

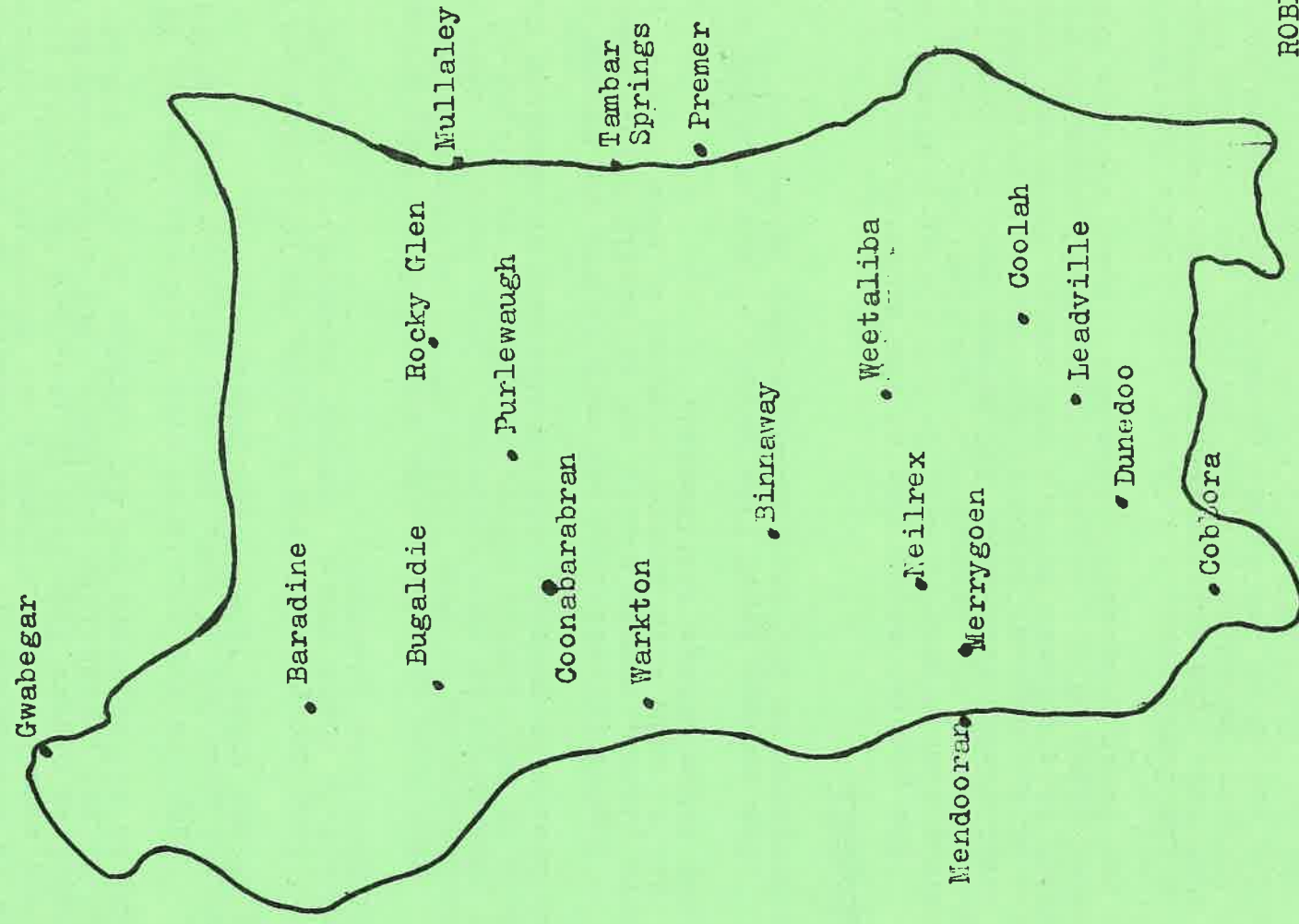
NEW SOUTH WALES DEPARTMENT OF AGRICULTURE

THE COONABARABRAN DISTRICT

Understanding the environment is the first requirement for successful property management.

This bulletin endeavours to provide background information to assist present and prospective landholders in the Coonabarabran and Coolah Shires.

Background information is provided to describe climatic detail, topography, soils, cropping practices, livestock enterprises, and pasture improvement.



12th Aug. 1977

ROBERT FREIBAIRN
District Agronomist
Coonabarabran

THE COONABARABRAN DISTRICT

INTRODUCTION:

This bulletin has been designed primarily to provide background information on the cropping and livestock industries of the Coonabarabran and Coolah Shires.

It aims to assist present and future landholders in the planning of their overall farm programme. The bulleting should also be a worthwhile guide to prospective buyers when choosing their property.

CLIMATE:

Average annual rainfall varies from about 560mm west and north west of Baradine to about 780 mm in the more elevated parts of the Liverpool and Warrumbungle Ranges. (See Table I for average annual rainfall). Average annual rainfall for most of the district is about 610 mm.

There is no definite pattern of seasonal rainfall although there is a tendency for summer rainfall to exceed winter rainfall. Average annual rainfall figures are deceptive as considerable variability occurs from year to year and from month to month (See Table II for probability figures). Dry autumns can be expected in 30% to 50% of years and dry springs in about 30% of years.

Moderate dry spells of from 1 to 4 months can be expected about one year out of two, and are slightly more common in autumn than at any other time of the year.

Long droughts of from 4 months to 10 months can be expected about one in eight years, however consecutive years of long drought conditions have occurred.

The term drought can be confusing. A long drought refers to a lengthy period of very little effective rainfall resulting in very poor crops or crop failures. Long droughts also mean lengthy periods of very little effective rainfall resulting in substantial stock losses or considerable landfeeding to maintain stock health.

Summer temperatures are warm to hot and except for the North Western plains, summer nights are generally mild. Winter temperatures are cool to mild with severe frosting in some areas. (See table III for temperatures and frosts).

The average frost free period varies from 200 days at Coonabarabran to 250 days in the warmer areas.

TOPOGRAPHY:

The general topography of the district varies from the uniformly flat western plains to undulating plateaux and the hilly rugged areas of the Warrumbungle and Liverpool ranges. Height above sea level varies from about 200 meters near Gwabegar to almost 1,200 meters at the highest peaks of the ranges. The greater part of the district lies between 300 and 600 meters above sea level. The more elevated parts of the ranges and their off shoots have higher rainfall and lower evaporation than the slopes, valleys and plains.

The Castlereagh and Manoi rivers drain the northern half of the district. The Castlereagh rises in the Warrumbungle Range near Coonabarabran meandering south through Birraway and Mendooran before swinging around to follow its northwesterly course across the plains.

The Talbragar River rises where the Dividing Range joins the Warrumbungles and flows south past Duredoo to its junction with the Macquarie near Dubbo.

SOILS:

Some of the richest soils in the State occur in the Coonabarabran and Coolah Shires, as well as some of the poorest. Broadly, they can be classified as either basalts (red and black) or sandstone, however, often the two merge to form a wide range of soil combination.

Areas of basalt soil occur in the Dinnaway, Coolah, Junedoo, Goolianawa, Mendooran, Premier, Turlewaugh, Mullaley, Liverpool Range, and on the southern slopes of the Warrumbungles. The principal trees on these soils are white box and Kurrajong. Yellow box or pine are found in some areas. These soils are generally high in natural fertility and comprise excellent cropping and pasture country.

Extensive areas of sandstone soils occur throughout the district and range from very low to medium fertility country. The better sandstone types are often indicated by apple and white pine with some times occasional box timber. Ironbark, black pine, white gum, blood wood and red stringy bark are also constituents of this soil group and generally represent poorer and more acid soils. Many good alluvial and sedimentary soils exist throughout the district.

CROPS:

The Coonabarabran and Coolah Shires are mixed farming areas where the main crops are wheat, oats, barley, grain sorghum and sunflowers. Miscellaneous crops grown in small quantities include linseed, rapeseed, field peas, cowpeas, millets and fodder sorghums. Lupins are increasing rapidly in popularity and are forming a major grain growing industry especially on the lighter soils.

Acreages for the principal crops are given in Table IV,

WHEAT:

The area sown to wheat generally has exceeded that of all other crops. Average yield per hectare over a 20 year period for both Shires is 1.2 tonnes^x, however better farmers are averaging 1.6 tonnes to 2.2. tonnes.

The north western sections of the district (Baradine area) produce premium hard wheats on high fertility soils in quick-finishing conditions. The central and southern parts of the district produce slightly lower protein hard wheats principally of the southern hard type.

In common with the general north western areas of N.S.W. the district's most important disease of wheat is stem rust. Frost damage has been a major problem in the southern areas of the district.

To obtain good wheat yields (as with any crop for this district) over a period of years, it is necessary to prepare good long fallows and maintain soil fertility through pasture rotations or appropriate fertilizer useage. The application of phosphate fertilizer with wheat crops is necessary in most of the district and often there is also a need to apply nitrogen fertilizer on the medium and lighter soil types or the more heavily cropped clay soils. Often Nitrogen is required to supplement induced deficiencies as a result of poor fallows.

Black oats, skeleton weed, mustard, poppy, wimmera rye, bindweed and various thistles are among the main weed problems of winter cereal crops.

+ 18 bushells per acre

x 25 to 33 bushells per acre

GRAIN SORGHUM:

Grain Sorghum market conditions fertility (either

Average yield per hectare, however this amount.

Summer rains before grain sorghum long term basis technology, grain in the farming pr

Apart from good prepared long fall weed control.

OATS:

Oats forms an grown regularly as a dual purpose harvested for gra

rain requirement early sowing during suitable varieties

SUNFLOWERS:

In recent years main summer crop. hectare (one fifth 1.25 tonnes per h long term average

Sunflowers do w than grain sorghum depth is important

Long well prepara control with the required. Sunflow of the district w However, Sunflowe provided soils ar

BARLEY:

Barley producti because of the in varieties and the Present day varie lower fertility s

Growing require of barley will de

Low protein sam the malting trade the feed trade (b

GRAIN SORGHUM:

Grain Sorghum production varies greatly according to prevailing market conditions and is mainly restricted to soils with high fertility (either natural or because of pasture improvement).

Average yield in recent years have been about 1.7 tonnes per hectare, however individual farmers have averaged twice this amount.

Summer rains tend to be more erratic than winter rains, therefore grain sorghum production is regarded as less reliable on a long term basis than wheat. However, in recent years, with improved technology, grain sorghum has found a profitable and regular spot in the farming programme of many properties.

Apart from good soils, grain sorghum requires very well prepared long fallows, low sowing rates, correct variety and good weed control.

OATS:

Oats forms an integral part of the livestock industry and is grown regularly to supplement winter feed. Most oats is grown as a dual purpose crop - grazed during the winter, and subsequently harvested for grain.

Main requirements include a well prepared seed bed to allow early sowing during the late February/March period, use of latest suitable varieties and attention to correct fertilizer rates.

SUNFLOWERS:

In recent years sunflowers have surpassed grain sorghum as the main summer crop. Average yields have been about 0.5 tonnes per hectare (one fifth ton per acre) with many good crops exceeding 1.25 tonnes per hectare. Good production methods should result in long term average yields of about .8 to 1 tonne per hectare.

Sunflowers do well on high fertility soils and comparatively better than grain sorghum on medium and poorer fertility soils. Good soil depth is important.

Long well prepared seed beds are necessary and adequate weed control with the use of chemicals or interrow cultivation is required. Sunflowers are more suited to the higher latitude areas of the district where slightly cooler day temperatures are experienced. However, Sunflowers are grown successfully anywhere in the district provided soils are suitable.

BALLEYS:

Barley production has expanded rapidly during recent years, mainly because of the increased demand from malsters, development of better varieties and the more efficient organisation of the export trade. Present day varieties yield better than wheat, particularly on lower fertility soils.

Growing requirements are similar to wheat and the future expansion of barley will depend on price relativity with other winter crops.

Low protein samples of two-row barley (malting) are accepted by the malting trade with the remainder of the local crop going to the feed trade (both export and local).

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LUPINS:

Lupins are ideally suited to the lower fertility soils of the district. Being a grain legume crop, they contribute to soil fertility (nitrogen) whilst at the same time provide an acceptable cash income.

Special requirements for Lupins include choosing correct variety, excellent weed control (chemical or otherwise) sow early (march/April) inoculate, use superphosphate and sow seed at 60 or more kgs. per hectare.

The grain is high in protein and has a ready demand from intensive livestock industries (poultry, pigs) as well as excellent opportunities on the export market.

OTHER OILSEED CROPS:

Linseed and rapeseed have been grown successfully throughout the district for several years now, and have proved quite successful. However, an extremely high standard of management is necessary as the crops are more liable to weed competition, insect attack, harvesting problems and moisture stress. Several growers with a high standard of crop management have found these crops more profitable than other winter crops - of course depending on price relativity.

Yields of over 1.25 tonnes per hectare ($\frac{1}{2}$ ton per acre) have often been experienced however, average yields over a period of years are more likely to be about 0.7 tonnes per hectare.

MILLETS:

The only grain millet sown until recent years was Hungarian millet (also known as setaria or panicum). Unstable market prices and low yields limit the area grown. White french millet is now also grown.

The grain millets have an important advantage. They mature quickly and can be harvested from 90 to 105 days after planting.

Forage millets are also widely grown to produce summer feed.

COWPEAS AND MUNG BEANS:

Cowpeas and Mung beans are summer growing grain legume crops and therefore also have the dual role of providing a grain or grazing income as well as acting as soil fertility builders.

Cowpeas are more suited to the very sandy soils but like Mungbeans can also grow well on loam soils.

Markets for both cowpeas and Mungbeans are variable, ranging from very high to extremely low.

Excellent weed control (including the use of chemicals) is essential for satisfactory yields.

FORAGE SORGHUMS AND SUDAN GRASSES:

A wide range of hybrid and open pollinated sorghum and sudan grasses are grown to provide summer feed and in some cases carry-over winter feed. Good soil fertility is necessary and as available varieties are constantly changing it is necessary to check on recommendations each season.

LIVESTOCK:

Livestock numbers from sheep swing from sheep was mainly because

Sheep:

Merinos are the production and for First cross ewes on properties with

Winter fodder and lamb industry and supplementary feed

Successful sheep of nutrition and disease prevention are important con

Cattle:

Though a fairly a winter feed short horns are all breeding has increased. Fertilizer in late winter and production depend

Pigs:

Recent development the popularity of prices relative to

Pig production and efficiency is profitability in

PASTURES

Pasture improvement and the expanding on better pastures stocking rates by more fertilizer and

Much of the crop restorations by time to time.

Lucerne:

The number one and suitable to rate in the top for Lucerne.

Lucerne is a crop capable of production for the extreme productivity, Lucerne

Inoculation and necessary with all particularly on the and rotational grass for good lucerne s

LIVESTOCK:

Livestock numbers for the district are given in Table IV. The swing from sheep to beef during the late sixties and early seventies was mainly because of over reacting to changing price relativity.

Sheep:

Merinos are the dominant breed, both for pure merino wool production and for breeding 1st cross ewes for prime lamb production. First cross ewes for prime lamb production is a common enterprise on properties with a high degree of improved pastures.

Winter fodder cropping is an important adjunct to the prime lamb industry and added attention to fodder conservation and supplementary feeding is increasing the stability of the industry.

Successful sheep production is much dependent on a high level of nutrition and a high lambing survival rate. Worm control, disease preventions, and breeding for the correct type of sheep are important considerations.

Cattle:

Though a fairly safe cattle area, the district often experiences a winter feed shortage. Herefords dominate the breeds although Shorthorns are also becoming very popular. The amount of cross breeding has increased, mainly with Brahmins, Braford's and Santa Gertrudis. Fertility levels are good. Calving mostly takes place in late winter and spring. As with sheep, successful cattle production depends on good nutrition and a high breeding rate.

Pigs:

Recent developments in co-operative pig marketing have increased the popularity of pigs. However, numbers fluctuate according to grain prices relative to market prices.

Pig production is rapidly becoming a more specialised business and efficiency is a main requirement to survival. There is no profitability in running pigs in a second rate manner.

PASTURES

Pasture improvement has developed rapidly during recent years and the expanding livestock industry is increasingly dependent on better pastures. Tremendous scope still exists for increased stocking rates by improved pastures with the use of better species, more fertilizer and better management.

Much of the cropping area throughout the district requires restorations by the use of improved legume pastures from time to time.

Lucerne:

The number one improved pasture species throughout the district and suitable to most soil types. Coonabarabran and Coolah Shires rate in the top four Shires throughout N.S.W. for total area sown to lucerne.

Lucerne is a drought hardy highly productive perennial plant capable of producing high quality feed throughout the year - except for the extreme cold period during June and July. Apart from high productivity, lucerne is a great restorer of depleted soil fertility.

Inoculation and lime pelleting of seed at sowing is generally necessary with all legumes (including lucerne) in this district. Particularly on the lighter soils. Correct attention to fertilizer and rotational grazing management are other important requirements for good lucerne stands.

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With the appearance of the Spotted Alfalfa Aphid and the Blue Green Lucerne Aphid in New South Wales, it is essential to sow resistant varieties. Presently all seed of resistant varieties comes from the U.S.A. and there are approximately ten suitable resistant varieties available.

Subterranean Clovers

Because of the erratic nature of autumn and spring rains the productivity of winter growing annuals such as the sub-clovers vary tremendously from year to year. In at least 30% of years productivity of winter annuals are low because of poor seasonal conditions. For this reason the perennial Lucerne which can respond to rain at virtually any time of the year is more popular.

However the sub-clovers are a useful component of the improved pasture sward on the medium to lighter soils. The most suitable varieties will vary according to the introduction of new species, but are currently a mixture of Woogenellup and Geraldton or Seaten Park and Geraldton.

Barrel Medics

The medics are again winter growing annuals and more suitable to the alkaline higher fertility basalt soils. Currently, Jemalong barrel medic is the most suitable variety available for general sowing throughout the district.

Woolly Pod Vetch

A recently introduced winter annual legume species suitable to the lighter soils of the district.

Perennial Grasses

Sirocco Phalaris is currently the most superior perennial grass species for the district and sowings are increasing every year. Sirocco Phalaris stands are particularly valuable on highly improved properties where there is a real need to prevent bloat with productive grass based pastures.

Sirocco is extremely drought resistant when well established, and a high producing autumn/winter/spring plant.

Other introduced pasture species with valuable roles in specific circumstances include:

- a. W.A. Serradella - very light country.
- b. Hyfia White Clover - hill grazing country.
- c. Wimmera Rye - annual winter grass.
- d. Palestine Strawberry Clover - damp areas.
- e. Yarloop, Trilkala and Larisa sub-clovers - damp patches.
- f. Buffel Grass - summer growing perennial grass
- g. Bambatsi Panic and Green Panic - summer growing perennials - high fertility soils.
- h. Rhodes Grass and Buffel Grass - special purpose summer perennials.

Natural Pastures

Several important natural species respond well to pasture improvement. These include Burr Medic, Button Medic, Wallaby Grasses, Barley Grass as well as many others.

Fertilizers

It is not practical to advise general fertilizer recommendations

for crops and pastures. Soil type and soil paddock to paddock merits.

In general the 1 possibly also nitrogen been over-cropped, and range from very phosphate levels include crop or pasture perennials.

Most basalt soil necessary for pasture not required for the process of aerating basalt soils can be fallows can also be Soil tests are a must levels.

ADDITIONAL INFORMATION

Purchasing Properties

Because of the development, and past purchasing properties don't rush in - take a few days work before.

Although the Department relation to a part general background to give constructive.

Some possible properties and what include:

1. Property unit assessment area
2. Particularly insurmountable and/or prices impossible to
3. Total area in cost of uncleared of cleared
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More detailed information, crop establishment, almost any through the Department is a constant Department is assessed all farm practice.

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for crops and pastures in the Coonabarabran and Coolah Shires. Soil type and soil fertility are extremely variable, even from paddock to paddock and it is important to assess each paddock on its merits.

In general the lighter and medium soils are low in phosphate and possibly also nitrogen if not previously pasture improved and/or have been over-cropped. The basalt soils are variable in phosphate level and range from very low to very high. Best guides to determine phosphate levels include, soil testing, plant deficiency symptoms, past crop or pasture performances, and trial strips.

Most basalt soils are low in sulphur, the addition of this being necessary for pasture improvement. However sulphur application is not required for grain crops as sufficient sulphur is released via the process of aeration caused by normal cultivation. Over-cropped basalt soils can also become low in nitrogen and poorly prepared fallows can also generally exhibit low available nitrogen levels. Soil tests are a most important aid in determining soil fertility levels.

ADDITIONAL INFORMATION

Purchasing Properties

Because of the tremendous variability in soil type, stage of development, and past level of management there are many pitfalls in purchasing properties throughout this district. Main advice is - don't rush in - take your time and do a bit of checking about. A few days work before purchase can often save a lifetime's disaster.

Although the Department of Agriculture can't advise directly in relation to a particular purchase, we can and do assist by giving general background information. Many local landholders are willing to give constructive advice if approached in a reasonable manner.

Some possible problems which commonly arise through purchase of properties and where insufficient background information is obtained include:

1. Property units maybe too small. It is important to gain some assessment as to likely returns and costs.
2. Particularly with smaller enterprises, low equity can present insurmountable problems. In years of low income (poor seasons and/or prices) high interest rates are difficult, if sometimes impossible to meet.
3. Total area is no criteria to productive capacity. Development cost of uncleared country is extremely high, and productivity of cleared country ranges greatly - depending on soil type.
4. When purchasing a property it is often necessary to budget for negligible income in the first year. This is particularly the case if country has not been prepared for cropping.

More detailed information concerning such things as pasture establishment, crop management, latest variety recommendations, livestock, almost any related subject of agriculture are available through the Department of Agriculture at the local office. Agriculture is a constantly changing business and as a continuous process the Department is assessing new species, management strategies, and over-all farm practice.

This information is available without charge to the landholder as a part of the service provided by the New South Wales State Agricultural Department. Officers of the Department are available to advise on all aspects of agricultural management and are willing to inspect your property to discuss with you various management strategies.

The Department of Agriculture is also associated with many trials and experiments throughout the district and field days and meetings to discuss new developments are commonly held.

Day to day management advice and information concerning new developments is regularly provided by the Department of Agriculture through the local "Goonabarabran Times" and radio stations at Gunnedah, Dubbo, Mudgee and Orange.

December	Total	No. Years	Recorded
53	577	84	84
61	702	84	84
= 25.4 mm.			
59	570	63	63
52	563	78	78
=			
58	586	52	52
66	645	79	79
approx. 4 points.			

TABLE 1

AVERAGE ANNUAL RAINFALL IN mm*

<u>Month</u>	<u>Baradine</u>	<u>Coonabarabran</u>	<u>Binnaway</u>	<u>Mendooran</u>	<u>Dunedoo</u>	<u>Coolah</u>
January	67	74	69	62	62	69
February	61	82	66	59	63	67
March	49	62	51	53	48	52
April	40	55	43	40	44	45
May	46	50	33	39	42	42
June	51	59	45	44	47	54
July	43	52	40	45	46	49
August	40	51	39	42	41	49
September	35	46	33	39	39	44
October	46	54	42	42	44	49
November	46	56	50	46	52	54
December	53	61	59	52	58	66
Total	577	702	570	563	586	645
No. Years Recorded	84	84	63	78	52	79

* 100 points

= 25.4 mm.

1mm

= approx. 4 points.

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Dec
Average

30.8
23.9

(P - 32)

$$*C = \frac{9}{5}$$

58 Total

6.9

12.9

RAINFALL PROBABILITY

Table 11

These probability figures are for the property "Glendowda" which is located in the Purlewaugh district, east of Coonabarabran. Probability figures for "Glendowda" are typical of the Coonabarabran and Coolah Shires, however probability figures are available for other parts of the district if required.

M-O-N-P-H

Probability of receiving rain during the month	Jan	Feb	Mar	Apr	May	June	JULY	Aug	Sept	Oct	Nov	Dec
0-12 mm*	9%	18%	22%	22%	29%	22%	20%	13%	13%	23%	20%	16%
13-25 mm	4%	14%	10%	9%	23%	20%	22%	22%	27%	4%	20%	20%
Sub Total	13%	32%	32%	31%	52%	42%	42%	35%	40%	27%	40%	36%
26-37 mm	13%	7%	11%	22%	13%	11%	13%	16%	20%	20%	2%	13%
38-50 mm	7%	4%	11%	17%	5%	10%	16%	9%	9%	7%	9%	4%
Sub Total	20%	11%	22%	39%	18%	21%	29%	25%	29%	27%	11%	17%
51-75 mm	22%	22%	22%	12%	16%	20%	13%	31%	18%	11%	22%	22%
76+ mm	44%	35%	24%	18%	14%	17%	16%	9%	13%	35%	27%	24%
Sub Total	67%	57%	46%	30%	30%	37%	29%	40%	31%	46%	49%	46%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

*1mm = approx 4 points rain

TABLE 111

Month	TEMPERATURE		COONABARABRAN		
	Mean C°	Max* C°	Mean C°	Min C°	No. Frosts
January	32.2		14.5		
February	31.2		14.0		
March	28.6		11.4		
April	24.0		6.8		1
May	19.5		2.7		6
June	15.5		1.0		11
July	14.7		-0.5		17
August	16.9		0.5		15
Sept	20.6		3.1		7
Oct	24.7		6.7		1
Nov	28.4		10.3		-
Dec	30.8		12.9		-
Average	23.9		6.9		Total 58

*C = $\frac{5}{9}$ (F - 32)

Table 11
RAINFALL PROBABILITY

These probability figures are for the property "Glendowda" which is located in the Purlewaugh district, east of Coonabarabran. Probability figures for "Glendowda" are typical of the Coonabarabran and Coolah Shires, however probability figures are available for other parts of the district if required.

M-O-N-T-H

TABLE IV

STATISTICS AREA SOWN TO MAJOR CROPS & STOCK NO.'s

(ESTIMATES Coonabarabran Shire 1976-1977 Year)		Coolah Shire	
Wheat	- ha*	66,000	40,000
Barley	- ha	8,500	6,000
Oats	- ha	10,000	15,000
Grain Sorghum	- ha	5,000	4,500
Sunflowers	- ha	7,000	2,000
Linseed	- ha	1,000	1,000
Lupins	- ha	1,000	500
Cowpeas & Mung Beans	- ha	2,000	1,000
Forage Sorghums & Millets	- ha	2,000	1,500
Lucerne	- ha	23,000	29,000
Other Pastures	- ha	25,000	55,000
Sheep No.		323,000	644,000
Cattle No.		105,000	118,000
Figs No.		12,000	7,000

* ha = hectares.

1 hectare = 2.47 acres.

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TABLE IV

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Barley	- ha	8,500		6,000