1984 POTATO RESEARCH PROGRESS REPORT

Submitted by

Whitney Cranshaw
Department of Entomology
Colorado State University

A. INSECTICIDE EFFICACY TRIALS

During 1984 a major effort was made to establish the relative efficacy of insecticides against Colorado insect pests of potato. Primary insects of interest were potato psyllid and green peach aphid. Potato aphid and Colorado potato aphid were also involved in these studies. A separate trial was specifically established to help develop recommendations for potato psyllid control in homeowner vegetable gardens.

1. Control of potato insects with soil applied systemic insecticides, Greeley, CO.

   Purpose: To evaluate soil applied systemic insecticides for control of potato insects.

   Results: Organophosphorous insecticides (Thimet, DiSyston) provided good control of potato psyllid and green peach aphid 55 days after a planting time application (July 9). All carbamate insecticides (Temik, Furadan, Lance) caused a significant increase in potato psyllid relative to the untreated check. Temik, but not ~~often~~ carbamate materials, suppressed green peach aphid. Severe stand loss due to seed piece decay prevented follow-up studies.

2. Potato Insect Control, Center, CO.

   Purpose: To evaluate various foliar applied and soil systemic insecticides for aphid and potato leafroll control.

   Results: All foliar treatments, except PP321 and Thiodan, effectively suppressed potato aphids for two and a half weeks following the first application. Green peach aphid control with Ambush, Thimet, and PP321 was poor on the final evaluation date (August 23), three weeks after the second foliar application. Tubers were saved from plots for 1985 planting to assess differences in control of potato leafroll.

1985 RESEARCH PROPOSAL

1. Cultural practice/Aphid interaction studies

Potatoes will be grown using various cultural practices. Aphid landing rates, aphid colonization, and leaf roll infection will be measured on these plantings. Specific cultural practices that will be studied include:

a. differences in plant spacing;
b. differences in fungicide use;
c. differences in crop background.

2. Insecticide efficacy trials

Plots will be established to test the relative efficacy of foliar and soil applied insecticides for control of aphids, potato psyllid, and the spread of potato leaf roll.

3. Psyllid/Varietal studies

Commonly grown potato cultivars and certain numbered varieties will be planted and surveyed for ability to support potato psyllid and to tolerate psyllid injury.

1985 BUDGET REQUEST

Graduate resesarch assistant (1/2)	$3,500
Summer labor	500
Travel	800
Supplies, equipment	250
	$5,050
(1984 Funding received late)	-2,500
1985 Request	$2,550

Submitted by:

Whitney S. Cranshaw
Department of Entomology
Colorado State University

3. Control of potato insects with foliar insecticides, Greeley, CO.

Purpose: To evaluate potato insecticides for control of potato psyllid and green peach aphid. Emphasis was on experimental and registered synthetic pyrethroid products.

Results: All tested products (Ambush, FMC 54800, Imidan, Monitor, Pay-off, Pydrin, PP321, Thiodan) provided significant control of potato psyllid. Significantly higher green peach aphid populations occurred on Thiodan treated plots than on untreated plots one week following the first application. Light pest pressure existed throughout the test.

4. Control of potato psyllid and green peach aphid, Ft. Collins, CO.

Purpose: To evaluate insecticides for control of green peach aphid and potato psyllid. Emphasis was on products available to homeowners or "organic" growers and low rates of labelled synthetic pyrethroid insecticides.

Results: Several insecticides currently recommended for psyllid control by homeowners (Sevin, methoxychlor) performed poorly and consequently were deleted from recommendations. Sevin also sharply increased green peach aphid populations relative to the untreated check. Among homeowner products, only diazinon gave acceptable control of psyllid and green peach aphid. Wide variation due to natural insect controls occurred throughout the experiment.

5. Control of potato insects with soap sprays, Greeley, CO.

Purpose: To further evaluate soaps as psyllid control materials for homeowner use.

Results: Ivory dishwashing liquid (40:1 dilution) gave a high level of psyllid control when plots were evaluated 2 days after treatment. Safer's Insecticidal Soap (40:1 dilution) was intermediate in effectiveness between Ivory and the untreated check.

B. INSECTICIDE GROWTH REGULATOR STUDY

Purpose: To determine if soil applied systemic insecticides can directly affect the growth of potatoes, independent of insect/pest control effects.

Results: Aldicarb (Temik) significantly increased the flowering of Russet Burbank potatoes and the effect appeared to be rate - responsive. Phorate (Thimet) did not significantly increase flowering, relative to the untreated potatoes. These results were consistent with earlier findings.

None of insecticides had significant effects on the rate of tuber development nor final yields. Previously (1982) a delay in the onset of tuberization had been observed from aldicarb treatment. During 1984 an increase in haulm growth was observed on aldicarb treated plots.

C. FUNGICIDE/APHID COLONIZATION STUDIES

Purpose: To determine if fungicide treatment can affect the landing and colonization of aphids on potatoes.

Results: Laboratory trials showed a consistent increase in landing by aphids on potatoes treated with yellow fungicides (Dithane) versus untreated potatoes or potatoes treated with white fungicide (Bravo). Field studies in 1984 at two locations showed similar trends but differences were not significant. Poor stands due to seed-piece decay destroyed most 1984 aphid landing rate studies.

D. APHID PAN TRAP STUDIES

Purpose: To improve retention of aphids captured in yellow pan traps.

Results: Among additives placed into pan water only Basic H significantly caused an increase in aphid captures over plain water. Ivory Dishwashing Liquid and ethylene glycol did not increase aphid captures.

Treatment of pans with slippery Fluon coating failed to increase aphid captures and whole pan Fluon treatments appeared to reduce aphid captures, perhaps by affecting the reflectance of the trap. Banded Fluon applications at the water line allowed slightly higher aphid captures relative to the untreated pans, but the difference was not significant.

Funds for these studies were provided by the Colorado Agricultural Experiment Station, Pesticide Impact Assessment Project - Western Region, and personal funds.

At the end of the season, a grant was received from the Area II Potato Administrative Committee. These funds will be applied against 1985 research or returned, as the committee determines.