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Sulfur Preparation and New Measures of Control against Various Vine Diseases

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Annotation: Currently, in the work that is being carried out in our country to increase vineyards, instead of harmful chemicals, it is appropriate to use biological control methods and harmless substances. In the first place, it is advisable to use sulfur-containing preparations in order to protect vineyards from harmful organisms. Our scientists and farmers have been using various forms of sulfur against grape dew, anthracosis and other diseases for several centuries. We are now in compliance with the preparation of new preparations of sulfur using the residues of petroleum products, this information is presented in our following works. Is a fight against the disease. Because when affected by the disease of oidum, on average, 20-30% of the crop is lost. To prevent this, it is appropriate to use the new SFM substance

Keywords: Flour-dew, Sulfur, disease, Vine, drug, experiment, chemicals, weed, productivity, efficiency.

Sulfur is necessary for plant growth and development. Compounds such as sulfur, methionine, cysteine and cystine in the composition of higher and lower organisms perform various functions and play an important role in their vital activity. Sulfur is of great importance in the oxidation and reduction reactions that take place in the process of oxygen exchange in plants. With its

participation, nitrogen is collected from the atmosphere, nodular bacteria are formed. With the increase in the application of mineral, especially nitrogen fertilizers, the productivity increased sharply, and at the same time, the release of sulfur from the soil increased. Due to the regular development of the industry, the increasing use of electricity, gas and oil in the industry, it is noted that the emission of sulfur from the atmosphere has decreased somewhat. Also, the use of sulfur-rich coal is decreasing sharply. In order to fight against environmental pollution in large factories and power stations, the complex of waste gas cleaning measures has become very important, and this is the reason for the reduction of sulfur in the atmosphere.

Every year, the sulfur stock replenishes the soil up to a certain level with rainwater, which provides the agricultural crops with a little problem of ectogy for this element. However, as a result of leaching of sulfur from the soil and leaching from crops, a large amount of it is lost every year. [5,6]

Experiments show that plants are not getting enough sulfur from the atmosphere. Therefore, in recent years, in various regions of our country, much attention has been paid to determining its amount in the soil and searching for its simple forms for agriculture. In particular, due to the lack of these element compounds in the areas where cotton is planted, such lands need replenishment of sulfur reserves. Thus, there is a great need for sulfur to increase the productivity of crop fields and strengthen the resistance of plants to pests. When studying the aspects of rational use of sulfur powder and sulfur-lime decoction, it was found that they not only effectively protect crops from spider mite, but also accelerate the physiological processes of the plant.

B.S. Most of Boltaev's (1988) studies showed that when a 2% suspension of sulfur soaked in water was used against the spider mite in cotton, it was observed that it had a high biological effect against the spider mite and the cotton yield increased by 3.7-6.0 centners and the technological properties of the fiber were improved.

When sulfur preparations are used against pests and diseases, they have a positive effect on the growth and development and fertility of many plants. In addition, there is information about the positive effect of sulfur on the soil and its ability to accumulate water-soluble beneficial substances in the soil.

Plants treated with sulfur are distinguished by their good appearance, green leaves and high productivity. On the contrary, the lack of sulfur in the plant reduces its resistance to low temperatures, drought and diseases. Along with agrotechnical and biological control measures, chemical control measures play a key role in the fight against plant pests and diseases. [2,3]

Materials and methods: Based on research, it is appropriate to note that sulfur is an effective agent in the fight against spider mites and diseases compared to other contact preparations. When it is sprayed uniformly on the underside of the leaf (in conditions of high enough air temperature), a complete loss of moving, adult and hatched spider mite larvae can be achieved.

Processing efficiency also depends on the quality of the sulfur preparation and its application methods. In the spraying method (depending on dispersion), it may be enough to spend from 0.3 to 1 kg per hectare to completely eliminate mites. It should be noted that the effect of temperature plays an important role in the effectiveness of sulfur preparations. In order to achieve high effectiveness in the fight against mites, the daily air temperature should be 30°C, at least for several hours of the day at the above temperature. When the daily temperature is around +30°C, sulfur has a highly lethal toxic effect against mites. The higher the temperature, the more mites die. The effect of sulfur can last up to 1 month, but its high efficiency is observed between 6-10 days. Sulfur preparations have a high efficiency against powdery mildew, rust and other diseases of plants, especially diseases and rotting pests of fruit trees. The effectiveness of sulfur preparations depends on the long-term release of pure gold-match vapor in the vicinity of the fungal mycelium. This, in turn, requires the need to ensure that the fungicide is evenly distributed over the protected plant. For this, the fungicide must adhere well to the plant and be stable. Sulfur powder is light-colored

powder, the diameter of its particles is 4-250 μm. will be up to Contains 95-99% pure sulfur. It does not dissolve in water and does not mix with it. Evaporates slowly in air. Sulfur sawdust does not attract moisture from the air and does not stick when stored, but small particles can stick together and become wormy. Sulfur has the property of spontaneous combustion. In dry conditions, it is used by dusting, consumption rate is 15-30 kg/ha. If the drug is used when dew falls on the plant, its effect will be higher. When using it, the air temperature should not be lower than 23°C. Segra drug is obtained by grinding sulfur sawdust in special mills. Of course, wetting agents and stabilizers (emulsifiers) are added. This preparation contains up to 80% pure sulfur. 12 kg of saturated sulfur and 6 kg of unslaked lime are added to 10 liters of water in preparation of lime-sulphur decoction (OOK). First, unslaked lime is put in the cauldron, and more than 2 parts of water is burned on it. After the lime is slaked, it is heated and the stones and other debris are removed and replaced with the same amount of unslaked lime. In another container filled with a little water, add sulfur and stir until it becomes creamy. Sulfur soaked on boiling lime while the lime is being quenched it is added little by little. The mixed water is burned and boiled with stirring. Before boiling, stick a stick into the liquid in the cauldron and check its height. As the liquid in the cauldron boils down, water is kept burning up to that height instead. 15 minutes before the decoction stops boiling, stop boiling water, after the mixture begins to boil, boil for 60-70 minutes (until the mixture turns brown). Then the liquid is cooled and carefully poured into another container. Depending on the composition of the boil, as well as the quality of lime and sulfur, the strength (sharpness) of the main boil is 13-320, mostly 15-20°. The sharpness of the main boil (OOK) is checked with a hydrometer. Before spraying the drug, the main decoction is turned into a working mixture. When using this drug, it is necessary to pay attention to the type and species of plants, because some plant leaves are delicate and can burn. For example, if 1° lisi is sprinkled on apple seed, 0.5° lisi is used for pear. In addition, the drug is also used against fungi and mites and their causative reserves, for which lime-sulfur broth should be taken at a high level (1.5-5°). If the decoction is prepared incorrectly, it will burn the leaves. Therefore, it is necessary to spray it a little before using it. It is toxic to humans and warm-blooded animals. Although the above-described sulfur preparations (sulfur talc, lime sulfur decoction) are effective against spider mites and fungal diseases of plants, they are not without some drawbacks.

On the other hand, almost 40 percent of the sulfur talc that is pollinated is scattered in the air with the dust fox and pollutes the environment. As a result, it is necessary to apply the drug in a large amount per 1 ha area. In addition, if the powder is small, the particles will stick together and not dust well, and the duster will stick to the devices and stop the unit from working. Therefore, when pollinating the plant with talc of the drug, it is recommended to mix additional talc, kaolin, slaked lime with the drug in a ratio of 1:1 or 1:3. In order to prevent a piece of unslaked lime accidentally falling into the sulfur talc, it is sieved. The mixed board should be carefully leveled with a wooden shovel over the plywood. In practice, sulfur sawdust is used without mixing the above additives.

The process of preparation of lime-sulphur decoction (COS) requires additional labor and money, but it is also toxic to humans and domestic animals. It has an inflammatory effect on the skin. Therefore, when working with OOK, it is necessary to strictly follow the technical safety rules for working with highly effective toxic preparations. In particular, it is necessary to protect the eyes, skin and respiratory tract with care. Apart from these, the high effectiveness of the above-mentioned sulfur preparations against the spider mite does not exceed 6-10 days and does not affect the eggs of the pest. It weakens the crop when the crop is treated with these preparations during drought years and hot weather hours. It is important to remember that sulfur applied to the upper part of a plant leaf has no effect against the pest. Taking into account the shortcomings of the sulfur preparations mentioned above, we managed to create a new form of the sulfur preparation, i.e. "water-soakable sulfur" preparation. Water-wettable sulfur is a paste-like mass prepared from an aqueous solution of surfactants (synthetic detergents -SOB), which forms a stable suspension with various amounts of water. The drug is prepared from sulfur processed on the basis of Shakhrisabz inter-district MTTB open joint-stock society. Since 2009, this drug has been

produced on an industrial basis at the Shakhrisabz inter-district MTTB enterprise in Koshi. [7]

The drug is yellowish, green in color, with a weak sulfur smell. Sulfur soaked in water adheres well to the plant. Not only is it highly effective in the fight against spider mites, it also has a contact effect on the body of other pests. At the same time, its biological effectiveness lasts 20-25 days.

Among the sulfur preparations, the water-soaked sulfur preparation is the most effective, when its 2% working suspension is used, it kills 100% of spider mites' eggs on the second day, 88% under the influence of 1.5% suspension, and up to 73% of eggs on the third day under the influence of 1% working suspension. because "SFM" contained in this drug form increases its viscosity and toxic effect.[1]

One of the most important positive properties of the water-soluble form of sulfur is that it improves the condition of the plant. Special experiments on a large scale have shown that the acceleration and activation of the germination properties of cotton seeds and corn seeds treated with a water-soaked sulfur suspension, and when treated directly on the plant, due to its positive effect on its growth and development, the harvest is advanced by one week, cotton yield per hectare It was noted that it increased by 3.1-4.2 centners. In particular, when it is used against vine ash (oidium), apple powdery mildew and powdery mildew, it not only helps to preserve the crop, but also increases the mass of grapes and apples and increases the quality of the product. Long-term studies of the effect of the drug on natural pests of agricultural crops (golden-eyed, horned beetles, trichogramma, bracon) have shown that due to the weak toxic effect of the water-soaked sulfur drug on entomophages, on the second day of treatment in the fields treated with this drug, the biolaboratory against pests and mass-produced entomophages can be used in biofactories.

The drug, even a mixture of bacterial microbiological drugs, can be successfully used in the fight against plant-sucking and rodent pests and fungal diseases.

One of the more important features of the drug is that when silk kurti is fed in the feed treated with its suspension, it increases the viability of the silk kurti, the weight of the cocoon shell, and the number of eggs of butterflies. Taking this into account, the water-soluble form of sulfur (on weeds and mulberry) can be widely used as a preventive control measure and during feeding of mulberry silkworm, against sucking pests of cotton and other agricultural crops.

According to the information of the Institute of Sanitary Hygiene and Occupational Diseases of Uzbekistan, the water-soaked sulfur preparation is one of the less toxic (poisonous) substances, and there is no objection to its use in the practice of plant protection from the point of view of sanitary hygiene.

Preparation of a water-soluble sulfur preparation is easy and inexpensive.

When there is a direct need to prepare the drug in field conditions, it is done according to the tune.

To prepare the "kur" pulp of the drug, a solution of synthetic detergent in water is first prepared: that is, cold water (river water, etc.) - 40 parts of the total mass of the drug "kur" pulp is taken, and the synthetic detergent is dissolved in it - 5 parts of the total mass dissolves in water. When the synthetic detergent solution is ready, crushed (passed through a sieve with fine holes) sulfur - 55 parts of the total mass - is added little by little and mixed thoroughly until a uniform mass is formed (15-20 minutes).

In the field, a 200-liter metal barrel, shovel (wooden), zinc-coated bucket, metal type with 0.5 mm holes, technical scale and stones are needed for making large quantities of pulp in the field. First, 40 l of water is poured into the barrel, and then 4-5 kg of synthetic detergent is dissolved, stirring regularly with a shovel. After the synthetic detergent granules are completely dissolved, a little (3-4 kg) of fine sieved (felt) sulfur (55 kg) is mixed into the resulting solution. The pulp is mixed for 15-20 minutes until it becomes a uniform creamy consistency.

In order to facilitate manual work, it is appropriate to prepare the "cur" pulp in a simple device, including in the device presented in Figure 1: 1st contact transmitter, intermediate belt transmitter

(i=2); 2-A02-42-8 electric motor (R-3 kW, p-720 rpm). The device can be prepared in any mechanical workshop of the farm.[8]

For example, 6-9 kg of crushed sulfur, 600-900 g of synthetic detergent, and 600 l of water are used to make a sulfur working suspension for one filling of the tank of the OVX-28 spray unit.

300-400 liters of the working suspension of the drug per hectare is sprayed using a large-hole nozzle, depending on the phase of development of the tuber, in the OVX-28 unit with a hydraulic conditioner (a tuber fan sprayer). But after processing, a little water should be drawn into the sprayer and the stems should be washed. Otherwise, the drug may stick to the feet.

Conical SMX-4 seed drill reducer

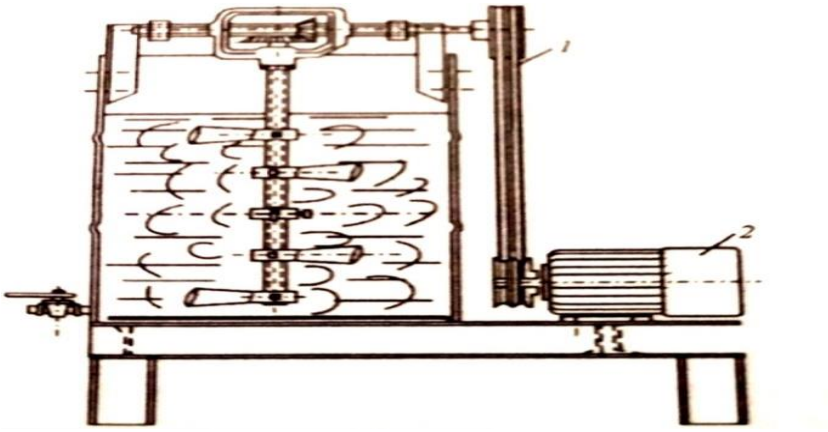

Figure 1. **A device for the preparation of water-soaked sulfur "kur" pulp**

A new water-soluble form of sulfur is considered highly effective in the fight against spider mite in cotton. 95-100% of the spider mite and 78-85% of the aphids enter the fields infested with the pest 8-10 days after treatment. Especially, when the areas treated with the drug are irrigated, the biological effectiveness of the drug becomes visible faster. Spraying is carried out in the width of 8 rows of the plot.

Water-soluble sulfur preparation can be used at any time of the day. The treatment of the drug is simple (it can be prepared in the field), it is suitable for warm-blooded animals, silkworms and other useful insects, it is quickly washed off the clothes and skin of workers, and the smell rises quickly.

In particular, it should be noted separately that in the experiments of foreign specialists and scientists, it was noted that in the crops treated with a suspension of mineral fertilizers with sulfur mixture, the absorption of fertilizers by plants, and the effectiveness of fungicide (sulfur) against harmful organisms increased. Taking this into account and based on some experiments carried out in the republic, spraying diluted fertilizers on cotton mixed with a 2% suspension of sulfur soaked in water solves three issues at once: feeding cotton with leaf orca, fighting crop-sucking pests, and increasing the resistance of cotton to pests and diseases. .

In the conditions of the Bukhara region, the yield is decreasing due to the increase of pests, diseases and weeds of agricultural crops in the following years. To prevent this, instead of harmful chemicals, it is advisable to use biological control methods and harmless substances. One of the factors for the further improvement of the agricultural economy is the perfect development of measures to combat the powdery mildew (oidium) disease in vineyards . This disease increases in the years of high irrigation, and in the year when there is no treatment against it, up to 80-86% of vineyards can be affected by powdery mildew.

Due to the fact that this disease is rapidly increasing in the following years and its damage is increasing excessively, the need to find measures to combat it is reflected in the decisions issued by the Cabinet of Ministers of the Republic of Uzbekistan. In the complex of measures, the use of

sulfur drugs against these diseases has a special place, because this drug is considered dangerous for the external environment. However, these preparations are not without some drawbacks.

Work progress

When applying the anti-sulfur drug against the disease, it adheres less to the plant and its leaf surface, and some of them do not mix the sulfur powder with water and do not form a suspension, and as a result of provard, it becomes unusable for use. Various sulfur colloids, which form a suspension, have the property of quick adhesion. Based on these, it is necessary to improve the use and preparation of sulfur preparations at the present time. In 2022-2023, research was conducted on the use of sulfur suspension in stable form and development in the farms of Bukhara region, the experimental farm of Bukhara State University, and the farms of Kalmoq MFY of Jondor district. The conducted experiments proved that it is possible to obtain a stable suspension from sulfur powder. Also, the application of sulfur suspension containing surfactant (SFM) against powdery mildew (oidium) disease in the vine in the conditions of Bukhara region and determining its standards and concentration were studied in field conditions. At the same time, the effect of this drug on the vine and its productivity was also analyzed. Experiments are carried out with the help of a hose sprayer of the OVX-28 tractor after the vine has fully bloomed in the following variants:

1. 600 l/ha with 1% sulfur suspension containing 0.15% SFM.
2. 600 l/ha with 2% water
3. Therefore, 800 l/ha with 2%
4. Therefore, 800 l/ha with 2%
5. Therefore, 600 l/ha with 3%
6. Therefore, 800 l/ha with 3%
7. E.c. with 80% of sulfur. (soluble powder) spraying in the form of a 2% suspension at 600 l/ha
8. Tokkin Omayt drug 30% e.c. spraying with 0.5% suspension at 600 l/ha
9. Control 600 l/ha.

Each variant consisted of 3 replicates, and the area of one replicate was 0.5 ha. Treatment with chemical preparations was carried out on June 6, 2022-2023. One day before processing and on the 5th, 10th, 15th, 20th and 25th days after processing, the spread of powdery mildew was calculated according to the point scale and its biological efficiency was analyzed. In the experiment, SFM is taken in an amount of 0.15% compared to the working fluid. As a result of the experiment, it was clear that the suspension of sulfur with SFM in the amount of 0.15% showed a high biological efficiency against powdery mildew in grapevine compared to both comparison options. As a result of the experiments, the application option of 600 liters per hectare of 2% suspension of SFM added sulfur had a high result. Biological efficiency was slightly higher in the comparison option when applying 80% of sulfur, but the amount of pollen in the vine was higher than its economically dangerous threshold number on all reporting days. This, of course, had a negative effect on productivity. In the grape fields where the second control option Omayt was used, its efficiency was higher than the 7-day period. In the remaining days, the amount of flour-dew increased sharply, and as a result, it became necessary to carry out repeated processing. As part of the experiments, the sulfur suspension stored by SFM was 15.8-21.2 t/ha higher than the growth and development of vines at all application rates.

Summary

It is known from the conducted experiments that the suspension of sulfur containing SFM in the amount of 0.15% showed higher efficiency in the fight against powdery mildew in vines than the soluble powder of 80% sulfur or the soluble powder of Omayt drug containing 30%. Therefore, it was determined that a suspension of sulfur containing 0.15% SFM, 80% or Omayt can be reliable.

Also, application of 600 l per hectare of 2% suspension of sulfur containing 0.15% SFM against powdery mildew and flowering of vines in the soil climate conditions of Bukhara region is highly effective and has created an opportunity to get an additional yield of 15-21 t/h.

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