

Important information for fruit growers!

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With the warming of the weather in February and March, the trees are planted in the new orchards, if this has not been done in the autumn after the end of vegetation.

Orchards occupy the same area for a prolonged period of time. Their establishment requires substantial financial resources and labour, which necessitates that growers comply with the basic requirements of the individual crops. In addition, they must take into account the current consumer requirements for fruit free of residual amounts of pesticides, as well as for the protection of soil and water from pollution.

Sites for new orchards must meet the biological requirements of the fruit species and cultivar. Furthermore, the protection of fruit trees from pests must be considered already at the stage of establishing the new plantations.

For a period of 4 years, orchards must not be established on sites that were previously occupied by the same species. It is very important that orchards are established on areas where there is no infection of bacterial canker caused by *Rhizobium radiobacter* syn. *Agrobacterium tumefaciens*.

The most reliable way to reduce the use of pesticides is the selection of cultivars that are resistant or less susceptible to economically important diseases.

When establishing an apple orchard, it must be borne in mind that apple scab (*Venturia inaequalis*) causes the greatest damage to producers, a problem that can be solved by planting resistant cultivars. Worldwide, more than 150 scab-resistant cultivars have been developed. The more widespread are: Prima, Priscilla, Sir Prize, Liberty, Jonafree, Redfree, Freedom (developed in the USA); Macfree, Novamac, Moira, Brightgold (Canada); Florina, Judeline (France); Pioneer, Romus-1, Romus-2, Voinesti (Romania); Rubinola, Topaz, Rajka (Czech Republic); Gavin (England); Rebella, Regine, Revena, Reglindis (Germany), of which Rebella is also resistant to fire blight.

Plum pox (sharka) is caused by a virus and is the most harmful disease of this fruit species. So far, the only way to prevent damage from sharka is to plant plum cultivars that are resistant or tolerant to the disease. The cultivar Jojo is resistant, while Stanley, Cacanska Najbolja, Cacanska Lepotica, Altanova Renkloda, Hanita, Tegera and others are tolerant.

Brown rot of cherry and sour cherry (*Monilinia* sp.) is also a serious problem in years with frequent rainfall during the ripening and harvesting of the fruit. In cherry, fruit cracking is the main reason for their infection with the causal agents of rot. To reduce fungicide treatments and losses from rot, cultivars that are relatively resistant to cracking are recommended. In numerous publications from various European countries, the cultivars Lapins, Regina, Sam, Germersdorfer, Merton Marvel, Castor, Kordia are cited as slightly susceptible to cracking.

In certain years, peach leaf curl (*Taphrina deformans*) causes significant damage to producers. So far, among the cultivars grown in our country there are no cultivars resistant to the disease, but there are such as Redhaven, Benedikte, Cherven Ellerstädter, Suncrest and others, which are less severely attacked.

Before establishing orchards, careful consideration must be given not only to the selection of cultivars, but also to the planting scheme, especially if the orchard is mixed. In arranging the species and cultivars, it is essential to take into account pollination and the protection of the trees and fruit yield from pests. A well-thought-out planting scheme of the orchard is a prerequisite for reducing the use of pesticides throughout the entire period of cultivation of the fruit species.

The different susceptibility of apple, pear, cherry, sour cherry and plum cultivars to the most economically important diseases, the different ripening periods of the fruit and the flowering phenophases allow the application of differentiated plant protection. In this way, unnecessary spraying of individual cultivars is avoided.

Differentiated plant protection requires that orchards be established according to schemes consistent with the susceptibility of the cultivars to diseases and the ripening periods of the fruit.

All this can be substantiated with specific examples for the individual species.

For scab-resistant apple cultivars (listed above), it is not necessary to treat against scab, while for the others between 8 and 14 treatments are required, depending on the meteorological conditions during the year and the degree of susceptibility of the cultivar. In plantations with highly susceptible and scab-resistant cultivars, they must be arranged in such a way that they can be sprayed differentially.

The same requirement is mandatory with regard to cultivars with different susceptibility to powdery mildew, bearing in mind that for the protection of slightly susceptible cultivars a minimum of 2 and a maximum of 4 sprays are carried out, whereas for highly susceptible ones – from 5 to 10.

The main pest in bearing apple orchards is the codling moth (*Cydia pomonella*), against which control must be carried out annually. The ripening of the fruit of the summer cultivars usually begins at the end of June and in July – Vista Bella, or in August – Mollie's Delicious, Prima, etc., which creates problems in protecting apples from codling moth and California red scale in orchards where the planting scheme does not allow differentiated spraying. In such orchards, even after the harvest of the summer cultivars, the treatment of the trees against codling moth continues due to the impossibility of excluding them, which not only increases the cost of fruit production, but also unnecessarily pollutes the environment. In orchards where the planting scheme allows cultivar-specific plant protection, two insecticide treatments are eliminated for the summer cultivars. All this also applies to the pear and plum fruit moths.

The cherry fruit fly (*Rhagoletis cerasi*) shows selectivity regarding the degree of fruit maturity when laying eggs. It has been established that it prefers to lay eggs in ripening fruit, which is why in most years it does not cause worm damage in early ripening cherry cultivars such as Ranna Cherna Edra, Seneca, Bigarreau Burla, Early Laurie, Kosara and others, for which spraying is not necessary. For medium-ripening cherry cultivars one spray is needed, and for late-ripening ones – two sprays against this dangerous pest.

At high population density of the hairy beetle (*Epicometis hirta*) in cherry, sour cherry and apple plantations during the period of initial and rapidly increasing fruit set, spraying must be carried out at the flower bud phenophase, which occurs at different times in the individual cultivars. This also necessitates the implementation of differentiated control.

Growers who wish to reduce the use of pesticides in fruit crops must seek the advice of specialists in pomology and plant protection when choosing the site, suitable species and cultivars, and when drawing up the planting scheme of the orchard.