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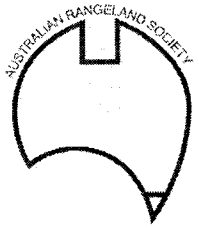

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SEED PRODUCTION AND GERMINATION IN GIANT PARRAMATTA GRASS (*Sporobolus indicus* var *major*)

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ABSTRACT

Giant Parramatta Grass (GPM) is a serious grass weed of coastal Eastern Australia. Its ability to invade pastures is due, at least in part, to its ability to produce large quantities of seed throughout summer and autumn. Most seed shed in the current year is dormant and unlikely to emerge, even under ideal conditions, but is added to a large soil seedbank. Seeds from this seedbank are much more likely to emerge in bare areas compared with vegetated areas in the following year.

INTRODUCTION

Giant Parramatta Grass (*Sporobolus indicus* var *major*) is an insidious perennial grass weed currently infesting 250,000 ha of native and improved pastures along the east coast of Australia.

The aims of this study were to:

1) quantify and identify seasonal seed production and subsequent seed rain on the soil

2) to identify when seedlings of GPG emerge. Since GPG has a seed bank which persists for at least 1 year there are two parts to this study:
   a) emergence of seeds existing as part of the seedbank
   b) emergence of seeds produced in the current year

METHODS

Seasonal seed production was estimated by marking six quadrats in high density infestations of G.P.G. At monthly intervals, seed production/m squared was estimated by:

- Counting and marking seedheads produced/m squared x
- Mean length of seedheads (cm, estimated from a sample of 20) x
- Mean number of seeds/cm (estimated from 5 seedheads).

Seed rain was estimated using 4 seed traps pegged to the soil in each of the seed production sites.

To monitor the emergence of seedlings from the persistent seed bank, grazing exclosures were set up on infested areas.

To monitor the fate of seeds produced in the current year, an artificial seedbank was produced. Grazing enclosures were set up on areas free of GPG. Seed of GPG was collected at three times and there was also three sowing times. Seed collected at each time was sown then and at each subsequent sowing time.

For each each experiment, there were two levels of competition (vegetation clipped monthly and bare) and emerged seedlings were counted and removed monthly.

RESULTS AND DISCUSSION

Seed production and seed fall occurred throughout summer and autumn although most production occurred during January, February and March (**Fig. 1.**).

Minimising seed production in GPG is likely to be difficult because of its large monthly potential seed production and ability to produce seed over a long period of time although any efforts to do so would be most effective during January, February and March.

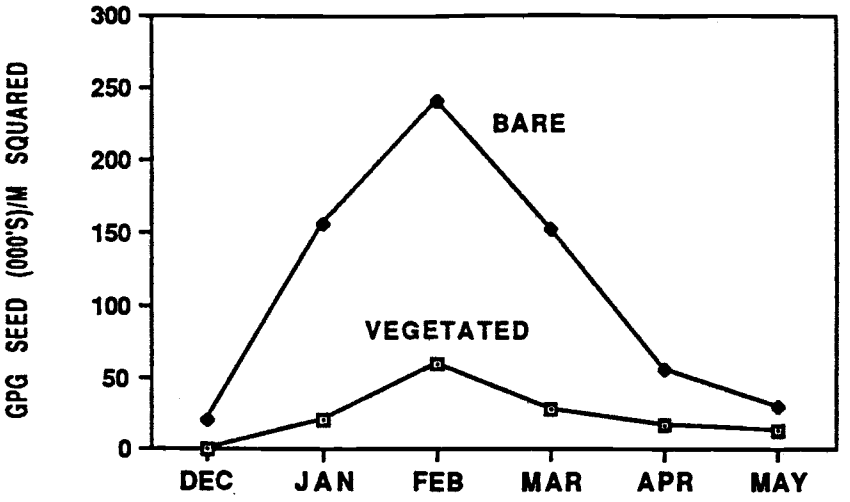

Figure 1. Seed production of GPG during the summer of 1991/92.

Seedling emergence from G.P.G. seeds existing in the seed bank was recorded throughout the summer and autumn although most was recorded during April and May (Fig. 2.). The high autumn emergence may have been related to high rainfall at that time or a temperature/daylength effect.

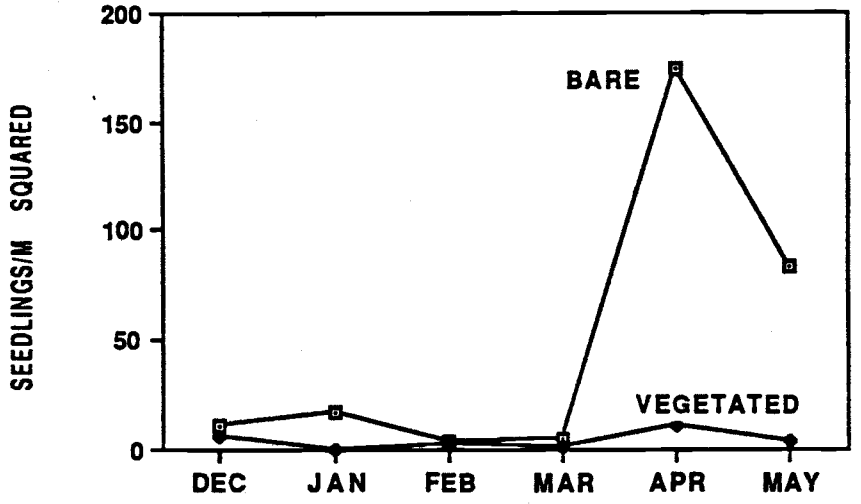

Figure 2. Seasonal Emergence of G.P.G. Seedlings During 1991/92

Very low emergence occurred for seeds sown immediately after they were collected even in bare soil (Table 1). Seeds stored for some time showed a gradual breakdown in dormancy, as initial emergence rose in the bare areas. Negligible emergence occurred in vegetated areas at any time.

COLLECTION DATE	SOWING DATE	INITIAL EMERGENCE (%) BARE	VEGETATED
NOVEMBER	NOVEMBER	3.5	1.0
	APRIL	14.5	0.5
	FEBRUARY	32.0	1.5
APRIL	APRIL	7.5	0.5
	FEBRUARY	19.0	1.0
FEBRUARY	FEBRUARY	2.5	0.0

Table 1: Emergence of G.P.G. at Three Collection and Sowing Dates

Seedling emergence was much greater from bare areas in both experiments. Bare areas must therefore be avoided where possible by improving pasture where possible, using pastures resistant to the effects of chemicals and identifying and using correct rates of chemicals.