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# Agrotechnical activities in the orchard in September

**ас. Кирил Кръстев, Институт по декоративни и лечебни растения – София**

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September may mark the beginning of a more noticeable transition to autumn weather. This month is expected to be more dynamic, with alternating warm periods and intrusions of cooler air. The month is not expected to be consistently cold, but the probability of prolonged heat gradually decreases. Agrometeorological conditions will be determined by temperatures above climatic norms and precipitation around and below the monthly norm. The precipitation that fell during the past August - local and in most of the country, with the exception of places in the northeastern and southwestern regions, is below 30% of the monthly norm.

During the first and the beginning of the second ten-day period of September, a probability of short-term precipitation is forecast, but after the deepened summer drought, they will not lead to a significant change in the condition of the upper soil layers.

In the first days, periods of sunny and warm weather are possible, especially in the lowlands and southern regions. Temperatures on some days can reach 29–35 °C, and locally slightly higher values.

Gradually, however, the atmosphere is expected to become more unstable. With the passage of atmospheric fronts and the intrusion of cooler air, the probability of precipitation and thunderstorms will increase. Particularly interesting may be the afternoon hours, when local heating is still strong enough for the development of cumulonimbus clouds. Short-term but intense precipitation, accompanied by thunderstorms and temporary wind intensification, is not excluded. The risk will not be the same for the entire country. A higher probability of precipitation may exist in Western and Central Bulgaria, the mountainous regions and the northern parts of the country, while in Southeastern Bulgaria and along the Black Sea coast, dry periods will more often persist.

Overall, temperatures during the first ten-day period are expected to be around or slightly above climatic norms at the beginning, then gradually decreasing.

At the end of the period, maximum temperatures in many regions can already more often be in the range of 23–29 °C.

During the second ten-day period, more frequent intrusions of air from the north and northwest are possible, and with a suitable synoptic configuration –

also from the northeast. This may lead to a noticeable decrease in temperatures after the passage of atmospheric fronts. On some days, maximum temperatures may remain around 20–26 °C, and with a more serious intrusion – even lower. Mornings will already become noticeably cooler. In the valleys and high fields, minimum temperatures may drop to 8–13°C, and with clear and calm weather, locally below these values. In the mountains, autumn will begin to be felt even more noticeably.

Significant precipitation processes may form over Southern Bulgaria, the Rhodopes, Strandzha and the southern regions of the country. At the same time, with the passage of cold fronts, there will be conditions for short-term, locally heavy precipitation and thunderstorms. It is not excluded that the weather will change rapidly – from warm and sunny to cloudy, rainy and significantly cooler within 24–48 hours.

The signals for the third ten-day period of the month point to a continuation of the more dynamic weather characteristic of the transition between summer and autumn. New warm periods are possible, but the probability of sustained hot weather will already be relatively small. On individual days, temperatures can again reach 25–30 °C, especially with the transport of warmer air from the south.

Towards the end of the month, the autumn character of the weather will be felt more and more often. Mornings will become cooler, and in the valleys and high fields, values around 5–10 °C are possible. In the mountains, temperatures will be significantly lower, and with the intrusion of cold air, the first more serious winter manifestations are possible in the highest parts of the mountains. Along the Black Sea coast, the sea will continue to have a moderating influence and temperatures there will decrease more slowly.

The leaf apparatus of the trees photosynthesizes actively, providing assimilates for feeding the fruits, differentiation of fruit buds and deposition of reserve nutrients. The more timely the fruits are harvested, the better the trees store nutrients, the more easily they tolerate low winter temperatures and bear fruit normally the following year.

Earlier than usual, during the third ten-day period of September, the later wine grape varieties will reach technological maturity. The forecast sunny and warm weather on most days of the month will be a prerequisite for the synthesis and deposition of more sugars in the grapes and fruit of the fruit trees.

*In fruit tree nurseries*

Care for the seedbeds continues – they are watered during drought and cultivated. Care is taken that the rootstocks do not sprout.

The ties used after budding are inspected and, if there is a risk of constriction, they are loosened.



No later than the middle of the month, the budding (bud grafting) of the rootstocks in the first-year nursery is completed.

The soil in the nurseries, compacted by the grafters, is cultivated.

The soil in the second-year nursery is also cultivated.

The clearing of the mother plantations from impurities continues. Now is the most suitable time for identifying the rootstocks.

*In fruit tree plantations*

In order for the wood to harden well, care in young plantations is aimed at timely cessation of growth. However, during prolonged drought, especially for pome fruits, moderate watering is recommended.



The harvest of autumn-winter apple and pear varieties begins. The harvested produce is transported and sorted. The moment of harvesting the fruits must be correctly determined. The harvest maturity of the fruits can be determined by the following complex of signs:

- Force of fruit retention. At harvest maturity, the fruits separate easily from the wood bearing them.
- Clarification of the color of the skin and flesh.
- Firmness of the fruit flesh. A certain degree of maturity corresponds to a certain firmness of the fruit flesh. It is determined with a penetrometer.
- Age of the fruit. For each fruit species and variety, a genetically determined period from flowering to harvest maturity corresponds. For late apple varieties, it is 130-146 days, and for late pear varieties – about 120 days.
- By starch test. The method is based on the ability of starch to stain blue under the influence of iodine. At optimal harvest maturity, 1/3 to ½ of the cut surface stains blue.

At the end of summer, fruits increase their weight by 1-2% per day, so very early harvesting leads to significant losses. In addition, early harvested fruits do not have the typical organoleptic complex of the variety and do not acquire it during post-harvest ripening. In late harvested fruits, the percentage of damage from physiological breakdown of the fruit flesh increases, a mealy consistency and glassiness occur.

The fruits are brought into the fruit storage facilities and the chambers are loaded. The proper storage of the fruits is monitored.

The optimal temperature for fruit storage is about 0 $^{o}$C, at relative air humidity of 85-90 %. The air in the refrigeration chamber must be subjected to circulation. Air replacement during the first month of storage is done weekly, and later once or twice a month.

Harvesting of late plum varieties is carried out – Strinava, Gabrovska, Angelino.



Walnut fruits are harvested en masse. The fruits of some late peach varieties are harvested.



And towards the middle of the month, the harvest of almond fruits begins. The most suitable moment is when the fleshy hull is completely open, but before it has dried and adhered to the shell.

*In strawberry plantations*

If necessary, strawberry plantations are irrigated – both young and old.

The planting material for establishing new plantations is lifted and stored.

Depending on the planting time, strawberry planting material is lifted from the mother plantations from the end of August to the end of November. For autumn

planting, it is lifted earlier, and for storage in a refrigerator and for summer planting, later, but at an air temperature not lower than 0 $^{o}$C. From the plants intended for autumn planting, after lifting, those damaged by diseases and pests are removed. The rest are cleaned of runners and dry leaves, tied in bundles of 25 or 50, placed in crates or other containers and stored until planting, with care taken that the roots do not dry out.

The plants that will be stored in a refrigerator are lifted and defoliated. The roots are cleaned of adhering soil by shaking off or washing with water. The plants are moistened well and placed 500 each in polyethylene bags (35 - 40 x 45 - 50 cm). A label with the name of the variety, the class and the number of plants is placed in each bag. The bags are stored hermetically and are stored at a temperature of -2 $^{o}$C. The air humidity in the refrigeration rooms is maintained above 90%.

Autumn planting of the planting material in the new plantations is carried out. Immediately before planting, the roots of the plants are cut to a fresh living part, without excessive shortening. To reduce evaporation the old leaves are removed.



The planting of the plants is carried out at a depth as they were before lifting or slightly deeper, with care taken that the roots are not bent and the bud is not covered with soil. The soil around the planting material is pressed well and watered. With early planting dates, watering is repeated, and with late ones – after about 7 days. After about a week, the establishment is checked and the places of failed plants are filled in. Until the end of autumn, watering is done 2 - 4 more times.

*In raspberry plantations*

The mother plantations are cleaned of weeds. Young and fruiting plantations are cultivated regularly. The fruited canes are cut, removed and burned (if this was not done in August). The preparation of the areas for new plantations continues.

*In blackcurrant plantations*

During drought, watering has a very good effect. Depending on the needs, watering is done 1-2 times. The soil is cultivated regularly.

The rooting beds are watered 1-2 times. The soil is cultivated and maintained loose and clean of weeds.



The areas for the new plantations are prepared – fertilizing is carried out (3-5 t of farmyard manure, 80-100 kg of superphosphate or the same amount of another phosphorus fertilizer, 25-30 kg of potassium sulfate or the same amount of another potassium fertilizer per decare), deep plowing.

*In plantations with other crops*

The summer grafting of Caucasian persimmon with buds from Japanese persimmon is completed.

A check is carried out for the establishment of the buds and, if necessary, loosening of the ties is done.

After the grafted shoot of the lemon grows to 10-15 cm in height, the rootstock is cut without a stub above the grafting site. To straighten and tie the shoots, small stakes are driven in.




The harvest of figs continues.

The soil in the plantations, seedbeds and nurseries of the southern crops is maintained loose and clean of weeds.

If necessary, regular irrigation is done, especially for actinidia (kiwi).

Care continues for the green cuttings of kiwi, aronia, sea buckthorn, etc., set for rooting at the beginning of July.

The hardening process begins. Gradually, the number and duration of misting are reduced. Gradual ventilation of the vegetative facilities is carried out.

*In vineyard plantations*

In September, the harvest of medium-ripening dessert varieties continues and the grape harvest of wine varieties begins.



Technological maturity is established by physicochemical and chemical means, monitoring every 6–7 days the change of sugars and total acids in the grapes. Technological maturity is considered to be that moment when the amount of sugars and total acids in the must reach values and a ratio most favorable for the type of wine. Grapes with