

Root distribution of consol lovegrass

W.H. Johnston

Soil Conservation Service of New South Wales P.O. Box 5146, Wagga Wagga South N.S.W. 2650

Root distribution affects survival of plants during prolonged periods of water stress. For instance, Pook and Costin (1) found on the Southern Tablelands of N.S.W. that perennial ryegrass lacked the strong vertical root extension of phalaris and was more seriously affected by drought. Dormant phalaris was maintained by deep soil moisture reserves not accessible to ryegrass. The rooting pattern of Consol lovegrass (*Eragrostis curvula*) would be conducive to its survival on non-cracking soils in low (300 - 500 mm) rainfall environments.

Methods

In October 1984, at Wagga Wagga N.S.W., seven replicate, 3.9cm diameter soil cores were obtained equidistant between plants of Consol lovegrass, to a depth of 1m, using a thin-walled tube sampler. The Consol lovegrass plants were established in October 1977 25cm apart in a 5 by 20 plant microward. The weight of roots (i.e. old (dead) + new (alive)) in each 10cm segment of each core was determined by soil dispersion and washing and finally by weight loss after ignition. Root mass was expressed as g/cm³ and analysed by two way analysis of variance. Mean values were converted to % of total mass to 1m.

Results and discussion

The largest proportion of roots were in the top 10cm of soil, however roots also penetrated to the limit of sampling and probably beyond (Table 1). Differences between depths were highly significant ($P < 0.01$).

Table 1. Root distribution (live + dead) of Consol lovegrass

Depth (cm)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Root distribution (% of total root mass to 1m)	57.9	14.4	8.1	5.8	3.9	2.6	3.0	1.2	1.4	1.8

The high density of surface roots would be conducive to water gathering where light falls of rain or dewfall may provide transient quantities of available water. Deep root penetration would aid survival during extended periods of moisture shortage when the water need is reduced by dormancy and other water saving strategies. It has been noted that where root systems are damaged by soil cracking mortality is high, otherwise Consol is highly persistent in the 300 - 500 mm rainfall zone. Root system integrity is thus vital for survival. Consol lovegrass responds rapidly to short periods of rain which demonstrates the efficiency of its water gathering strategy. This response enables the grass to accumulate dry matter during the summer when other perennial species are dormant or relatively unresponsive.

1. Pook E.W. and Costin A.B. (1971). *Fld. Stn. Rec.* (CSIRO) 10, 59-72.