**Abstract**

Most experiments were carried out in a glasshouse at Universiti Putra Malaysia, while the field survey was conducted in ricefields in the Muda area, Kedah. This study was initiated during March 2003 and ended on November 2005. The objectives of the study were to investigate the prevalence of *F*. *miliacea* in ricefields both above ground as well as in the soil seedbank, its emergence behaviour, life cycle, life table, competitive ability with rice, and its management.

Results from field survey revealed that *F*. *miliacea* was the fifth most prevalent weed out of 35 species in the Muda area with 46 -52% fields infested and widely distributed over the four districts of Muda with infestation rating scores from traces – 30% weed coverage. Out of 20 weed species identified in the soil seedbank, *F*. *miliacea* was the most abundant with 66.07% of total seed reserve (equivalent to 750.84 million seeds/ha), of which 55% emerged in soils incubated in trays (411.48 million seedlings/ha), 8% germinated in incubation tests in petridishes (61.59 million seedlings/ha), while 37% or the equivalent of 277.77 million seeds/ha remained dormant or dead.

*Fimbristylis miliacea* exhibited high emergence (44.38%) from surface seeding. Seeds sown at 0.5 cm depth had significantly reduced emergence (13%) and no seedlings emerged from 1.0 cm soil depth. For flooding durations of 7, 14 and 21 days, per cent emergence and dry matter production were higher under saturated conditions than at 5 and 10 cm flooding depths. A flooding duration of 14 days or more and in flooding depth up to 10 cm showed a clear trend in reduced emergence and dry matter production of *Fimbristylis miliacea*.

During the cropping season (4 month period) each *F*. *miliacea* plant produced on average of 2.3 tillers/plant and a total of 134 inflorescences, with 84 inflorescences/plant ripening within this period. Each inflorescence comprised of 48 spikelets with 511 seeds and matured after 3 weeks of emergence. Total seeds/plant and 1000 seed weight were 42,275 and 0.035 g, respectively. Time required for seed ripening was 76 days after emergence. This species had three important growth stages: a slow growth stage during the first 4 week after emergence (WAE); a rapid growth stage from 4-9 WAE; and finally, a maximum growth stage from 9-17 WAE. The life table study showed that plants establishing from every 100 seeds of *F*. *miliacea* plants can reproduce 287,722 seeds with nitrogen treatment, which was 1.66 fold greater than without nitrogen. High death rates in *F*. *miliacea* among young seedlings indicated a Deevey Type III survivorship curve. Early emerging cohorts had greater survivorship and contributed most extensively to the next generation by producing more than 90% seeds.

The interaction between weed density and nitrogen (N) fertilization had a pronounced influence on rice yield. At low weed densities of up to 500 plants/m2, rice yields increased with higher N fertilization. On the other hand, at the higher weed density of 1000 plants/m2, increasing N fertilization to 170 kg/ha had no significant effect on yield. However, rice yield at this level of N fertilization with the lowest weed density of 250 plants/m2, was similar to the weed-free treatment. Based on the predicted Logistic and Gompertz response curves the critical period for controlling *F*. *miliacea* in direct-seeded rice was between 14 – 28 days after sowing.

Flooding and use of herbicides are two important weed control methods in direct-seeded rice. Flooding had a major suppressive effect on stand establishment and growth of *F*. *miliacea*, especially during the early growth stages (7 and 14 DAS). Delayed flooding at 21 and 28 DAS required a 10 cm flooding depth for effective control. All tested herbicides were effective in controlling *F*. *miliacea*, but the herbicides bensulfuron and fentrazamide increased grain yield by more than 80% compared to the unweeded treatment and were comparable to the weed-free (hand-weeded) treatment.