VOLUME-1, ISSUE-6

Effect of spider mite infestation on cotton yield in cotton cultivation.

Umedova Mehriniso Ergash qizi.
mehrinisoumidova9185@gmail.com
https://orcid.org/0009-0009-6859-518X

Abstract. In this thesis, the damage caused by the spider mite to cotton is scientifically based on statistical analysis and the work done in this field is covered in detail. Spider mite is one of the dangerous pests that damage the cotton crop. Today, duya scientists have studied a lot about the effects of spider mites on cotton cultivation. This research is also a logical continuation of these researches. In this article, the damage of the spider mite to the cotton crop is explained with clear examples.

Key words. Cotton, spider mite, productivity, hybrids, tolerance.

Today, one of the most urgent problems in cotton cultivation is the creation of cotton varieties that are resistant to pests, resistant to diseases, and have high fiber quality [1, pp. 78–82]. The spider mite (Tetranychus urtecae), which belongs to the category of biting insects, is also one of the main pests of cotton [2, p. 115].

With Tetranychus urtecae, young plants lag behind in growth, and during the flowering period, it causes shedding of the pods. If certain types of cotton are damaged in June, the yield will decrease by 50-60%, if damaged in July by 25-40%, if damaged in August by 2-6% [3, pp. 160–170]. The specific danger of Tetranychus urtecae is that the thrips, which is considered a natural entomaphagus, cannot be reproduced in a biolaboratory due to its pestilence in cotton [4, pp. 197–203]. Golden-eyed entomaphagus is not considered an effective method in case of spider mite infestation [5, pp. 697–700]. It can be seen that there is no biological method of combating Tetranychus urtecae. The only solution is chemical control, and when we use pesticides on our own, it leads to poisoning of the environment with chemicals.

In our experiments, as reported in the literature, spider mite infestation had a negative effect on cotton yield. In order to study the effect of spider mite infestation on plant productivity, the same samples grown under the same conditions and belonging to hybrid combinations, spider mite-infested and non-spider mite-infested plants Observations were made on the number of bolls per plant and the cotton weight in one boll (see Table 1). According to the results of these observations, 45% more yield loss was observed in the model C-6524 variety, and 6.5% more yield loss in the sensitive Namangan 77 variety (51.5%) compared to the model variety. Omad variety (47.2%) showed 2.2% less yield loss

compared to the standard variety, and 4.3% less than the sensitive variety. It was observed that one of the donor samples Fiber Verte (8.3%) lost 36.7% less yield than the standard variety and 43.2% less than the sensitive variety. The next donor sample New Impr (27.6%) lost 17.4% less yield compared to the sample, and 23.9% less than the sensitive variety. Upland (15%) and Ryad 548 No. 6/33 (37.6%) samples are 30% compared to the sample variety due to spider mite damage; 17.4%, and 36.5% compared to the sensitive variety; 12.9% less crop lost. It can be seen that the C-76 sample (77.3%) selected as the maternal form lost 32.3% more than the standard variety and 25.8% more than the sensitive variety. In the hybrids of the F1 generation, the rate of yield loss due to spider mite damage was significantly reduced and yield loss was observed from 15.5% to 28.2%. The highest yield loss in hybrids of the F1 generation was observed in the combination C-76 x Ryad 548 #6/33 (28.2%).

1 Table

Effect of spider mite infestation on cotton yield.

Type and pattern name	The number of pods in one plant, pcs		Weight of 1 bag, gr		Productivity, gr		Crop loss %
	Not damaged	Damaged	Not damaged	Damaged	Not damaged	Damaged	
St.C-6524	12,3	6,9	4,1	4,0	50,5	27,8	45,0
Sezgir, Namangan 77	10,5	5,07	3,8	3,8	39,5	19,2	51,5
Omad	10,1	5,3	4,4	4,4	43,8	23,1	47,2
Fibre verte	8,1	7,6	3,9	3,8	31,5	28,9	8,3
New Impr	11,9	8,6	3,4	3,4	40,2	29,1	27,6
Ryad 548 №6/33	13,1	9,2	2,2	1,9	28,4	17,8	37,6
C-76	15,3	8,6	4,0	1,6	60,5	13,8	77,3
Upland	14,2	12,1	5,0	5,0	70,8	60,1	15,0
F_1 (Upland x Omad)	18	15,3	7,2	6,9	129,6	105,6	18,5
F_1 (C-76 x Ryad 548 №6/33)	25,5	22,1	3,86	3,2	98,4	70,7	28,2
F_1 (Namangan 77 x Omad)	14,9	11,3	6,02	5,8	89,7	65,5	26,9

F_1 (New Impr x Namangan 77)	17,7	15,3	6,5	6,2	115,1	94,9	17,5
F_1(New Impr x Fibre verte)	18,7	16,2	7,48	7,3	139,9	118,3	15,5
F_2 (Upland x Omad)	16,0	14,5	5,6	5,4	88,9	78,7	11,5
F_2 (C-76 x Ryad 548 №6/33)	16,1	12,1	3,9	2,4	62,2	28,7	53,8
F_2 (Namangan 77 x Omad)	13,9	9,6	5,1	3,3	70,2	31,7	54,9
F_2(New Impr x Namangan 77)	14,4	9,8	5,5	3,9	78,2	37,7	51,8
F_2(New Impr x Fibre verte)	14,9	12,5	5,6	5,6	82,8	69,4	16,2

F2 generation C-76 x Ryad 548 No. 6/33(53.8%), Namangan 77 x Omad (54.9%), New Impr x Namangan 77 (51.8%) hybrid combinations yield due to spider mite damage loss was dramatically higher compared to F1 hybrid combinations. A sharp decrease was observed in the affected plants in the F2 generation of these hybrid combinations according to the number of harvest kings per plant and cotton weight per bag (see Table 1).

Summary.

If we introduce varieties of cotton resistant to spider mite infestation, farms may be at risk of losing more than 50% of their cotton crop due to spider mite infestation. If we develop varieties resistant to spider mite damage, we will not only preserve the abundant harvest of cotton, but we will also prevent the environment from being poisoned by chemical pesticides against spider mite.

Reference

[1] Umedova M. , Husenov N., and Turayev O., ‘G`o`zaning so`ruvchi zararkunandalariga chidamli yani navlarini yaratishda zamonaviy molekulyar-genetik usullardan foydalanish.’, 2019.

[2] Umedova M. , Husenov N., Kushakov Sh., Normatov I., Kushanov F., and Turayev O., ‘“Genom seleksiyasi” usulidan foydalanib G`o`zaning zararkunanda hasharotlarga chidamli yangi liniyalarini olish.’, FAN VA TA`LIMNI RIVOJLANTIRISHDA YOSHLARNING O`RNI. O`zbekiston respublikasi Fanlar akademiyasining 75 yilligiga bag`ishlangan Respublika miqiyosidagi Ilmiy va Ilmiy-texnik materiallari to`plami, noyabr yil 2018.

[3] H.X.Kimsànbayev, S.F.Ergashev, R.Sh. O`lmasboyeva., and B.SH. Sulaymonov, *ENTOMOLOGIYA o`quv qo`llanma*. „O‘QITUVCHI“ NASHRIYOT- MATBAA IJODIY UYI, 2006.

[4] X. Martini, N. Kincy, K. Vaughn, J. Dever, and Christian Nansen, ‘Positive association between thrips and spider mites in seedling cotton: Thrips and spider mites in cotton fields’, *Agricultural and Forest Entomology*, vol. 15, no. 2, pp. 197–203, May 2013, doi: 10.1111/afe.12004.

[5] Alisher O‘lmasovich Maxmatmuradov, Otamurod Aslamovich Po‘latov, and Botirxon Muhammadxo‘ja o‘g‘li Imomxo‘jayev, ‘OLTINKO‘Z ENTOMOFAGINI BIOLABORATORIYADA ZAMONAVIY USULDA KO‘PAYTIRISH’, Volume 3 | SB TSAU Conference | 2022 Tashkent State Agrarian University Theoretical and Practical Principles of Innovative Development of the Agricultural Sector in Uzbekistan, 2022.