Generally the experimental animals initially lost weight following a depressed feed intake in the first 3 weeks. Animals gained weight appreciably thereafter. The mean daily weight gain of 39 and 14g for the sheep and goats respectively were statistically different ($P < 0.05$) and comparable to figures obtained by ILCA (unpublished data) for sheep (36g) and goats (19g) in the extensive system as practiced in the villages of Southern Nigeria.

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PROCEEDINGS

RESEARCH IN AND PRODUCTION OF THE DAIRY INDUSTRY IN THE FASSIFERN DISTRICT

FIELD MEETING—MUTDAPILLY RESEARCH STATION—APRIL 29TH, 1983

The wet weather in April forced a curtailment of the original program which had included a visit to the dairy property of the Parcell Bros. at Harrisville. The day was spent entirely at the Department of Primary Industries, Mutdapilly Research Station. We were, however, fortunate to have Mr. Mick Parcell describe the operation of his farm to us. The 33 visitors greatly enjoyed the series of talks on Dairying in the Fassifern Valley and saw the Rotary Dairy in operation. Unfortunately, again because of the wet, we were not able to inspect pastures on the research station.

INTRODUCTION TO THE FASSIFERN DISTRICT

E. J. WOODS

Department of Primary Industries, Ipswich, Qld

This district is one of the oldest cultivated areas in Queensland being settled in the 1840's, and originally grew significant areas of cotton. In the early 1900's the area diversified into dairying.

The area is a sedimentary basin continuous with the Clarence, Esk and Maryborough basins. It is divided into:

1. Walloon sediments—the fine grain sediments giving rise to prairie soils and the coarser grain sediments to the duplex soils. These soils are infertile to very infertile on the hills.
2. Alluvial sediments—riverine origin, giving rise to heavy textured soils of which the Wiesenboden is the main type. These soils are fertile (pH 6–7, high P, high K status) and have been used for intensive production for 100 years. Main limitation is their low organic matter content, poor structure, low infiltration rates and slow drainage.

Annual rainfall is 750–870 mm yr^{-1}, predominantly in summer and unreliable, hence irrigation is essential. Irrigation water is supplied from the Moogerah Dam. Local bore water is alkaline and generally unsuitable for irrigation.

Summer and winter growing pastures are widely used. Low winter temperatures and frosts limit growth of temperate pastures in winter for only about 4–6 weeks each year.

DAIRYING IN THE FASSIFERN VALLEY

M. J. LAKE

Department of Primary Industries, Boonah, Qld

Currently milk producers number 86 and cream suppliers 26. The 1981/82 milk production was 16.374 million litres for a farm average of 190 000 litres. This is an increase of 21% in milk production over the past 7 years. Dairying is carried out on 10 300 hectares. Cream suppliers generally do not rely on dairying for their living.

Farm types

(a) Irrigated—30 farms with average production in 1981/82 of 282 000 litres. This has increased 50% since 75/76 (7 years). Several farms produce up to 700 000–800 000 litres per year.

(b) Semi-Irrigated—(Water used for strategic irrigation) 19 farms with average production in 1981/82 of 156 000 litres. This has increased by 18% since 1975/76.

(c) Dryland—37 farms with average production in 1981/82 of 138 000 litres. This has decreased 5% since 1975/76.

Farm Size and Production Intensity

The average size for irrigated, semi-irrigated and dryland is 126, 113 and 107 hectares respectively.

Irrigated farms average 2225 litres milk ha^{-1} compared to 1290 litres ha^{-1} for dryland (57%). This takes into consideration total farm area, not just irrigated area. Highest production average is 8000 litres of milk ha^{-1} with most of the farm irrigated. Irrigated pastures are capable of 20 000 litres milk ha^{-1} per year.

Economics

In 1981/82 milk averaged 23 c per litre an increase of 91% over the rate of 12 c in 1975/76. The gross income for irrigated farms has increased by almost 300% and dryland farms by almost 200% in the past seven years. The increase in income on irrigated farms has been above cost increases in the same period.

Trends

The industry has remained relatively stable. Variable costs of production range from 30–50% of income with the trend towards irrigation farms being lower in cost per unit mainly because of volume and adaptation of cost effective systems. This analysis may appear a little gloomy for dryland farmers, and it has not been rosy for this group in the past. The trend is for considerable expansion and improved profitability for dryland farms in the next 5–10 years, although there will be a section which will not be relying on dairy farming for its future income source.

Increased returns have made previously marginal inputs, such as pasture and fertilizer programmes very profitable for dryland farmers. Pasture trends are towards permanent pastures at the expense of cropping with emphasis on intensification of summer growing species to provide improved quality and yield in autumn and spring. There have been extensive plantings of Callide Rhodes this year.

The trend is towards minimal cultivation techniques and systems with low mechanical inputs. This has been influenced by rising repairs, maintenance and fuel costs which consume 25% of Total Variable Costs on some farms and have been rising. The most significant trend however is towards an improved lifestyle in dairying. This has resulted in herringbone installations and improvements, with milking rates of 100 cows plus per man hour being achieved and 80 cows per man hour common. Farmers can afford the technology and capital to reduce labour—travelling irrigators are now common.

The Department considers that an economic dairy unit must produce 180–200 000 litres of milk per year to generate income to meet costs, and development, and provide a satisfactory living.

The majority of farms can achieve this level of economic production—it depends on the farmers need to achieve that production which will influence the stability of the lower production group.

DAIRY PROPERTY MANAGEMENT

MICK PARCELL
Harrisville, Qld

The property is 143 ha, milking 120 cows in 1977–78 increasing to 180–200 cows in 1982. Increase in milking herd has been supported by larger areas sown to ryegrass-berseem clover pastures and to winter-active lucerne. The latter helps fill in the feed gap between summer and winter. The property also has 10 ha of kikuyu and some naturalized paspalum flats. During the recent very dry summer milk production was maintained by fertilizing the natural grass pastures with up to four bags of sulphate of ammonia per hectare.

Enthusiastic questioning after Mr. Parcell's talk indicated that grain was fed to the cows at about 600 kg per lactation with a trend to using more molasses which is currently cheaper. All year round feed supply was maintained by use of winter-active lucerne (cvv. Granada or CUF), Lablab, Caloona peas and white panic in summer, and berseem clover, ryegrass and oats in winter. Forage sorghum is being replaced by millet for a quicker flush of feed. The irrigated ryegrass pastures received up to 1000 kg ha^{-1} of urea. When asked about lowering of soil pH following high N fertilizer over many years, Beth Wood indicated that so far this was not a problem in this area. Excess pasture is baled for winter feeding and as a reserve for when the flat country is flooded and out of production.

INTRODUCTION TO MUTDAPILLY RESEARCH STATION

W. J. SCATTINI
Department of Primary Industries, Toowoomba, Qld

The station was acquired in 1980 and comprises 5 dairy farms for a total of 460 ha. The major activity will be research for the dairy industry but some work will be done on beef and sheep in the longer term. The site chosen is suitable for research on both tropical and temperate pasture systems.

The objectives of the research on the station are:

1. To define cost effective systems for dairy farmers
2. To examine means of stabilizing or reducing the costs of production in the Industry
3. To maintain the quality of the milk produced.

Activities on the station include studies of: pasture introduction and evaluation, pasture utilisation, cropping systems, feed storage, heifer growth, cow fertility, milk quality and animal behaviour.

Further details of the Research Station can be obtained from a booklet published by the Queensland Department of Primary Industries in September 1980.

The staff of the station are to be congratulated for the rapid development of the property since acquisition in 1980.

PROPERTY AND DEVELOPMENT

D. SCHOFIELD AND W. STEENTSMA

Department of Primary Industries—Mutdapilly and Ipswich, Qld

The property has required extensive development of sub-surface drainage systems, new roads, new dams, remodelling of existing dairies, paddock rearrangement and fencing to suit pasture and irrigation requirements, and buildings for staff. Some facilities were transferred from research stations at Ayr and Coolum. Flood control in consultation with neighbouring properties was a prime consideration of the early development.

About two-thirds of the 460 ha is suited to irrigation, the present water allocation is 370 megalitres per year and more is required. Bore water is available but, as in many surrounding areas, it is too alkaline for irrigation, and one of the Station's projects is to investigate possible treatments to enable this water to be used.

SOILS

K. LOWE

Department of Primary Industries, Ipswich, Qld

On the flats, the soils are dark self mulching, cracking, medium-heavy clays with dark grey alkaline subsoil (Ug 5.16–5.25), and Fassifern Wiesenbodens, mottled grey to grey-brown self mulching clays with mottled alkaline subsoils and poorly drained.

On the hills there are prairie and duplex soils, and some areas of black-earths.

GRAZING EXPERIMENTS

R. MOSS AND K. LOWE

Department of Primary Industries, Mutdapilly and Ipswich, Qld

(i) For summer, experiments will look at permanent grass pastures with and without irrigation and ± nitrogen fertilizer, and at millet and Dolichos crops.

(ii) For winter, the main work, which has commenced, is on irrigated, temperate pastures made up of Tama ryegrass and Clare, ladino and NZ red clovers. This experiment is currently being grazed at 5 or 10 cows ha^{-1}. The first lactation has been completed and the experiment will run a further two years. The irrigated temperate pasture is grazed May–December and then the animals are stocked on dryland pastures at 1.25 or 2.5 cows ha^{-1} stocking rate reduced milk production from 16 litres day^{-1} cow^{-1}. High (at 5 cows ha^{-1}) to 12 litres day^{-1} cow^{-1} (at 10 cows ha^{-1}) over the winter, and from 13 to 9 litres day^{-1} over the full year.

(iii) Midmar, a South African ryegrass cultivar has performed well in cutting trials and is currently being evaluated against Tama for milk production. The experiment

uses stocking rates of 4, 7 and 10 cows ha^{-1} on Midmar compared with 4 and 7 cows ha^{-1} on Tama with four rotations and two replications. The experiment aims to:

1. measure comparative milk production
2. relate relative performance under cutting to that under grazing
3. record changes in ryegrass growth rates due to different stocking pressure.

(iv) Commencing in spring 1983 the milk production potential of N-fertilized Callide Rhodes grass will be assessed in an experiment using fertilizer at 0, 200, 400 and 600 kg N ha^{-1} $year^{-1}$ and stocking at 1.5 and 2.5 beasts ha^{-1}. Winter grazing will be supplemented by oats and cows will receive 3 kg grain day^{-1} for 200 days to follow possible commercial management strategy. Callide Rhodes has proven to be the most productive grass under dryland conditions in this area.

(v) Cutting trials on a range of pasture grasses over a range of sites are also being established.

The lively discussion after these talks emphasized the value of the clovers in the temperate pastures because they helped extend production in the late spring-early summer, they had higher digestibility and protein content than the ryegrass and lowered the N fertilizer requirement. The clover-based pastures can be maintained for 2–3 years with careful stocking and irrigation over the summer. The clovers however are more susceptible to frost damage than the ryegrass, are slower to establish and more prone to weed invasion in winter. Mick Parcell emphasized the great success he has had with Berseem clover on his property, though this apparently was not always the case on other properties in the district. Berseem clover sometimes has nodulation problems and requires a specific rhizobium strain which may not be present in all areas.

PLOT TRIALS

G. Reason

Department of Primary Industries, Newstead, Qld

These trials are investigating different planting times (mid March, mid April and early May) for different pastures (ryegrass alone, Clare subterranean clover alone, Ladino alone, Clare + Ladino, and Ryegrass + Clare + Ladino). Best producing pastures have been ryegrass alone with production of 7600 kg ha^{-1} for the March planting decreasing to 5350 and 5600 kg ha^{-1} for the later plantings. Comparable figures for the ryegrass + clovers were 3700, 2500 and 2900 kg ha^{-1}.

A subsequent trial will investigate even earlier plantings from February onwards with Ryegrass + Clare + Ladino, Ryegrass + Ladino + Berseem, Clare + Ladino + Oats, Beerseem + Ladino + Oats, and Clare + Ladino + ryegrass oversown in March.

These trials emphasized the interest in getting earlier establishment of the temperate pastures to reduce the feed gap between summer and winter. Discussion brought out the risks involved and the possibility of establishment failure in 1 out of 3 or 4 years. The risk can be minimized by more frequent irrigation, and many producers in the district are already trying much earlier sowings than are currently recommended. Because irrigation water is one of the limiting resources on many farms it is important to recognize that clover pastures require more water per hectare and therefore may not be as efficient as ryegrass in giving maximum feed output per unit of water used.

AUSTRALIAN FREISIAN SAHIWAL BREED

I. Goodchild

Department of Primary Industries, Mutdapilly, Qld

The assessment and breeding of AFS cattle is one of the stations programs. Nearby land was purchased to maintain a nucleus herd of AFS and soon there will be 4

proven bulls for semen production for local and overseas distribution. Currently there are 500 head of AFS distributed over about 55 cooperative herds for evaluation. The breed is considered as an alternative to existing breeds and not a replacement. Heavy culling is based on the ability of cows to let their milk down without the presence of a calf.

The AFS seems to be a better producer under dryland conditions but not as productive as current breeds in the higher producing herds on irrigated farms.

BOOK REVIEWS

Proceedings of the XIV International Grassland Congress. Eds. J. Allan Smith and Virgil W. Hays (1983). ISBN 0–86531-280-X. Published by Westview Press. Distributed by Bowker Publishing Co. Erasmus House, Epping, Essex, U.K. 878 pp. US$52.00.

With the continued expansion of the numbers of people working in pasture science, the size of the regular International Grassland Congresses must also expand. In 1970 some 750 delegates attended the XI Congress and 257 papers were presented. The XIV Congress held at the University of Kentucky in 1981 attracted approximately 1500 scientists from around the globe and nearly 500 papers were presented on previously unpublished original research or experimental research and development projects. The publication of the proceedings of a congress of such size presents substantial problems in space and cost. The solution adopted in the present instance was to severely edit the papers and publish only 273 in the proceedings. These cover the current basic and applied research on production and utilization of forages from grasslands the world over.

The papers appearing include 10 Plenary papers, 2 invited papers (Grassland development in Japan and other Asian countries—I. Nikki; and Livestock resources in the world food supply—J. A. Pino); 53 on Plant Introduction, Evaluation and Breeding; 9 on Seed Production; 16 on Soil Fertility; 8 on the Nitrogen Cycle; 11 on Multiple Use of Grassland; 16 on Physiological Processes; 22 on Grassland Ecology; 17 on Evaluation Techniques; 28 on Management of Grazed and Conserved Forages; 17 on Mechanization and Treatment of Forages; 25 on Utilization of Forages in Animal Production; 17 on Tropical Grasslands; 11 on Transfer of Grassland Research Findings and 10 on Socio-Economic Aspects. The usual sections on opening and closing ceremonies, business meetings, committees and list of congress delegates are also included in this one large (29 × 22 cm × 878 page) volume.

The inclusion of a special section on tropical grasslands is of interest and indicative of the interest this area creates these days. It contains papers ranging from intensive beef production in the humid tropics, to pasture research programs in the Brazilian Amazon, and the tropical savanna region of Brazil and Bolivia, to diet-quality considerations and pasture development in the Australian dry tropics, subtropics and semi-arid areas with other papers from Thailand (Verano stylo), Nigeria (lowland humid tropics), Florida (*Aeschynomene* sp. and *Hemarthria altissima*) and Brazil (*Galactia striata*). All are worth reading. As well many other papers on tropical pastures occur within the subject sections of the contributed papers.

The Plenary papers are presented along with remarks by the Discussion Leader and questions, comments and responses. Invited and section papers are not so adorned. Overall presentation of the material is excellent and this volume will join those of previous IGC as a widely used reference and a permanent record of the "state of the art" in grassland science in 1981.

D. G. CAMERON