

EVALUATION OF SOME CHEMICALS AGAINST THE APHIDS, JASSIDS AND WHITE FLIES IN POTATO

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ABSTRACT:: An experiment was conducted at Agriculture Research Institute, Tarnab Peshawar during 2009 for the evaluation of some chemical against Aphids, Jassids and White flies in Potato. Six insecticides were applied against these insect/pests of potato. All the insecticides showed above 85 percent mortality against these pests of potato.. Tender 10 EC and Sharp 25WP caused the highest 96.4 % mortality in Aphids. The efficacy of Tender 10EC against Jassids was higher than other insecticide that was about 88.7 percent followed by Sharp 25WP. In case of white flies the highest mortality was caused Sharp 20SL, which was about 86.6 percent and the lowest mortality was caused by Talent which was 85.3 percent. Tender 10EC and Sharp 25WP should be used for controlling aphids, Jassids and white flies in potato crop.

Key Words: Potato, Chemical, Aphids, Jassids, White flies

INTRODUCTION:

Potato (*Solanum tuberosum* L) is the world's most important food crop. Three crops of potato are annually grown in Pakistan, i.e. autumn and spring crops in the plains and summer crop in the hills [1]. In Pakistan, potato is cultivated over an area of 133435 hectares with production of 2581554 thousand tons and in NWFP potato is cultivated over and area of 9655 hectares with production of 129529 tones [2]. The most important aphid pest of potato is green peach (peach-potato) aphid, *Myzus persicae* (Sulzer). *Myzus persicae* is a species complex that includes two other described species: tobacco aphid, *M. nicotianae* (Blackman) and *M. antirrhinii* (Macchiati) [3]. Peach-potato aphids (*Myzus persicae* cause many diseases in potato such as Potato leafroll virus (PLRV), potato virus X (PVX) and potato virus Y (PVY) [4]. Whiteflies (Homoptera: Aleyrodidae) are serious pests of many crops, cotton, okra and potato etc. They are the major carriers of viral diseases causing severe damage to the cotton and other vegetables crop [5]. White flies can cause serious damage to cotton and many vegetables i.e potato, Okra, Bitter gourd etc [6]. Cotton leafhopper or cotton Jassid (*Amrasca biguttula biguttula* Ishida), (Homoptera: Cicadellidae), has a broad host range including cotton, okra, brinjal, eggplant, potato and jute and. Both nymph and adult stages can destroy the plants by not only sucking into the leave tissues but also by transmitting different viruses, resulting in symptom and yield loss [7]. Keeping in view the about facts the present study was carried out to check the efficacy of different chemicals against these pests.

MATERIALS AND METHODS:

To test the efficacy of some new insecticides, an experiment was conducted in RCB design at ARI, Tarnab Peshawar during 2009 with seven treatments including control and was replicated four times. Pre and post spray data on the number of live adults of aphids, Jassids and white flies were recorded on 5 randomly selected plants per treatment. Post

spray data were recorded at the intervals of 24hrs, 48hrs, 72hrs and 7 days by counting the total number of live adults on five randomly selected plants in a treatment. The mean number of the pest per plant was computed and data generated was statistically analyzed. The crop was sprayed with the following insecticides with Knapsack sprayer.

Insecticides	Dose/acre
Buster 20SL	125 ml
Tender 10EC	250 ml
Sharp 25WP	250 gm
Sharp 20SL	250 ml
Confidor 20%SL	60 ml
Talent 48SC	25-125 ml
Check	-----

Percent mortality was calculated by using Abbott Formula [8].

% Mortality =

$$\frac{\text{No. of larvae in control} - \text{No. of larvae in Treatment}}{\text{No. of larvae in control}} \times 100$$

RESULTS AND DISCUSSIONS:

The data in the table-1 reveals the all the six insecticides showed significant results in controlling aphids as compared to the check plot. The percent mortality of all insecticides was above 95 percent. The maximum mortality was found in Tender 10EC and Sharp 25WP, which was 96.4 percent, followed by Buster 20SL 96.3 percent. The experiment results are in compatibility with Foster et al., (2000) that the insecticides can control the Peach-potato aphids effectively. According to Thomas [9] the chemical control of aphids in potato can minimize Potato leafroll virus. The results are also in similarity with that of raqib et al [10] they managed the aphids population by using different chemicals.

Table-1: Mean number of aphids per leaflet on potato

Treatments	Pre-Assessment	Mean # of aphids/leaf				% Mortality
		24 hr	48 hr	72 hr	One Week	
Buster 20SL	13.40	0.40 b	0.60 b			96.3
Tender 10EC	11.20	0.20 b	0.20 b			96.4
Sharp 25WP	13.00	0.20 b	0.60 b			96.4
Sharp 20SL	12.25	0.40 b	0.60 b			95.9
Confidor 20SL	13.52	0.40 b	0.60 b			96.1
Talent 48SC	14.62	0.40 b	0.40 b			96.2
Check	14.60	21.20 a	24.40 a			

Means followed by the same letter in columns are non significant at 5% level of probability

Table-2: Mean number of Jassids per leaf on potato

Treatments	Pre-Assessment	Mean # of Jassids/leaf				% Mortality
		24 hr	48 hr	72 hr	One Week	
Buster 20SL	5.20	0.60 b	0.95 b			88.1
Tender 10EC	4.60	0.40 b	0.99 b			88.7
Sharp 25WP	3.80	0.50 b	0.87 b			88.6
Sharp 20SL	3.90	0.63 b	0.78 b			87.2
Confidor 20SL	4.10	0.65 b	0.87 b			88.1
Talent 48SC	3.98	0.74 b	0.80 b			87.4
Check	7.58	8.20 a	10.00 a			

Means followed by the same letter in columns are non significant at 5% level of probability

Table-3: Mean number of White flies per leaf on potato

Treatments	Pre-Assessment	Mean # of White flies/leaf				% Mortality
		24 hr	48 hr	72 hr	One Week	
Buster 20SL	3.26	0.42 b	0.73 b			86.1
Tender 10EC	4.20	0.38 b	0.72 b			85.4
Sharp 25WP	3.75	0.60 b	0.88 b			85.6
Sharp 20SL	4.25	0.70 b	0.53 b			86.6
Confidor 20SL	3.90	0.68 b	0.73 b			85.7
Talent 48SC	4.00	0.67 b	0.82 b			85.3
Check	4.22	5.65 a	7.24 a			

Means followed by the same letter in columns are non significant at 5% level of probability

All the insecticides showed above 85 percent mortality in Jassids as compared to the check plot after spray application but didn't differ from each other. Highest (88.9%) mortality of Jassids was observed in plots sprayed with Tender 10EC and lowest (88.1%) mortality of Jassids was observed in plots treated with and Confidor 20SL and Buster 20SL (Table 2). Present study follows the results of Muhammad et al., 2003 that insecticides can control Jassids effectively and it should be controlled in the early stage. If it is not controlled at this stage then it can cause a significant damage in shape of transmitting diseases. Razaq et al. [11] studied the chemical control of Jassids. Chemical should be used alone but this will give insect pests a chance to develop resistant against a specific group of insecticides so the combination of insecticide can give good results.

Results in the Table-3 indicate that all the six insecticides were significantly effective against white flies as compared to the check plot after spray application and didn't differ from each other. High Percent mortality of 86.6 was recorded in Sharp 20SL while lowest 85.3 percent was recorded in Talent 48SC. These results are in conformity with those of [12] and [13] who observed significant mortality of whitefly with the application of different insecticides against white flies. The finding of the present studies also in similarity with the results of Mohan and Katiyar [14] who stated that confidor was the most effective in suppressing the whitefly population and its continuous use should be avoided to prevent the resistant phenomena in white flies against this pest.

CONCLUSION:

In the light of the above results it is concluded from the experiment that the chemical can control the sucking insect/pest of potato. Tender 10EC and Sharp 25WP are the best chemical for the control of sucking pests in potato. These pests should be controlled in the early stages to minimize the direct feeding and indirect loss which is transmitting of diseases to get higher yield.

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