

RESEARCH NOTE

GREEN MANURE FOR THE CONTROL OF SOIL-BORNE PATHOGENS

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The application of fungicides to control soil-borne pathogens is uneconomical and cannot be practised with ease by farmers on a large scale. Furthermore, there are indications that the effect of such chemicals on non-target organisms could aggravate disease problems which at present are of marginal importance. There is therefore an urgent need to evolve simpler and economical alternate strategies to deal with soil-borne pathogens.

Presently there is considerable interest in the use of botanical pesticides for the control of pests. Many plants possessing insecticidal properties have been identified. In Sri Lanka, the farmers have been selective in the plant species they used as green manures on different crops. Thus *Croton laccifer* was considered as the best green manure for betel, *Pongamia pinnata* for cucurbits, *Cassia auriculata* for onion, *Indigofera aspalathoides* for manioc, *Tephrosia purpurea*, *Clausena indica*, *Cullen corylifolium* and *Pavetta indica* for tobacco. There is evidence to suggest that the selection of a particular green manure for a specific crop is related to the ability of the green manure to help in the control of pests and diseases associated with that crop. Incorporation of leaves of *Pongamia pinnata* into the soil when preparing nursery beds believed to reduce the occurrence of pest attacks, is a practice which continues even today. Most of the plants used as green manures are also used in indigenous medicine as antiseptics.

Attempts were therefore made to study the effects of crude leaf extracts of various plants used as green manures on the growth and development of some soil-borne fungal pathogens of cultivated crops. The pathogens selected for this study included *Phytophthora vignae*, *Pythium butleri*, *Pythium myriotylum*, *Sclerotium rolfsii*, *Rhizoctonia solani* and *Fusarium solani*. The crude leaf extract was incorporated into potato dextrose agar (PDA) medium at 10% and 2mm pieces of fungal culture grown on PDA were transferred to these media in petri dishes. Colony diameter was measured after 24, 48, 72

and 96 hours. In the case of slow growing fungi like *P. vignae*, the measurements were taken after 144 hours. The test fungi were grown on PDA for comparison. The plates were examined at various intervals for the presence of reproductive structures of these fungi.

Adhatoda vasica (Adhatoda) leaf extract effectively suppressed mycelial growth of *Phytophthora* and *Pythium* species. Sexual reproduction was also inhibited by the same extract. The leaf extract of *Azadirachta indica* (margosa) greatly enhanced oospore production in *Pythium butleri*. Oospore production in *Phytophthora vignae* was also enhanced by the extract of *Vigna unguiculata* (cowpea) plant which is its specific host. *Adhatoda vasica* and *Cullen corylifolium* (Sinhala: Bodhi) showed suppressive effects on the growth of *Sclerotium rolfsii*. The leaf extract of *Azadirachta indica* inhibited the mycelial growth of *Rhizoctonia solani*. None of the leaf extracts tested was effective against *Fusarium solani*. The results seem to indicate that different green manures could selectively suppress or enhance microbial populations in the soil. Detailed studies are in progress.

OMISSION

Fig. 1 inadvertently omitted in "Effect of preharvest fungicidal application on soybean seed quality under humid tropical conditions" by V. Arulnandhy, Vol. 143 (1987) pp. 49 — 60, is given below:

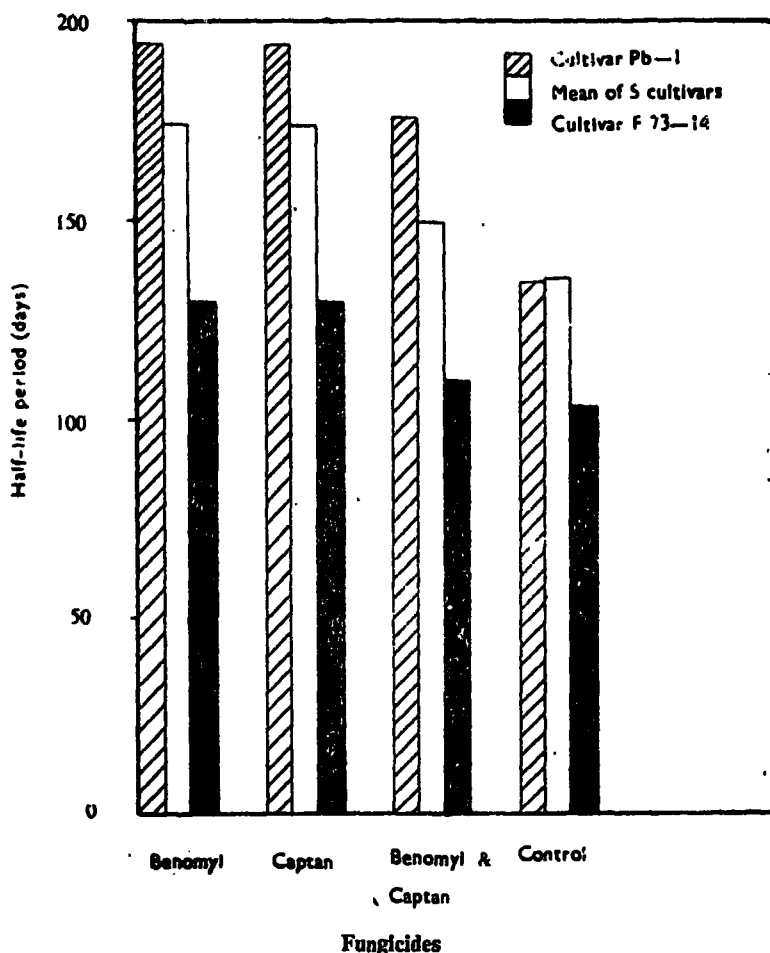


Fig. 1. Half-life period of the preharvest fungicide treated seeds stored under ambient conditions