A comparison of the performance of softseeded and hardseeded subterranean clover cultivars prior to and after the drought of 1994

G.A.Sandral and B.S.Dear

NSW Agriculture, Agricultural Research Institute, Wagga Wagga, NSW. 2650

The NSW subterranean clover improvement program evaluated Goulburn for release from the Australasian Subterranean Clover and Alternative Legume Improvement Program in 1991. Before its selection Goulburn was tested in all subterranean clover growing areas of Australia over a period of 6 years. During this time (1985 to 1991) Goulburn had not experienced a sever drought. The results presented here compare the performance of Woogenellup and Goulburn from 1992 to 1995 which included the drought year of 1994.

Methods

A field experiment established at the Agricultural Research Institute, Wagga Wagga, in 1992 contained 20 experimental lines of annual legumes which included Goulburn and Woogenellup subterranean clover. The design was a fully randomised complete block design with 3 replicates. Seedling regeneration, dry matter yield and soil seed reserves of Goulburn and Woogenellup were compared over the period 1992 to 1995.

Results and discussion

Results for the establishment year (1992) and first regeneration year (1993) showed seedling regeneration and dry matter yields for autumn/winter and spring where similar for both Goulburn and Woogenellup but winter (July 93) seed reserves of Goulburn were substantially higher than for Woogenellup. These seed reserve differences continued through to the last measurement time of December 1994. Due to the drought in 1994 little production data was gathered that year but Goulburn had better seedling regeneration and higher seed reserves than Woogenellup in 1994. In 1995 the year following the drought, seedling regeneration and dry matter yields measured in autumn/winter and spring were substantially higher for Goulburn than Woogenellup.

Although both Woogenellup and Goulburn had similar initial seed reserves and similar autumn/winter and spring dry matter production, Goulburn was far better able to recover from the drought year of 1994. By 1995 Goulburn was clearly superior in

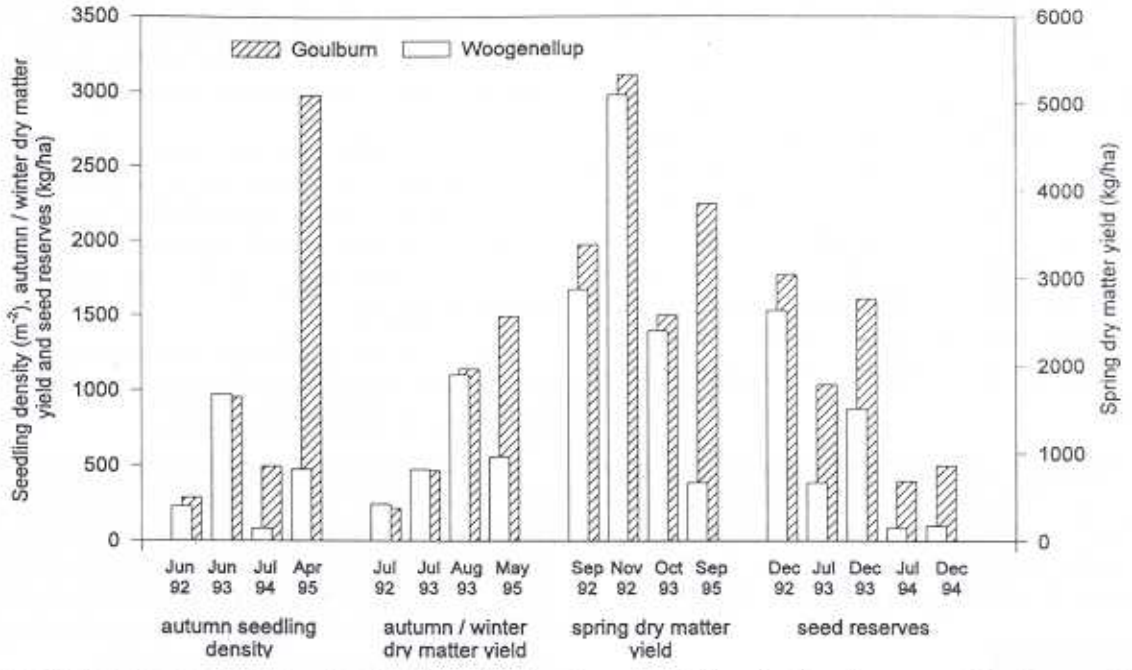

Figure 1. Seedling regeneration, autumn/winter and spring dry matter yield and soil seed reserves of Goulburn and Woogenellup from 1992 to 1995.

all 3 parameters, seed reserves, autumn/winter and spring dry matter production. The productivity of Goulburn was over 2 fold better than Woogenellup. The most important factor contributing to this superiority was thought to be the substantially higher hardseed levels of Goulburn (30%) compared with Woogenellup (5%). It is apparent that the reserves in the winter period prior to the drought (July 93) were substantially higher in Goulburn than Woogenellup (Figure 1). Hardseed reserves in December 94, at the end of the drought were over 3 times greater in Goulburn (Figure 1) which lead to greater production in the year after the drought (1995). This finding clearly demonstrates the value of selecting cultivars with higher hardseed levels where false breaks or periods of drought are likely to substantially reduce seed reserves of softerseeded cultivars.