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MULTIPLE PEST MANAGEMENT IN CHICKPEA (*CICER ARIETINUM* L.) WITH REFERENCE TO CHEMICAL CONTROL TREATMENTS

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ABSTRACT: The comparative study was carried out during 2014-15 and 2015-16 Rabi seasons for sucking pest population against pesticidal treatments in Chickpea crop ecosystem at Nandikandi village of Sangareddy district, Telangana State. The pest control methods adopted are, chemical control, biological control, treatment with botanical pesticides and IPM treatments (in which more than one of the above practices were included) and were compared with farmers practice and untreated control. The assessment of the performance of chemical treatment on Aphids, Jassids, Thrips and Whitefly population means are investigated during 2 rabi seasons. Obviously the chemical treatment recorded significantly less population means than untreated control. Jassid population is low in 2014-15, and whitefly population in 2015-16 rabi seasons.
Key words: Chickpea, Sucking pests, IPM

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INTRODUCTION

Chickpea, (*Cicer arietinum* L.) is a leguminous Pulse crop commonly called as "Chana" or "Bengal gram". It is very important component of cropping systems of dry, rain fed areas, because it can fix 80-120 Kg nitrogen fixation [1]. India accounts for 68% of total global output of chickpea. The crop is raised mostly marginal farmers. It is generally grown under residual soil moisture conditions in rabi season. Several factors are responsible for low production of this crop. Insect pests and diseases are very important in field and during storage [2]. Around 60 insect species are known to feed chickpea [3].

Amongst many insect pests, sap-sucking pests especially Aphids, Jassids, Thrips, Whitefly are the most devastating pests of chickpea in Asia, Africa, and Australia [4,5]. In which the multiple pests are, Aphids –*Aphis craccivora* Koch, 1854, Hemiptera, Aphididae – Sucks sap from tender leaves, flower stalks and pods and Pea aphid-*Acrythosiphon pisum* Harris, 1776, Homoptera, Aphididae- Sucks sap from growing tips, flowers and Pods. Jassids – *Empoasca kerri* Pruthi, 1940, Hemiptera, Cicadellidae, Thrips- *Megalurothrips usitatus* Bugnall, 1913, Thysanoptera, Thripidae and White fly – *Bemisia tabaci* Gennadius, 1889, Aleyrodidae, infest leaves [6-8].

Insect pests generally damage the crop either as vectors of various bacterial and fungal diseases or as destroyers of seedlings, foliage, flowering and fruiting bodies. Pod borers, Aphids, Jassids, Thrips and whiteflies are important that cause great economic losses. Pod borers alone were reported to cause grain losses of 400 kg/ha in chickpea. Hence, various pest management practices are employed in the present investigation and compared their efficacy through population estimation of each pest [9]. The pest control methods employed are chemical, biological, Botanical pesticides and IPM and compared with farmers practice and untreated control [10-13].

MATERIALS AND METHODS

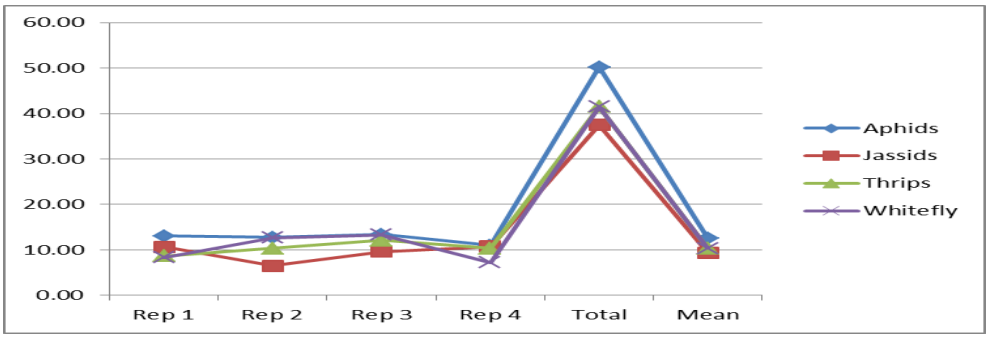
The present study is conducted for multiple pest management in Chickpea with Chemical insecticides/ pesticides treatment during Rabi seasons of 2014-15 and 2015-16. The field investigations were carried out according to RBD with Four (4) replications, randomized within each replication block. The size of each treatment plot was 200m^2 (20m ×10m). A spacing of two (2) meters between two replication blocks and 0.5 meters between two treatment plots was adopted to minimize the drift effect of one treatment over another.

Pest populations like aphids, jassids, thrips and whiteflies were treated with insecticides. The popular Chickpea varieties ICCC37 (Kranthi), JG – 11 are sown and similar agronomic practices were followed. The Chemical treatment includes insecticides like Acephate 75% SP, Monocrotophos 36% SL, Quinolphas 25 EC, Deltamethrin 2.8% EC, Endosulfan 35% EC were sprayed on 21st, 36th, 54th, 71st and 85th days after sowing (DAS). Observations regarding the sucking pest populations were recorded from 10 randomly selected, tagged plants from each plot24 hours before spray apart from weekly scouting. The data retrieved subjected to statistical analysis using single factor analysis of variance.

Table 1: Multiple Pest management in Chickpea with Chemical control in the year 2014-15

	Rep 1	Rep 2	Rep 3	Rep 4	Total	**Mean**	
Aphids	13.06	12.77	13.40	11.00	**50.23**	**12.56**	
Jassids	10.66	6.49	9.60	10.73	**37.48**	**9.37**	
Thrips	8.68	10.37	12.06	10.37	**41.47**	**10.37**	
Whitefly	8.33	12.64	13.33	7.20	**41.50**	**10.37**	
						C.D (p = 1.27)	

Note: Figures in the columns are Mean values of 12 weekly observations

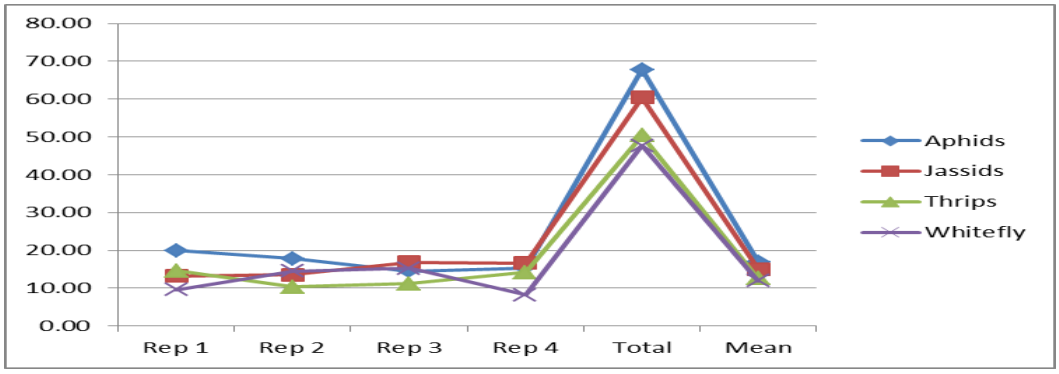


Graph No.1: Multiple pest populations in chemical control.

Table 2 : Multiple Pest management in Chickpea with Chemical control in the year 2015-16

	Rep 1	Rep 2	Rep 3	Rep 4	Total	**Mean**
Aphids	19.97	17.86	14.53	15.41	**67.77**	**16.94**
Jassids	13.30	13.55	16.88	16.71	**60.44**	**15.11**
Thrips	14.60	10.39	11.19	14.20	**50.38**	**12.60**
Whitefly	9.58	14.53	15.33	8.28	**47.72**	**11.93**
						C.D (p = 0.29)

Note: Figures in the columns are Mean values of 12 weekly observations



Graph No.2: Multiple pest populations in chemical control.

RESULTS AND DISCUSSION

The assessment of the performance of various chemical treatments on the Sucking pest populations were investigated and found that the Sucking pest Jassids are showing low population mean i.e., 9.37 in 2014-15 rabi season, whereas thrips and whiteflies followed with 10.37 mean. Aphid population is comparatively with high mean of 12.56. And the same white fly population in the 2015-16 rabi season is also showing less population mean of 11.93 followed by thrips, jassids and aphids with 12.60, 15.11 and 16.94 respectively. All the multiple pests were recorded significantly less than untreated control.

Spraying the combinations of insecticides for 5 times in successful management of mixed pest status. Whereas the spraying of insecticides, sometimes shown the total reduction of pest population and they may not support the survival of the entomophagous predators, parasite and pathogens.

CONCLUSION

In an untreated control abuse of pesticides was observed very much. Farmer has misused insecticides by employing for 5-6 times in each season which is much above the recommended levels in chickpea agro-ecosystem. This has resulted in insecticidal resistance in aphids during 2015-16 rabi season.

. Though it is not an eco-friendly, safer approach for receiving good yields. Our pesticide treatments on chickpea crop yields higher than untreated plots

Thus, with this field study, the usage of pesticides is successful and useful in managing chickpea sucking pests effectively in the existing ecosystem of Sangareddy district of Telangana.

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