

Selection of *Sclerotinia sclerotiorum* resistance  
from a *Phaseolus* spp. germplasm collection

K.K. Middleton<sup>1</sup> and R.J. Redden<sup>2</sup>  
Senior Plant Pathologist and Senior Plant Breeder

Navy beans production in Australia is frequently affected by epidemics of *Sclerotinia sclerotiorum*, and in objective of the breeding program conducted by Queensland Department of Primary Industries with industry financial support is to incorporate resistance to this pathogen in varieties being developed for commercial production.

A modified version of the limited-term inoculation procedure described by Hunter, Dickson and Cigna (1981) was used for initial screening of approximately 1600 germplasm accessions in the Department collection. This screening was achieved rapidly, using this procedure, after failing on each of two attempts to screen in disease-prone fields.

This modification to the procedure as originally described involved the substitution of colonised autoclaved bean pod sections for celery pieces. Plants were placed in a growth chamber at 20°C with a 12 hour light period supplied by fluorescent and incandescent lights. Throughout the period in the growth chamber, leaves and stems were kept moist without restraint and after that time was removed from the stems of the plants. Plants remained in the growth chamber under similar environmental conditions for a further 24 hours (i.e. until 48 hours after inoculation), and were then removed to the greenhouse for 3-6 days before being rated for susceptibility on a 0-4 scale.

Using this procedure, 120 entries plus susceptible checks could be tested in each set, and two sets could be tested per week in a growth chamber with a plant bed of approximately 1.2 m x 1.0 m. This allowed for rapid testing of the entire collection.

Fifteen lines have been selected by this procedure as resisting hyphal invasion, which is considered analogous to the expansion phase of the epidemic under field conditions. The fifteen lines are identified as Tweed Wonder, Selection 3-19, PI203958, Uribe Redondo, Flair, CPI 165948 (small seeded selection), CPI 175263, CPI 95838, C 34, 22-6-4, Pearly Wonji, Mita-RSP-1, BAC 17, Per 257 (P787)G6038 and BAT 447-1C. The reaction of these lines to infection by this method was confirmed, relative to susceptible lines, in replicated tests using the same procedure.

The selected lines will now be tested for resistance to infection by *P. sclerotiorum* using both ascosporic inoculum in the greenhouse at flowering and field testing in a sick plot, before being used in the breeding program.

Hunter, J.E., Dickson, M.H., and Cigna, J.A. 1981. Plant Disease 65(5): 414-417.

---

1 Queensland Department of Primary Industries, Kingaroy 4610

2 Queensland Department of Primary Industries, Warwick 4370