A NEW RESEARCH PROGRAM ON BIOLOGICAL CONTROL OF SOILBORNE DISEASES OF PEACHES AND STRAWBERRIES

Dr. Cynthia G. Eayre

This program is being established at the USDA ARS Horticultural Crops Research Laboratory in Fresno, CA. The overall objective is to develop alternatives to methyl bromide as a soil fumigant. Most of the methods that I am considering are biological disease control methods, that is, use of an organism other than the crop plant or the pest, to control the disease. Since the root diseases controlled by methyl bromide fumigation are not well understood, another objective is to better understand the etiology of these diseases. My main collaborators are Dr. Bob Hutmacher, Dr. Frank Martin, and Dr. Greg Brown, all with USDA ARS. Other collaborators include Dr. Howard Orr, Dr. James Sims, and Dr. Bruce Jafffee of the University of California. I also have a Cooperative Research and Development Agreement with Gustafson, Inc.

A major part of the early stages of this program is to screen a number of bacterial isolates for ability to promote growth in strawberries and peaches. The bacteria involved are called Plant Growth Promoting Rhizobacteria, and are in several different taxonomic groups. The term rhizobacteria refers to the fact that the bacteria are found on, and isolated from, the surface of roots and the soil immediately surrounding the roots. Some isolates of rhizobacteria have been found to promote growth and to induce resistance to diseases in other crop plants. The plants most often studied have been tobacco and cucumbers. It is not known if plants in the Rosaceae, the family containing both peaches and strawberries, respond in a similar manner. Therefore, it is appropriate to screen a large number of isolates.

Gustafson is providing more than a hundred strains, all known to promote growth in some crop plant. We are isolating bacterial strains locally from peach and strawberry roots. The strains are being tested for ability to increase vigor in strawberry transplants and in peach seedlings. Strains that do increase vigor will be tested for ability to induce resistance to specific diseases.

This research program also includes testing nematophagous fungi for potential to reduce nematode populations on peach roots. The first trial was set up in spring of 1996. The fungi involved are *Hirsutella rhosilienesis* and *Monacrosporium cinopagum.*

Another aspect of this program is testing the efficacy of methyl iodide for control of peach replant and for preplant fumigation for strawberries. The first of these tests was set up this spring. A possible strategy for control of replant disorder and other diseases is to follow chemical applications with the introduction of biologicals. This might help slow or prevent the reintroduction of pathogens.