Subtropical Grass Evaluation for Pastures in Northern NSW

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Abstract

Evaluation of subtropical grasses for northern NSW had its beginnings in the late 1950's with only limited areas being sown. The need to ameliorate degraded soils has now increased the usage of subtropical grasses and created a need for a more coordinated evaluation of species to improve pastures. This program is currently collecting and collating data on 27 cultivars over 20 new and? existing trial sites. Soils range from sandy acid to the highly alkaline self mulching clays. Rainfall across sites varies from 450 to 700 mm average annual rainfall. This paper reports varietal evaluation by soil type and rainfall and implications for new releases.

*Key words: Subtropical, grasses, subtropical pastures, pastures northern NSW.*

There is considerable potential to increase productivity and restore degraded land on the lower slopes and plains on northern NSW with subtropical grasses and suitable legumes. Large areas on the slopes have a long history of cultivation and much of the lighter soil types have become unproductive because of low fertility, low organic matter and poor soil structure. These soils require large amounts of fertiliser to successfully establish temperate perennial species and many areas are marginal or unsuitable for these species because of harsh climatic conditions. Many subtropical species will grow on relatively infertile soils and these species are much better adapted to the hotter climate of the lower slopes and plains.

On the plains there are large areas where perennial grasses need to be re-established because the native grasses have been removed by cultivation or overgrazing. Other areas of light soil on the slopes and plains have poor quality native grasses or are dominated by weeds such as spiny burr grass and blue heliotrope.

The North West Slopes and Plains is a very diverse environment with large variations in soil type, fertility, altitude, temperature and rainfall. For this reason, it is likely that a range of grass species would be needed to maximise productivity and stability of the pastures under these diverse conditions. Subtropical grasses are adaptable to a wide range of soil types and many species are able to persist under harsh climatic conditions. They can produce high levels of dry matter and have at least moderate feed quality when managed correctly.

Materials and methods

This program is collecting data on 27 cultivars over 20 new and existing trial sites. The older? trials were sown in 1990. Trial sites are assessed annually using a ground cover assessment and scored 0-5; 0 nil present, 1?~?0-10%, 2 ~ 10-25%, 3 ~ 25-40%, 4 ~ 40-60%, 5 ~ greater than 60%. This method allows rapid assessment of a large number of trial sites, but care has to be exercised when the grasses have a lot of bulk because actual plant numbers can be deceiving.

Trials need to be continued for at least 4-5 years, preferably under grazing. With subtropical grasses some species establish very easily such as rhodes grass (*Chloris gayana*) while other species such as lovegrass (*Eragrostis curvula* cv. Consol) take longer to achieve the same ground cover. Seed quality is an important issue with subtropical grasses. When buying uncertified seed always insist on sighting a seed analysis report.? This report contains information on the germination percentage and weed contamination. In the first series of trials distributed in this project digit grass (*Digitaria eriantha* ssp. *eriantha* cv. Premier) performed very badly because of poor seed quality. This cultivar has performed well in earlier trial series and good quality seed is being distributed in the latest kits.

Results

The performance of cultivars has been analysed using bi - plot analysis against the parameters of soil type, soil pH and average annual rainfall. The soils were grouped into 5 classes related to soil texture. Class 1 is light sandy soil and class 5 is heavy black clay.

Cultivar performance was better correlated to soil type and pH than to rainfall and latitude, but rainfall is obviously an important factor. The severity of frost may also be important but this was not analysed.

*Light soils*

Lovegrass cv. Consol, digit grass cv. Premier, rhodes grass cvv. Pioneer and Katamborah, have consistently out performed other varieties in the light soil category. The relative performance of lovegrass cv. Consol improves as pH declines, which corresponds to evidence of its adaptability to acid, high aluminium soils. Rhodes grass cv Callide and buffel grass (*Cenchrus ciliaris* cv. America) performed well on the lower rainfall sites but cv. Callide is declining and may only have a relatively short term persistence.

*Medium soils*

A number of cultivars performed well on a range of soil types. This was evident with bluegrass (*Bothriocloa petusa* cv. Bowen) and (*Bothriocloa insculpta* cv. Bisset) which performed well on medium and heavy soils.?? Rhodes grass cv. Katamborah performed well on the range of soil types assessed. The new spring active buffel grass cvv. Viva, and American also performed well on these soils at the lower sites.

*Heavy soils*

Purple pigeon Grass ( *Setaria incrassata* cv. Inverell), panic (*Panicum coloratum* cv. Bambatsi) and creeping bluegrass cv. Bisset quickly showed their potential to outperform the other cultivars in production and ability to handle heavy grazing pressures on these soil types.

Conclusion

This project has been the first attempt to coordinate the evaluation of subtropical grasses for pasture improvement over a wide area of northern NSW. These results confirm research, district trial and anecdotal evidence on the place for subtropical grasses in the northern NSW grazing systems.

In terms of future evaluation, the project has provided statistical evidence that the ground cover assessment, if used correctly, is a useful technique to quickly evaluate performance across a wide geographical area. Soil type, soil pH and rainfall are useful parameters for the evaluation of various species.

The project will continue with additional trial kits being distributed in 1997/98. These kits contain eight cultivars which have not been evaluated in northern NSW and four varieties with only twelve months evaluation.