

IMPROVEMENT OF KANGAROO VALLEY PERENNIAL RYEGRASS

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The Kangaroo Valley perennial ryegrass ecotypes has developed in a small geographical region in the Kangaroo Valley and Shoalhaven flood plain of coastal NSW. It is the most persistent perennial ryegrass in coastal and tableland NSW and tolerates a wide range of grazing managements. Two cultivars (Roper and Boomer) have been developed on the basis of a small range of material within the ecotype (1). The high level of diversity within the ecotype suggests that gains in agronomic performance could be made by selection and breeding from a wider collection of plants from old (>40 years) paddocks in the ecotypes centre of origin.

MATERIALS AND METHODS

Nine thousand plants were collected from 45 sites within the Kangaroo Valley and Shoalhaven flood plain in August 1992. Records of elevation, rainfall, grazing history, grazing pressure, density of perennial ryegrass, botanical composition of pasture and soil characteristics were recorded for each collection site. Using principal component analysis sites differed in Total N%, Mg and Na concentration and Al saturation, with sites in the Shoalhaven flood plain tending to be higher in N, Mg and Na. Collections were space planted along with standard varieties (including Ellett, Embassy and Grasslands Pacific) at Berry (34°48'S) and Timboon (38°32'S) with 50 collections or cultivars and 10 replicates. Plants were scored for seasonal yield, rust incidence, greenness, leafiness, persistency, habit and tiller density, leaf angle, leaf width and heading date.

RESULTS AND DISCUSSION

Despite climatic differences between Berry and Timboon, performance of the collections and standard plants were highly correlated ($r=0.79-0.99$). The standard cultivars tended to be higher yielding, have higher tiller density but with a greater rust incidence than the collections ($P<0.01$); however, two collections were as high yielding as the standards. Collections originating from the Shoalhaven flood plain tended to be higher yielding with greater tiller density than plants from the Kangaroo Valley ($P<0.01$).

Selections from Timboon were made from within five groups, formed from principal component analysis of all plant characters, for polycross half-sib formation. At Berry selections were made on the basis of seasonal yield and then grouped according to heading date for polycross half-sib formation. Half-sib evaluation commenced in autumn 1995 at Timboon, Kyabram (36°21'S), Berry and Gatton (27°33'S) to determine the average general combining ability of parent selections for synthetic cultivar production.

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REFERENCE

1. Cunningham, P.J., Blumenthal, M.J., Anderson, M.W., Prakash, K.S. and Leonforte, A. 1994. N.Z. J. Agric. Res. 36, 295-310.