Studies in the glasshouse showed that swards containing Paterson's curse produced much more herbage than pure sub.clover swards. Production of the mixed sward was as great as the pure Paterson's curse sward because Paterson's curse plants were larger in mixed than in pure swards. Sub. clover plant weight was depressed in mixed swards. However, suppression of sub. clover in mixed swards is not important in terms of total pasture productivity, as the presence of Paterson's curse invariably boosts herbage production and stock readily eat the plant.

The high herbage productivity of pastures containing Paterson's curse is likely to give high stock productivity because the nutritive value of Paterson's curse is high. Paterson's curse and sub. clover herbage collected in pastures near Albury generally showed a similar nutritive value during the year, and both appeared adequate to support grazing stock. In addition, under moderate to heavy grazing, Paterson's curse retained a high nutritive value into mid-summer while sub. clover dried off.

The results presented in this paper suggest that Paterson's curse is a useful plant in pastures and, where it occurs, should be utilized rather than controlled.

MORPHOLOGY OF THE UNDERGROUND PARTS OF SILVERLEAF NIGHTSHADE

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Silverleaf nightshade (*Solanum elaeagnifolium* Cav.) is a serious weed of South Australia and western Victoria. It is increasing in importance in southern New South Wales, where there has been at least a threefold increase in known area of infestation over the last 5 years.

The significance of silverleaf nightshade as a weed is a function of its ability to survive adverse conditions and its invasive capacity. Both characters are related to the growth habit of the root system and the formation of root buds on both vertical and horizontal roots.

In general the root system consists of two kinds of roots: thick, perennial 'long' roots of great length and 'short' or feeding roots of limited development. Following germination the primary root grows vigorously downwards along an irregular course to a currently indeterminate depth. In one Riverina soil the main axis was still more than 1 cm in diameter at a depth of 2 metres when the excavation terminated. Cambial activity leads to an increase in diameter through secondary thickening and some branching occurs at depth. The main axis, acting as a storage organ, tends to increase in diameter downwards before abruptly narrowing to its growing point. Numerous lateral roots develop in acropetal sequence behind the growing point. Most are of limited extent and, though branching occasionally, appear to lack secondary thickening. A few do show secondary thickening and like the parent taproot persist from season to season. These laterals grow more or less horizontally (there appears to be a slight positive geotropism all the time) often for long distances (more than 2 m), before turning vertically downwards. Some branching occurs and root buds initiate new plants at intervals along the lateral. In the overseas literature available these robust laterals are variously referred to as roots or rhizomes. All of them examined by the author, however, showed the typical anatomical features of roots and are referred to as such. In contrast the upward growing tissues formed from root buds showed typical stem anatomy and leaf scars.

Thus the underground portion of silverleaf nightshade may be divided into four parts: (a) the main taproot which divides at depth into one or two robust branches which, following soil crevices, rapidly change shape and direction; (b) a number of robust, occasionally branched laterals which grow horizontally for varying distances in the upper soil layers and, like the parent taproot, fall into the descriptive category of 'long' roots; (c) numerous weakly branched, slender laterals of limited extent and duration usually described as 'short' roots; and (d) vertical stem tissue from the crown of the main axis, from root buds on the laterals and, occasionally, from root buds formed at depth on the main axis.

In undisturbed soils the lateral 'long' roots joining parent and satellite plants form a complex network in the 0 to 15-cm layer. The origin of these laterals is frequently less than 5 cm below the surface. In disturbed soils these surface laterals, which are cut off and brought to the top of soil, tend to be replaced by fewer and deeper laterals in the 20- to 40-cm layer. New root growth does occur on the stubs of the surface laterals, the extent of which may be affected by soil type.