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Antibiotics May Open New Horizons for Plant Disease Control

Summer's tests indicate antibiotic techniques to be within economic range

SPRING LAKE, N. J.—Antibiotics have been extensively investigated as potential materials for plant disease control for the past three years. In many cases research workers have reported better control than that obtainable by any present commercial methods. Despite the demonstrations of the efficacy of these materials, the good control reported is largely an academic procedure unless the cost of antibiotic treatment can be made low enough to be attractive to the commercial grower.

For control of orchard disease a figure of $50 per acre per season is considered to be close to the maximum cost for practical commercial usage. However, at least two commercial antibiotic producers seem to believe that widespread use of these materials is near enough to call for field tests of spray formulations. Pfizer has field tested its Agri-Mycin for pear and apple blight control throughout the nation this summer. It seems probable that antibiotic spray formulations will be commercially available for next year's growing season.

Current status of some of the research on this subject was reviewed here on Sept. 10 by John C. Dunegan, Agricultural Research Service, USDA, for the members of the National Agricultural Chemicals Association. These research developments in the area of plant disease control seem certain to introduce some new questions for the future consideration of NACA members.

The results of extensive field tests using streptomycin and Agri-Mycin for control of diseases in orchards were reported at the recent meeting of the American Phytopathological Society (AG AND FOOD, Sept. 1, page 904). In addition to the work on orchard blight, control antibiotics are being investigated in connection with a number of other plant diseases.

Actidione (cycloheximide) is one of the most promising antifungal antibiotics currently being field tested. This material, produced by the same species of fungus which elaborates streptomycin, was originally tested against mildew fungi. It is now being used commercially for the control of leaf spot of cherry trees. At one time plant pathologists had high hopes for Actidione as a control agent for apple mildew. However, it has not lived up to these anticipations in recent field tests.

Tobacco blue mold, another fungus disease, has been effectively controlled in small scale tests with sprays of 100 to 200 parts per million of streptomycin. Preliminary results indicate that streptomycin gives better control than carbamate fungicides which are now standard treatment.

Helixin, toximycin, and antimycin are three relatively recent antibiotics to be investigated for antifungal properties. All three are being studied for possible control of fungus diseases of grain.

In the tropics studies are under way with musarin for the control of Panama disease of the banana.

Dr. Dunegan told NACA members: "Several years ago I publicly lamented that plant pathologists did not have magic control materials like DDT, parathion, BHC, and others possessed by our entomological colleagues. Our prospects are now much brighter, for the antibiotic materials offer possibilities of disease control we hardly dared dream of 10 years ago."

Regulation of Antibiotics. We should never lose sight of the fact that the primary reason for being of the antibiotics is to heal the sick, William R. Jester, Food and Drug Administration, reminded the audience. He said it seems evident that if present studies on the use of antibiotics result in a petition for the establishing of residue tolerances under the new Miller amendment to the Food and Drug Act, FDA will establish tolerances designed to safeguard their use as drugs.

Reviewing research and regulations concerning nonpharmaceutical uses of antibiotics, Dr. Jester noted that most of the uses, those in effect and those proposed, are in the field of agriculture, although he sees the likelihood that they may be found useful in many other industries.

John C. Dunegan (left), Fruit and Nut Crops Section, Horticultural Research Branch, USDA, and Nestor Bohonos, American Cyanamid research division, in a corridor discussion of this summer's results with antibiotic spraying of fruit trees