred, reared and fattened on the property, they are

Plate 1.

Typical Peninsula Cattle on Their Way to Meatworks at Cairns.

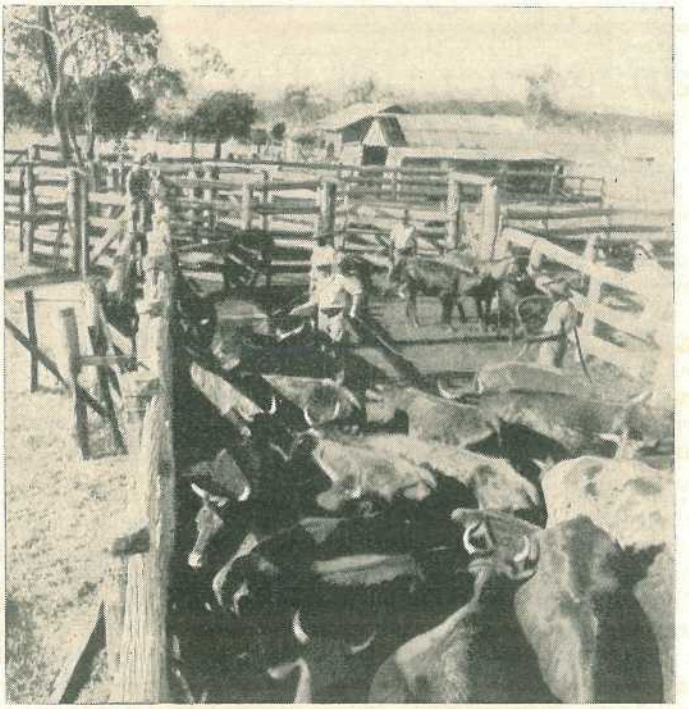

Plate 2.

Spraying Cattle For Tick Control With a Portable Spraying Outfit.

from four to six years of age before being fit for slaughter. However, if the animals can be kept gaining weight during their second winter and spring they can be ready for slaughter before the third winter. Unless that weight loss is prevented, very few bullocks indeed can be turned off as first grade beef under the age of four years.

Cattle tick and buffalo fly are present through the area and when not kept in check are a constant cause of loss of condition in cattle. Insecticides applied by dipping or spraying are the main means of control. Frequently the interval between treatments is too long to give continuous effective control.

Most cattlemen agree that the low feeding value of the dry grass in spring and early summer and the cattle tick present the greatest difficulties in the area.

THE PROBLEM OF WEIGHT LOSS.

Growth rate studies have highlighted the heavy weight losses which occur during late winter and spring. That loss of weight seems to be the main obstacle to the provision of the young, good-quality light-weight animal which is required of the present-day beef producer.

We may well ask ourselves, "What steps can be taken to overcome or lessen this loss of weight?"

There are several steps, some of which are more immediately practicable than others. Here are three:—

(1) Hand feeding either with fodder produced on the property or with some type of purchased fodder.

(2) Grazing on cultivated crops.

(3) Improving husbandry and management practices in order to minimise the weight losses. This includes the sale of young cattle as stores.

It is considered that item 3 is the logical approach to the problem. The three alternatives listed are not necessarily separate. In fact, it is quite likely that the execution of item 3 would open up the economic possibilities of the first two.

Under present conditions items 1 and 2 do not receive a great deal of consideration. The cost of purchased feed for commercial steers is very high and would not be justified from an economic standpoint under present conditions. In addition, very limited areas of pasturage in the region are suitable for the making of bush hay.

Areas of soil suitable for the production of summer-growing fodder crops are limited but are sufficiently large to have an important bearing on the industry if and when they are exploited. The costs of production would be comparatively high and there is a lack of labour with farming experience. In any case, the benefits to be obtained from cropping on a large scale only become obvious when they follow management practices which are, as yet, not fully in vogue.

Any feeding or cropping programme involves machinery and techniques with which most cattlemen are as yet unfamiliar. In the meantime, the extension and intensification of management practices already in use in varying degrees will play a big part in the development of the industry in this area. It

Plate 3.

Mineral Licks May be Supplied in Simple Open Troughs During the Dry Season.

is these management and husbandry practices that are now discussed in some detail.

IMPROVING MANAGEMENT PRACTICES.

(1) Use Pastures Better.

Under very extensive systems of grazing some pasture areas are scarcely utilised at all while other sections are grossly overstocked and eaten out. It is common to find overgrazing in the vicinity of watering points. Further, the more nutritious and palatable pasture grasses become eaten out and are replaced by poorer types.

Isolated areas can be found which are practically worthless from a cattle raising point of view. However, there are other areas which would provide reasonable grazing for part of the year if stock were confined on them, but which are scarcely grazed at all otherwise. Fencing would be necessary to keep stock on such areas and of course water would have to be provided. Since the grazing of these areas would normally be done during or soon after the "wet" season, water supply should not be so difficult at those times.

The better grasses, which are normally grazed down, would then be spelled and have a chance to become more vigorous. They would also have a chance to shed seed and thus thicken up.

(2) Subdivide and Spell.

By subdivision and spelling one or more paddocks at some time of the year the better grasses can be maintained and more use can be made of the poorer ones. Recent research has also shown another very important advantage and that is in relation to tick control. It has been found that when cattle are dipped and then

Plate 4.

Subdivision is the Basis of Better Cattle Management.

placed into a paddock which has been unstocked for three to four months, considerably fewer dippings are needed to control cattle tick.

(3) Turn Off Earlier.

Results of weighings so far completed in the area indicate that there is a progressive decline in weight gain per day after the yearling stage. Table 1 illustrates this point. The cattle concerned had an average weaning age of 260 days. Sixty pounds (representing the estimated average birth weight) has been deducted in all cases in order to arrive at the liveweight gain.

The dates shown in the table indicate those on which the peak weight for the respective years was reached.

This table indicates that turning-off at the peak weight as yearlings would take full advantage of the rapid earlier growth. At present, however, there is the difficulty of finding a suitable market. Almost all properties in this area both breed and fatten their own stock. The cattle fatteners who buy stores are mainly on the coast in the far north. There are also a few fatteners on the Atherton Tableland. In neither region have they shown much interest in yearlings, although it must be said that in recent years they have had little, if any, opportunity to purchase good yearlings in fresh condition.

The turn-off of 2-year-old stores in late autumn or early winter is considered the best approach at present.

TABLE 1.

LIVEWEIGHT GAIN PER DAY OF BRITISH BREEDS AND CROSSBREDS.

Date of Weighing.	Number of Days.	British Breeds.		Crossbreds.	
		Weight Gain from Birth (lb.).	Gain per Day (lb.).	Weight Gain from Birth (lb.).	Gain per Day (lb.).
5–11–52 ..	260	261	1·00	310	1·19
22–5–53 ..	458	488	1·06	594	1·30
4–6–54 ..	836	633	0·75	779	0·93
9–5–55 ..	1,176	868	0·73	1,008	0·86

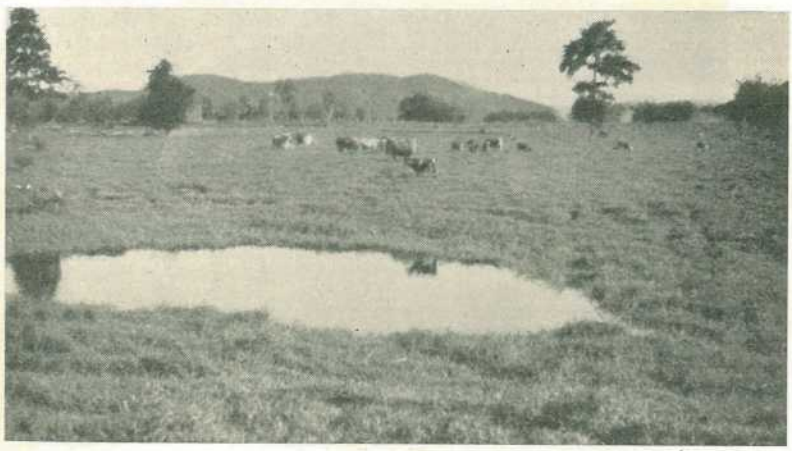

Plate 5.

Para Grass, an Introduced Plant, Makes Good Grazing on the Daintree River.

A change to this from the present practice of turning off 4-6-year-old bullocks involves alterations in the composition of the herd. When the sale cattle are disposed of at a younger age, it is obvious that breeders must comprise a bigger percentage of the herd. Since breeders are usually the most vulnerable group in dry times or drought, careful consideration must be given before adopting any system which involves increasing their numbers and so raising the potential losses. For that reason it is necessary to apply the best management principles to breeders.

Heavier losses are apt to occur among the younger breeders, particularly 2-year-old heifers that calve in the early spring when pastures are dry and low in protein and phosphate.

(4) Calve Heifers at 3 Years.

The big losses brought about by young heifers calving too early in the year are one reason why little effective culling of breeding stock can be done. The losses are so high that most of those reared are required simply to maintain the numbers of the herd.

With uncontrolled mating, many heifers calve at about two years of age. This places too great a burden on them under most conditions in North Queensland. At this age, cattle are usually acquiring the first permanent teeth and grazing is often restricted on this account. Further, the heifer at this stage is still growing and developing. Should she have a calf to feed, her protein requirement increases greatly, as nearly as much protein is needed to

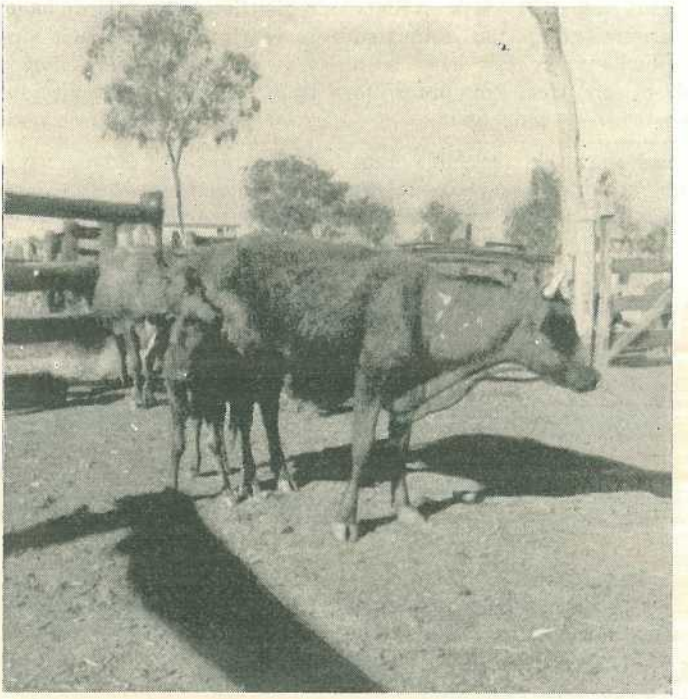

Plate 6.

The Result of Calving at Too Early an Age. This photograph was taken in a good year!

produce one gallon of milk as is required to maintain the animal itself for 24 hours. Thus a heifer producing one gallon of milk a day has a double protein requirement.

For these reasons heifers should not be mated before they are two years of age. The first calving would then take place when the heifer was about three years old and she would be in a much better state to survive and rear her calf.

Some cattlemen fear that the withholding of heifers from service until they are two years old or over, together with controlled mating (see item 6 below), may be responsible for their failing to get in calf when required. Any such effect is small and is more than offset by the advantages gained. It is clearly better to have a fat barren heifer than a dead cow and calf. Moreover, the level of fertility in the herd will gradually rise as a result of what amounts to automatic culling for infertility.

(5) Mate in February-April.

In general, calving should commence towards the end of November and cease about mid-February. Storms often relieve the dry conditions in November and provide some green grass which helps to carry cattle over to the wet season.

Of course, it is quite possible that pastoral conditions will still be dry and unfavourable in November and December. Even if that is so, the cow that calves in late November or December has a much better chance of survival than one which has calved in September, since the earlier calving cow will be in much poorer condition by November.

If calvings do not commence until the end of January, and then extend into April, there will be difficulty when the calves are weaned because of unfavourable pastoral conditions. The earlier in the year that calves can be weaned the better the pastoral conditions are likely to be for them. On the other hand, if calves are weaned when very young, they lose the advantage of their dam's milk.

Taking everything into account, the best weaning time can be accepted as being from June to August. When weaned into a reserved paddock there should still be fair grazing for them and the calves would be from 6 to 9 months old.

When the year's calf crop occurs within a space of about three months, there are certain other advantages. Routine operations such as branding, marking and dehorning are less time-consuming and they can be performed at the right age to obtain the greatest economic advantage.

Large even lines of sale cattle are available. This is an advantage to the seller.

A practice which may be especially important when breeders are segregated and the time of calving controlled is the provision of a phosphate lick. The short-term feeding of a small quantity of high-protein concentrate to breeders may also prove to be sound in dry years.

(6) Control the Mating.

If it is agreed that calving should commence towards the end of November, mating would need to commence about mid-February. When mating is to be compressed into three months of the year, it may be necessary to use a higher percentage of bulls. The procedure of staggering the admission of bulls into the herd would probably yield good results where practicable. Half the total number of bulls could be placed into the herd in mid-February, an additional quarter at the end of February and the remainder a week or so later. This ensures a supply of fresh bulls

during the time of greatest breeding activity in the herd. All spayed cows should be removed from the breeding herd before mating begins.

When bulls are in the herd throughout the year, the bulk of the matings are determined by seasonal conditions. Should early storms occur in October, many cows will get into calf in November. This means August calvings the following year. Should conditions be bad at that time—and they usually are—it is inevitable that losses of cows and calves will be heavy. This has been happening for many years and is a big factor limiting herd improvement and production.

PROVISION OF SPECIAL PADDOCKS.

(1) Mating Paddocks.

In order to improve the calving percentage, a mating paddock should be provided. Since mating will occur during the wet season when grass is plentiful, the stocking rate can be high. This concentration of breeders allows the bulls to readily find the cows to be mated.

On some properties, it may be practicable to use a paddock as a mating paddock, then spell it and later use it as a weaner paddock.

At the end of the mating season, the bulls are taken out and the cows moved out into other paddocks which have been spelled. In ticky areas, tick control measures should be taken before cattle are placed into a paddock which has been spelled.

(2) Weaner Paddocks.

Mention has been made of a reserved weaner paddock. It is suggested that one, or preferably two, paddocks should be heavily grazed during the wet season by concentrating cattle on them. The paddocks should then be completely spelled by removing all stock in April. No stock would then be allowed in until

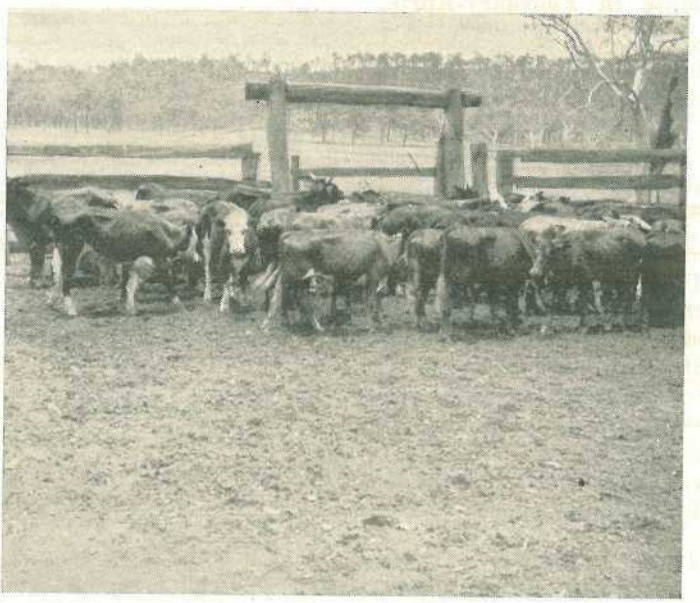

Plate 7.

Weaning of Calves Gives the Breeders a Chance to Build Up Before Next Calving.

the weaners are taken there about July. A reasonable growth of fresh grass could be expected in these paddocks, and in ticky areas the population of seed ticks should be low. In such areas, the weaners should be thoroughly treated for ticks before entering the fresh paddocks.

Dingoes may be a menace to young stock on some properties and stock-owners are then reluctant to leave young cattle without protection. Probably 10 per cent. grown cattle in the mob would give reasonable protection against dingoes. Spayed cows or larger male cattle can be used for this purpose.

(3) Bull Paddocks.

The bull paddock or paddocks should be as isolated as possible in order to minimise the desire of bulls to break out. In practice, cattlemen in this area find that there is little trouble in holding the bulls. Natural boundaries can sometimes be used to advantage. Thought should be given to the type of animals in paddocks next to bull paddocks. It may be possible to have a horse paddock on one side and perhaps a paddock for steers along another side.

As far as possible, remove the urge for bulls to break out of their paddock. It is not practicable to build a station bull paddock to hold a bull that really wants to break out, and to stock the adjacent paddock with empty cows and heifers is inviting failure.

When bulls are running with a herd all the year round they occasionally wander off alone and sometimes miss treatment for tick and buffalo fly control. These pests on bulls are often better controlled when all the bulls are in one paddock. The good manager will ensure that his bulls go out to work in good condition and free from parasites.

PLANNING FOR FUTURE IMPROVEMENTS.

Permanent water supplies and fences are basic to more intensive cattle management. Separate paddocks are necessary for weaners, growing heifers, breeders, steers and bulls.

Most properties are adopting improved practices in one way or another. Variation in soils, location of ranges, availability of water and liability to flooding are factors which vary from property to property. In giving consideration to improvements there should first be a full appreciation of all the natural features on a property. It is then often useful to plot on a plan of the property any proposed improvement such as a watering site or a fence to help decide whether it is placed to best advantage. It may take years to complete a developmental programme and it is important to make each improvement a step in a well co-ordinated plan.

Better cattle control is the foundation of better husbandry. To obtain this there has to be an ample water supply and fencing. Without them it is difficult to see how any real and permanent improvement can take place in the industry.

BREEDING PLAN INCREASES LAMBS AND WOOL.

A flock management plan which has the twofold aim of increasing both lambings and wool production is showing promise under field conditions in north-western Queensland.

The Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) said recently that low lamb markings are one of the Queensland wool industry's biggest problems. High lambings are necessary to allow a woolgrower to cull his flock yet maintain his stocking rate.

For instance, with a 60 per cent. lamb marking, a woolgrower would have to mate his ewes for six years to account for losses and to allow him to cull at the rate of 30 per cent. When the lamb marking is down to 50 per cent., it is necessary to mate for five years to replace flock losses alone. To allow a culling rate of 30 per cent., it would be necessary to mate for a further three years. By that time the ewe would be nearly 10 years old.

The average lamb marking in Queensland is 50 lambs for every 100 ewes mated. In the hot, shadeless north-west, lamb markings on many properties fall far below the State's average. For this season, investigations into methods of increasing lambings are being carried out at the Department's Toorak Field Station, near Julia Creek.

There, research has been focussed on the ability of a ewe to have and to rear good lambs as well as to produce wool. Ewes are mated three times, and if they fail to produce two lambs in three years they are culled. Wool production is also considered at the culling, and in this way a ewe flock consisting of the best producers and the best mothers is built up.

Three groups have emerged from the Toorak trials—the very good mothers, average ewes and culls. It has been found that the top group rears 13 per cent. more lambs to marking age than the average group. On top of that, when fleece weights were considered, the very good mother group also selected for fleece weight had 20 per cent. more clean fleece weight than the average group.

Mr. Collins said that since these methods had been applied in the Toorak flock, over 600 maiden ewes had cut 10.3 lb. of greasy wool per head. The average cut per head in Queensland is 8.24 lb. Although some of this gain was due to the good season, part of it was achieved through breeding—and the gain through breeding is permanent.

STUDY SHEEP AND WOOL ADVISORY SERVICE.

Ten sheep and wool students from all Australian States will this year study the advisory service Queensland provides for its wool industry. It is part of a nine-months' post-graduate course for sheep and wool officers arranged by the Australian Wool Bureau.

Announcing this, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) said his Department had arranged a seven weeks' programme for the students. In this time they will be able to examine Queensland's sheep and wool advisory service as it operates under field conditions.

As observers, the students will attend two in-residence schools for woolgrowers during a month's visit to Queensland in May and June. A one-week school for woolgrowers is being held in Central Queensland and another in South-eastern Queensland. During the fortnight between the schools, the students will be attached to field officers of the Sheep and Wool Branch who are actually carrying out the advisory service.

In October, they will return to Queensland and attend the Department's annual school on extension methods for three weeks.

Mr. Collins said Queensland's sheep and wool advisory service is regarded as the equal of any in Australia. Its objective is to bring improved methods to the notice of woolgrowers as soon as possible so that the industry can quickly obtain the benefits of the latest advances of science.

At present, the sheep and wool advisory service is stressing the need for the industry as a whole to attack the two problems of blowfly and lice control. Research has found the counter to these pests, but State-wide control can be achieved only by the combined action of the whole industry.

The nine months' course also includes a study of the wool industry in New South Wales, Victoria and South Australia and a period at the C.S.I.R.O. Wool Laboratory in Sydney.

How Should We Manage Our Ewe Flocks?

By G. R. MOULE and A. T. BELL, Sheep and Wool Branch.

Your future may well depend on how you manage your ewe flocks.

Certainly Merino ewes are unsurpassed as woolgrowers, but what about their lambings? They do not reproduce as well as ewes of other breeds, but don't dismiss the Merino's poor showing too lightly. With adequate care at mating and lambing time one Merino stud in Queensland consistently marked over 120 per cent., so perhaps low lambings come back to the way you manage your ewe flocks!

To produce and rear lambs is the first job ahead of your ewe flocks. But don't forget that in Queensland they have to use a large variety of country, experiencing different climatic conditions. Everyone knows season influences lambings, but let us see how each of the climatic factors that make up the season influence breeding performance.

Rainfall.

You can divide Queensland's sheep country into two main zones, depending on the distribution of the rainfall. In the north, the rain falls most commonly in the summer; in the southern part of the State both summer and winter rains occur.

Most of the sheep pastoral country is west of the 20 in. rainfall line and the average annual rainfall decreases

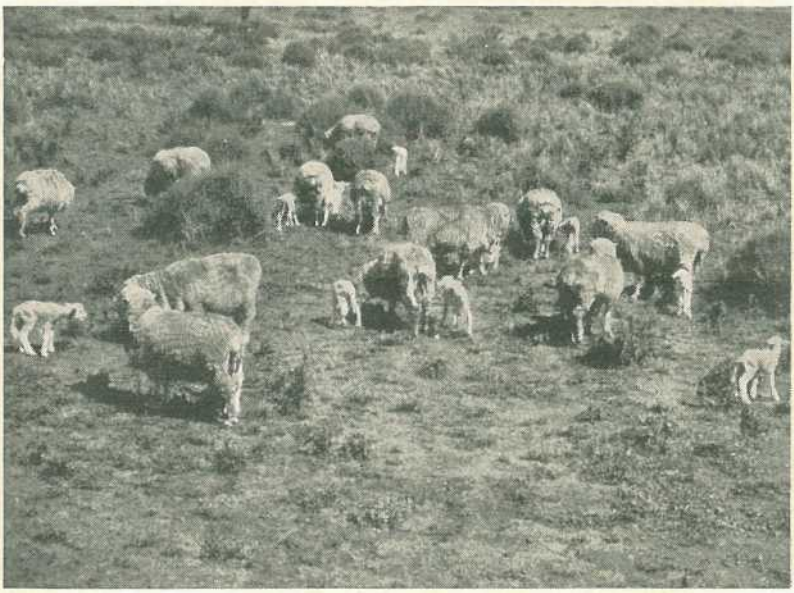

Plate 1.

The Number of Lambs That Survive is the Key to Successful Flock Management. Summer pregnancies are adverse to good lambings. Shade and water help towards a good lamb drop, but ewes need green feed during late pregnancy and lactation.

as you go further west! While the plants adapt themselves to the amount of rain, you meet the situation by varying your stocking rates. The effects of the rainfall distribution on the amount of feed available to your ewes is shown in Plates 6, 8 and 9.

Light and Temperature.

Both light and temperature affect the breeding performance of ewes.

As you know, the day and night are about the same length on Mar. 21; from then the days get shorter till June 21. After the middle of winter the days lengthen until Dec. 21, when they again commence to shorten. On Sept. 21 days and nights are about the same length.

The difference between the longest and the shortest day on your property depends on how far you are from the equator. In the far north there is only a small difference of a couple of hours or so between the shortest and the longest day. This difference increases as you come further south, and at the Queensland-New South Wales border it is about three hours.

Air temperatures follow the changes in day length. As the days get shorter, the weather becomes cooler until a little past midwinter. From then on it gradually gets warmer until midsummer is past.

But what effect can changes in day length and air temperatures have on the management of flocks of breeding ewes?

The changes in day length control the ewe's natural breeding season.

As the days get shorter, more and more ewes start to come on heat. If they are not mated with a fertile ram they continue to come on heat every 17 - 19 days until the early summer, when the days are getting appreciably longer. Fewer ewes come on heat then, and when they do the time between one heat period and the next may be a little irregular.

As midsummer passes the ewes will start to come on heat again—at first a

Plate 2.

Green Mitchell Grass at its Best After Summer Storms. In March, Mitchell grass has a protein value of about 15 per cent. By August, the protein value has dropped to about 4 per cent.

few, then more until about April or May, when most ewes are at the height of their natural breeding season.

This means the autumn is the best time to mate your ewes to get most of them in lamb.

There is a little more to it than just getting those ewes in lamb. The ewes conceive more easily during April and May. In addition, field observations by the Sheep and Wool Branch on a number of properties in Queensland have shown many more twins are born as the result of an April/May joining than from matings at any other time of the year.

The autumn is not the only time of the year when you can join Merino ewes in Queensland. Many properties have recorded quite fair results from late summer, midwinter and even spring or early summer matings.

Research by workers in a number of Australian States have shown that the sudden association of the sexes when the rams are joined with the ewes may bring them into heat. The way in which this occurs is quite interesting. First a few ewes start coming in heat, then a few more, and so on, until in about 19 or 20 days quite a large number of ewes mate quite regularly.

The results of autumn and spring matings are shown in Plates 4 and 5.

Air Temperature.

Air temperatures in Queensland do not influence the occurrence of the breeding season amongst ewe flocks. But they do influence the birth weights of lambs.

Field studies by officers of the Sheep and Wool Branch showed that ewes that are pregnant during the summer produce

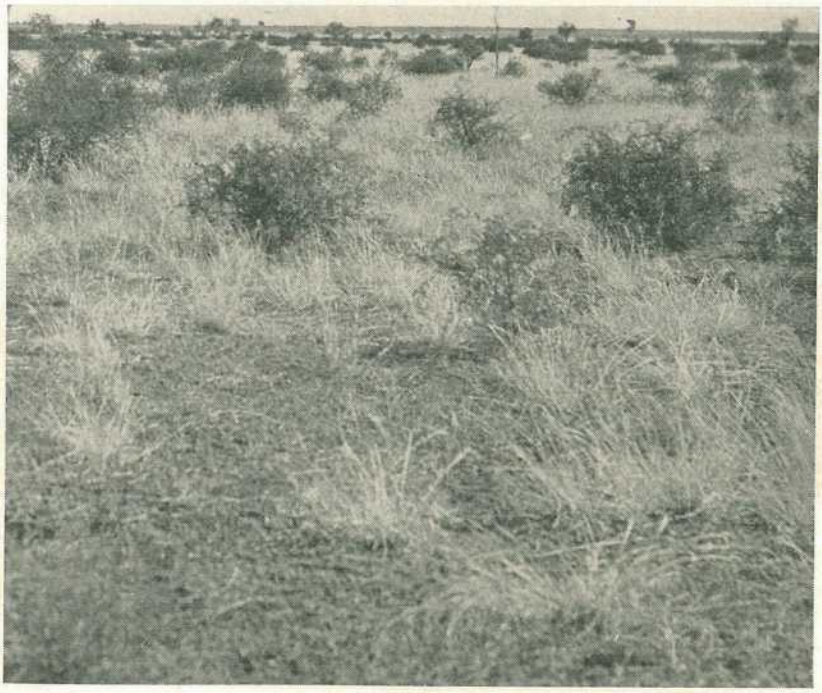

Plate 3.

In Winter, the Mitchell Grass has Become Dry and Straw-coloured. Wide patches of bare ground indicate the lowered value of the pasture. Contrast this with Plate 2, which shows the same paddocks five months earlier.

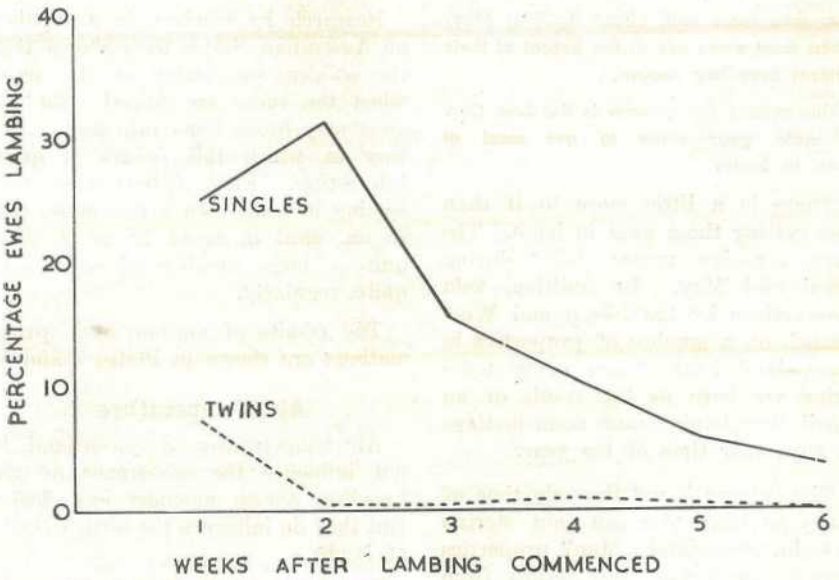

Plate 4.

Lambing Following Autumn Mating. The graph shows the percentage of lambs born (singles and twins) during each week after lambing commenced. A high percentage of lambs was born during the first three weeks. This indicates a high level of fertility at the beginning of joining.

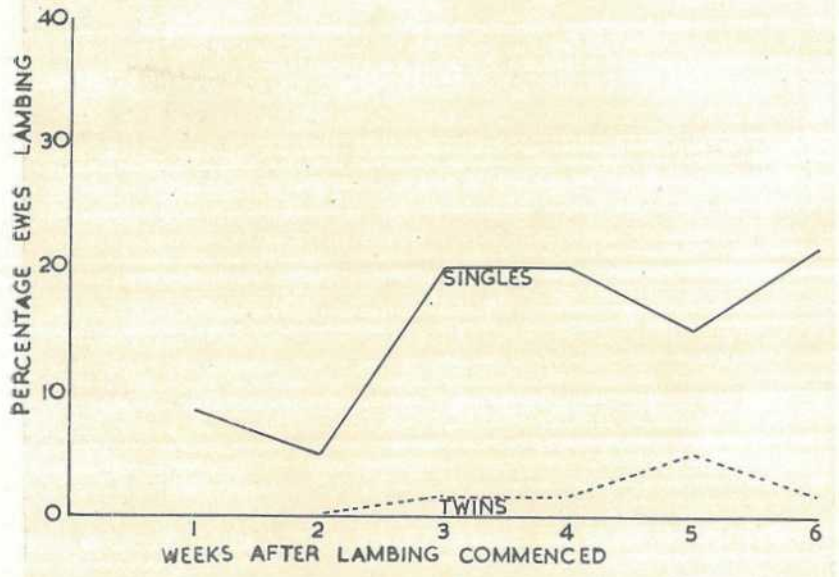

Plate 5.

Lambing Following a Spring Mating. The graph shows the percentage of lambs (singles and twins) born during each week after lambing commenced. The percentage of ewes lambing during the last three weeks indicates a low original fertility and a response to association with the rams.

lighter lambs than those pregnant during the winter. In these observations, the ewes pregnant in the summer had better pastures than those pregnant in the winter.

This observation prompted some detailed experiments in the hot room at the Physiology School at the University of Queensland. The results showed that some ewes exposed to high temperatures during the whole of pregnancy failed to lamb. Those that did complete their pregnancies

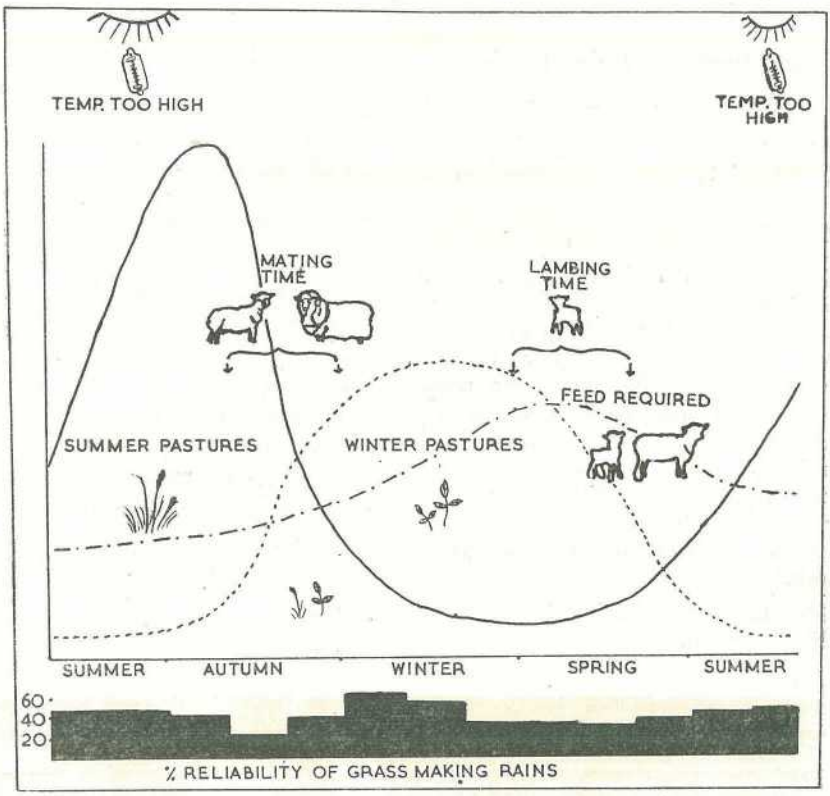

Plate 6.

Autumn Mating and Spring Lambing in Southern Queensland. The diagram shows:—

(1) The times of the year when you are most likely to get sufficient rain to make the pasture grow. This is shown by the black blocks at the bottom of the diagram.

(2) The amount of grass and herbage likely to be available to your sheep. Summer pasture represented by black line, winter pasture by dotted line.

(3) The feed that your breeding flocks require throughout the year. This is shown by the dot-dash line.

(4) Times when high temperatures lower the fertility of your rams and ewes. These are the summer months that will be hot enough to lower the fertility of rams in the different districts of southern Queensland. They are as follows:—

Pittsworth-Goondiwindi-Surat-Roma ..	Nil
St. George-Bollon	January
Cunnamulla	January, February,
Charleville	January, February, December

Joining in the autumn gives a good chance of lambing on feed in the spring in the southern sheep areas.

produced light lambs. If the high temperatures occurred during only the last two months of pregnancy, most ewes carried their lambs through to full-term. However, these lambs were lighter by two or three pounds than the lambs from ewes that experienced cooler weather.

Management to Raise Lambings.

It is relatively simple to develop systems of management for southern Queensland, where the winter rain is heavier and more reliable. The position is summarised graphically in Plate 6.

Here are the guiding principles. Mate your ewes and rams in mid-April and during May, provided of course you received your normal summer rains. Be sure your rams are in good order before joining. If you are going to mate on an "age basis" you would be better advised to join young rams with young ewes. Doing so will reduce the risks of spreading epididymitis through your flock.

Six to eight weeks is a long enough mating period.

Joining in small paddocks with adequate shade, feed and water is the best way of overcoming the additional labour required to muster and yard your ewes at night. Your ewe flock should not require any very special attention for two months or so after the rams are removed.

Four to six weeks before lambing, you will need to shear or crutch the ewes. If you live in a district where worms occur, drench them in August with phenothiazine and put them into a paddock that has been free of sheep for at least three weeks—but longer if possible.

As your ewes will lamb in this paddock it should have:—

(1) Adequate feed—the ewes need more feed during the last months of pregnancy and for milking.

(2) Adequate shade and protection from strong winds or hot sun.

(3) Adequate watering points, well distributed over the paddock so lambing ewes are never far from water.

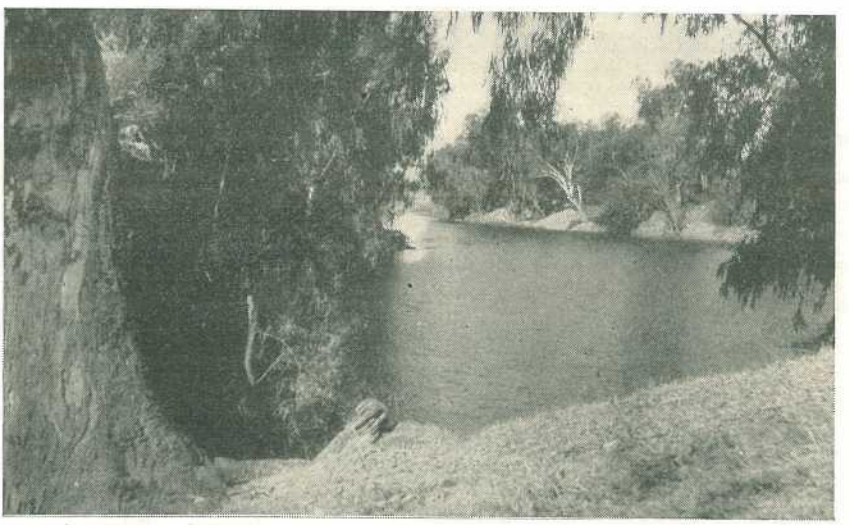

Plate 7.

Ample Water and Leafy Shade Assist Good Lambings. But beware of bogging with rapid summer evaporation of river waterholes and dams.

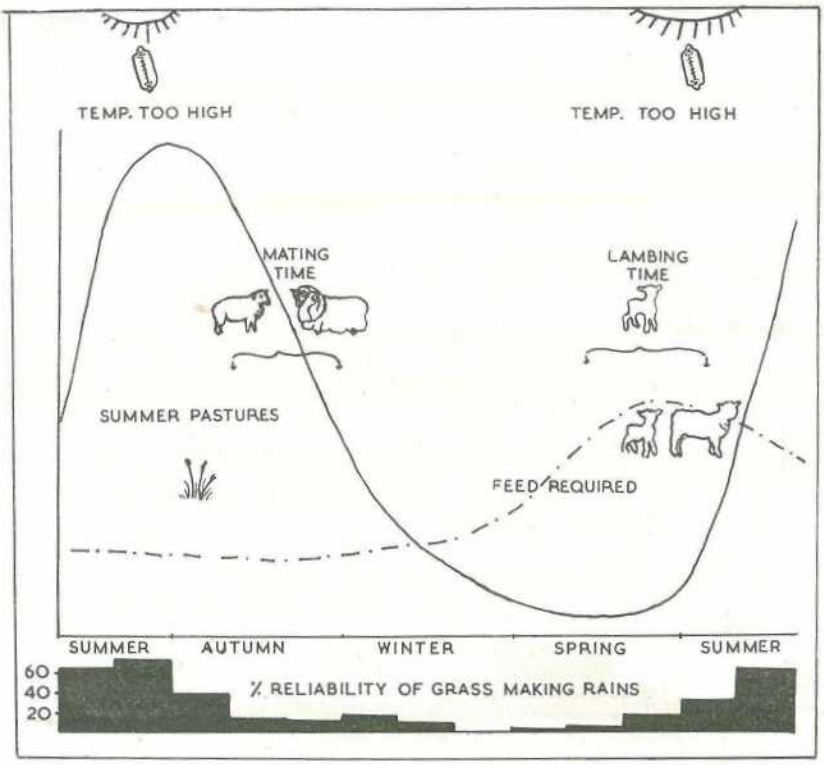

Plate 8.

Autumn Mating and Spring Lambing in Northern Queensland. The diagram shows:—

(1) The times of the year when you are most likely to get sufficient rain to make the pasture grow. This is shown by the black blocks at the bottom of the diagram.

(2) The amount of grass and herbage likely to be available to your sheep. Summer pasture represented by black line; there is no winter pasture.

(3) The feed that your breeding flocks require throughout the year. This is shown by the dot-dash line.

(4) Times when high temperatures lower the fertility of your rams and ewes. These are the summer months that will be hot enough to lower the fertility of rams in the different districts of northern Queensland. They are as follows:—

Blackall-Isisford-Longreach ..	January, February, November, December
Cloncurry	January, February, October, November, December
Winton-Kynuna-Richmond ..	January, February, March, October, November, December

If you mate your ewes in autumn when their fertility is high it is very likely that they will have to lamb on poor feed in the spring.

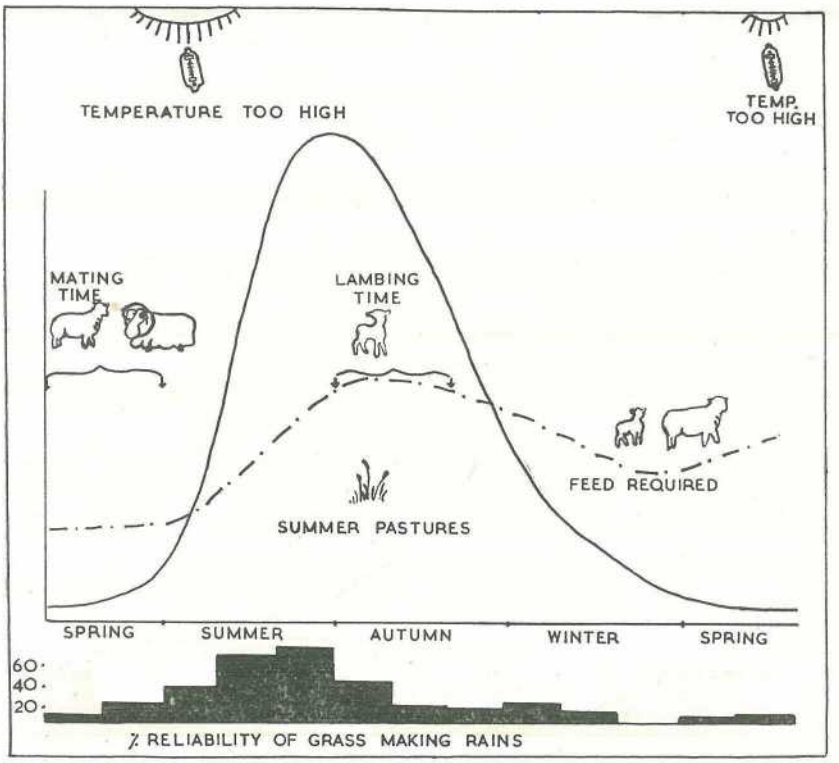

Plate 9.

Spring Mating and Autumn Lambing in Northern Queensland. The diagram shows:—

(1) The times of the year when you are most likely to get sufficient rain to make the pasture grow. This is shown by the black blocks at the bottom of the diagram.

(2) The amount of grass and herbage likely to be available to your sheep. Summer pasture represented by black line; there is no winter pasture.

(3) The feed that your breeding flocks require throughout the year. This is shown by the dot-dash line.

(4) Times when high temperatures lower the fertility of your rams and ewes. These are the summer months that will be hot enough to lower the fertility of rams in the different districts of northern Queensland. They are as follows:—

Blackall-Isisford-Longreach ..	January, February, November, December
Cloncurry	January, February, October, November, December
Winton-Kynuna-Richmond ..	January, February, March, October, November, December

Joining the rams in spring gives a good chance of lambing on feed in the late summer, but ewe fertility is low at joining time.

(4) Few predators—you can't exterminate crows but you can reduce the numbers of pigs and foxes. Conduct a well-organised campaign to poison them before your ewes start to lamb. You will get best results if you commence this soon after mating is finished.

If you live in North Queensland the problem is not so simple. Are you to join in the spring and early summer in anticipation of rains next summer—or are you to join in the autumn and lamb your ewes on pastures that have received no rain for anywhere between six and eight months?

This is a decision each woolgrower must take for himself. It will depend on your property—how well it is improved—and your past experience.

The alternatives you might follow are summarised graphically in Plates 9 and 10. Whatever time you decide to mate you can follow the main guiding principles set out for the April-May joining.

Trials on the Toorak Field Station, Julia Creek, showed that in 1953, 1954 and 1955 autumn matings were eminently successful. The ewes conceived readily, at birth the lambs were strong and vigorous. Losses between birth and marking were comparatively low.

Spring matings were not so successful; fewer ewes conceived, fewer lambs were born; they were light and weak, losses between birth and marking were heavier.

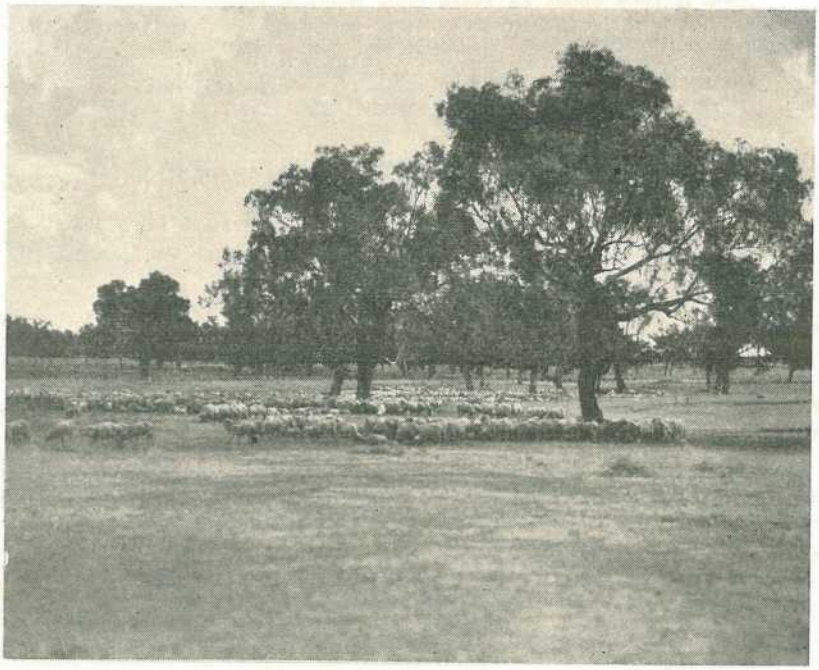

Plate 10.

The Midday Camp. Sheep seek shelter from the fierce sun and camp near available water supplies, in this case on the banks of the Barcoo River.

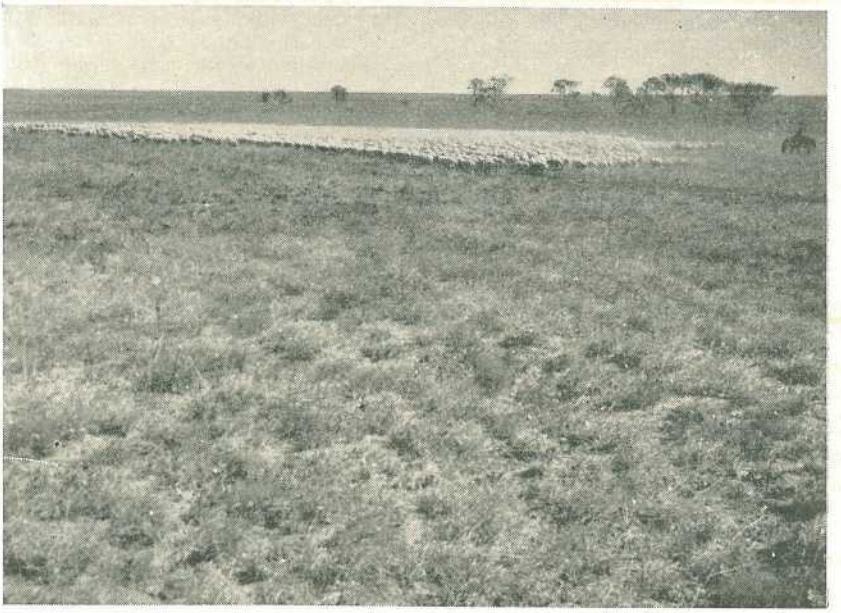

Plate 11.

There is Little Shade on These Wide Northern Plains. Several summer months of intense heat, with dry winters, make successful lambings difficult in open grasslands of the central-west and north-west.

WOOL PRODUCTION IN 1955-56.

A bulletin recently issued by the Queensland Government Statistician shows that during the year 1955-56 wool production in Queensland was 186,406,000 lb. This was the highest figure recorded since 1943-44.

The amount of wool cut per sheep or lamb shorn was 8.47 lb., compared with 8.03 lb. in the season 1954-55.

The average price of greasy wool sold during the year was 66.83d., being 6.03d. per lb. lower than in the previous year. The clip returned about £50,000,000, compared with £52,109,343 in 1954-55.

The Southern Division of the State produced 57.3 per cent. of the total wool, the Central Division 32.0 per cent. and the Northern Division 10.7 per cent. The numbers of sheep and lambs shorn were: Southern Division 11,334,827; Central Division 6,644,670; Northern Division 2,503,182; total 20,482,679.

In the past 10 years, annual production of wool has ranged from 138,767,000 lb. in 1951-52 to last year's figure of 186,406,000 lb. Fleece weight in the same period has varied from 7.24 lb. to 8.52 lb.

The total value of the wool produced in the past 10 years exceeds £480 million, and the average for the past five years is £54 million.

PROGRESS AT TOBACCO RESEARCH STATION.

The research programme at the Inglewood Tobacco Experiment Station has reached the stage where it is beginning to yield useful information.

Dr. W. A. T. Summerville, Chairman of the Queensland Tobacco Advisory Committee, pointed out recently that the Inglewood Station, in common with other tobacco farms in the district, has recovered well from the damage caused by the 1956 floods.

As part of the plan to restore the flood-damaged tobacco soil on the Station to a usable condition, a little over 30 acres of wheat was planted last winter. An excellent average yield of 36 bushels to the acre was obtained.

Dr. Summerville said this indicated the potentialities of the area for wheat as well as for other argricultural crops.

The main experiments at present in progress at the Inglewood Station are a crop rotation trial and a chlorine uptake trial. In addition, there is a substantial tobacco seed increase block.

Flood waters distributed nut grass far and wide in the district and small patches have appeared on many farms. On the Experiment Station, infestations have been dealt with effectively by spraying with hormone weed-killers and by manually digging out and destroying germinating nuts.

"It is possible to grow tobacco and other crops under irrigation on land infested with nut grass," Dr. Summerville said, "but of course, production is easier if this weed pest is never allowed to get out of hand."

Progress at the Station was inspected recently by members of the Queensland Tobacco Advisory Committee which met at Inglewood. The committee is made up of two members each from the manufacturers, growers and Department of Agriculture and Stock and a representative of C.S.I.R.O.

Other members of the committee who inspected the Station with Dr. Summerville were: Mr. W. J. S. Sloan (Director of Agriculture, Department of Agriculture and Stock), Dr. H. R. Angell (C.S.I.R.O.), Mr. N. F. Emery (British Australasian Tobacco Company) and Messrs. H. McNee and A. Agostinelli (growers' representatives). Mr. F. Chippendale, Senior Agronomist in charge of tobacco work in the Department of Agriculture and Stock, who acts as secretary of the committee, was also present.

Mr. G. Harvey, Commonwealth Department of Primary Industry, who is secretary of the the Central Tobacco Advisory Committee, attended the meeting and accompanied the Queensland Committee on its inspection.

BUILDINGS TO BOOST TOBACCO RESEARCH.

The Department of Agriculture and Stock is to erect buildings valued at £17,708 on the Parada Tobacco Experiment Station, near Mareeba. Funds are being provided from the Tobacco Industry Trust Account.

Commenting on this decision, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) said the building programme will permit the expansion of tobacco research in North Queensland. The buildings to be erected are staff quarters, curing barns and associated buildings needed for the production of tobacco leaf.

These new facilities are expected to be available for the 1957-58 tobacco season. Seedbeds for enlarged trial plantings in 1957-58 will be prepared in June.

Mr. Collins said the Parada Tobacco Experiment Station is designed to play a leading part in the development of research and advisory services for North Queensland tobacco growers.

Additional technical staff has been appointed to assist with the enlarged programme. A specialist officer trained in irrigation methods is to commence duty at Mareeba in July and at the end of this year an Agronomist will go to the Parada Station. This officer will make a special study of tobacco varieties and the cultural requirements of the tobacco crop.

Research at Parada will be directed towards improving tobacco varieties and studying fertilizer requirements, crop rotations and irrigation methods. Investigations will also be made into the factors affecting tobacco leaf quality. Plots to increase supplies of purebred seed will be laid down.

The enlarged research and advisory programme at Parada is expected to step up the rate of progress throughout the tobacco industry in North Queensland. It will also cover the production of crops other than tobacco.

Agriculture in the Central Burnett

By K. B. ANDERSSEN, Adviser in Agriculture.

(*Continued from page* 170 *of the March issue.*)

FODDER CROPS.

In the principal dairying areas, the production of supplementary fodder to help maintain continuous milk supplies is a major farm activity. The growth of fodder crops (particularly winter fodders) has in times past been regarded as somewhat hazardous because of the irregularity of the winter rainfall. However, the improvement in prices of dairy produce during and after World War II. has provided dairy farmers with the means of bringing new land into cultivation.

With this trend there has been an associated advance in mechanisation on farms. As a result there has been greatly increased efficiency in land preparation, sowing, weed control, etc., and the risk of crop failures has been correspondingly reduced. The principal crops grown for grazing and stored fodder are lucerne, oats, cowpeas and sweet sorghum.

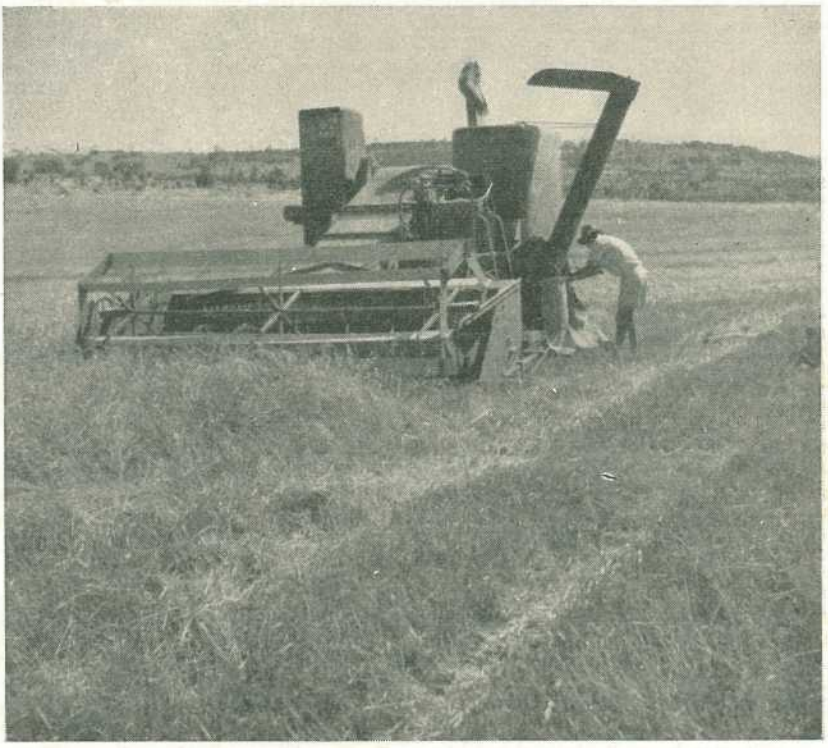

Plate 10.

Wheat Harvesting with Modern Equipment. The crop, which is somewhat tangled, is being harvested by modern auto-header. The crop was September-planted Gabo, harvested in December 1953.

Lucerne.

Extensive areas of lucerne are grown under both dry farming and irrigation conditions. The main soil types used are the river and creek alluvials, but the red and brown soils of the softwood scrubs and the grey-black brigalow soils are also used successfully.

The crop is commonly strip-grazed with the aid of electric fences, and in favourable seasons the residue is baled as hay. The chief variety used is the Hunter River Broadleaf, although European strains (originating in France and Italy) have been sown successfully and very little difference in yield has been observed. Under normal conditions hay yields of 3–3½ tons per acre are produced annually by dry farming, whilst 6–7 tons per acre may be produced under irrigation.

Oats.

Although the planting of oats is governed to a large extent by the prospects of winter rainfall, most of the sowing is completed by early May, on the late summer and autumn rains. The length of the fallow period and the successful control of weeds during this period have a large bearing on the success of this crop. The main purpose of the crop is to provide nutritious grazing for dairy cows during the winter and early spring, when pasture production is at its lowest.

The chief varieties are Algerian, Belar, Sunrise, Mulga and Vicland. The newer crown-rust-resistant variety Bovah is also gaining ground. The use of Dun field peas with oats is gradually finding favour for purposes of both grazing and haymaking.

Cowpeas.

This summer-growing legume is grown for both grazing and seed production. It is also being used to some extent in combination with sorghums, Sudan grass, etc., to improve the protein content of the mixed fodder, whether for grazing, hay or ensilage.

The principal variety in the past has been Poona, though it is likely that it will be largely supplanted by newer stem-rot-resistant varieties as the latter become available commercially.

In addition to serving as a local fodder crop, cowpeas are also grown as a cash crop for seed production. The seed is largely disposed of in the nearby coastal sugar districts, where the crop is grown as a green manure.

Sweet Sorghum.

As in a number of other dairying districts, sweet sorghum is widely grown in the Central Burnett as a bulky summer fodder crop. The stalks and leaves of this crop are sweet at maturity, and provide a very palatable low-protein feed.

If the crop is planted during the late summer it will mature in autumn or early winter, and has the virtue of being able to stand-over for considerable periods. When allowed to stand-over into winter its yield and feed value decrease to some extent. However, this practice frequently results in feed being available at a time when other sources are non-existent.

The varieties in common use are Saccaline, Sugardrip and Honey. Yields of 7–10 tons of green material per acre are generally obtained; in good seasons and on fertile soils yields of over 20 tons per acre are possible.

Other Fodder Crops.

Between 5,000 and 6,000 acres of other summer fodder crops are planted annually for grazing and haymaking. The most important of these are Sudan grass and the millets, the latter including Japanese millet, white panicum and giant setaria. When summer conditions are favourable and these crops are not required

for grazing or hay they may be allowed to mature, when a seed crop is harvested.

Pumpkins and grammas are also used as supplementary fodder crops, particularly when market prices are low. They are sometimes sown directly for this purpose, but frequently as dual-purpose crops.

GRAIN CROPS.

Land clearing by bulldozers and other mechanised clearing units since 1945 has increased the feed grain potential of the district enormously. As a result, local requirements have now been completely met and a substantial surplus provided. Understandably, the climate of the district normally favours the production of summer rather than winter grain crops. Production of winter cereals has also increased but the irregularity of the winter rainfall is reflected in the great variability in production.

Grain Sorghum.

Grain sorghum is the district's principal grain crop. Its main advantages are (1) its summer growing period, corresponding with the period of maximum rainfall expectancy, (2) its capacity to survive considerable periods of dry weather, (3) its ease of harvesting by standard grain harvesting machinery, and (4) the grazing value of its stubble. Its worst disadvantage is its susceptibility to the sorghum midge, which can under some conditions completely ruin the grain yield.

Recent farm mechanisation has resulted in increased sorghum acreages, better cultural methods and better success in handling weeds and insect pests. The district acreage is now estimated at 10,000 acres, and yields commonly average 30–36 bus. per acre.

The chief varieties grown are Alpha and Wheatland, both of which have proved themselves very reliable throughout the district. Caprock, Hegari, Early Kalo and Plainsman are also grown to a small extent.

The grain is largely retained on farms, being ground for use as a concentrate in the feeding of pigs and dairy cows. The stubble provides a

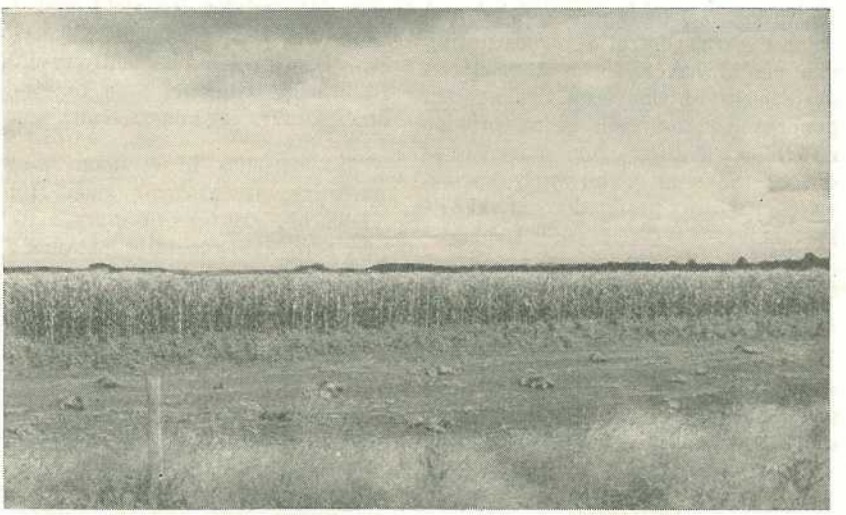

Plate 11.

Maize Growing, Gurgeena Plateau. This is an attractive uniform block of Queensland hybrid, Q. 692.

most valuable grazing roughage for dairy stock during the winter months. The residue after grazing is ploughed under, and this, together with the animal manure, adds useful organic matter to the soil.

Wheat.

The district's production of wheat is strictly limited by climatic considerations. The heavier clay loam soils are most suited to wheat-growing because of their capacity to store considerable quantities of summer rainfall for use by the winter crop.

It has been estimated that about four out of 10 years will supply sufficient seasonal rainfall for the successful growth of this crop. In about three more years in each 10, attention to moisture conservation coupled with the use of early-maturing varieties should enable payable yields to be obtained. In the remaining years, wheat production will fail, due largely to the lack of suitable planting rains.

The principal varieties grown are Seafoam, Gabo, Spica, Lawrence, Puora, Festival, Kendee, Charter and Celebration. The average district area is about 6,000 acres, and the average yield in favourable seasons about 30 bus. per acre.

Maize.

This summer grain crop is not as widely grown as grain sorghum

Plate 12.

Certified Seed Production—Hybrid Maize. This is a crossing plot in which two rows of "male parent" are alternated with each six rows of "female parent." The tassels have all been removed from the "female parent" rows to ensure that they will be crossed with the males. In the foreground is a planting of Queensland Blue pumpkins.

because (1) it is more subject to loss through seasonal dry spells, (2) it is less easily harvested, and (3) its stubble is of no feeding value. Maize growing is generally restricted to the relatively small areas comprising the fertile scrub soils and some of the better forest soils.

Production is now almost confined to hybrids. The most popular of these are the Queensland hybrids, Q.692, Q.23, Q.431, Q.716, Q.739, and Q.724, and the Grafton hybrids, Victory and Jubilee. Open-pollinated varieties which are still grown to a small extent are Leaming, Fitzroy, Improved Yellow Dent and Ninety-day.

Somewhat less than half the area is now machine-harvested, the remainder being picked by hand. Much of the crop is used on the farms. It is common practice to grind the grain, or even hammer-mill the cob in husk, for feeding to pigs and dairy stock.

The annual acreage is approximately 4,000. While heavy yields of 80 bus. per acre or higher are obtained under good conditions, the average yield is about 30 bus. per acre.

OTHER FARM CROPS.

Cotton.

This crop has been closely associated with the development of the Central Burnett, as it was frequently the initial cash crop grown on newly burnt areas. The acreage has fluctuated greatly as a result of variations in price and in the availability of labour or machines for harvesting. Since 1950 there has been a gradual but steady rise in production, due mainly to the provision of a guaranteed price and to the availability of mechanical pickers supplied by the Cotton Marketing Board.

The strains in use are all Queensland selections from introduced varieties. The most widely grown is Miller 43.9.0., with Triumph and Lonestar filling a less important role.

At the present time approximately 40 per cent. of the crop is machine-harvested and the remainder picked by hand. The average district area is about 1,000 acres, and yields are usually in the vicinity of 600 lb. of seed-cotton per acre.

Peanuts.

This crop has increased considerably in importance in recent years, but production is mainly confined to the basaltic red soils and more fertile sandy loams. As the crop has been grown on soils which are new to peanut production, consistently high yields have resulted. However, if this satisfactory yield level is to be maintained, the crop must be treated as part of a sound rotational cropping system.

Only two varieties are commercially grown in Queensland (Virginia Bunch and Red Spanish) and both varieties are to be found in the Central Burnett. Of the two, Red Spanish is at present the more popular with growers. The district acreage is approximately 3,000, and yields average over 1,500 lb. per acre in good seasons.

Pumpkins, Grammas, Etc.

Pumpkins do not constitute a major crop in this district, but small areas are common on mixed crop and dairy farms. Production may be intended for sale, but is frequently used for home consumption and for stock feeding. The major variety is Queensland Blue; varieties of less importance are Triamble, Crown, Turk's Head, Ironbark and so-called Cattle types.

Grammas and squashes are grown mainly for domestic use, and in periods of glut for stock fodder. The main varieties of gramma are Bugle and Papaw, and of squashes, Early White and Golden Custard.

Minor Crops.

Relatively small areas of linseed, potatoes, onions, sunflowers and broom millet are grown annually as cash crops or for local consumption. These minor crops are grown quite successfully, but do not total more than 800 acres per year.

SEED CERTIFICATION.

The increasing production of grain crops has widened the interest of farmers in certified seeds. The only district crops to which seed certification applies are sorghum, maize, Sudan grass and cowpeas. In the case of other major crops, such as wheat, cotton and peanuts, the maintenance of seed supplies of a satisfactory standard of quality is in the hands of the respective marketing boards. These crops therefore are not included in the Department's seed certification scheme.

In the past it has been necessary for this district to draw its certified seed supplies from other districts of the State. However, the recently increased interest in pedigreed seeds has made it advisable that some certified seed production of the more important varieties should be initiated within the district.

To date, the district's certified seed production programme has included the following crop varieties:—

Hybrid maize—Q.23, Q.692, Q.716.
Grain sorghum—Alpha, Wheatland.
Sudan grass—Roma, Sweet.

Plate 13.

Certified Seed Production—Close-up of a Hybrid Maize Crossing Plot on Gurgeena Plateau. In this plot there is one male row to every three female rows.

HORTICULTURE.

The Central Burnett has developed a highly specialised citrus industry, and this crop entirely dominates the horticultural field. Small areas of other fruits, such as bananas, grapes, pineapples and passion fruit, also occur, and the usual range of vegetable crops is produced.

The citrus groves are located on the sandy alluvial soils of the Burnett and some of its tributaries, where water supplies are adequate to maintain regular irrigation during dry periods. The relatively dry climate, the comparative freedom from severe frosts, the suitability of the soils, availability of ample water, and efficient management all combine to produce quality citrus with nation-wide recognition. The district is noted for its early navel oranges, mandarins and lemons, with grapefruit occupying a less important position.

Vegetable cropping in the district is on a small scale, largely because there are no large centres of population to supply. The principal vegetable crops are tomatoes, rockmelons and watermelons; the melons provide a useful sideline for citrus growers, especially on orchards which are not yet fully bearing.

Further details of horticultural activity in the Central Burnett may be obtained from the Department's Advisory Leaflet No. 211.

DAIRYING AND PIG RAISING.

The dairying industry has contributed greatly to closer settlement in the Central Burnett.

In the subdivision of the larger holdings into dairy blocks, and particularly those containing a large proportion of scrub country, farm areas varied from 160 to 400 acres. Farm sizes were influenced mainly by the estimated stock carrying capacity of the land, the amount of arable land and the availability of water supplies. These farm sizes have in general required only minor adjustments.

As the industry has progressed, so has the better class of forest country been brought into use for dairy production. This development has been aided by farm mechanisation coupled with the provision of improved pastures and grazing crops, improved transport facilities, and the development of locally adapted strains of dairy stock.

The major dairy breed is the Australian Illawarra Shorthorn, followed in order of importance by the Jersey, Guernsey and Friesian breeds.

Modern butter factories function in the townships of Gayndah, Mundubbera and Biggenden, while a cheese factory operates in the Coalstoun Lakes district.

Pig raising is a useful subsidiary of the dairy industry, being an ideal adjunct to the mixed farming practices carried out on most dairy farms. Pigmeat is a major outlet for the grain production in the mixed farming areas, the grain being supplemented by skim-milk, meatmeal, and various fodders.

Breeds commonly used are Berkshire, Large White, Tamworth and Wessex Saddleback. The stock marketed may be either purebreds or crosses involving two or more breeds, according to individual interpretation of the requirements of the bacon and pork trades.

BEEF CATTLE RAISING.

This industry is synonymous with the development of the Central Burnett district. In recent years, closer settlement has resulted in a reduction in both size and number of beef cattle holdings, but the industry has remained the district's mainstay.

Cattle grazing blocks vary considerably in size, ranging generally from

5,000 to 20,000 acres. They are found bordering the dairying and farming centres, and extending outwards to the perimeter of the district.

It has been estimated that 30,000 to 50,000 head of stock are despatched annually from the Central Burnett, this outward flow being determined by seasonal variations and economic trends. Up to 75 per cent. of these animals may be stores on their way to coastal and Brisbane Valley districts for fattening prior to marketing.

Major cattle sales are conducted at the large and historic saleyards at Eidsvold. The main trucking centres are Eidsvold, Ideraway, Mundubbera, Byrnestown, Degilbo and Ceratodus.

The dominant beef breed throughout this area is the Hereford, with Aberdeen-Angus and Polled Hereford occupying considerably less important places. In addition, the district has recently received importations of the Santa Gertrudis breed and much interest is being displayed in the behaviour of the crossbred progeny.

The technical aspects of the industry are being catered for at the recently established Pasture Research Station at "Brian Pastures," about 10 miles south-east of Gayndah. This station has been provided by the Australian Meat Board and its work is administered by the Queensland Department of Agriculture and Stock. Its main field of investigation is the raising of both quantity and quality of beef production in Queensland by means of better pastures, improved methods of pasture use and management, supplementary feeding of grain, hay and fodders, and improved animal health and animal husbandry.

Cattlemen generally have widened their sphere of activities in recent years. Important developments have been in the field of land clearing, both by aerial spraying and by the use of heavy mechanical equipment. Clearing has been followed by pasture sowing, involving principally Rhodes, green panic and buffel grasses. In this connection, aerial sowing has been carried out with success.

Plate 14.

Modern Methods of Peanut Harvesting. This crop (at Reid Creek) was windrowed, and not stooked. Here the windrows are being mechanically handled by a pick-up thresher.

Plate 15.

Lime Workings at Didcot. This is a small open-cut from which limestone is gathered by tractor and scoop for crushing for agricultural purposes.

While fodder conservation is still only on a minor scale, increasing quantities of farm machinery are being pressed into service to provide reserves of grain and hay. In good seasons, considerable areas of both native and introduced pastures are now being cut and baled as hay. Little development has occurred to date in the conservation of fodder as ensilage.

ELECTRICITY SERVICES.

The Wide Bay Regional Electricity Board completed a survey throughout the district in 1952-53 and by the end of 1954 had incorporated the key towns in its major electrical network. Since then the work associated with feeder line services has been pushed forward vigorously, bringing to the outlying farms and properties the benefits and service hitherto enjoyed only by the townspeople.