

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

L. Schmidl

Department of Crown Lands and Survey, Victoria

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.

New shoots can form at all the rhizome nodes; however, many of the buds stay dormant on undisturbed plants. In growth studies with single node rhizome sections, 78% produced shoots and 46% became established. Under favourable temperature and moisture conditions shoot development and plant establishment are greatly restricted. Also, defoliation by grazing of shoots at the outer perimeter of the crown limit vegetative reproduction.

The seeds of *P. macrourum* are formed in cylindrical panicles averaging 10 in (25.5 cm) in length, and counts have shown a production of 17 panicles and an average of 11,000 spikelets per square foot (0.09 per sq metre) of infestation.

Germination of pure *P. macrourum* seeds was fairly high in laboratory tests. Ten weeks after harvest, a germination of 82% was reached at a constant temperature of 25°C. The seeds started to germinate on the fourth day and germination was complete within 14 days. In pot trials under natural precipitation and temperature and using two soil types, it was found that, in general, higher germination occurred in a sandy loam soil during the first 3 weeks of the test. However, germination in the sandy soil subsequently improved. In this test seeds covered with ½-1 cm of soil gave 48% (light sand) and 53% (sandy loam); seeds covered with a thin layer of sphagnum moss gave 46% germination in both soils; while seeds sown on the soil surface gave 34% (light sand) and 45% (sandy loam). Seeds with a soil cover produced the earliest germination and the highest final germination.

In the field most germination occurs in the autumn. Seeds harvested in March and immediately planted in pots commenced to germinate 3 weeks later. A total of 135 points (33 mm) of rain fell during this period and the daily maximum temperature range was from 62 to 84°F (17-29°C).

Seed germination is, however, a different phenomenon from plant establishment in the natural environment and trials under various field conditions showed almost no establishment of *P. macrourum* seedlings. Field observations have shown that some of the old established isolated plants originated from seedlings. As seed production and seed viability are high, it would be expected that some propagation could occur by seed, but apparently this is very limited. The seeds can be readily carried by a number of means and the spread of the species to distant areas would be by seed.