

SPINY BURR GRASS IN EASTERN AUSTRALIA

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Spiny burr grass (sand burr, innocent weed) is a summer-growing annual grass native to southern USA and Central America. It is generally regarded as a weed because of a spiny burr which encloses the spikelets. Within mainland Australia it occurs in the three eastern States and in South Australia. Although present in the south-west of Australia, it has not spread to any extent probably owing to the very low summer rainfall in that area.

Specimens collected from several localities throughout its range indicate the presence of two taxa. I have identified the two from descriptions by DeLisle (1963) as *Cenchrus incertus* M.C. Curtis (syn. *C. pauciflorus* Benth.), and the recently described *C. longispinus* (Hack. in Kneuck.) Fern. These identifications have yet to be confirmed. Plants from the Darling Downs in Queensland and the north-west slopes and plains and the Leeton area of New South Wales were identified as *C. incertus*. Those from Victoria, the Murray Mallee of South Australia, and a specimen from Mudgee in New South Wales were identified as *C. longispinus*. The main characters used to distinguish between the two species are the length of the florets and the number of spines on the burr. *C. longispinus* has florets longer than 5.8 mm, and more than 45 spines and bristles on the burr. Burrs produced late in the season in Victoria often have fewer than 45 spines, but are referable to *C. longispinus* on floret length.

C. longispinus is a pioneer plant on disturbed sandy soils. It is most abundant in the irrigated horticultural areas of the Murray Valley, where the combination of cultivation and ample moisture provides ideal conditions for its establishment and growth. From these areas it has spread into the dryland Mallee as an invader of roadsides and sandy ridges under cultivation. These infestations can be dense in stubble and on fallow, but decline during the ley period. The density also varies greatly between years, and there can be a high mortality of seeds. Eradication is difficult because two types of seed are formed within each burr. The upper, or first-formed, seed afterripens rapidly and can germinate over a fairly wide temperature range within a few months of anthesis. Lower seeds, on the other hand, afterripen slowly and many are dormant a year after formation. *C. longispinus* has the potential to spread over most of south-east Australia, but is

unlikely to be important except in localized areas of suitable habitat.

C. incertus is a highly variable species with a wide geographic range. In Australia, it is most frequent on the northern slopes and plains of New South Wales on sandy and sandy loam soils. Unlike *C. longispinus*, dense infestations can be found in open 'native pastures', and are only slowly controlled once the pasture is sown and fertilized. It is also common in disturbed areas such as roadsides and river banks.

COMPETITIVE EFFECTS OF WILD OATS ON WHEAT UNDER FIELD AND GLASSHOUSE CONDITIONS

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It has been observed on the Darling Sowns that wheat crops may give grain yields of 30-45 bushels per acre (2,018-3,057 kg per hectare) even when wild oat populations are heavy (50 plants per sq yard, or 41.8 plants per sq metre). In most cases, however, there were no wild-oat-free areas from which grain could be harvested to assess the effect on yield of these weed populations.

A trial was commenced in which the interactions of five wheat populations (0-290 wheat per sq yard, 0-242 wheat per sq metre) and five low wild oat populations (0-50 wild oat per sq yard, 0-41.8 plants per sq metre) were investigated. It is in this range of wild oat populations that most interest lies. The trial has shown that only when the wheat to wild oat ratio was less than 1 did any significant reduction occur in wheat yields. Under these conditions, the proportionate reduction in dry matter per plant of the wild oats was greater than that of the wheat. It appeared that wheat was the stronger competitor.

Graphing dry matter per plant against log density showed that competition, either of wheat on wild oats or wheat on wheat, was greatest 6-8 weeks after emergence. It was also noted that, after each shower of rain, wild oats would continue to germinate even when the wheat was in full head. The late-germinated wild