

Isolations of the fungus were made at the time the plants were changed from one temperature to the other. Two petiole sections were taken from each of 6 plants inoculated with the Verticillium isolates. All of the sections from plants inoculated with the cotton isolate and kept at 85°F produced the fungus while 79% of those from plants inoculated with the potato isolates yielded Verticillium. The reverse was true at 65°F; 75% of the sections from potato plants inoculated with the cotton isolate and 100% of those from plants inoculated with the potato isolates yielded Verticillium upon isolation.

Discussion

Much more needs to be determined about the fungus and the disease. We need to know, for example, (1) can pathogenicity of the isolates be changed by serial transfer or by cropping cotton-Verticillium infested soil with potato, (2) what is the relation of environment to infection of potato plants in the field, and (3) what actual yield and postharvest losses are caused by the disease to the commercial potato crops of Arizona.

We hope to locate growers that have been troubled by the disease and who would be willing to cooperate in field testing of experimental fungicides for control of the disease. A chemical that could be used for control in Arizona on heavily infested fields would be of great value in the event of future outbreaks of the disease.

Potato Soft-Rot Diseases (William J. H. Stone)

Abstract: Investigations on the problem of black-leg and tuber rots have revealed an interaction between two pathogenic organisms, a bacterial species and Pythium aphanidermatum.

Introduction

During the Spring of 1964 our attention was brought to problems of black-leg of potato plants in commercial fields. Plants continued to die during the season. As tuber set began, we found some fields with relatively large numbers of rotted seed pieces and tubers. Exact figures were not available, but it was evident that some growers suffered monetary losses.

Methods

Pathogenic bacteria were consistently isolated from both the diseased plants and from the rotted tubers. Some of the tubers were rotting in a manner not typical of black-leg. Microscopic examination revealed a fungal mycelium in the tissues. Isolations produced a fungus that has been tentatively identified as Pythium aphanidermatum. Inoculations of surface sterilized sections of potato tubers with the fungus demonstrated its ability to cause soft-rot. Young potato plants inoculated with the fungus in the greenhouse were rapidly killed. Since both the bacterium and the Pythium were frequently associated

in infected tissues, we desired to learn of the association, if any, between the two. Young potato plants were root-dip inoculated with suspensions of bacterial isolates alone, the Pythium alone, and a mixture of both pathogens.

Results and Discussion

The combination of the organisms resulted in more dead plants and greater reduction in growth of surviving plants than either alone under our conditions (Table 1). The Pythium alone was slightly more pathogenic under these experimental conditions than the bacterium alone. The information obtained thus far implies a definite synergistic effect between the two organisms. Further investigations of the significance of this apparent interaction are being initiated.

Since this disease complex can evidently be a serious problem, both laboratory and greenhouse research directed towards finding control measures will be pursued.

Table 1. Data from inoculations of potato plants with a bacterial isolate and P. aphanidermatum. Seventeen days after inoculation.

	Total Plants	Living Plants	Dead Plants	% Dead	Average Height (mm)	Height as % of Controls
Bacterium	17	12	5	29	231.6	77
Pythium	17	13	4	24	130.7	42
Bacterium + Pythium	15	4	11	73	127.5	43
Controls	19	19	0	0	302.3	100

Influence of Tuber Maturity, Phorate Insecticide, Storage Conditions and Reconditioning on Chip Potato Quality and Chip Characteristics.

(Paul M. Bessey)

Introduction

Data in this report are from the first two years of a three-year study which is not yet complete.

Behind this experiment was a rash of protests from buyers and rejections of chipping potatoes which were claimed to fry up unacceptably dark. It was maintained that the phorate treatment for systemic insect control was the cause of this condition.

Since no direct information was available on the influence of phorate on chip color this series of tests was set up at the request of and in cooperation with the University of Arizona Entomology Department. To obtain background information and to evaluate their relative influences, certain other factors which are known to affect chipping quality of Arizona potatoes were combined in a complex factorial design.