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Research Article

SULFUR PREPARATIONS AND THEIR ROLE IN REDUCTION OF DANGEROUS SPIDER MITES IN COTTON PLANTS (IN BUKHARA REGION)

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ABSTRACT

This article is devoted to the research on the use of lime-sulfur decoction and surface-active substance (surfactant) against against the dangerous spider mites found in cotton plants. It was found that the use of cited preparations in the Bukhara-6 type of cotton plant in moderation resulted in extra harvest in the amount of 4.2 - 4.4 centner per hectare.

KEYWORDS

Cotton plant, spider mites, lime-sulfur decoction, surface-active substance, sulfur, preparations, yield, allatropic, fungicidal, insecticidal, powder, nodular bacteria, surfactant.

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INTRODUCTION

Sulfur feeding of plants is one of the present concerns. Because a big portion of the sulfur in the soil is expelled by the crop, the rest falls into the bottom layer of the soil when the soil is washed away.

Sulfur is required for regular plant development and growth. Sulfur, methionine, cysteine, and cystine are compounds found in plants that conduct a range of tasks and are essential to their survival. (1,2)

Sulfur plays a key function in oxidation reactions and recovery reactions that occur in the process of protein metabolism in plants. In its presence, nitrogen accumulates from the atmosphere, generating nodular bacteria.

Each year, sulfur reserves are replenished by rainwater to a certain extent. This, albeit to a lesser extent, meets the need for this element in agricultural crops. However, due to sulfur leaching from the soil and removal of it with a crop, a significant amount of sulfur is lost each year. Because these element compounds are in short supply in agricultural crop fields, the areas where these crops are grown must replenish sulfur stocks. Sulfur powder and lime-sulfur decoction effectively protect agricultural crops from spider mites and other diseases. In addition, they accelerate the physiological processes of crops (3, 4, 5, 6).

It is known that sulfur is one of the most extensively utilized and least harmful agricultural chemicals used in our country. Sulfur and some of its compounds simultaneously have insecticidal, acaricidal, and fungicidal properties. In the beginning, sulfur was used only as pesticide.

It is now commonly used as a fungicide and acaricide. We do not, however, have complete knowledge regarding these features. Plant and factory exhaust gases are being used to recover natural sulfur ores or conventional sulfur. The element sulfur is in the vapor state in these gases. Ordinary sulfur is recovered in Germany from the gases of metallurgical facilities and the gases of gypsum production. Uzbekistan now generates a huge amount of sulfur, which it exports to other countries.

Ordinary sulfur. Sulfur is found in nature primarily in two allotropic forms: rhombic and monoclinic crystals, as well as in vast quantities in other crystalline forms. At 2, 07, 112.8 degrees, the specific gravity of the rhombic shape evaporates, insoluble in water and stable at room temperature. In alcohol, it is almost impossible to dissolve. The monoclinic form becomes a rhombic shape during storage. In addition to the rhombic and monoclinic forms, there are also crystalline forms, which are also divided into other crystalline forms. Cooling rhombic sulfur in the vapor state yields monoclinically wrong sulfur. It transforms into rhombic sulfur at temperatures below 95.50°C. At 1190°C, monoclinic sulfur evaporates.

Specific gravity is 1.96. It is resistant to temperatures above 95.50 C. Ordinary sulfur is naturally mined from sulfur deposits and is a natural product. Ordinary sulfur is found in all parts of the globe. It can be found in volcanic magmas and in the form of volcanic remnants. Sulfur deposits in CIS countries are located in Karakum, Govurdak, Shorsuv, Crimea, Povolje and other places. The largest sulfur reserves are in Texas and Louisiana (the US), and Sicily island (Italy). Initially, sulfur preparations was found to be effective as an insecticide against crystalline powder.

Insecticides and fungicides are currently sold as crushed and sieved powders. The effect of a small fungus on conidia is dependent on how efficiently it is

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crushed, according to researchers. The more crushed the sulfur powder, the better the effect and the harder it is to wash off the plant leaves under the influence of rainwater or wind. If the sulfur powder is 27 in size, it will not stick to the leaves or be stored for a long time. Crushed sulfur contains up to 35% of particles smaller than 10 in diameter, so it is more efficient than crystalline sulfur. Those forms of sulfur do not get wet in water, so it is recommended to add various additives when using them by spraying.

Lime-sulfur decoction. Boiled polysulfide calcium is formed from slaked and ground sulfur, and this liquid is called a lime-sulfur decoction. Lime-sulfur decoction was first recommended in 1833 to eradicate the plant worm; for this 4.4 kg of quicklime, 0.27 kg of sulfur talc and 0.11 kg of lamp oil were used. In 1851, the gardener first used lime and sulfur in equal amounts to boil in water. This liquid was called Grizone liquid. In the eastern United States, this liquid has been widely used since the 1900s.

Lime-sulfur decoctions, which include 8 % to 25 % polysulfide and 1 % to 4 % thiosulfate, are currently available in many countries. Polysulfide and monosulfide have a 3:1 to 4:1 ratio, with a strength of 20-25 Be (Bome). For the highest quality OOQ sample in the U.S., 30-32% polysulfide calcium storage is required. In this case, their specific gravity is 1.283-1.925 (32-33 Be). In Germany, 15-18 g of polysulfide per 100 ml of lime-sulfur decoction should not be less than 18.5% and the specific gravity should be 1,300.

To summarize, the additives added to lime-sulfur decoction composition, the duration of boiling, and the shelf life are all important factors in their preparation. It is possible to prepare a good lime-sulfur decoction if the above criteria are followed (7, 8).

Given the foregoing, the spiderm mites, which is one of the most harmful pests, is the most dangerous pest that can harm the cotton plant. In cotton fields, the "common spider mite" kind is common, killing 30 to 40% of the crop.

According to F.M. Uspensky, spider mites kill 50-60% of cotton in June, 35-40% in July and 2-6% in August (9, 10, 11).

These estimates have been averaging 10-12 % in recent years, so it's important to look for ways to manage the most hazardous pests, which proliferate quickly and cause exaggerated damage. In view of this, the experiments in cotton were carried out four times in one variant, these are the following options: 1. Surface-active substance (1; 1.5% and 2%), 2. Lime-sulfur decoction (1% by bome) (comparative variant) 3. 600 liters per hectare when sprayed with control water. Spider mites and other pests on the lower, middle, and upper leaves of each plant in the study are taken into consideration. The experiment took place on July 19, 2021, during a period of mass cotton fertilization. The spider mites counted every 5 days to see how long the preparation impact lasts. The average effect of the surface-active substance from spider preparations in the field, as indicated in Table 1, is 2 % concentrate liquid, which has the greatest effect. After 20 days, 89.1% efficiency was reported, especially when sprayed in comparison to other variations. The sulfur surface-active substance with the highest biological activity against spider mites is 2% liquid. Similarly, when sprayed with 1% liquid, the biological efficiency is 71.3 % after 15 days and 76.6 % after 1.5 % spraying.

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The results of the comparative and control options are presented in Table 1.
JONDOR OLIMJON ZAMINI
farm in the Khumin mahalla of Jondor district, Bukhara region (2021)

Table 1
Effect of surface-active substance against spider mites

№	Variants	Concentration of the preparation	The average number of spider mites per 100 leaves					Biological efficiency by day			
			Until processing	After processing				5	10	15	20
				5	10	15	20				
1	Surface-active substance	1%	290	125	92	56	27	37.3	59.8	71.3	78.5
2	Surface-active substance	1.5%	281	119	114	41	22	39.9	48.4	76.6	82.6
3	Surface-active substance	2%	596	127	166	67	28	68.8	65.2	83.2	89.1
4	Lime-sulfur decoction comparator	1%	267	95	120	156	-	46.6	43.2	13.1	-
5	With control water	-	318	212	255	214	138	-	-	-	-

JONDOR OLIMJON ZAMINI
farm in the Khumin mahalla of Jondor district, Bukhara region (2021)
Table 2

№	Variants	Fluid norm	Weight of 1 bowl	Number of bowls per plant	Number of plants	Cotton yield	Norm of preparations used	Additional
1	Sulfur (SAS) 1%	400	4.3	7.0	98.9	29.7	4	1.8
2	Sulfur (SAS) 1.5%	400	4.4	7.2	100.2	31.0	6	3.1
3	Sulfur (SAS) 2%	400	4.8	6.7	99.7	32.3	9	4.4
4	Lime-sulfur decoction comparator (1% bome)	400	4.8	6.8	98.9	32.1	1	4.2
5	(With) control water	400	4.0	6.9	101.0	27.9	-	-

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The effect of a sulfur surface-active substance cotton yield in JONDOR OLIMJON ZAMINI farm (Khumin mahalla of Jondor district, Bukhara region) resulted in the followings: in the experimental versions, the yield difference was 29.7 - 32.3 centners, and the increased (additional) yield was 1.8 - 4.4 centners. To summarize, the surfactant sulfur is an effective measure in the fight against spider mitess among modern chemical preparations. The effect of poisoning with a concentration of working fluid of 400l / ha lasts up to 25 days when sprayed with a tractor at a rate of 2%. Lime is better than lime-sulfur decoction, so we recommend spraying the suspension of 2% surface-active substance with 400l / ha of working fluid for production, and this drug is safe and cost-effective.

In conclusion, the time of boiling and the shelf life of the additives added to the composition of Lime-sulfur decoction and Surface-active substance are critical in their preparation. If the above conditions are followed, quality Lime-sulfur decoction and Surface-active substance can be prepared.

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