# The Germination of *Bursaria spinosa* var. *spinosa*

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## INTRODUCTION

*Bursaria spinosa,* commonly known as sweet bursaria, is a widely distributed member of the Pittosporaceae family. Variously described as a shrub or small tree, the species is found in all mainland states except the Northern Territory. It is a common and widespread member of many different vegetation communities. *Bursaria spinosa* var. *spinosa,* one of a number of named variants of the species, is identified by its smaller, obovate leaves (to 25 mm) and spines located along the branches. The inflorescence consists of a terminal panicle of fragrant, white-cream flowers in late summer/early autumn, followed by brown clusters of two-celled, purselike capsules, each housing a small number of seeds (Costermans, 1981; SGAP, 1991).

Both seed and cuttings are used for propagation of the species, however, seed is the preferred method for most revegetation activities. Information gained from a number of nursery propagators (see acknowledgments), suggests that there are a number of difficulties with seed propagation of *B. spinosa* var. *spinosa.* These difficulties include: poor and uneven rates of germination, seedling survival and, production scheduling.

## MATERIALS AND METHODS

A trial was conducted at Victorian College of Agriculture and Horticulture Ltd - Burnley to examine germination of the species under various conditions and to observe the morphology of germinants.

Seed was collected from specimens of *B. spinosa* var. *spinosa* located at Bushy Creek Reserve, N. Croydon in April, 1993. They were stored in darkness at 5C in a sealed foil sachet. Three lots (100 seeds in each with five replicates) were sown from January 28 to 31, 1994 under the following conditions:

- In 9 cm paper-lined petri dishes (growth cabinet);
- In 12 cm × 6 cm seedling punnets (growth cabinet);
- In 12 cm × 6 cm seedling punnets (glasshouse).

Growth cabinet conditions included artificial light for 12 h with 15C maximum and 5C minimum temperatures. Glasshouse conditions over the period included natural daylight and approximate maximum and minimum temperatures of 34C and 18C. Seeds sown in punnets were covered with 5 mm of screened vermiculite. The glasshouse punnets had daily overhead sprinkler irrigation. Petri dishes and punnets in the growth cabinet were moistened as required. All sowings were maintained for up to 60 days and checked for germination every 2 to 3 days.

## RESULTS

**Germination.** Germination during the trial was defined as being either the protrusion of the embryonic root or shoot through the testa (2 mm) petri dishes; or emergence of the hypocotyl through the medium (punnets).

***Petri-Dish Sowings in the Cabinet.*** First germination was recorded on Day 28 when some 18% of seed had germinated. The maximum germination was reached at Day 46 when 54% of seed germinated (Figure 1). Approximately 25% of seed in the petri dishes "rotted" following imbibition and failed to germinate. The remaining 21% of seed also failed to germinate within the time period. No viability tests were made.

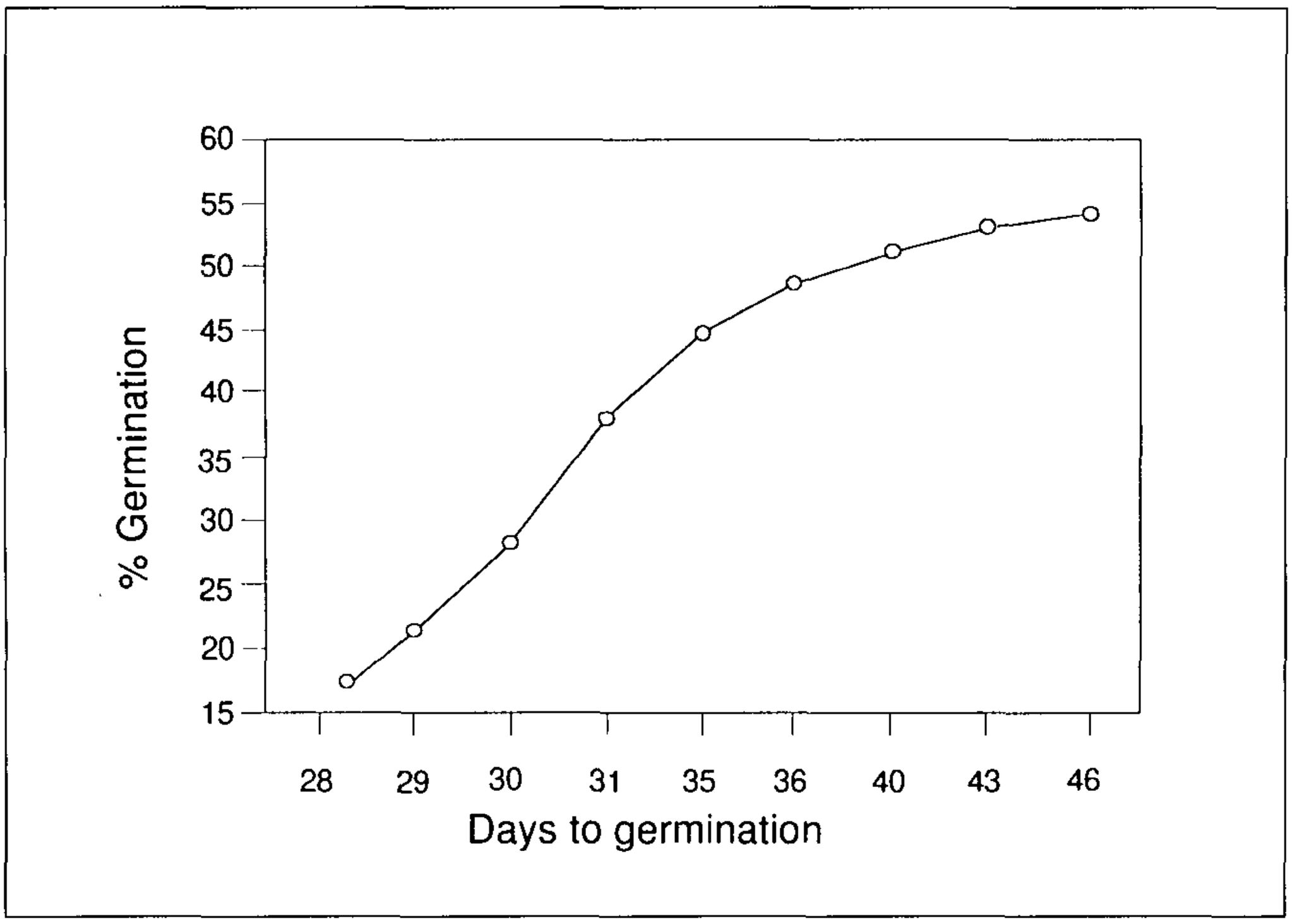


**Figure 1**. Germination of *Bursaria spinosa* var. *spinosa* at 15/5C and 12 h light.

***Seedling Punnets in the Growth Cabinet.*** First germination was recorded on Day 32 when some 6% of seed had germinated. Maximum germination was reached at Day 58 when 15% of seed had germinated. The vermiculite covering the seed proved to be an unsuitable material in the conditions as it dried out too quickly between irrigations. This seems likely to have had an effect on the overall rate of germination in the punnnets.

***Seedling Punnets in the Glasshouse.*** No germination of seed was recorded over the 60-day period.

## DISCUSSION

A comparison of germination under growth-cabinet temperatures, (15/5C) and glasshouse temperatures, (34/18C) would indicate that the species has a relatively low optimum temperature requirement for germination. This is consistent with some other *Pittosporaceae* species studied. *Hymenosporum flavum* and *Pittosporum phylliraeoides* have requirements for either winter germination or cool temperature germination respectively (Fox et al., 1987; Dunlop and Galloway, 1984). Optimum conditions for germination of *P. undulatum* have been identified as

being between 18 and 21C, with seeds germinating after 35 days under these conditions (Gleadow, 1981). This study also showed that germination was slower (50 days) under lower and higher temperatures, with no germination being recorded at 4 and 30C (Gleadow, 1981).

Lower optimum germination temperatures would certainly favour the establishment of *B. spinosa* var. *spinosa* during winter, with subsequent seedling growth continuing into spring. In southern Australia at least, this provides some advantage over germination occurring immediately after seed dispersal in the less favourable conditions of late summer/autumn. This requirement for exposure to certain environmental conditions before germination can proceed is described elsewhere (Mott and Groves, 1981).

The examination of *B. spinosa* var. *spinosa* suggest that some form of embryo dormancy exists in this species, although further work would need to be undertaken to confirm this. There is some debate as to whether embryo immaturity is a cause of dormancy (Bradbeer, 1988). Others have developed clear definitions and identifiable characteristics of embryo dormancy (Come and Thevenot, 1982).

Future work on the species could be directed towards testing seed viability, and examining appropriate storage conditions and a greater range of germination treatments. I trust this will ultimately lead to developing a protocol for maximising germination of the species and improve the scheduling of tubestock production.

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