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Prediction of spider mite outbreaks and control methods

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Abstract

In the article Apple is one of the most cultivated crops in the world, with an annual production of almost 58 billion tons. It consists of a total of 261.8 thousand hectares in the territory of Uzbekistan. 120,500 hectares are seed orchards; apple orchards make up 95% of all orchards. This shows that apple orchards make up 44% of the total orchard area. The apple tree ranks high due to its adaptability to various soil and climatic conditions, as well as its high productivity and nutritional value as an economic raw material. Agrotechnical activities in horticulture are as follows. Cutting off branches that have dried up due to pests and diseases. Constantly shaping and pruning trees, carrying out rejuvenation activities, and picking fruits that have fallen due to disease and damage. Working between garden rows. Mechanical method. This method includes activities such as cutting off dead parts of trees, putting different types of trapping devices on trees, keeping the surroundings of garden areas clean, and removing pests from the bark of trees. Treating tree trunks with lime water, etc., is effective in preventing pest infestations.

Keywords: Apple, crops, orchard, mites, damage, fruit trees, material

Introduction

Apple is one of the most cultivated crops in the world, with an annual production of almost 58 billion tons. It consists of a total of 261.8 thousand hectares in the territory of Uzbekistan. 120,500 hectares are seed orchards, apple orchards make up 95% of all orchards. This shows that apple orchards make up 44% of the total orchard area. The apple tree ranks high due to its adaptability to various soil and climatic conditions, as well as its high productivity and nutritional value as an economic raw material. In the conditions of 2018, spider mites in orchards were found in Angor, Sarosiyo, Denov and Jarkurgan districts of the Surkhandarya region of the Republic, in Qibray, Zangiota, Yangiyol and Urtachirchik districts of the Tashkent region, in Fergana region, Kuva, Altiariq, It was observed that it spread over large areas in almost all areas of Fergana and Beshariq districts. In 2020, orchard mites are expected to spread over 41,300 hectares.

According to the State Statistics Committee, in the first seven months of 2021, Uzbekistan exported 4,200 tons of apples worth 8.6 million dollars to five countries. Apple export decreased by 7.3 thousand tons compared to the same period last year. The most famous apple varieties: Simirinko, Golden, Besh Yulduz, Rosemary, Tashkent Borovinka, Tilla Alma, Samarkand Alosi, Nafis and others. Apple orchards across the country are located in Tashkent and Samarkand regions. Apples are grown in different cultivars from sea level to 2300 meters. The most productive varieties develop in the range of 400-1800 meters. Apple red mite (*Panonychus ulmi* Koch), hawthorn mite (*Amphitetranychus viennensis* Zacher) are among the pests that cause great economic damage in fruit orchards.

In recent years, arachnid spider mites have been causing considerable damage in the orchards of our Republic. In 2020, spider mites are predicted to spread over a total of 41,300 hectares. Abamectin + spirodiclofen preparations were used against spider mites in 30,500 hectares of apple orchards.

The spider mite usually causes more damage to the apple tree, but it also affects other seed and pome fruit trees. Spider mite-infected leaves first turn yellow, and then turn brown and fall off. The fruit spider mite overwinters in clusters under bark and in tree trunk cracks, under weed debris, on branches and partially near buds on branches. The pest feeds on the sap of the leaf cells of fruit trees. Leaves and fruits will fall if timely fighting is not carried out.

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Table 1: The prediction of the spread of garden pests in thousand hectare

Territories name	Crop area	Pests						
		prophecy done field	including					
			Apple worm	Shields	moths	Spider mites	Aphis thrips	Another pests
Karakalpakstan Republic	3,15	1,58	0,67	-	0,10	0,11	0,70	-
Andijan	18,70	17,58	5,61	1,87	0,94	4,68	3,37	1,12
Bukhara	10,03	8,89	2,92	1,64	0,62	1,32	1,46	0,94
Jizzakh	7,45	6,98	4,62	0,51	0,46	0,74	0,28	0,37
Kashkadarya	19,33	17,00	4,40	0,40	0,30	2,40	9,50	-
Navoi	4,48	3,51	1,58	0,88	0,14	0,18	0,42	0,32
Namangan	16,08	11,90	4,65	1,32	1,43	1,91	1,43	1,17
Samarkand	23,06	48,65	17,29	8,07	4,61	6,92	9,22	2,54
Surkhandarya	12,63	11,80	1,00	1,35	0,75	2,84	4,35	1,50
Syrdarya	4,62	9,33	2,23	1,42	1,23	1,60	2,01	0,84
Tashkent	30,51	17,24	5,47	0,35	0,35	7,27	2,24	1,57
Ferghana	32,75	26,83	4,91	4,58	4,25	3,93	3,60	5,56
Khorezm	7,46	44,75	7,46	7,46	7,46	7,46	7,46	7,46
Total	190,2	226,0	62,8	29,8	22,6	41,3	46,0	23,4

Garden pests are combated by agrotechnical, biological, chemical, physical, mechanical methods and quarantine measures are taken.

Agrotechnical method. This method is the basis of coordinated protection of orchards. With the help of agrotechnical methods, it is possible to prevent the increase of pests, sometimes they can be completely eradicated.

By successfully applying the agrotechnical method, it is possible to create unfavorable conditions for pests, to create favorable conditions for the good growth and development of orchards and the reproduction of entomophages.

The agrotechnical method is mainly useful in two directions. Healthy trees are naturally pest and disease resistant, and using this method also creates unfavorable conditions for these species. Conditions are created for diseased plants to develop and recover. In addition, the implementation of agrotechnical method together with the measures of the integrated method is one of its advantages. This method usually does not require additional expenses.

Agrotechnical activities in horticulture are as follows. Cutting off branches that have dried up due to pests and diseases. Constantly shaping and pruning trees, carrying out rejuvenation activities, picking fruits that have fallen due to disease and damage. Working between garden rows.

Mechanical method. This method includes activities such as cutting off dead parts of trees, putting different types of trapping devices on trees, keeping the surroundings of garden areas clean and removing pests from the bark of trees. Treating tree trunks with lime water, etc., is effective in preventing pest infestations.

Chemical method. The use of chemicals against harmful organisms gives good results in the coordinated protection of orchards. It is recommended to spray one of the following chemicals against spider mites in orchards. Pilarstar or Talstar – 0.4–0.6; Neoron - 1.5-3; Bi-58 (new), Nugor or Danadim – 1–2; Atila, Karate or Wrestling - 0.4-0.8; Break-ME – 0.2–0.4; Omayt or Uzmayt - 1.5-3; Danitol - 1.5; Duet, Nurell-D, Sayren-S, Tagrell-D, Sipi plus or Siperfos - 1-1.5 l/ha; Nissorin - 0.3 kg/ha.

Biological method. The biological method means the use of natural pesticides and their vital products against pests.

Natural pests include predatory and parasitic insects, mites, entomophages, microorganisms, bacteria, fungi and viruses. Natural products include pheromone, attractant, repellants.

The integrated control system against the pests of fruit trees

is to increase productivity, produce ecologically clean products, and achieve the required amount of residues of used chemicals in cultivated products.

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