Discussion

It is quite apparent that increasing stands to near 100% from a commonly achieved 25% for Arizona fall potatoes is not sufficient to produce the 200-plus cwt per acre needed to make a profitable winter crop deal. Yet, without providing for a full stand, other yield producing factors cannot completely substitute.

Dormancy of seed and high ambient air and soil temperatures at planting can drastically delay emergence and cut potential stand. Physiological seed-piece breakdown under high temperatures has been an explanation for loss of seedpieces and poor stand. Actual rotting of dormant or high temperature growth inhibited seed is probably a major factor.

Warm (70°F) seed storage for at least one month prior to planting is valuable, perhaps critical, in reducing the dormancy effect.

Aside from the inhibiting effect of high soil temperatures, the cutting of seed is probably the most important of factors influencing emergence and final stand. This is in contrast to winter planted potatoes where whole seed generally results in higher stands with greater vigor. Cutting seed breaks the dominance of the terminal bud and at least doubles the respiration rate allowing more uniform and earlier emergence.

The studies on bed color have shown that soil temperature at seedpiece depth can be manipulated. Also, it appears that soil temperature in excess of 90°F is seriously damaging. The most effective means of modifying soil temperature is to delay planting until after September 1.

In fall potato production in Arizona, stand is a prime consideration but is clearly not the only limiting factor. With certain treatment combinations coupled with some luck in disease control and delayed killing frosts, some plot yields have exceeded 100 cwt U.S. No. 1-A potatoes. Thus there is some hope for achieving the necessary 200-plus cwt/acre.

Potato Insect Control with Granular Systemic Insecticides
(Paul D. Gerhardt)

Abstract: Ten percent granular formulations of phorate and Di-Syston at 20 pounds per acre will effectively control psyllids, aphids and thrips on potatoes. Two years study varying the placement of granular systemic insecticides in the soil in relation to the seed piece has not produced any significant differences in the insect control.

The yields from plots in which the granules were placed four inches to the side and two inches below the seed piece were greater. All were better than the untreated check.
Of two new systemic insecticides applied as granules at planting time, the material US-21149 (Temik R) gave outstanding insect control and above average yields on Kennebec variety potatoes. Compound NIA-10242 gave less effective insect control and yields below UC-21149.

Introduction

There are three important insect pests associated with the growing of potatoes in Arizona. They are the potato psyllid Paratrioza cockerelli, green peach aphid Myzus persicae Sulz. and leaf hoppers, mainly of the genus Empoasca sp. Of these, the most important is the potato psyllid.

For the past five years experiments have been underway at various potato growing areas in the Salt River Valley where certain systemic type insecticides were evaluated as granular formulations for the control of the above mentioned sucking type insects.

Ten percent granular formulations of phorate (Thimet) \(^1\) and Di-Syston \(^1\) are used at the rate of 20 pounds per acre applied at planting time to red potatoes and Kennebec variety of white potatoes.

Methods

Two separate studies have been under way on the control of potato insects. The first has to do with the placement of the granular insecticide in relation to the seed piece. The second concerns the evaluation of new chemicals which may have a place in the control of insects on potatoes.

In the first study, Kennebec variety white potatoes are planted in the standard manner. Plots are four beds wide and 40 feet long with each treatment replicated four times. One fertilizer band remains constant in relation to the seed piece in all plots. This is approximately 4 inches to the side and 2 inches below the seed piece. The position of the other fertilizer band plus phorate at 20 lbs. per acre is varied in each plot according to the following schedule:

<table>
<thead>
<tr>
<th>Placement in relation to seed piece</th>
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<tbody>
<tr>
<td>To the Side</td>
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\(^1\) Commercially available.
In the other study, new chemicals as granular formulations or sprays are evaluated for control of potato pest. A 10% granular NIA-10242 and 10% U.C.-21149 (Temik R) were applied in one of the fertilizer bands at planting time at 20 pounds per acre.

Sprays are applied as topical applications to the foliage once or twice during the growing season at 35 gallons of spray mixture per acre. Plot size is usually the same and are replicated four times.

All treatments are evaluated by examining 25 leaves from the middle two rows of each plot at weekly intervals during the growing season. The numbers of aphids, psyllids and thrips are recorded.

At harvest each plot is dug and graded separately according to the standard potato grades.

Results and Discussion

To date no significant differences in insect control have been found in the varying placement of the phorate granules in relation to the seed piece. Slight differences have shown up with the 4 inches to the side and 2 and 4 inches below looking better. When yield data is taken at harvest the plots receiving phorate 4 inches to the side and 2 inches below have produced higher yields of marketable potatoes. All treatment are better than the check.

Of the two new compounds, U.C.-21149 - 10% granular at 20 pounds per acre gave excellent season long insect control and with a high yield of quality potatoes at harvest. Compound NIA 10242 did not give as favorable insect control as did U.C.-21149, but it was definitely better than the untreated check. Further trials are planned for these and other new materials.

Verticillium Wilt of Potato
(William J. H. Stone)

Abstract: Isolates of Verticillium Albo-atrum were obtained from potato and from cotton. Investigations are in process to ascertain the relationship between cotton Verticillium wilt and potato Verticillium wilt and to determine the significance of the disease to Arizona potato production.

Introduction

Several Arizona growers have expressed concern about possible losses from Verticillium wilt, particularly since it is serious on cotton, and many growers raise potatoes on land that has previously been in cotton.