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(Accepted for publication August 12, 1982)

## PERSISTENCE OF JOINTVETCH (*AESCHYNOMENE FALCATA*) IN EXPERIMENTAL SOWINGS IN THE AUSTRALIAN SUBTROPICS

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### Abstract

*A survey of 50 old field evaluation experiments in coastal northern New South Wales and southern Queensland revealed that Aeschynomene falcata cv. Bargoo had persisted in all these experiments and had usually spread from the original plots. Seed reserves of Bargoo in the topsoil at six of these sites averaged 4000 m<sup>-2</sup> (range 1150 to 7560). These levels are high for a pasture legume that is a perennial.*

The agronomic characteristics of jointvetch (*Aeschynomene falcata*) cv. Bargoo have been described by Wilson (1980). In brief, it is a prostrate, non-stoloniferous perennial with a moderately thick tap root (up to 15 mm) and its key features are persistence, resistance to heavy grazing and tolerance of poor soil fertility. Bargoo was registered in 1972 with the recommendation of the New South Wales Herbage Plant Liaison Committee.

To increase our knowledge of Bargoo, particularly its persistence, we recently examined 50 plant evaluation experiments in which Bargoo had been sown and established. Most of the trials ceased to be formal experiments some years ago and had reverted to farm grazing; others were under farm grazing from the outset. Most experiments had been sown more than ten years previously; the oldest being 26 years.

The sowings were located from north of Gympie (26°S) to Kempsey (31°S) with one isolated sowing near the Tropic of Capricorn (23°50'S). Site rainfalls ranged from 1600 mm to 720 mm. Some sites were heavily frosted and some were frost free. There were many soil types included (e.g. solodics, podzolics, prairie and red earth) but not cracking clays.

Bargoo had persisted in all 50 experimental sites. Usually, there had been spread from the sown plots and frequently there were isolated patches away from the original sowing. We assume that these had developed from seed disseminated in cattle and marsupial dung. Grazing management varied from light periodic grazing to heavy grazing (less than 5 cm through the year). The only edaphic constraint noted was that persistence was poorer on the one site which was often waterlogged during summer.

Seedling regeneration is characteristic of established swards of Bargoo, hence during 1980 we documented soil seed reserves in the six stands listed in Table 1, using methods described by Jones and Bunch (1977).

TABLE 1  
Soil seed reserves of *Aeschynomene falcata* cv. Bargoo in established Bargoo pastures

Site	Soil type	Year sown	Associated grasses	Seeds m <sup>-2</sup> in 1980
Grafton, N.S.W.	Yellow podzolic	1972	<i>Paspalum notatum</i> (bahia), <i>Axonopus affinis</i> (carpet), <i>Cynodon dactylon</i> (couch).	2800
Fineflower, N.S.W.	Yellow podzolic	1973	<i>Imperata cylindrica</i> (blady), <i>Axonopus affinis</i> (carpet), <i>Aristida</i> sp. (wire).	4590
Cangai, N.S.W.	Red earth	1973	<i>Paspalum dilatatum</i> (paspalum), <i>Axonopus affinis</i> (carpet), <i>Imperata cylindrica</i> (blady).	5260
Beerwah, Qld	Nodular podzolic	pre 1970	<i>Paspalum notatum</i> (bahia).	2690
Samford, Qld	Red podzolic	1965	<i>Digitaria decumbens</i> (pangola).	7560
Gympie, Qld	Red podzolic	1962	<i>Axonopus affinis</i> (carpet), <i>Paspalum dilatatum</i> (paspalum).	1150

Reserves of seed in the top 10 cm of soil (average 4000 m<sup>-2</sup>) were very high. This is particularly interesting for a basically perennial plant. Ninety-five per cent of recovered seed was viable, usually with over 90% hard seed. In contrast to Bargoo, soil seed reserves for Siratro seldom exceed 1000 m<sup>-2</sup>, and are usually less than 400 seeds m<sup>-2</sup> even in stable Siratro pastures (Tothill & Jones 1977). The seed reserves of Bargoo are similar to those of white clover (*Trifolium repens*) in clover based pastures in subtropical Australia (Jones and Bunch 1977, Jones and Evans 1977, authors' unpublished data).

The variability between soil seed reserves of Bargoo at the six sites listed in Table 1 is less than the variability we have measured for other tropical legumes (*Trifolium repens*, *Trifolium semipilosum*, *Macroptilium atropurpureum* and *Desmodium intortum*—authors' unpublished data). This suggests that seed set in Bargoo is less affected by environment and management. The Gympie site, which had the lowest seed reserves (Table 1), has been extremely heavily grazed for some fifteen years without application of maintenance fertilizer, yet still had 1150 seeds m<sup>-2</sup>.

It is unusual for a legume to persist in 100% of sites in evaluation experiments and even more unusual after the experiments have reverted to farm grazing. Because of its persistence and other attributes (Wilson 1980), we believe that commercial production of Bargoo seed should be encouraged. Lack of seed is the main factor limiting its use in subtropical Australia.

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(Accepted for publication December 9, 1981)