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Early spring care in fruit plantations

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- Agricultural producers who apply plant protection products in production are obliged to use only plant protection products authorized for use on the respective crop, pest, and at the respective dose, included in the **"List of Plant Protection Products Authorized for Placing on the Market and Use"**, published on the website of the Bulgarian Food Safety Agency (BFSA) at: http//www.babh.government.bg
- The purchase of plant protection products must be made only from traders holding a license for the activity and included in the **"List of Companies Granted a License for Wholesale Trade of Plant Protection Products, Retail Trade of Plant Protection Products in an Agricultural Pharmacy, Repackaging of Plant Protection Products, and Conducting Fumigation and Disinfection of Areas, Premises, and Plant Products against Pests"**, published on the website of the **BFSA**.

Directorate "Plant Protection and Control" at the BFSA

Early Spring Agrotechnical and Plant Protection Measures in Fruit Orchards

Disease/Pest	Control
Apple powdery mildew, pear scab, brown rot, black rot on fruit species, damage from bark beetles, wood-boring insects, leopard moth, apple clearwing moth, etc.	**Winter Pruning:** • early spring phytosanitary pruning before bud swelling – earliest on apple and pear as more cold-resistant, later on cherry, sour cherry, peach, and apricot • crown formation • removal of infected branches to reduce overwintering pest infestation and limit their spread during the active vegetation of the crops • cutting out dried branches and twigs, making cuts at a distance of 20–30 cm from the site of damage • removal of old cracked bark • cutting out caterpillar nests, egg clusters, and mummified fruits • sealing cuts with damp paint or white latex, to which a copper-containing fungicide is added, or using a ready-made fruit tree sealant for better callusing and protection against secondary infections
Apple and pear scab, white rust on cherry and sour cherry, red leaf spot on plum, cherry fruit fly, black plum fruit wasp, etc.	**Soil Cultivation:** • plowing under fallen leaves to destroy the overwintering stock of diseases in the leaves and pests in the soil • during soil cultivation, avoid injuring the root system to prevent infections with bacterial canker and root rot pathogens • the depth of plowing is determined by the age of the plantation and the type of rootstock
Control:	**Winter-Spring Chemical Treatment:** Carried out after bud swelling, before bud burst, and after performing winter pruning. • **Against diseases** – with 1% *Bordeaux mixture*, to protect fruit species from infection with *peach leaf curl, shot hole disease on stone fruits, early brown rot, bacterial dieback, plum pox*, etc. • Against pests – with 2–3% *Para Sommer* (75% *paraffin oil*), upon detection of: ◦ *European red mite* – 60–80 winter eggs per 10 cm of twig

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Disease/Pest	Control
	◦ *Aphids* – 10% of buds with eggs ◦ *Leafrollers* – 3–5 egg clusters per tree ◦ *San Jose scale* – upon confirmed presence ◦ *Plum scale* – 20–30 individuals per 100 cm of scaffold branch • To achieve a high-quality and maximally effective winter-spring spray, the following conditions must be observed: ◦ treatment should be carried out in dry, warm, and calm weather with an air temperature above 5 °C and wind speed up to 2–3 m/sec ◦ high application rate of working solution (100–120 l/decare) for abundant spraying (drenching) of trees from the top to the base of the trunk ◦ the sprayer nozzles should have openings that ensure large droplets

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
Peach leaf curl, nectarine, apricot	Taphrina deformans • fungus	• single or numerous, pale yellow, pale green, or crimson swellings on the upper leaf surface, sunken on the lower side • thick, rough, and wavy curled tissues	• the disease pathogen overwinters as ascospores between bud scales or on the bark of infected shoots • infection occurs with the bursting of leaf buds
Control:	• Spray with 1% *Bordeaux mixture* before bud swelling. • Upon bud swelling, conduct 1–2 more treatments at 10-day intervals. • **Registered fungicides**: Dithane M-45 – 0.3%, Dithane DG – 0.3%, Sancocide 80 WP – 0.3%, Score 250 EC – 0.02%, Thiram 80 WG – 0.3%, Funguran OH 50 WP – 0.15%, Shavit F 72 WDG – 0.2%, Champion/Macc 50 WP/Champ WP – 0.3%.		

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
Fire blight on pome fruit species – pear, quince, apple, medlar	Erwinia amylovora - bacterium	• young shoots curved shepherd's-crook style from the tip downwards and dried out • branches with dried leaves and fruits • diseased leaves curled like funnels remain on the tree even after leaf fall	• the bacterium overwinters in cankers formed on trunks, branches, and twigs of trees • in spring, bacterial exudate forms on the cankers, which is spread by tools during pruning, by rain, wind, hail, birds, insects, by bees during pollination

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
		• entire dead trees, with un-shed flowers, leaves, and fruitlets, which have a scorched appearance • during and after flowering, the first lesions are observed on fruit-bearing trees • flowers and pedicels turn brown, dry out, and most remain attached • necrosis quickly spreads to adjacent flowers from the pedicels and adjoining shoots • in humid and warm weather, infected parts become covered with droplets of exudate • on pear and quince, the necrotic areas blacken, while on apple and medlar they are dark brown • cankers form on twigs, scaffold branches, and trunks • around the site of damage, the bark cracks and turns yellow	• over long distances, the bacterium is transmitted through planting material and scions from diseased plants

Control:

- Before bud swelling it is necessary to:
  - cut out infected branches 50–70 cm below the boundary between diseased and healthy tissue
  - collect and burn infected branches
  - uproot and burn severely infected trees
  - pruning of healthy trees is performed before that of diseased ones
  - after each cut, tools are disinfected with a 10% bleach solution, 2% formalin, or denatured alcohol diluted with water 1:3, for 2–3 minutes
  - wounds are coated with white latex with the addition of a 1% solution of a copper-containing fungicide
- Maintain an optimal N-P-K balance, avoiding excess nitrogen:
  - the early spring nitrogen fertilization should be split, with half the amount applied a month before the start of growth, and the remaining part – after petal fall
- Before bud burst, perform a late spray with 2% *Bordeaux mixture* or other copper-containing fungicides.
- Do not purchase planting material or take scions from areas where the disease is widespread.
- Plant only healthy planting material, selecting resistant varieties.

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
		• During the growing season, conduct observations and upon detection of sources of secondary infection, remove them immediately with disinfected tools. • Use copper-containing products, performing from 4 to 8 sprays, under conditions (temperature and moisture) favorable for disease development. • Protective sprays during flowering and after hail are particularly important, when the bacterium most easily penetrates plant tissues.	

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
Common pear psyllid on pear 	Psylla pyri	• adults, larvae, and nymphs suck sap from buds, leaves, flowers, fruits, and shoots • while feeding, psyllids excrete "honeydew", which contaminates the attacked parts, as sooty mold fungi develop secondarily • causes premature aging of shoots, twigs, and leaves, increasing their nitrogen content • vector of mycoplasma, clogging the conducting vessels → exhaustion and death of pear trees during mass multiplication	• overwinters as an adult under fallen leaves, in cracks, under old cracked bark on the trunk, and in other suitable places
Control:		• Treatment in the first warm days of February or March when the temperature remains above 5–8 °C for three or more days. • The control is against adults when they leave overwintering sites and move onto the short and spur-bearing twigs of the pear tree. • Economic threshold – 1 adult and 8–10 eggs per 8–10 spur-bearing twigs. • **Registered insecticides**: *Vaztak Nov 100 EC – 0.02%, Deca EC – 75 ml/decare, Decis 2.5 EC – 0.03%, Decis 100 EC – 12.25 ml/decare, Sineis 480 SC – 30–43.7 ml/decare, Sumi alpha 5 EC/Sumicidin 5 EC – 0.03%.*	

Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
San Jose scale – attacks about 200 plant species, mainly apple and pear	Quadraspidiotus perniciosus	• sucks sap from the bark of the trunk, branches, twigs, fruits, and leaves • under heavy infestation, the bark cracks and dies	• overwinters as a first-instar larva on the bark of twigs and the trunk, which completes its development during the flowering of apple trees

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Disease/Pest	Causal Agent	Symptoms/Damage	Life Cycle
		• individual branches dry out, and later the entire tree dies	
Control:		• During the non-vegetative period, control is directed against the overwintering stage – the larvae. • Before bud swelling on apples and pears, perform a treatment with the registered product *Para Sommer – 2% (75% paraffin oil)*, which acts by asphyxiation – forming an oil film that covers the scale of the overwintering larva and deprives it of oxygen, causing it to die. • When treating with *3% Para Sommer*, the overwintering eggs of the **European red mite** are also destroyed, upon detection of a density of 60–80 winter eggs per 10 cm twig on apple and 40–50 eggs per 10 cm twig on pear, as well as action against **scale insects, aphids, plant bugs**, etc. • The product can be added to the fungicide solution or used alone	