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METHODS OF COMBATING DISEASES OF FRUIT TREES

Andijan agriculture and agro technologies Institute
Acting assistant professor of Andijan agriculture and agro technologies Institute, PhD
Turdiyeva Dilfuza Tirkashboyevna

Аннотация. В условиях Андижанской области в полевых опытах изучена эффективность применения фунгицидов против курчавости листьев персика осенью в период опадения листьев. Биологическая эффективность препаратов с д.в. дифеноконазол (Раёк 25% к.э.) и крезоксим-метил (Устроби 50% в.д.г.) была самой высокой и составила, соответственно, 86-93% и 85-89%. Эффективность комплексного препарата с д.в. хлорокись меди + цимоксанил (Ордан 73% с.п.) и пенконазола (Топоз Икс 10% к.э.) была ниже и равнялась 65-70% и 65-79%, соответственно.

Ключевые слова: персик, курчавость листьев, *Taphrina deformans*, борьба, фунгицид, дифеноконазол, крезоксим-метил.

Abstract. The efficacy of fungicide spraying against peach leaf curl disease at leaf fall stage in autumn has been evaluated in the conditions of the Andijan region in field experiments. The biological efficacy of difenoconazole (Rayok 25EC) and kresoxim-methyl (Ustroby 50WDG) was the highest and amounted, respectively, 86-93% and 85-89%. The efficacy of the complex formulation copper chlorine oxide + cymoxanil (Ordane 73WP) and penconazole (Topoz X 10EC) was lower and equaled 65-70% and 65-79%, respectively.

Key words: peach, leaf curl, *Taphrina deformans*, control, fungicide, difenoconazole, kresoxim-methyl.

Diseases and arthropod pests (insects and ticks) always coexist in all crops. For this reason, both of the above systems are practically a single, complex system, which is applied together in the field or garden and includes the fight against all pests in the crop. Its common name is the Integrated Disease and Pest Management System (IDPM; sometimes abbreviated as IPM). When developing a control program to achieve the highest biological and economic efficiency in disease control, it is necessary to have all relevant information about the crop, pathogens, disease history of previous seasons, disease resistance of the variety, expected weather conditions, growing location and costs are given. In some cases, if the crop is at risk of a specific underlying or single disease (e.g., apricot klyasterosporiosis or peach leaf wilt disease), a IPS program is designed to plan to combat that source of risk. IP systems imply the following.

1) to determine the incidence and development of disease species in plants; loss of primary inoculum in the crop or reduction of its quantity and effect;

2) not to eradicate pathogens, but to keep their quantity at a level that does not cause economic damage to the crop, while ensuring that the negative impact on the environment is minimal;

3) ensuring a high level of agricultural technology for the cultivation of plants that are resistant to adverse conditions and complete, including the application of special agro-technical measures that reduce the number of particularly harmful phytopathogens;

4) increase the resistance of the host plant; planting of disease-resistant and pest-resistant (tolerant) crop varieties; delay the onset of the disease; reducing the number of pathogen-producing offspring by slowing disease progression;

5) regulation (reduction) of the number of phytopathogenic organisms and selection and application of means and methods that not only stop, but also activate their activity, while maintaining the number of natural antagonistic microorganisms;

6) implementation of effective measures to reduce the amount of pests, primarily the use of biological and chemical agents after a detailed analysis of the agrobiocenosis and an objective determination of the expected level of disease development.

The methods used in IPS should not harm beneficial organisms in nature. One of the important conditions of IPS is the use of disease prevention methods as much as possible and the creation of unfavorable conditions for the emergence and development of the disease.

Thus, IPS is the most optimal combination of biological, agrotechnical, chemical, physical and other methods recommended against a complex of diseases (and pests) in a particular ecological-geographical region, a particular crop type, which, while maintaining the number of beneficial natural organisms, phytopathogen a system aimed at reducing the number of organisms to a level that does not harm the farm.

The IP system is prepared separately for each crop type grown in a particular region, taking into account the specific characteristics of the region and crop type and other conditions. Applying the IP system scheme prepared for one ecological-geographical zone mechanically in another region does not give good results.

Successful application of the IP system in practice involves the use of agro-technical preventive methods, primarily disease-resistant varieties. Cultivation of such varieties not only reduces the number of chemical treatments, but also radically improves the ecological condition of agrobiocenoses, reduces pollution of the environment and agricultural products with pesticide residues. Adherence to crop rotation schemes, planting times, tillage, and fertilizer application rules can often protect plants without the use of chemical methods.

Chemical, biological, physical and other methods aimed at actively reducing the number of pests in the IP system are applied taking into account the expected level of development of these organisms, the planned yield, "threshold criteria" of phytopathogenic organisms and economic damage.

The use of a IP system rather than the use of a separate control measure ensures that the economic performance of phytosanitary measures is high, while environmental requirements are fully met, and adverse effects on natural agrobiocenoses and nature in general are minimal (Popkova et al., 2005; Agrios, 2008; Alston et al. , 2012 and b).

The most important element of IPS is that the specific information collected about the presence of a particular disease (and pest), when it occurred, and at what stages of development were observed, is recorded in a special workbook - a diary. This book also includes important, detailed information about the fungicides used against the disease, the prevalence and development of the disease during treatment, the biological and economic efficiency obtained as a result of treatment. These data can serve as a basis for short-term (weeks, months) forecasting of disease and pest development and selection of the most optimal control measures against them (Hetherington, 2005).

In order for the seedlings to grow, develop and not get sick until they start to bear fruit after transplanting, it is necessary to feed them with fertilizers in a timely manner, watering, bushing and treating them against pests and diseases common in this region. It is necessary to pay more attention to the period of fruiting of trees, to take measures to combat any disease that occurs in them. All trees with diffuse disease caused by a systemically developing pathogen (e.g., virus, phytoplasma) in the body should be dug up and destroyed as soon as possible.

In gardens, the fight against diseases (and pests) can begin during the winter, when it is necessary to pick up, burn, or bury the weak, diseased or dead twigs, branches and hanging fruit. This measure will reduce primary sources of infection by phytopathogenic fungi and bacteria next spring. For this purpose, the garden should also collect and remove fallen leaves, fruits and twigs, or spray the soil with fungicides or biological control agents. Each time after processing (before processing a new tree) it is necessary to disinfect the work tools with a special liquid. Shrubs should be sprayed with one of the fungicides as soon as possible (such as benomyl) to prevent cancer-causing fungi from entering the scars.

Many fungi and bacteria (as well as insects and canals) are also active in the weather during spring budding, so trees should be treated with a fungicide-bactericide or other simple fungicide and insectoacaricide mixture, such as Bordeaux liquid, before the buds burst. . Later, when the buds open, usually the

flowers and leaves become very resistant to pathogenic fungi and bacteria. For this reason, they should be sprayed again with a fungicide and / or bactericide, and possibly with an insect acaricide that is harmless to bees, in the form of a tank mixture. If it is not possible to mix the pesticides, each of them should be sprayed separately. During this period, when flowering lasts several days, when new flowers continue to open, and when the leaves grow rapidly, many fungi release spores into the air, and bacteria also spread in large numbers by rain and wind; during this period, flowers and leaves may need to be protected with a systemic fungicide. If only a protective fungicide (or bactericide) is available, the trees should be treated once every 3-5 days. If the fungicide still needs to be added insectoacaricide, it should not be poisonous to pollinating bees. The longer the weather conditions are maintained and the longer the plant tissue continues to grow, the longer the regular treatments with pesticides should be continued. In this case, processing times are based on weather forecasts. In developed countries, computer programs are used to determine when to start gardening and how often and when to continue (Hetherington, 2005; Agrios, 2008; Bazdyrev et al., 2014).

Fruits are often resistant to certain staining and rot-causing fungi from the time of ripening to the time of harvest as well as during storage. For this reason, the fruits need to be sprayed with appropriate fungicides every 10–14 days before harvest. These fungi often enter the fruit from areas damaged by insects, so insecticide spraying is also continued. To protect the fruits from damage, they should be carefully picked and placed in containers. Containers used for picking fruits should be clean, free of rotten debris, packaging and warehouses should be clean, disinfected with formalin, sulfur dioxide or any other fumigant. In many countries, harvested fruit is washed with water containing a fungicide or biological agent, and this measure protects the fruit from damage during storage and transportation. Before packing, the damaged and damaged fruit is separated and discarded. Fruit warehouses, transport used for transportation and storage containers should be refrigerated during the period of sale (Agrios, 2008).

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