TAXONOMIC AND BIOLOGICAL STUDIES IN *ECHINOCHLOA*

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Echinochloa spp. are the worst weeds of many summer crops, for example rice, cotton, maize soybeans, and vegetable crops, in New South Wales. Currently, Dr Vickery of the National Herbarium of New South Wales and the author are engaged in a detailed taxonomic study of the Australian species. There are many problems in dealing with a range of introduced species and forms from various parts of the world and a number of apparently indigenous species.

One of the greatest difficulties in the taxonomic study of introduced weeds is the lack of comprehensive collections in Australian herbaria. A plea is made to those involved in studies on weeds and weed control to make adequate collections (with notes on any special characteristics) of the species with which they are concerned. In herbarium specimens of *Echinochloa* it is often difficult to say whether a particular plant is perennial or not, and mature spikelets are often lacking. Seed collections (with voucher herbarium specimens) to be used for growing, if required, are certainly desirable. In this work on *Echinochloa*, difficulties would have been multiplied many times if it had not been possible to grow many of the plants under controlled conditions. It is believed that the observation of live plants together with the close examination of herbarium specimens has cleared the way towards a much better understanding of the genus.

The three best known species in Australia are the two weeds *E. crus-galli* and *E. colonum* and the cultivated Japanese millet (*E. utilis*). In rice in the Murrumbidgee Irrigation Areas, *E. microstachya* (from North America) and *E. oryzoides* (from Western Asia) are important also. The latter, known in the MIA as hairy millet, heads at the same time as rice and is a common contaminant in rice grain. *E. crus-pavonis* (from South America) is quite uncommon in New South Wales, but with increasing emphasis on irrigated crops it may become more important.

Within *E. crus-galli* in Australia, there is a wide range of forms differing in habit, size of spikelets and panicles, degree of awning, and heading time. The awned forms may or may not produce awns depending on the conditions in which they are grown. Differences in dormancy also occur. Similarly, in *E. colonum*, there is a wide range of forms differing in general stature, ability to root at the lower nodes, size of spikelets, and heading time. Differences in susceptibility to diuron have also

been demonstrated. The physiological differences between forms may well be relevant to control.

Japanese work on barnyard grass has mostly been concerned with *E. oryzicola*, a mimic of rice, which differs from *E. crus-galli* not only in morphological characteristics but also in physiological properties, especially in its ability to emerge through water. As far as is known, this species does not occur in our rice fields but it is important for us to be able to recognize it, so that if it were found, immediate steps could be taken towards its elimination.

PRELIMINARY STUDIES INTO THE PROPAGATION OF *PENNISETUM MACROURUM*

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A tall perennial grass, African feather grass (*Pennisetum macrourum*) has the ability to propagate vegetatively and by seeds. In Victoria the flowers are formed in December and January and the seeds mature in February and March. It is a vigorous spring-growing plant, but some vegetative development occurs throughout the year; consequently the plants never entirely dry off. The least development of aerial growth is from June until September, when the plants have their driest appearance due to the presence of dead seed stalks and dry leaves.

P. macrourum forms a large number of thick rhizomes, and spread by these propagules is efficient, although localized. Vegetative propagation is rapid from September to March with a peak in December, January, and February. This depends largely on the available moisture in the summer months. Growth studies with young plants showed that rhizomes commenced to develop at the age of 7 months and a dense crown of 12 in (300 mm) diameter was reached at the age of 20 months. Development after this stage was much faster; at 28 months the crown diameter had increased to 39 in (1000 mm) while a diameter of 59 in (1500 mm) was reached after 32 months. Also, isolated subsidiary plants from rhizomes occurred up to 30 in. (760 mm) outside the edge of the crown.