

requiring dedication for the selection of features required in a commercial industry. A first class display of cattle completed a well illustrated and informative day on aspects of development and cattle breeding in the Millmerran Shire area.

## PASTURES FOR THE TOOWOOMBA-CROW'S NEST DISTRICT

### FIELD MEETING, NOVEMBER 23, 1979

A field meeting was held, in conjunction with the Annual General Meeting, to inspect pasture development in the Toowoomba-Crow's Nest area of south-eastern Queensland (152°E, 27°S). Average annual rainfall varies over the range 800–1000 mm. Distribution is uneven with 70% of annual rainfall occurring in the October–March period.

Soils are variable, from heavy clays derived from basalt to lighter sandier soils derived from sandstone or granite. The major soil types along the range are the lateritic red earths. The original vegetation was mainly open eucalypt forest with isolated patches of softwood scrub. Yellow box is the main tree species on the soils derived from sandstones.

Some sixty members and guests were able to inspect a selection of mixed pastures of temperate and tropical species, providing high quality forage for both dairy and beef cattle enterprises.

## EVALUATION OF LUCERNE FOR DISEASE AND APHID RESISTANCE

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Even before aphids appeared in 1977, lucerne stand life was short due to disease, particularly *Phytophthora* root rot (PRR) and *Colletotrichum* crown rot (CCR). Mass recurrent selection breeding programmes have developed separate *Phytophthora* and *Colletotrichum* resistant lucerne lines. Selected F<sub>1</sub> and F<sub>2</sub> lines from Hunter River and Siro Peruvian were evaluated for CCR by rating individual plants and parent lines for the expression of stem lesions, plant mortality and yield. Both Siro Peruvian F<sub>2</sub> and Hunter River F<sub>2</sub> lines contain *Colletotrichum*-resistant germplasm. Siro Peruvian derivatives were higher yielding than Hunter River types, but Hunter River lines were more persistent.

In 1977, the arrival of both Spotted Alfalfa Aphid (SAA) and Blue Green Aphid (BGA), which devastated Hunter River, resulted in the introduction of aphid-resistant lucerne lines from western U.S.A. Evaluation of 23 of these for yield, persistence and aphid and disease resistances at 4 sites in Queensland (Biloela, Gatton, Toowoomba, Mitchell), suggest that the effects of BGA are less than SAA and the probability of severe damage to mature-plant stands seems low. With seedlings, severe losses are inflicted by even short-duration infestation of SAA on lines which are moderately resistant as mature plants.

In the mature-plant evaluation at Toowoomba, the lines PS545, PS581 and Matador have given the best yields and demonstrated resistance to PRR, CCR and SAA in the first year of evaluation.

## PASTURES FOR DAIRY PRODUCTION

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Suitable pastures for dairy production can be provided by highly productive irrigated pastures or by less productive but less costly dry land pastures. This was illustrated by visits to two farms. On the first property, owned by A. A. and M. J. Gould, nitrogen fertilized rye grass and kikuyu pastures formed the basis of a dairying operation of 35–45 head on a total of 22 ha. The whole farm was sown to kikuyu with liberal application of fowl manure fertilizer during 1965–1974. Production declined as the effect of the fowl manure decreased. In 1978, 17.5 ha of irrigated and nitrogen fertilized kikuyu was used to maintain milk production. This year, 4.5 ha of this was oversown to Tama and Tetila rye grass using a total of 1 tonne urea and 300 kg superphosphate per hectare. The area has been grazed rotationally using electric fencing. Under this system, a herd of 30 milking cows has been maintained entirely on the 4.5 ha rye grass for 190 days, rotating 5 times in the period. With the addition of 4 kg grain (bail fed roller milled barley), this herd has averaged 15 to 16 litres milk per cow per day. Total milk production for 1979 has in fact increased by 1000 litres with fewer cows.

On another property close by owned by J. van Slidregt, a dairying operation based wholly on grazing pastures provided a contrast in approach to feed supply. This operation is located of slightly poorer grey to brown sandy clay loam soils of pH about 6.0 of low phosphorus (5–20 ppm) and potassium (0.10 to 0.44 m.e.%) contents.

Sown pastures of Demeter Fescue, Kangaroo Valley Rye with Ladino white and Montgomery red clovers, and Hunter River lucerne have been established. Paspalum, as a natural invader, Pioneer Rhodes and Whittet kikuyu are the associated grasses in most paddocks. These pastures have received 125 kg superphosphate per ha per year with 125 kg urea when extra feed or grass for hay was required. Under this regime, naturalized white clover has spread through all pastures.

Milk production ranges from 9–14 litres per cow per day depending on season. Bail feeding of one kg crushed barley per day is standard practice. Urea and a calcium-phosphorus supplement is supplied when deemed necessary. Hay is fed in stalls for the three winter months.

## ALTERNATIVE TEMPERATE PASTURE MIXTURES

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Several temperate grass and legume species have been evaluated for dry matter yield and persistence over three years in the Toowoomba range area. Three sites (Geham, Ramsay, Nobby) were chosen to represent the range of areas available for improvement with temperate species or where existing species do not provide sufficient forage during winter-early spring period.

### *Geham site*

Nine grasses were evaluated when sown as pure grass, grass plus white clover and grass plus nitrogen (100 kg per hectare split between spring and autumn). There was little difference between the grasses. *Sirosa phalaris*, Demeter fescue and Currie cocksfoot, tended to produce reasonable levels of dry matter throughout the whole year. Grass plus white clover yielded less than grass plus nitrogen in the first year, but

by the third year, grass plus white clover yielded more than grass plus nitrogen. Yield of protein was about 1 tonne per hectare mostly from the clover. Yield of grass was unaffected by the presence of clover.

In a separate trial evaluating several clover lines, Safari clover (*Trifolium semipilosum*) out-yielded all the white clover (*T. repens*) lines and was more drought resistant. Of the white clovers Haifa was the best winter producer. The best clover plots, yielding 2000–3000 kg of clover per hectare per year, were invaded by naturalized paspalum.

The recommendation for maximum year round dry matter yield, based on these trials, would be a mixture of Sirosa phalaris, Currie cocksfoot, Demeter fescue, Haifa white and Safari clovers.

## PASTURES FOR BEEF PRODUCTION

R. PECHEY

“Listening Ridge”, Pechey

Pastures based mainly on white clover and paspalum have proved satisfactory over a number of years. Unimproved land in this area has a carrying capacity of one beast to 2 or 2.5 ha, but with superphosphate, at 100–150 kg per hectare per year, and white or Safari clover will carry at least one beast to 0.5–0.8 ha without supplementary winter feeding. Under a close grazing management, white clover can be maintained over long periods with paspalum coming in as fertility improves. Farm experience suggests that paspalum-white clover is a better pasture for beef than kikuyu-white clover in this environment. Soils of the area are lateritic or podzolic of pH 6.2–6.5 and respond to phosphorus immediately, and frequently sulphur, potassium and molybdenum after a period of improved productivity.

An experimental area of Safari clover suggested that this legume is more drought resistant than white clover, with better summer production. Safari responds to heavy applications of phosphorus and is adapted to a wide range of soils from North Isis to Numinbah on yellow podzolic and krasnozem soils and from Nanango solodics to Coolool podzolics. Soil seed levels average 100 kg per hectare suggesting that persistence is achieved by reseeding as well as perennation of existing plants (information on Safari clover from Mr B. Cook, DPI, Gympie).