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PESTS OF COTTON AND STRAW CONTROL AT COLLECTION

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ABSTRACT

It is established that settling degree of stubble crops reaches by 44, 4 %, and with a corn moth by 37-71 %. Economically significant pests of corn and sorghum are bollworm, the corn moth and Leucania borers, of a peanut - the ordinary red spiders and bollworm. Estimation of biological products and insecticides efficiency against dominating group of pests (bollworm, corn moth, Leucania borers, the ordinary red spiders etc.). The main reservation of pests is the corn. The total biological efficiency of protective actions reaches to 50 % at triple application of insecticides.

KEYWORDS: ***Stubble Crops (Corn, Sorghum, Peanut etc.), Corn Protection from Pests, Cotton Bollworm (CB), Stem Corn Moth (CM), Leucania Borers, Insecticides, Entomophages***

INTRODUCTION

The environmental grain) wheat, mainly winter wheat, began to conditions of Uzbekistan (an abundance of be sown on the area equal to cotton. Wheat heat and prosperity of irrigation moisture) cultivation in a crop rotation with a cotton in allow sowing as repeated stubble cultures the conditions of irrigation agriculture has the plants with shorter vegetative period,growing ripe for 70-100 days. With that end in view are widely cultivated corn (Zea mays L.), Sorghum *(Sorgum Mocnch.* Pers.) and peanut *(Arachis hypogaca* L.) for reception of grain, green weight on a silo or a dry tops of vegetable. In republic territory, the grades of siliceous, half-odontoid, odontoid and sweet corn [1,2] are most widely cultivated. From Sorghym kinds in Uzbekistan spread *S. cernuum, S. vulgarc, S. technicum, S.sudancus* and *S. sacha* [2]. As stubble cultures, in farm economies are grown pumpkin, vegetable and bean.

It has the big economic and social value, because in personal and part-time farms of Fergana valley for long used to grow up small and horned cattle. In this connection on the lands, released after wheat in June mostly cultures, suitable for feeding of cattle corn (for grain and green weight), sorghum (for grain and green weight), technical sorghum (on brooms and green weight), peanut (for bean "nutlets" and a tops of vegetable), etc are sown. The special studying of pests of corn, sorghum and of peanut in Uzbekistan was not spent for a long time. The separate data about some pests of these cultures is resulted in [3], in the Reference book, 1963, and a number of other works. The structure of these pests in general is known, but with change of ecological factors of environment and technologies of crop cultivation, the economic value of kinds is changing. Therefore, in 1990th, the value of gnawing worms decreased, while of bollworms (CB)increased. For the last decade of years, the considerable expansion of areas and strengthening of injuriousness of a stem corn moth (CM) (Ostrinia nubilasis Hb) and Leucania borers [4, 5] in the Republic has been observed. Especially it is necessary to note CM, from which harmful activity the losses of corn grain reach up to 40-45 %, a silo - 35-39 %. The considerable attention to this wrecker is given and in other countries [6].

For the last decade, the number of CB, which was and remains being the basic wrecker of a cotton, corn, tomato, bean, pumpkin and other cultures in Uzbekistanhas sharply increased. We consider that one of the reasons of a new wave of strengthened development of CB on a cotton plant, especially in the conditions of Fergana valley, is the increase in crops of corn on stubble areas. From a total area of crops about one-third (12-13 thousand in hectare in each area) occupies this culture, cultivated for grain and ripening to the middle of October. In view of tallness of corn plants, its treatment against CB in the conditions of the shattered sites in small farm economies is complicated, in this connection, the caterpillars of 3 and 4 generations in weight finish the development on its crops. Half of these lands remain not ploughed, that promotes the safe re-wintering of the wrecker in soil, creating a problem for cotton growing at the next season.The similar situation is

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and with the ordinary red spiders (Tetranychus urticae Koch.), as approximately a half of stubble lands is sown with cultures strongly occupied by this wrecker (pumpkin, vegetable, bean, etc.).The stated above testifies to necessity of development of effective measures of protection of stubble cultures from the most harmful kinds of phyto-phages with a view of restriction of their number both in a current season, and on a cotton which is grown up on these lands in a following season. In this connection, the problem of our researches included revealing and studying of dominant kinds of pests of stubble cultures, development of means and methods of crops protection of separately taken bio-tops and warning of accumulation of their wintering stock for number decrease next year.

MATERIALS AND METHODS

Technique of Researches. The researches carried out in farms of Fergana and Andijan areas of Fergana valley of Uzbekistan on corn, sorghum, peanut and other cultures to be cultivated on the technologies accepted in the given region. At a choice of sites and a bookmark of experiences guided by the Regulations accepted at carrying out of registration tests of pesticides [7] issued by State Chemistry Commission of Uzbekistan. The manufacture and an estimation of biological means of pest control of studied cultures spent according to workings out existing in the Republic [8, 9]. The survival rate of CB estimated on sample of 50 chrysalises, put in different stations on wintering. At CB control, on corn the various schemes of release of its natural enemies - egg-eater of Trichogramma (Trichogramma pintoi Voegele) and a parasite of caterpillars of bracon (Bracon hebetor Say) on the signals received by researchers, and on catch of males on pheromone traps have been tested. Results of Researches For last two decades in Fergana valley of Uzbekistan, the areas occupied by stubble (sowed after wheat) cultures have considerably grown. Pre-estimation shows that Andijan area has an area of 76 th/ha, and Fergana - 69 th/ha.

Cotton Bollworm on Corn of Late Term of SowingIn Uzbekistan, CB as the pest of corn in stubble sowings has been insufficient studied and its control practically is not carried out. One of the reasons is the tallness of the plants, complicating carrying out of chemical and biological treatment in the conditions of small country sites.Its injuriousness is defined not only by size of decrease in a grain yield, but also by strong pollution of production by excrements. Supervisions have shown that in territory of Fergana valley practically everywhere all cultures on which were accounts spent are strongly enough occupied by CB. The most settled and needed carrying out of protective actions by cultures, besides corn, are cotton, tomato and chickpea (Table 1).

Table 1:
Degree of Settling of Various Cultures by Cotton Bollworm in Fergana Valley (the Andijan Region, the End of July)

Occupied by plants in areas, %	Balykchi	Huzhaabad
Cotton	36,2	12,1
Corn	28,4	2,1
Tomato	44,4	25,1
Chick-pea	31,1	27,6
Pumpkin	6,7	10,2

In Andijan area, the population of cotton and corn by the wrecker in a flat zone (Balykchin area) is several times above, than in a foothill zone (Huzhaabad area), that is why tomato, chickpea and pumpkin populated in both zones approximately equally. As the cotton is grown up mainly in a flat zone, at carrying out of the preventive protective warning actions against its settling by CB in a following season, the attention first should be turn on corn as most widely cultivated stubble culture in a flat zone of Fergana valley.

As the corn crops occupy in economies of Fergana valley from 40-60 % from a total area of all stubble cultures, it is the core reservation of highly viable CB population occupying cotton next year.The data obtained by us allowed introducing corrective amendments in flight terms of CB imago. Earlier considered that CB males take off for some days earlier, than females [10]. Our supervisions have shown that, on the contrary, females appear for 3-5 days earlier, than males. These data explain the presence of fact in separate years on fields of appreciable quantity of pre-imago phases of CB development at low density of population or absence of flight of its males in pheromone traps. Moreover, the obtained data are important and for the forecast of necessity and signalization of terms of trichogramma release on the various crops populated by the wrecker.

Studying of survival rate of CB chrysalis after wintering in different stations was one of the problems of our researches. For this purpose late

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October, 2008 from different fodder plants the CB caterpillars of advanced ages collected and finished feeding in laboratory. At conditions approached to natural, 50 normally developed chrysalis of the wrecker left on wintering. On indicators of survival rate of the chrysalis, received from three fodder plants, on the first place there is a corn, the second - cotton, the third - tomato. The similar indicators are received and on a share of ugly imago (Table 2).

Table 2:
Influence of Wintering on Survival Rate of Cotton Bollworms in Different Stations of Habitation

Fodder	Autumn 2008, wintering chrysalis, ps.	Has taken off imago, % in all	Spring of 2009, including the freak	Predicting flight of males, days
Cotton	50	67.5	14.7	3-5
Corn	50	76.2	3.5	4-5
Tomato	50	53.3	16.1	3-4

The phenological supervisions spent in 2008-2009 have revealed essential distinctions in CB development on stubble cultures on years. In favorable 2008, CB developed on corn in 5 generations (the firstweed, the others - on cultural crops), and on wintering went chrysalis of 4-5 generations, in 2009 it has developed only in 4 generations. Because of long rainy and cold weather in March May 2009, the first generation of CB has started to develop only in the beginning of June. On wintering went the part of chrysalis of penultimate (September) and of last (late October) generations. On the basis of these supervisions, it is possible to consider that scientifically well-founded terms of corn treatment against the wrecker are the periods of mass flight of females and laying eggs by them at the period of its maturing, that is mid-August and the second-third decade of September.

In 2009 at CB control on corn, we estimated the efficiency of release of its natural enemies - an egg-eater of Trichogramma (Trichogramma pintoi Voegele) and a parasite of bracon caterpillars (Bracon hebetor Say). In Balykchin area, there were tests on various schemes of release of their laboratory populations on the signals received by researchers, and on catch of males on pheromone traps. The results presented in Table 3 testify that only at consecutive release of Trichogramma (2 times on 1 g/ha) and Bracon in the ratio of 1 to 10 caterpillars the satisfactory (at level of 50 %) efficiency is provided.

The chemical treatment of corn and other tall cultures in republic spent only to an initial stage of their growth and development in control at caterpillars of Leucania borers. As CB caterpillars develop mainly on corn at formation and ears maturing period (and it is reserved under wrappers), the use of insecticides often does not give the positive results. For increase of insecticides application efficiency at protection of culture against this wrecker, we recommended the new scheme of its release and carrying out of treatment. This scheme provides cornrows alternation with rows of undersized intermediate cultures where the tractor ventilatory sprayer with lateral blasting moves ahead to process directly the corn.

As there are no recommendations on CB control means' application on stubble corn in the Republic, the development of insecticides assortment to be effective against imago during the period of their eggs laying, and caterpillars of younger age after birth was also required. For this purpose in laboratory conditions, we had selected the most effective imagocides - piretroids cipermetrin 250 CE and carate 25 CE and larvaecides - antranilamid coragen, 200 CK and carbamat lannat 20 JI, 200 РК. These insecticides have been tested in field conditions on sites where the corn was sowed under the scheme developed by us: 40 cornrows alternation with 8 rows of undersized intermediate culture.

With the help of pheromone trap, the period of mass eggs' laying confirmed by accounts directly on plants has been established. Treatments spent at number of 15-27 CB males caught on the average for night on pheromone trap, and 16-22 eggs and some caterpillars of younger age on 100 plants. For treatments the ventilator sprayer SVH-28 with unilateral side blowing and norm of the expense of a working liquid of 300 l/ha have been used.

The accounts spent after treatment, have shown the high biological efficiency of insecticides selected by us for CB control - 66-100 % decrease in number of caterpillars during 20 days.Stem Corn BorerLast century this wrecker has extended in the Republic on bluegrass (Poaceae) cultures, but had no economic value [3]. Nowadays, the considerable expansion of its areal and sharp increase of harm is observed. So in economies of Fergana area the population of corn by caterpillars of 1 generation in June made up 37-42 %, in September-October (П-Ш generations)-62- 71 %. It leads to decrease in corn crop and its quality.

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Leucania Borers on Sorghum and CornThe last decade corn and sorghum began strongly to be damaged by CM and borers of this sort. According to [3], there are 4 kinds of them in Uzbekistan, but an economic value have only Leucania vitellina Hb. and Mythimna (Leucania) album L. The supervisions have shown that corn and sorghum are damaged by I, II and III generations of these borers in all phases of development, beginning from the occurrence of shoots. The caterpillars, getting into the bases of petiolate leaf, damage it and a growth point, later - a stalk and ears like CM.

The difficulty of corn protection from the subsequent borers' generations in phases of flowering and maturing of ears is connected with inaccessibility for insecticides caterpillars after their penetration into stalks and ears.

In this connection, we spent a comparative estimation of one, two and three corn treatments during mass flight of butterflies and eggs laying of each generation of borers. Treatment of corn against the first generation of Leukania borers spent by means of manual sprayer MS, against two others - tractor sprayer SVH-28 with lateral blowing. Established, that one and two treatments by insecticides do not provide protection of corn from Leukania borers during a season. Only at triple treatment of plants (last - at plants entering in fructification phase), it was reached a satisfactory effect of protection of culture from these wreckers. Thus, it is necessary to underline that triple application of insecticides during a season provides protection of culture against all complex of lepidopterous wreckers (Leukania borers, CM, CB), and also from plant louses of an autumn wave of development.

CONCLUSION

In the Fergana valley of Uzbekistan after wheat cleaning on repeatedly sowed (stubble) cultures with shorter vegetative period (corn, sorghum, peanut, sunflower, vegetable, bean, etc.) economically significant wreckers of corn and sorghum are CB, CM and Leucania borers; of peanutthe ordinary red spider and CB.Among stubble cultures, the greatest areas occupy corn to be inhabited by dominant kinds of wreckers in high number that affects quantity and quality of its crop. On corn, a viable invasion source of wreckers (a wintering stock) is forming owing to which it is a reservation of some wreckers of cotton and other cultures in the subsequent season. In this connection, we develop and offer effective receptions and protection frames of corn from the most harmful kinds, providing decrease in their number on cotton and on a number of stubble cultures next year.

The best variant of biological CB control on corn is double release of trichogramma on signals of pheromone trap in the start of eggs laying (on 1 g/ha) with the subsequent single release of bracon in the ratio of 1 to 10 caterpillars. The total efficiency of application of these entomophages can reach 50 %.

At carrying out of tractor treatment of corn with insecticides for pest control against CB and Leucania borers it is necessary to make sowing of corn on special scheme providing alternation of corn (40 rows) with undersized intermediate culture (8 rows). Technical Efficiency of Bio-Method Against Cotton Bollworms on Corn Field Experiment, Andijan Area, 2009

Results of Corn Protection from Leukania Treatment Andijan Region, Treatment - Borers at Various Frequency Rates of Manual and SVH-300 l/ha, 2009.

S. No.	Variants	Norms of preparations' expense, l/ha	Contamination of plants in:							
			July		August		September		October	
			II*	**)%	II	%	II	%	II	%
Single treatment -25.07 (handsprayer-HS)										
1.	Ciperphos, 55 % c.e.	1,0	0	2	14	15	26	51	44	90
2.	Sumi-alpha, 5 % c.e.	0,5	1	4	16	21	27	62	51	81
3.	Control (without treat.)	-	13	8	31	37	58	79	69	92
Double treatment -26.07+10.08 (HS+SVH-28)										
1.	Ciperphos, 55 % c.e.	1+1,2	11	3	3	6	16	21	26	54
2.	Sumi-alpha, 5 % c.e.	0,5+0,5	2	6	3	10	21	27	19	46
3.	Control (without treat.)	-	13	8	31	37	58	79	69	92
Triple treatment -25.07+10.08+15.09 (HS+SVH-28)										
1.	Ciperphos, 55 % c.e.	1+1,2+1,5	0	5	7	10	4	20	8	11
2.	Sumi-alpha, 5 % c.e.	0,5+0,5+0,5	2	4	3	7	5	24	11	19
3.	Control (without treat.)	-	13	8	31	37	58	79	69	92

NOTE: *p - Quantity of Caterpillars on 10 Cont. Plants, ex.; **) %-The General Contamination of Plants

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The chemical treatment of corn against cotton bollworm should be spent at mass flight of butterflies and eggs laying period with possible occurrence of insignificant quantity of born caterpillars by cipermetrin (0.3 l/ha), carate (0.5 l/ha), coragen (0.2 l/ha), avunt.

An effective protection of corn against a complex of wreckers (Leucania borers, CM, CB and a plant louse of an autumn wave of development) provides 3-fold application of insecticides for a season. The first treatment is to be spent against I-II generations: Leucania borers, the second - against III generation of a Leucania borers and CM in July: the third - against the fourth generation of CB - in second half of August September.

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