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● IPSPRG NEWS/PUBLICATIONS

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■ Bibliographies of *Orobanche* on Tobacco and Sunflower

A collaborative project between Old Dominion University and the Institute for Tobacco and Tobacco Products, Plovdiv (Bulgaria) will attempt to list all references dealing with broomrape on tobacco on a world wide basis. Another collaborative effort for an exhaustive compilation of the world's literature dealing with broomrape on sunflower involves Old Dominion University and the Institute for Wheat and Sunflower "Dobrudja" (Bulgaria). Special efforts are being made to include non-western literature. Send any references to L. Musselman.

● STUDIES ON *FUSARIUM OXYSPORUM* FOR CONTROL OF SUNFLOWER BROOMRAPE

One of the most serious constraints in sunflower (*Helianthus annuus*) culture in Bulgaria is broomrape (*Orobanche cumana*). Studies of the culture, morphology, and possibility of biocontrol of *Fusarium oxysporum* f. sp. *orthoceras* were conducted at the Institute of Wheat and Sunflower, Dobrudja, near General Toshevo, Bulgaria. Results indicate that this fungus, isolated for the first time, is pathogenic to broomrape. Mycelial growth is best on potato dextrose agar and Czapeck agar but Houston's medium is best for its sporulation. Light has no effect on fungus growth and sporulation at 25 ° C. A technique using lemon leaves has been developed for the production of macro conidia by the fungus. Naturally infected plant debris of *O. cumana* increases disease incidence in *O. cumana* but not enough for control purpose. In the glasshouse, inoculum of the fungus prepared on barley grains or wheat straw amended with maize feed ("preparation F", 5%) gave more than 84% control of *O. cumana*. In the field, barley, preparation-F and soil amended with maize feed were best. Eighty grams inoculum on barley and preparation-F and 100g on soil amended with maize feed when applied per meter, gave more than 90% control during 1990 and over 80% control during 1991 in the fields artificially infested with broomrape. In the glasshouse and field, the fungus reduces broomrape attachment on sunflower roots and also affects the attached seedlings at all stages of their growth, killing them either under-

ground or aboveground before they can flower and produce seeds. Broomrape emergence and infestations in the field with the fungus are less than the control. The number of seedlings infected increased throughout the vegetative season, possibly due to the build up of inoculum in the host rhizosphere and the resultant decrease in the number of healthy uninfected seedlings. During 1990, less than 10% of the seedlings escaped infection in the field but up to 20% of the broomrape seedlings remained healthy during 1991, probably due to more rainfall during 1991. Experiments conducted in the field naturally infested with broomrape had 74 to 90% efficacy of the above substrates of inoculum, in controlling *O. cumana* on sunflower, during 1991. In the laboratory and under natural field conditions the fungus survives for at least 420 days.

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• LOW WATER POTENTIAL AS A DETERRENT TO MISTLETOES

Host specificity level is relatively high among mistletoes occurring in temperate Australia. In an attempt to identify different factors affecting mistletoe host specificity, water potential of six potential host species and two mistletoe species, *Amyema preissii* and *Lysiana exocarpi*, in Brookfield Conservation Park (BCP) (24 ° 25'S, 139 ° 25'E), South Australia, was measured on a monthly basis during an 18-month period. While predawn and middleday water potential of the two mistletoe species was consistently lower than that of their hosts, the predawn and middleday water potential of one of the non-host species, *Geijera linearifolia* was consistently lower than that of the two mistletoes. *Geijera linearifolia* is a evergreen shrub species. It is common in arid South Australia. In BCP, *Geijera* is one of the most common woody species and is occuring in close proximity with other mistletoe bearing plants. During the study period, seeds of the two mistletoe species were innoculated on individuals of *Geijera* and other plant species at BCP. The development of mistletoe seedlings was followed for up to 48 months. During the first few months, development of seedlings on different potential hosts was similar. The first leaves emerged about 5-6 months after inoculation. While seedlings on their usual hosts continued to grow, leaves of seedlings on *G. linearifolia* exhibited little resistance to haustorial penetration of the two mistletoes. Haustoria of the two mistletoes growing on this species were usually able to penetrate through the bark and reach the host xylem within a few months. All *Amyema* seedlings on *Geijera* died within two years of innoculation, but 12% of *Lysiana* seedlings on their usual host species had grown into plants with branches reaching 40 cm or more in length by the end of the 48 month study period, seedlings on *Geijera* remained quiescently related to the inadequate water supply from the host. Mistletoes are water parasites. One of the prerequisites for a mistletoe to establish on a potential host is the existence of a negative water potential gradient from the mistletoe to the host. The inability of mistletoes to establish on *Geijera* supports the view of Harris' et al. that lower water potential of the potential host (lower than that of the mistletoe's) acts as a deterrent to mistletoe infection.

Z. Yan, Ecosystem Management, University of New England, Armidale, NSW 2351, Australia

• LITERATURE

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ron induces germination, possibly via ethylene, and also haustorial initiation, in S. *hermonthica* but not S. *gesnerioides*).

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