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CO-ORDINATED PROPERTY DEVELOPMENT AND ENTERPRISES FIELD MEETING, SEPTEMBER 14, 1979

A joint field meeting with the Australian Society for Animal Production was held on September 14, 1979 at Yandilla (Millmerran Shire) on the theme "Co-ordinated Property Development and Enterprises". Some 120 members and guests were treated to excellent presentations and demonstrations of sown pastures, electric fencing and pedigree breeding in a beef cattle enterprise. The Society is indebted to Messrs D. and J. H. Anderson on whose properties "Bellevue" and "Inverary" the field day theme was developed and illustrated.

INTRODUCTION TO THE ENVIRONMENT

I. McCLEMENT

Department of Primary Industries, Toowoomba

The properties "Bellevue" and "Inverary" are located in the gently undulating box country on the lower catchments of Back and Grasree creeks to the north-east of Millmerran (151°22'E, 27°50'S).

The soils at "Bellevue" are alluvial brown calcareous clays, susceptible to erosion and only suitable for cultivation with special practices. Soils are low in phosphorus, nitrogen and potash, have a pH 7.5 and develop a crusty surface on cultivation. The original vegetation was poplar box (*Eucalyptus populnea*) woodland. For cropping purposes, superphosphate at 80–120 kg ha⁻¹ is required and in most instances a response to nitrogen can be obtained, but its application is rarely economic.

Climate of the area is described as temperate, with two-thirds of the annual rainfall (500–700 mm) falling in the October–March period. Rainfall is the major factor limiting crop and pasture growth. Evaporation usually exceeds rainfall, even during the growing season when mean maximum and minimum temperatures are 28 to 32°C and 15 to 18°C, respectively. August is the driest coolest month and there are 246 frost-free days.

For further details on the environment of the area, readers are referred to the Millmerran Shire Handbook, compiled by N. E. Delaney of Queensland Dept. Primary Industries, 1970, and to the Proceedings section of Tropical Grasslands, Volume 11, issue No. 3, pp. 285–287.

PROPERTY STRUCTURE AND FUNCTION

D. ANDERSON

"Bellevue", Yandilla

The property "Bellevue" was purchased in February 1977, as an adjunct to the main stud property "Inverary". The area had previously produced grain. However, its potential for development and its nearness to our main property were two principle factors considered when we sought possibilities for expansion of our stud breeding operation. A four stage development plan consisting of soil conservation, fencing, pasture establishment and irrigation, was devised. We are now in the pasture establishment phase.

Soil conservation

It is known that poor management can cause major erosion problems and so a whole property development plan was proposed (described in the following section). The essential features of this plan are that cultivation (e.g. grazing oats) is alternated

with grass strips on a straight and parallel plan and that fences and major lines of cattle movement caused minimal soil disturbance.

Fencing

An energized fencing system was installed according to the soil conservation plan. One energizer is used to control approximately 35 km of fencing. Despite initial reservations on height and efficiency, cattle on this property are now fully controlled by energized fences. A major attraction was low cost (\$220 per km for 4 wire energized versus \$800–\$1000 for traditional fencing) and minimal maintenance (one fault each 3 to 4 months). Our fences use hardwood pickets 86 cm (34 inches) and we have used single wire at 43 cm (17 inches) over creeks and gullies. Based on experience we suggest that the circuit layout be planned so as to enable rapid detection of faults, that gateways should not be energized and that the whole system be left on continuously.

Pasture

As this is a beef cattle enterprise, pasture development is essential, however, only limited progress has been made in two years. Despite a poor season, creeping bluegrass (*Bothriochloa inculpta*) has been outstanding in growth and persistence and has provided forage well into the dry winter period. There is no doubt that a substantial input is yet required to provide a pasture that ensures suitable animal nutrition through long-lasting pastures. Meantime, by grazing oats with native pasture roughage in alternate strips under our system of management, with soil conservation, energized fencing and pasture, we have lifted our calving rate to almost 100%.

Irrigation

To develop the property to its potential, we anticipate irrigating pasture from a dam built to retain otherwise wasted water from the property in heavy wet periods.

“BELLEVUE” SOIL CONSERVATION PLANNING

B. BRYANT

Department of Primary Industries, Millmerran

Four main steps of soil conservation planning were used in preparing a soil conservation plan for “Bellevue”. These are:

Inspect the property with landholder and discuss intended use, which in this instance was grazing stock on introduced pastures with some cultivation.

Record property inventory on a map to include fences, yards, lanes, access tracks, buildings, dams, cultivation and pasture areas.

Use a topographic survey to determine ridges and depressions. We used a mobile staff mounted on a motor bike and found the average slope was less than 1%.

Record soil information and map in relation to the property inventory and topographic survey.

Before inspecting the property a study of aerial photographs and guide maps indicated that some 220 ha of upland catchment drained through the “Bellevue” property, thus it was necessary to plan drainage and soil conservation on a subcatchment basis and co-ordinate surrounding properties.

The final plan of alternating straight and parallel strips of cultivation (100 metres) and native grass (10–20 metres), arising from a centralized access lane along the ridge line, provided for ease of cultivation, alignment of fences, yards and watering points on the grass strips, ease of mustering and a workable paddock size. Thus planning can aid property management as well as minimising the potential for erosion.

SOWN PASTURES

W. SCATTINI

Department of Primary Industries, Toowoomba

In response to a request for new pasture species for use in the heavy, sometimes waterlogging and saline soils of this area, creeping bluegrass (*Bothriochloa insculpta*) and Angleton grass (*Dichanthium aristatum*) were recommended. Both grasses were known to establish well in heavy soils and to withstand heavy grazing.

Three pastures, each of approximately 40 ha, have been established with a mixture of creeping bluegrass and Angleton grass (3 kg per ha) with lucerne (2–3 kg per ha) undersown to either Panorama panic (a setaria) with superphosphate (60 kg per ha) or Japanese millet with a mixture of sawdust/fowl manure (5 tonnes per ha) in September 1978. A mixture of snail and barrel medics (1–3 kg per ha) was drilled into each area during July 1979.

Despite severe moisture stress which has caused failure of the cover crop and limited growth of the legumes, both the creeping bluegrass and Angleton grass established and persisted well under grazing with every indication of potential as pasture species for the area. Companion legume species such as the annually self seeding yellow serradella (*Ornithopus compressus*) may be a useful supplement to the annual medics and lucerne.

A range of other temperate and tropical legumes and grasses for this area is being evaluated in separate small plot experiments at "Bellevue".

ELECTRIC FENCING

K. F. HOWARD

Department of Primary Industries, Toowoomba

Electric fencing has been the most dramatic single management development for the stock owner in recent years and has been accepted widely by producers.

There are several advantages:

Low cost. A new electric fence can be erected for \$200–\$280 per km versus \$800–\$1000 for conventional fences.

Effectiveness and ease of installation and maintenance.

Portability for temporary or emergency use.

Existing fences can usually be electrified with minimum alteration.

Some characteristics of electric fencing are:

Rate of installation. Under average conditions, new fences can be installed at one kilometre per day.

High density hardwood posts can be used without insulators.

Electrification avoids fence damage due to stock rubbing and pushing.

Energized fences of a single wire in clay and heavy soils do not require an earthwire, but one is required in sandy and drier soils.

THE ROLE OF FERTILITY IN CATTLE PRODUCTION

S. J. MILLER

Veterinary Surgeon, Warwick

Nutrition and management are two key factors related to fertility. Nutrition is a combination of landforms, soil types, climates, pastures and "lady-luck". Management is more amenable to control and includes stocking rates, watering facilities,

paddock sizes and age and structure of the herd. For the breeder the ideal goal is to have cows which reach a liveweight of 300 kg and become pregnant at 15 months of age, calve easily, rear the calf and be pregnant again at 27 months of age.

Reproductive performance is affected by body condition, age and lactation. Various trials have shown that cows gaining an average of 4 to 10 kg per month had pregnancy rates of 88 to 100% compared to 14 to 26% for the same average monthly loss in body weight during the mating period. Poor seasonal conditions during lactation can reduce pregnancy rates by 15 to 45%, affecting old cows and cows rearing their first calf more severely than other cows.

Protein, energy and phosphorus are the main nutritional deficiencies, as discussed in the next contribution. The economics of feeding energy diets to lift calving percentages are doubtful.

Disease can be a major factor reducing fertility levels in cattle. Vibriosis, probably the most important, leptospirosis and trichomoniasis are the more serious diseases encountered. An improvement from 44 and 66% calving for cows and heifers, to 95 and 90% respectively is reported from one property introducing disease control measures.

DEVELOPMENTS IN BEEF CATTLE NUTRITION

E. POWELL

Department of Primary Industries, Toowoomba

There have been several recent developments which have potential to improve the nutrition of beef cattle.

Alkali treatment of cereal straw

Alkali, mainly caustic soda, has been used for many years in Europe to increase the digestibility of cereal straws. Recent publicity has drawn attention to Australian research on techniques of lower cost field application, where 4 to 5% caustic soda is sprayed onto chopped straw during harvest. Its action breaks down the lignin, thus increasing the availability of cellulose carbohydrates for digestion. Increases in digestibility of 25 to 55% have been obtained in Australian field trials. The cost of treatment is currently outside the scope of all but the contractor or very large producer.

Monensin

Monensin is a fermentation modifier that when added to ruminant rations at a critical level (20–30 ppm), increases (by about 10%) the feed conversion efficiency, so that similar liveweight gains are achieved with less feed.

In the cattle industry, its current use is in feedlots. Very limited success has been achieved with paddock supplementation due to its highly variable intake, but current research on a slow release capsule in grazing cattle may expand its use.

“Ralgro”

“Ralgro” is the trade name given to a chemical compound, zeranol, which acts as a growth promotant in cattle. It is administered by pelleted implant and is available on veterinary prescription only.

Average increases in daily liveweight gain of about 12.5% and in feed conversion efficiency of about 8.5% are claimed in feedlots or when grazing good quality forage. “Ralgro” complements monensin in feedlot rations.

Sodium

Low pasture, water and saliva sodium have been recorded in investigations in southern Queensland. In one liveweight trial over 84 days, salt supplemented cows

and calves gained faster than unsupplemented cows and calves (0.35 and 0.77 versus 0.14 and 0.62 kg L.W. per head per day respectively).

Sulphur and sodium on fodder sorghum

Responses of 45 and 30% in liveweight gains were reported in two trials with cattle supplemented with sulphur and sodium and grazing fodder sorghum on red basalt country in the Glen Innes area. There were no responses in a similar trial on brigalow country at Theodore.

Copper

A survey of blood copper levels in weaner cattle grazing brigalow country on 30 properties in Taroom shire, revealed widespread potential deficiency. Serum copper levels (mg per 100 ml) were 0.035 on 13 properties, 0.063 on 11 and 0.075 on 6. Despite these low levels, there has been little or no response to normal copper therapy.

Protein supplementation

The use of non protein nitrogen supplements remains an important phase of drought and dry-spell strategy when standing dry matter is still available in the paddock. In the absence of a green pick and following weaning, additional protein is recommended for breeders that are likely to calve in less than strong store condition and for weaners and other dry stock experiencing severe weight loss.

Supplement selection will depend on price per unit of protein, palatability, convenience, mixing, feeding-out costs and other nutrient requirements. The use of by-pass or protected protein pellets is a better proposition than commercial non protein nitrogen supplements at similar or higher prices. True protein responses are achieved with younger feedlot cattle.

Molasses for survival

Molasses with 3% urea is successfully being used for drought feeding of all classes of cattle. It often has a cost advantage over grain.

CATTLE BREEDING IN PERSPECTIVE—FEATURES DESIRED AND WHY

D. ANDERSON

“Inverary”, Yandilla

The aim of the stud breeder should be to select and preserve in breeding stock those features of cattle that are important to the commercial industry. The seven most important characteristics used in this stud are:

Fertility Conception and calving should be natural and annual rates greater than 90% should be the goal. Anything less is undesirable in the commercial industry.

Growth rate Producers are paid by weight of product produced. Therefore, maximum weight gains are more profitable.

Carcass quality Animals must be evenly and densely fleshed with a high proportion of muscle and correct selvage of fat.

Soundness and structure Animals must be long living, with firm basic structure to carry maximum flesh weight and to remain free from injury. In times of stress (e.g. drought), the conformation of legs and feet are important for the animal to maintain health and therefore slaughter quality and weight.

Milking ability Udder and teat shape are important for ease of calf feeding and quantity of milk produced for greater calf weights.

Eye cancer A correctly structured eye is essential to avoid eye cancer in cattle. Any stud breeder worth his salt will face up to problems rather than hide them.

Temperament and handling Bruising is a major and costly problem in the industry. Animals which are easily handled and quiet in yards and during transport yield higher proportions of high quality beef.

The desirable and undesirable aspects of each of these features were illustrated with current breeding stock, culminating with the exhibition of the champion Poll Hereford bull from the 1979 Brisbane Exhibition.

A LIFETIME OF PEDIGREE BREEDING

J. H. ANDERSON

"Inverary", Yandilla

In a lifetime of stud breeding, I began with Clydesdale horses and progressed through Ayreshire and AIS cattle, crossbred sheep and steer fattening to the present Inverary Polled Hereford Stud. My experience at fattening Hereford, Shorthorn and Angus steers suggested that Hereford cattle were best, but I had a preference for polled cattle. Beginning in 1952, we built up, from stud animals from various sources, the present distinct "Inverary" type which has been the most successful exhibitor at recent Brisbane Exhibitions.

The frequent question is "How do you become a successful stud breeder?" The answer is "dedication, ability to visualize result of a mating, select from the same type and study pedigrees". Each animal must be considered as an individual, not as a group. For breeders, some useful points to follow are:

Select good females, don't expect good results from average females mated to good bulls.

Animals must conform to a standard for line (pedigree) and look like females (long neck, little dewlap and brisket).

Concentrate the "blood" (genes) by mating half sister to half brother before crossing out to a bull of another line.

Need to know where weakness exists and when to bring in new sire.

Plan ahead and don't be complacent.

Use and accept new ideas (e.g. weighing, fat scanning) but don't rely on them entirely. Regard them as useful tools.

Be creative, exhibit (so as to compare your stock with others) and know your animals individually.

SUMMARY OF FINAL COMMENTS

DR. P. C. WHITEMAN

University of Queensland, Brisbane

The main feature emerging from the "Bellevue" aspect of this enterprise is that there is a need for species able to produce a balanced diet for grazing beef stock in both summer and winter periods. Duplex soils that are difficult to cultivate without creating erosion, a paucity of information on plant nutrient requirements and an unreliable winter rainfall, add further difficulties. It is suggested that only experience will determine if pastures are the "best use" of this area. The key to success appears to be the definition of suitable pasture species, although the two grasses creeping blue and Angleton could fill this role, and low cost electric fencing.

On the stud cattle aspects, problems of maintaining fertility, intake of forage, and a keen eye for breeding, are key features. The owners of "Bellevue" and "Inverary", Messrs J. H. and D. Anderson, indicated that stud breeding is a task

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

D. L. LLOYD

Department of Primary Industries, Toowoomba

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 F₁ and F₂ 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 F₂ and Hunter River F₂ 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.