Bega Valley, NSW, Australia

Potassium Fertilization for Pastures Improves Dairy Profits

By John S. Glendinning

THE USE of potassium (K) fertilizer on dairy farms in the Bega Valley on the New South Wales (NSW) South Coast has increased by a staggering 6,600 percent in the past 20 years.[1] In the past 10 years, milk production increased by 78 percent, despite a decrease of 22 percent in the number of dairy farms. Milk production per farm increased by almost 130 percent.

The Bega Valley, covering approximately 3,000 square km, is located approximately 200 km southeast of Canberra and 400 km south of Sydney. The area has undulating hill country and small areas of "flats" adjacent to rivers and creeks. Annual rainfall, which is erratic and unreliable, ranges from about 620 mm to 1,025 mm.

Most of the agricultural development in the area is carried out on soils derived from Devonian granites. The soils on the moderately steep, rounded hills are dominated by brown and red friable earths. They have loamy A horizons, and the clay content increases gradually down the profile. The B horizons are well structured and brown or red in colour. Soil pH is acidic, generally between 4.8 and 5.5, when measured in calcium chloride (CaCl).

The area has been farmed since 1830 and is now primarily under grazing enterprises, including dairy, beef and sheep. From the 1940s into the 1970s, the area was also cropped heavily for maize (corn) and bean production. The maize was used for animal feeds, with some still being grown for silage production. The beans were produced for the fresh vegetable market.

Having been farmed for dairy production since the 1870s, the Bega Valley is famous for its cheese which is sold mainly under the brand names of Bega and Kameruka.

Dairy production has been based on improved pastures, consisting of ryegrass, white clover and subterranean clover. Silage is produced from pastures and maize for feeding during the dry periods when paddock feed is in short supply. Supplements are also fed during very dry times.

Seasonal fluctuations in rainfall and long droughts have led to the development of 5,700 ha of irrigation, mostly by some form of travelling irrigator for pasture production. The irrigated pastures are used almost exclusively for dairy production.

After a large initial increase in pasture productivity following the introduction of single superphosphate and improved pasture species, by the early 1960s productivity and persistence of the pastures had declined to an alarming degree. Under the dairy farming system practiced at that time, K in the cattle dung and urine was transferred through the stock management and farming programs and largely deposited in laneways, night paddocks and near the dairy.

By the late 1960s, the improved pastures of ryegrass and white and subterranean clovers achieved only a moderate level of production in the establishment year and then declined very rapidly to the point where they would need to be re-sown after the third year. Cultivation for seed-bed preparation

[1]Acknowledgment: Data reported in the opening paragraph and elsewhere in this article are from Mr. Harry Kemp, District Agronomist with the NSW Department of Agriculture in the Bega District.

Mr. Glendinning is consultant to Agrow Australia Pty. Ltd., 231 Miller Street, North Sydney, Australia 2060.

POTASSIUM fertilization has helped improve productivity of forages for dairy cattle in the Bega Valley.

assisted in the release of available K and mineralization of organic soil K, thereby providing sufficient K for the pastures' needs in the year after re-sowing.

During the period from 1975 to 1978, a soil testing program in 865 paddocks showed that:

- 32 percent of paddocks had low to deficient levels of exchangeable K,
- a further 11 percent were marginal for intensive production.

Soil phosphorus (P) levels were generally adequate to very high as a result of many years of superphosphate application. However, in the absence of satisfactory soil K levels, the pastures failed to grow adequately or to persist.

Field trials showed highly significant responses to applied K, with a vast improvement in pasture quality, due largely to the higher clover component of the pasture. With the introduction of K fertilization, pasture persistence has also improved markedly. Pastures now perform very well and are true stable, perennial pasture systems **(Table 1).**

Table 1. Trends in the use of K fertilizer: 1974/75 to 1990/91.

Fertilizer type	Fertilizer use - tonnes 1974-75	1983-84	1990-92
Muriate of potash	4	100	54
3:1 Super:Potash	46	1,200	3,844
Muriate of potash equivalent	16	400	1,074
Area treated with K, ha	256	6,400	17,184

This improvement in the productivity and quality of the pastures has, together with other factors, contributed substantially to increased stocking rates per ha, increased milk production per cow and increased production per farm. **Table 2** shows trends in milk production in the Bega Valley during the period 1981-1990.

Table 2. Trends in milk production in the Bega Valley, 1981 to 1990.

Financial year	Total milk production, million litres	Number of dairy farms	Average milk production, 000 litres/farm
1980/81	54.2	171	317
1981-82	63.3	164	386
1982/83	66.5	164	405
1983/84	74.9	161	465
1984/85	79.8	156	512
1985/86	76.8	150	512
1986/87	77.8	144	539
1987/88	88.2	159	555
1988/89	96.0	148	649
1989/90	96.5	133	726

Good fertilizer practice has helped to resurrect the fortunes of an area that was in decline. Coupled with the current favorable outlook in the Australian dairy industry, the economic viability of the dairy farmers in the Bega Valley seems assured for some time to come. ■