Improving the processing of raspberry by freezing**

Aleksandar Leposavić1*, Milinko Ristić2, Branko Popović1, Olga Mitrović1, Snežana Stevanović3, Biljana Veljković4

1 Fruit Research Institute, Čačak, Serbia
2 Metal inženjering, Ivanjica, Serbia
3 Faculty of Agriculture, Institute for Technology of Food Production, Belgrade, Serbia
4 Faculty of Agronomy, Čačak, Serbia

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SUMMARY

Raspberry fruit is very sensitive and susceptible to rapid decay. The decline in quality starts practically from the moment when the fruit is picked. Fruits initially lose strength, then release the juice, intensify the development of mold and at last the rotting process starts.

The goal of all technological processes after harvest is to stop the degradation and loss of fruit quality.

This is achieved by deep freezing in cold
Today, about 90% of harvested raspberry fruits in the Republic of Serbia freezes. In the world, there are several methods for freezing fruits and other food products. In our country, two main methods for freezing raspberry fruits are used: freezing in the classic tunnels and freezing in the flow-through tunnels (fluidizer).

Freezing in flow-through tunnels, which have a much higher daily capacity compared to conventional, is mainly applied in large cold storage. The introduction of sophisticated processing equipment in cold storage in recent years has significantly improved the processing of raspberry by freezing. With this improvement a significantly higher percentage of higher quality categories of frozen raspberries is achieved.

Key words: Raspberry, fruit, freezing, processing equipment, quality categories
The flow-through tunnels (fluidisers) possess a considerably higher daily freezing capacity compared to the classical systems and are typically used as part of large cold storage facilities.

However, in recent years the largest quantities of raspberries are frozen in small freezing facilities, typically located in the close vicinity of raspberry plantations, sometimes even within the plantation itself.

Regardless of its capacity, a cold storage must provide the required conditions and the space for the following functions: (1) quantitative and qualitative reception – a loading dock; (2) under-cooling (cooling chamber); (3) freezing (one or several small chambers with 1-10 tons capacity per batch); (4) storage of frozen raspberry in the original form (freezing chamber); (5) processing of frozen raspberry; (6) storage of finished products; (7) dressing room; (8) canteen; and (9) hygiene-sanitary unit (toilets, bathrooms).

The units specified under 1 to 9 above must be located under the same roof.

The paper presents the enhanced method of processing frozen raspberry in the market of the Republic of Serbia, depending on the capacity of the cold storage.
Technological methods of raspberry freezing

The technological method of processing fresh into deep-frozen raspberries consists of the following stages:

Reception of raw material. The reception of fresh raspberry represents the first stage in the technological method of converting the fresh into deep-frozen raspberry. The reception is typically performed at the loading dock or under the open sheds, which are an integral part of the cold storage facility. During the reception, the quantitative and qualitative condition of the fresh raspberry is determined (Veljković et al., 2010).

In order to assess the quality of raw material at the reception, mechanical analysis of the fruit is performed, determining the category of the fruits. The quantity of the raw material is determined following the quality assessment, by measuring the load at the weighing station or adequate smaller scales.

Under-cooling is performed immediately after the qualitative reception of the fresh raspberries, when these are taken to the under-loading chamber, where the temperature is lowered by the required standard. Since raspberry represents a perishable raw material, the lowering of the temperature to the pre-set level (between 0 and + 4°C) stops the activity and development of micro-
organisms, thereby terminating the processes of fermentation and disintegration of the raw material.

Freezing. Premises where freezing of the fresh raspberry takes place are usually referred to as classical freezing tunnels.

Flow-through tunnels are modern devices capable of performing fresh raspberry freezing within 12 minutes. Entering the flow-through tunnel from the feeding side, the fresh raspberry is transported by the means of a conveyor belt along the tunnel, where it is exposed to the current of cold air. Within 12 minutes, the raspberry is frozen, before exiting the tunnel on the opposite side. The air temperature in the tunnel ranges between -30° and -35°C. The temperature of the frozen raspberry exiting the tunnel ought to be in the range between -16° and -19°C. Raspberry undergoing freezing in the flow-through tunnel must be first processed in the under-cooling chamber.

Classical or discontinued tunnels represent smaller-size rooms capable of sustaining a temperature of -35°C. By using powerful fans, air flow is generated inside the chamber itself. Inside these tunnels, the freezing of raspberry is performed with the fruits placed in plastic trays stacked onto wooden pallets. The classical tunnel is first filled with pallets containing fresh raspberry, before the tunnel is closed and the
Freezing system activated. The freezing process lasts between 12 and 24 hours, depending on the tunnel capacity. After the freezing is completed, the freezing system is switched off and the tunnel is emptied, thus completing the process.

The temperature of the raspberry frozen in the classical tunnel ought to be in the range between -17 and -19°C.

The flow-through tunnel represents an advantageous solution for the quality of raspberry freezing process, both owing to the shorter freezing time and the better quality of the freezing itself, making a positive impact on the preservation of organoleptic qualities of the frozen raspberry.

However, the classical tunnels secure a larger proportion of Rolend (owing to lower breakage of fruits).

Gauging (separation of raw material according to quality classes). Raspberry frozen in this way represents a semi-finished product in the processing sequence and is typically referred to as the ‘original’. Following this stage, it is best to separate the ‘original’ according to four quality classes, as follows:

- raw material for Rolend;
- raw material for bruh;
- raw material for grit, and
- block raspberry.

This type of fast sorting is enabled by vibration sorting machine, which can have a capacity of up to 4 t/h. This type of sorting must be performed immediately after the freezing, in order to secure the following:
- the processing capacities can have an instant assessment of the percentage of Rolend in the overall quantity of the ‘original’ raspberry;
- subsequent processing of raspberry is much easier, faster and more cost-effective; and
- response to the customers’ demands is much faster (grit, bruh and Rolend can be delivered immediately, which is not possible with unsorted ‘original’).

After freezing in classical tunnels it is recommended to leave the raspberry in the chamber for some time to settle down, before being reloaded out of the plastic trays. By doing this, a high proportion of Rolend is secured. Pouring over the raspberry and sorting it out into four quality classes is performed at the line composed of the following elements:
- Conveyor belt for reloading of raspberry;
- Vibration sorting machine with three fields; and
- Non-powered sloping roller bed.
The ‘original’ raspberry is poured from the tray to the reloading conveyor belt, where the operators perform basic inspection: removal of undesired particles (leaves, grass, pieces of broken trays, etc.), and separation of raspberry blocks.

The conveyor belt moves the raspberry to the vibration sorting machine, where it is separated into the raw material for grit, raw material for bruh and Rolend.

The non-powered sloping roll bed preserves the Rolend raw material from getting crushed, since the material constantly slides down the sloping side of the box.

When freezing is performed in a flow-through tunnel, the line for reloading and sorting is set at the exit from the tunnel, with the technological method being identical to the freezing performed in the classical tunnel.

Following the separation, the material is collected inside cardboard boxes with a polyethylene lining.

Storage. Each of the separated quality classes of the raw material (Rolend, bruh, grit) is stacked onto separate box pallets, before being taken to the storage chamber, where it is stored in its separate place. When doing this, care must be taken to secure an easy access to each of the respective raw material stocks, so
The raw materials are stored at the temperature of between -19 and -21° C.

Sorting. All of the quality classes of raspberry (raw material for Rolend, raw material for bru and raw material for grit and block) are sorted in the subsequent stage of processing. Sorting is performed in special rooms with controlled working temperature.

The most favourable temperature range for sorting is between 0 and +4°C.

Sorting of frozen raspberry is performed at a special line with a combination of elements depending on the size and capacity of the cold storage, which mainly follows the following classification:

I – Capacities of up to 500 t:
- vibration sorting machine,
- inspection conveyor,
- desk with lighting,
- scales,
- non-powered roll bed (placed at points where raspberries are collected inside boxes)
- plastic bags welding unit
- floor mats for standing operators.

II – Capacities of over 500 t:
- vibration sorting machine,
- separating conveyor
- inspection conveyor (two, three or four inspection belts connected into a system),
- collection belt for Rolend,
- collection belt for soft selection
- desk with lighting (two, three or four units),
- scales,
- non-powered roll bed (placed at points where raspberries are collected inside boxes)
- plastic bags welding unit
- floor mats for standing operators.

In recent years, there is a growing use of lasers in sorting of raspberry grit and raspberry bruh, whereas the Rolend raw material is still sorted manually in order to prevent whole fruits from crushing.

Laser-aided selection of fruits considerably reduces the number of operators needed for this operation, thus improving its cost-effectiveness.

In order to start the process of raspberry sorting, it is necessary to pre-define the desired quality classes beforehand (Milić et al., 2013). There are four most typical quality classes of frozen raspberry that are commonly used in practice: Rolend, bruh, grit and block.

While Rolend represents the principal product of frozen
продукт, другите три к тегориите предст вляв т техни вторични продукти. елът, който з ем т со ло з мр зени плодове от общото количество з мр зени м линови плодове, основно определя ико номическ т ефективност н це лия процес н производство и прер ботк н този вид плод, по р ди две групи основни ф ктори:

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- увеличеният дял н соло з мр зени плодове от оригил ните м лини пр ви възможно д се н м лят р зходите з р ботн сил приложен з сортир не, к то основен елемент от р зходит е в прер ботк т. д се илюс трир тов, средно един р ботник в хл дилното скл дово помещение н гр. риле, успял д прер - боти квот от 50 кг оригил н з седем ч сов р ботн смян, при условие че оригил път съдърж 15–20% соло з мр зени плодове. 

По определение на работника, при условия че оригиналът съдържа 15–20%РОЛЕНД, средно един работник в хладилното помещение в гр. Ариле, успява да преработи квота от 50 kg оригинал за седем часови работни смена, при условие че оригиналът съдържа 15–20% РОЛЕНД. Въпреки това, същият работник ще е в състояние да преработи 100 kg оригинал на 60–65% РОЛЕНД, или над 200 kg оригинал на повече от 85% РОЛЕНД (Petrović and Leposavić, 2011).

Processing procedure according to quality classes

Sorting of raspberry Rolend. As it was mentioned earlier, the quality of the frozen raspberry is ḳҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚҚ泉水

raspberry, the other three classes represent its by-products. The share occupied by Rolend in the total quantity of frozen raspberry fruits mainly determines the financial viability of the entire process of production and processing of this fruit type, due to two groups of basic factors involved:

- for a number of years, the price ratio between Rolend and other classes of frozen raspberry (grit, block, bruh) in the global market has been 2:1; and

- increased share of Rolend in the original raspberry makes it possible to reduce the costs of labour force deployed for sorting, as a major item in the total processing costs. To illustrate this, an average operator in the Arilje-based cold storage facility manages to process a quota of 50 kg of the original during the seven hours' working shift, provided that the original contains 15–20% Rolend. However, the same operator will be able to process 100 kg of original containing 60–65% of Rolend, or over 200 kg of original containing more than 85% of Rolend (Petrović and Leposavić, 2011).
Гауба на Роленд. През последните десетилетия, пазарът на товари от чистоплодна Роленд е се разширил значително. Процесът на гауба на Роленд е важен за гарантиране на качеството на продукта. Малки зени плодове, където в това време, са измервани според дяла на соло замразени плодове от общата плодова маса, т.е. от оригинала. Ето проверено време, чрез гауба на Роленд, от всички плодове се отделят зени плодове, които са здрави и са измерени според отделения. Като следва отделение, след което следва отделение, след което следва отделение, след което следва отделение. Ето гауба на Роленд. През последните десетилетия, пазарът на товари от чистоплодна Роленд е се разширил значително. Процесът на гауба на Роленд е важен за гарантиране на качеството на продукта. Малки зени плодове, където в това време, са измервани според дяла на соло замразени плодове от общата плодова маса, т.е. от оригинала. Ето проверено време, чрез гауба на Роленд, от всички плодове се отделят зени плодове, които са здрави и са измерени според отделения. Като следва отделение, след което следва отделение, след което следва отделение, след което следва отделение.
Western Europe, and especially that of France, has developed standard requirements for a very narrow range of Rolend size.

Sizes within this narrow gauging range for Rolend (for example 18-20 mm) can be obtained only by using specially fitted pipe gauges for Rolend classification.

Packaging of raspberry Rolend. Raspberry Rolend is packed into polyethylene bags which are further laid into cardboard boxes. Most typically, the size of the polyethylene bags may range between 450g and 2.5 kg, depending on the customers’ requirements. Rolend is also packed into smaller packages, such as boxes of between 200g and 300g, which is performed at special lines for small packages, which are supplied to the world’s most exclusive markets.

Sorting of raspberry block. Raspberry block can be further processed into raspberry bruha and raspberry grit.

Raspberry bruha is in fact raspberry obtained from the bruha raw material, generated in the process of separating the Rolend raw material at the gauging machine. This raw material is cleaned by removing any fruits that are rotten or damaged by insects, irregularly shaped berries and impurities. The best-quality
мени плодчета или боклуции. Йдоброто к чество н н трошените плодове е тов, което съдържа 70% цели плодове, 25% см чк ни плодове и 5% смлени плодове.

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- инспекционн лент ;
- с нсьор и вентил тор;
- плот с осветление;
- везни;
- с моходни ролкови пл тформи (пост вени н пунктовете з под- режд не н м лините в к шони); - м шин з з тв ряне н пли- кове; и
- подови постелки з р ботници, които стоят пр ви.

bruh is the one including 70% of the whole fruits, 25% of crushed fruits and 5% of grit.

Whole fruits in the bruh are the fruits with 30% mechanical damage. Raspberry bruh is packed into cardboard boxes with polyethylene bags, usually weighing 10 kg.

Raspberry grit is obtained by grinding the sorted raw material for grit, generated in the process of separation of raw material at the gauging unit, or the so-called sorted block. The introduction of the laser-aided sorting of raspberry has made it possible to pulverise the compacted raspberry blocks in order to produce a certain quantity of grit.

Pulverisation of raspberry is performed using a special line which consists of the following elements:
- screw elevator;
- pulverising mill;
- vibration sorting machine for separation of dust;
- inspection belt;
- elevator and air fan;
- desk with lighting;
- scales;
- non-powered roll beds (placed at the points of collecting raspberry into boxes);
- plastic bags welding device; and
- floor mats for standing operators.
Gauged raw material for grit or raspberry block is further sorted on the inspection belt, by removing mouldy parts of the fruit, as well as any impurities.

After the sorting in this phase, the grit or block raw material is re-frozen in the chamber, before being lifted by the means of an elevator to the pulverising machine, where a mechanical device crushes the raspberry into small particles, producing the raspberry grit.

Coming out of the grinding machine, the raspberry grit falls down onto the vibration sorting machine, consisting of three vibrating colanders. The first and the second colander are fitted with 3x20mm openings, which separate the raspberry dust, whereas the third colander with the perforation of 8mm separates the grit. Larger parts of raspberry passing over the third colander become separated before being re-frozen and pulverised at the raspberry pulveriser and finally returned for re-grinding. Passing through the third colander, the raspberry grit falls onto the inspection belts, for the final sorting. At the end of the conveyor belt, the grit is raised by the means of elevator, onto the air fan, which removes any remaining particles (leaves, hairs, larvae and similar) which are lighter than the raspberry grit grains and which have not been visually detected by the final inspection. At the very
end of the process, the grit is packed into boxes with polyethylene bag, where it is compacted into even packages, usually weighing 10kg each.

Packed like this, the grit is stacked onto box pallets, before storing inside a chamber at the temperature of -20°C.

It is necessary to note that grinding of raspberry into raspberry grit is performed at the temperature of between 0° and -5°C. Grinding raspberry at lower temperatures slows down the process of compressing the raspberry into blocks during storage. This can also be applied for Rolend and bruh raspberry, which become compacted during storing. By processing the raw material at lower temperatures and securing sufficient quantities of comfortable packaging, it is possible to slow down the process of compacting the goods in the storage chambers.

Storage. Weighed and sealed boxes with finished products are passed through the metal detector. After passing through the metal detector, boxes with the finished products are stacked onto a clean and undamaged Euro-pallet, with a piece of cardboard inserted underneath and on the top of the finished pallet. Deep-frozen
Rolend, grit, bruh and original are stored in the storage chamber, at the temperature of between -19 and -21°C. The frozen raspberry can remain stored for a period of up to two years, although in actual fact this period tends to be shorter, for financial reasons. The storage time is often restricted in order to prevent the finished goods from becoming stuck together due to prolonged storage at low temperatures.

Delivery of finished goods. The first step in the delivery of finished goods is stacking the packed goods onto wooden Euro-pallets, 800x1200 mm. Stacked like this, the goods are wrapped using polyethylene (stretch) foil, whereas the whole operation at this stage is referred to as ‘stretching’. Wrapped finished goods are transported by fork-lift and loaded in the cold storage truck. The temperature of the finished goods during loading onto the truck must not be higher than -18°C.

The cold storage truck is fitted with the system securing adequate low temperatures during transportation of raspberry. The temperature at the unloading must be the same at the loading.

The delivery of the finished goods marks the end of the processing phase for frozen raspberry.
conclusions

Quality of the frozen raspberry is measured based on the share of Rolend in the total quantity, i.e. total mass of original fruit. By advancing the process and reducing the number of required operations in the course of the technological method of raspberry processing, application of freezing enables an increased share of Rolend compared to other classes of frozen raspberry (grit, block, bruš), which are offered at a lower price in the global market.

In addition to this, by advancing the existing and introducing new processing equipment to the methodology of freezing and processing, it is possible to significantly reduce the costs of labour for selection, which represent considerable part of the overall structure of costs.

references


State and perspectives of pear production in Bulgaria

Denitsa Serbezova
University of Forestry, 1756, Sofia, Bulgaria

SUMMARY
Natural and climatic conditions in our country are suitable for expanding the production of pears. During the studied period (2001-2015) the areas occupied with pear plantations steadily increased from 152 ha in 2006 to 528 ha in 2015.

The production of pear fruit also increased from 750 t in 2005 to 2953 t in 2015.

Received average yields are strong below the biological capabilities of pear varieties and vary from 2688 kg/ha to 6422 kg/ha in 2013.

The recent trend in the application of high yielded varieties and advanced technology for fruit production, leading to higher yields and quality.

Key words: pear, production, varieties

INTRODUCTION
Pear fruit is economically valuable fruit species with traditions in production in the country. Biological and economical characteristics allow it to take a leading position in our country. It is...
characterize by high productive capacity and varieties with different ripening period. Valuable nutritional, medicinal and dietary qualities make it a desirable fruit, both domestic and external markets.

Over the past 50 years have seen a decline in production, despite the presence of favorable soil and climatic conditions suitable for growing pears in our country (Gandev et al., 2014).

The problems facing pear production in the country are many and require hard work to restore production and improving production quality as intended aim of the present study.

MATERIAL AND METHODS

A detailed analysis of pear production in Bulgaria was made by regions for the period 2001-2015 in order to characterize the most suitable areas for growing pear culture in Bulgaria, using the harvested area (ha), average yield (kg/ha) and production of pear fruit (t), (Milanov, 2009; Gandev et al., 2014).

The collected data from the Department of Agricultural Statistics of the Ministry of Agriculture and Food and the FAO, were statistically processed and indicates the status of pear production in Bulgaria.
Areas of pears in our country increased continuously until 1965, when they reached 14665 ha, i.e. increase compared to those in 1939 by 31 times (461 ha), and then gradually decreased to 152 ha in 2006, and increased to 528 ha in 2015 (Table 1).

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Pear plantations are not as concentrated as apples, yet over 50% of them are in Plovdiv, Kyustendil, Pazadzhik, Burgas and Varna regions. Varietals structure is represented mainly by Williams, Cure, Abb te Fettel and Beurre D'Hardenpont (Domozetov et al., 2003).

Fruit production in pear dangerously reduced (Iliev et al., 1976). The state of pear production is extremely unsatisfactory. The reasons for this are:

- very low care for cultivation of plantations;
- very bad age structure of plantations because lately weren't created new plantations (Gandev...
- mass attack of plantations of *Psylla pyri*, which sharply reduced the productive capacity of the plantations.

Without serious measures to produce healthy planting material free from diseases, accelerated creation of new intensive plantations and improve support for existing can’t change the unsatisfactory situation of pear production in the country (Gandev, 1996; Milanov, 2009; Hrotko, 2013; Gandev et al., 2014).

During the study the smallest pear production was obtained in 2006 (572 t), and highest in 2015 (2953 t), (Table 2).

### Table 2. Production of pear fruits for the period 2001-2015 (t)

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This increase of production attach to improving agrotechnics in existing plantations as (fertilization, cultivation, irrigation, pruning and plant protection). The share of young pear trees created under a new scheme of planting and included new, more yielding and
при нов схема н з с жд не и включени нови, по-родовити и устойчиви н болести и неприятелите сортове.

олучен т крушов продукция по р йони пок зв , че н й-м лк е в еверен центр лен р йон през 2002 г. (9 т), н й- голям от (1257 т) през 2015 г. в жен центр лен р йон. сично тов пок зв , че в н ш т стр н им н й-подходящи природно-ключ тични условия з производство н крушов продукция по по-речието н реките риц, тру-м следв ни от мчия и гост.

й-високи средни добиви н плодове, от крушов т култура, у н с з период 2001-2015 г. с получени през 2013 г. (6422 kg/ha), н й-ниски през 2010 г. (2688 kg/ha), (блиц 3).

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Depending on the region the lowest average yields of fruits are produced in the North center in 2002 (417 kg/ha), and the highest in 2014 in the Northeast (8529 kg/ha).

In conclusion it can be said that the area, received production and average yields of pear fruits in Bulgaria are insufficient to meet the needs of our population. In support of what appear next two figures concerning the import and export of pear production in Bulgaria.

Imports of pear fruit in our country (Figure 1) started in 1992 – 9 t, reaches its maximum in 2008 – 1729 t, while in 2013 to 1515 t. By reducing the pear areas in the country increases imports because pear is a desirable fruit of the internal market.

Fig. 1. Import of pear fruits for the period 2001-2013 (t)
От нашата страна са изнесени най-голямо количество крушови плодове през 1975 г. – 8012 t, най-малко 2 t през 2009 г., към 2013 г. e 62 t (фиг. 2).

Of our country exported the highest amount pear fruit in 1975 – 8012 t, and at least 2 t in 2009 and 2013 was 62 t (Figure 2).

Фиг. 2. Износ на крушови плодове за периода 2001-2013 г. (t)

Fig. 2. Export of pear fruits for the period 2001-2013 (t)

Тези факти говорят за незадоволени потребности на нашия консуматор от крушови плодове. Следователно площите с крушови насаждения трябва да се увеличават. Успоредно с това, да се подобри агротехниката в съществуващите насаждения, а в новите да се въвеждат по-производителни и устойчиви сорта, противопоставяйки се на болести и вредители. Такова разширяване на произведената оризина ще се повиши цената на плодовете, разполагаща се в интервал от 1,50 до 3,50 лв.

These facts speak for unmet needs of our consumers from pear fruit. Therefore, the area with pear trees should be increased. In parallel, to improve agrotechnics in existing plants and in new to introduce more yielding and resistant to diseases and pests varieties.

Then retail prices of pear fruit, ranging from 1.50 to 3.50 lev will be reduced.

Европейският фонд и неговите партньори говорят за незадоволени потребности на нашия консуматор от крушови плодове на тичащия период (2001-2015) площите се увеличават от 152 ha през 2006 г. до 528 ha през 2015 г.

These facts speak for unmet needs of our consumers from pear fruit. Therefore, the area with pear trees should be increased. In parallel, to improve agrotechnics in existing plants and in new to introduce more yielding and resistant to diseases and pests varieties.

Then retail prices of pear fruit, ranging from 1.50 to 3.50 lev will be reduced.

CONCLUSIONS

During the study period (2001-2015) the areas occupied with pear plantations steadily increased from 152 ha in 2006 to 528 ha in 2015.
The production of pear fruit also increased from 750 t in 2005 to 2953 t in 2015.

Received average yields are well below the biological capabilities of pear varieties and ranges from 2688 kg/ha in 2010 to 6422 kg/ha in 2013.

To extend the pear production in the country should solve the following tasks:

- In the production of pear fruit to introduce new, more early yielding more fruitful, better quality varieties;
- To create a new specialized, intensive pear plantings that provide regular and high yields;
- Reduce unproductive period, using a dwarf rootstocks (quince rootstocks etc.).
- Use certified planting material to create new plantations;
- Introduction of new schemes of planting and pruning of pear trees;
- To improve water-fertigation and mechanize production processes in the plantations to increase productivity and reduce production costs;
- To extend the consumption of fruit fresh by storing in cold stores and processed in a different manufacturers;
- Contemporary, modern and specialized pear production is
Based on pear trees created rich soil;
-To conduct effective protection of plants against scab, pear flea and input in the production of varieties resistant and tolerant to fire blight.

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Стари местни ябълкови сортове от Юстендилски район

Деница Сербежова и Станислава Димитрова

Лесотехнически университет, 1756 София, България
Институт по земеделие, 2500 Юстендил, България
E-mail: ddomozetova@abv.bg

SUMMARY

Kyustendil is the oldest apple production area in Bulgaria, including a large number of habitats along the Struma River and its tributaries. A significant number of old local varieties originated there, the greatest economic importance has - Buhavitsa, Skrinynka, Tetoanka, Kandile and Yamborka. Vigorous in growth are Buhavitsa, Skrinynka, Tetoanka, and Yamborka. Most susceptible to apple scab are Buhavitsa, Skrinynka and Kandile. Buhavitsa, Skrinynka and Tetoanka can be grown in production plantations.

Key words: apple, old local varieties, Buhavitsa, Skrinynka, Tetoanka, Kandile, Yamborka
голям родовитост, едри плодове с високи хр нителни свойства; голямо търсене на зръра в свеж и преработен вид; висок икономически ефективност, добър трън нспорт билност (лиев и енев, 1964; итов и кол., 1996). бълковите сортове се различават по време на зреене (от средата на юли до края на октомври), което осигурява зръра със свежи плодове през всички сезони. Ябълковите сортове се различават по време на зреене (от средата на юли до края на октомври), което осигурява пазара със свежи плодове през значителен период от годината (Гърневски и кол., 1986; Джувинов и кол., 2008; постолов и кол., 2012). обръщането на някои зимни ябълкови сортове позволява консумацията на свежи плодове до ранна пролет (лиев и кол., 1984).

Голяма част от местните Кюстендилски сортове (Кандиле, Скринянка, Бухавица и др.) произлизат от южните вариетети на горската ябълка и представляват новия вид Malus orientalis Uglilz. Сортовете на M. orientalis изискват по-дълъг и топъл вегетационен период, но се различават по своето издръжливост на продължителни и екстремни горещини, тъмносфери и суша - в някои случаи през принудителна зимна спяка, както и в повечето случаи през пролетта. Якои от тях (Кандиле) проявяват достатъчна дълготраеност и продуктивност в горещи местораселства, възбудимост към пробив на гръдната стена през принудителна зимна спяка, както и в повечето случаи през пролетта. Съществува също много брой кръстоски между

There were very large number of crosses between

fruit with high nutritional properties; demand on the market in fresh and processed form; high economic efficiency, good transportability (Iliev and Penev, 1964; Mitov et al., 1996).

Large number of local Kyustendil's varieties (Kandile, Skrinyanka, Buhavitsa etc.) originated from southern varieties of forest apple and represents new specie Malus orientalis Uglilz. Varieties of M. orientalis require a longer and warmer growing season, but differ in their resistance to prolonged and extreme heat, atmosphere drought and cold weather. Some of them (Kandile) exhibits sufficient longevity and productivity in hot habitats. The same group of varieties exhibit unequal excitability to growth in forced dormancy and different resistance to turning colds.
южни виетети и горски ябълък (M. orientalis) и слабо и силно растящи виетети и ябълък формилиите се сортове обаче се ръзличат в този чително по к чест в нощ плодовете, по изискванията към топлината и от сънишките им към топлината и от сънишките им в месносторения с продължителни горещини и тмосферни з суш вини през лятото и з топления в кр я н зим т етовк ) пон съ са з дозволително горещините и тмосферните з суш в ния.

Й - ст рият и известен ябълков район е Кюстендил. В него се включва значителен брой месторения по поречието на р. Струма и притоците й (Оиков, 1947; Нечев 2007). Количествените условия на тези месторения обаче не са еднакво благоприятни за отглеждане на ябълката. Например при еднакви грижи за градините дърветата на всички ябълкови сорта в относително по-ниски месторения (села Шишковци, Копиловци, Николичевци и др.) проявяват по-малка дълго летност и д по-малки добиви с по-ниски к честв, понеже се случва по-често и по-продължителни з топления в кр я зим т , повръщати т съ условия на по-високите месторения из предпланински вериги и

The oldest and famous apple region is Kyustendil. It includes a significant number of habitats along the river Struma and its tributaries (Boykov, 1947; Stancheva, 2007). Ecological conditions of these habitats are not equally favorable for growing apple.

For example, under the same care for the garden trees of all apple varieties in relatively lower habitats (villages Shishkovtsi, Kopilovtsi, Nikolichevtsi etc.) exhibited less longevity and give smaller yields with lower quality, because there are a longer warming at the end of winter, turning frosts in early spring and strong atmospheric heat and drought in summer.

Favorable conditions for apple are higher habitats around the foothill chains Osogovo, Konyavska mountains and the upper stream of
The aim of this study is exploring the preserved old local forms of Kyustendil region and opportunities for their distribution.

MATERIAL AND METHODS
In this study were used the Methodology for studying of plant resources in fruit plants (Nedev et al., 1979), updated with the indicators of UPOV (2005).

RESULTS AND DISCUSSION
Buhavitsa (Red buhavitsa)
Local variety originated probably from Kyustendil. It is assumed that originated as a bud mutation of Skrinyanka (Stoichkov et al., 1958). The two varieties are very much alike in many places don’t distinguish them.

The fruits are medium-sized, 64 mm hight, 73 mm width and weight 130 g fairly equally in size. They are equally in shape, flattened or flattened rounded to high rounded, usually asymmetrical (Fugure 1).

Light greenish to yellowish-green base color and bright red blush on the sunny side, which sometimes covers the whole fruit; observed a few small points, rusty, whitish halo; there subcutaneous whitish dots that are most to stem...
The skin is almost thin, smooth, greasy, shiny, tough.

Fruit flesh is whitish, firm, coarse texture, juicy, with a nice refreshing acid with a specific flavor, good quality.

The fruits acquire harvesting maturity in the first half of September. When approaching it they begin to fall off.

Transportability is good.

Consumptive maturity fruits acquired at the end of November. Store the end of March and form a subcutaneous spots.

The tree has a vigorous growth, reached large size and features great vitality, reaching 50-60 years or more. Forming a broad, thin crown and slightly
The leaves are very large, which is an distinctive character of the variety, oval-shaped on the shoots and mostly ovoid back and rarely oval in the shorter fruiting branches, roughly double serrated, dark green, with an average hair on the underside of the leaf.

The flowers are large, white with pink spots or pass, pink white. The variety is medium blooming.
годин след засаждането и се отличава с много добра родовитост. Обивът в рир 400-500 kg/дърво, твърде често – по 700-800 и повече килогрм. Тудоустойчивостта е добър. Кто плодовете, та и листът с дост чувствителни към струпяване – не. Той днес от струпяване на плодове много често се нанасят. Ето към голяма степен устойчивостта. Ето за плодовете, така и листата са доста чувствителни на струпяване. Инфестирани плодове настъпват по-често се напукват.

Distinctive characteristics of Skrinyanka. In habitus of the tree and leaves no difference between Buhavitsa and Skrinyanka. There is a difference only in the fruit which consists in the fact that the fruits of Buhavitsa are larger, more unequal in size, their red blush color is lighter, with a white and a less coarse texture. During storage it often gain subcutaneous spots. The fruits of Skrinyanka are smaller, with a darker blush color and more greenish and rough flesh-meat. They suffer less from hypodermic bitter spots.

Skrinyanka
Local apple cultivar of unknown origin. It is assumed that it comes from with. Skrinyano, Kyustendil, where received its name (Stoichkov et al., 1958).

The fruits are medium-sized, with high of 47 to 64 mm, wider by 57 to 75 mm and heavy average 100 g, and equal in size, the fruits are fairly evenly equal in shape, oval, barely noticeable ribbed (Fugure 3).
Fruit skin is thick, smooth, tough, greasy, greenish based color with blurred dark red and darker red stripes blush color; almost whole the fruit is covered with a blush red color giving it a beautiful appearance. Subcutaneous spots are scattered around the fruit, large, relatively well noticeable.

The fruit flesh is greenish or greenish hue with green strands, firm, coarse texture, juicy, sweet, wine-acid, no aroma or with a specific aroma, good quality.

The fruits acquire harvest maturity in the first half of September. Then they easily fall out.

Characterized by good transportability.

Consumptive maturity fruits acquired at the end of November. Store the end of March - beginning of April. During storage in ordinary fruit-stores give a small percentage of wastage 4, but
лък процент фир 4, но ср в-
нително голям процент з гнили плодове.
лодовете н кринянк с
подходящи з употреб в прясно състояние и з сушене.
ървото н кринянк е буй-
но р стящо. плодод в щ въз-
р ст добив 10 m широчин и 10 m височин , в отделни случаи и – 12 m височин и 17 m ширин . орон т е кълбовидн, рядк, добре осветен и с добре р звит центр лен скелетен клон (вод ч), ( игур 4). ор т н стъблото и дебелите клони е н пук н, чер-
венник в, цветът н кор т н ост н лите клони е червенник во-
к фав откъм ограян т от слънце-
то стр н и зеленик в сосив откъм сенчест т стр н. етор стите им т червенник в цвят, средн дебелин , средно дълги междуувъз-
лия и с дост овл сени.

Fig. 4. Skrinyanka – tree

The fruits of Skrinyanka are good for use in fresh and drying.

Tree of Skrinyanka is growing wildly. Fruit-bearing age grow up to 10 m width and 10 m height, additional cases – 12 m tall and 17 m wide. The crown is rouded, a rare, well lighten and well-developed central skeletal branch (leader) (Fugure 4). The bark of the trunk and thick branches cracked, red, the color of the bark of the other branches is reddish from the sunlit side and greenish-grey from the shady side. Shoots have a reddish color, medium thickness, medium length internodes and are quite hairy.
Цветовете са големи, бели с розови петна или постепенно преминаващ розов цвят в белия. Цъфтежът е среден.

Скринянка е лош опрашител. плододове в не встъпват към 6-8-ра година след засаждането и се отличават с много добър родовитост. тудоустойчивостта й е добър. Кто плодовете, т.к и листът със дост.чувствителни струпявач не. П да тите от струпявач не плодове много често се пуква т.

etoV

etoV is a local variety of unknown origin (Stoichkov et al., 1958).

The flowers are large, white with pink spots or gradually flowing pink color in white. Blossoms is average.

Skrinyanka is bad pollinator.

In the fruiting enters at 6-8 year after planting, and has good yielding. Its cold resistance is good. As fruits and leaves are very susceptible to scab.

Infested fruits of scab often crack.

Fig. 5. Tetovka – fruits

Flat rounded and rarely rounded cone-shape of fruit, with obliquely truncated peak, often with very little issued very broad
много широки ребра; плодовете с изр върни по форм.

тънк, гладки, слабо мазна, лъскава кожица, с резедав основен цвят при беритбена зрелост и жълтеникав при потребителна зрелост, покрит в по-голям т сич ст или д же изцяло с р змит мр морир н или във вид н ивици червен цвят; в р йони с високо н дморско ниво покроявят цвят обхвщччст от плодовата лъко, отколкото в р йони е по-високо н дморско ниво; кожицата е покрит с н леп.

плодовото месо е белезниково със зеления в оттенък, който с н пред в н потребителска зрелост изчезва , средно плътно, крехко, сочно, к то сочностт при съхранение след януари римляем , сл бо възкисело, без или с много слаб ром т; вкусовите качества на недобре узрелите плодове с з добрителпи, н добре узрелите – добри.

беритбена зрелост плодовете придобиват обикновено към средата на септември, в по-ниските р йони – към края на септември и в н ч лето н октомври. плодовете узрежат едновременно и им т добър т спортност и отрицането зрелост плодовете придобиват към края на ноември и в н ч лето н декември ст срок н съхранение обикновено до края на март, к то з пзв т свежия си вид и не сп руши т. о времето н съхранение обикновено плодовете з гният от к флаво и меко гниене.

тървото в мл и възраст е

With a thin, smooth, slightly greasy, shiny skin with chartreuse basic color at harvest maturity and yellowish at consumer maturity, covered in large part or even entirely blurred marbled or strips of red color; in areas with high sea level blush color covers less part of than in the regions is lower above sea level; skin is covered with a coating.

The flesh is whitish with a greenish blush, which progresses consumer maturity disappears, medium firm, tender, juicy, and juiciness in storage after January decreased slightly sour, with no or very light aroma; taste of poorly ripened fruits are satisfactory, and ripe – good.

Harvest maturity fruits acquired usually by the middle of September and in the lower areas – at the end of September and in early October. The fruits ripen simultaneously and have good transportability.

Consumers mature fruits turn at the end of November and early December. Storage usually endure to the end of March as retain its fresh appearance and not fade. During storage the fruit rot brown and soft rot.

Tree at a young age is a fast
бързо растящо, след това умерено до слабо растящо. Стежът чувствително отслабва при встъпване в плодобивето и при незадоволителна отготвяна при по-възрастните дървета почти спира. Остига средно големи, клонящи до малки размери (4-6 m височина и 7-9 m ширина) (фиг. 6).

Цветът на кората на стъблото е сив, прошарен с възкафявочервени петна. Леторастите са дебели, с червеникав цвят, силно овласени, с многобройни дребни лещенки.

Тетовка цъфти рано. Продължителността на цъфтежа е 4-6 дни. Цветовете са големи, в значителна степен розови. Характерно е, че близалцето е по-дълго от тичинките.

The color of the bark of the stem for the most part is gray, grizzled with brownish-red spots. The shoots are thick, with a reddish color, strong haired, with numerous small spots.

Tetovka bloom earlier. The duration of flowering is 4-6 days. The flowers are large, largely pink. It is characteristic that the stigma is longer than the stamens.
Тетовка има жизнен прешец с много добър кълняемост и е добър опрат шител. Обри опр шители и етовк с им-н зл тн пр.мен, носбергск ренет, ълт белфьор и л тн превъзходн. плодод - в не встъпв р но – обикновено н 4-5-т годин след з с жд нето.

м много добър до изобилн родовитост и склонност почти към редовно плодод в не. редно от дърво при пълно плодод в не се получ в т около 300 kg плодове, к то при добър гро-техник добивите бив т и двойно по-големи. тудоустойчивост ѝ к кто спрямо зимните мр зове, т к и н повр тните студове е добър. увствителност н сорт спрямо болести и неприятели е норм лн. е-чувствителни н струпяв с не с лист т.

р йони с по-горещо лято и по-м лко тмосферт вл жност по плодовете се явяв слънчев пригор. ор ди по-сл б т р с-тежн сил н дървото, голям т му родовитост и склоностт му към ежегодно плодод в не дър-вет т н етовк ост рав т пре-дивременно, ког то не се провеж-д т своевременно поливки и торене.

Кандиле

именов ния и синоними: етовк (в кедония и лб ния), яло кюстендилско к ндиле, юстендилско бяло к ндиле, яло к ндиле, етовк, осенч. последните дв синоним е известен между някои овош ри в ловдивско и сеновгр дско

Tetovka has viral pollen with very good germination and it is a good pollinator. Good pollinators are Tetovka Golden Winter Pearmain, Landsberger Reinette, Bellefleur Yellow and Golden Delicious. Early fruiting age - usually a 4-5 year after planting.

There are very good to abundant fertility and a tendency to almost regularly fruited. Average tree in full fruiting produce about 300 kg of fruit, while good farming practices and yields are twice as large. Its cold resistance as compared to winter frost and cold of turning good. The sensitivity of the variety to diseases and pests is simple. More susceptible to scab are the leaves. Keep well on the tree in the wind.

In areas with hot summers and less atmospheric humidity in the fruit appears sunburn. Due to weaker growth strength of the wood, its great fertility and its tendency to annually fruiting trees grow old Tetovka preliminary when not held timely irrigation and fertilization.

Кандиле

Names and synonyms: Tetovka (Macedonia and Albania), White kandile Kyustendil, Kyustendil white kandile, White kandile, Tetovka, Bosnian. In the last two synonym is known among some growers in Plovdiv and Asenovgrad (Stoichkov et al., 1958).
The fruits are medium to large-sized, high 48 to 79 mm, wide 60 to 90 mm and light; the average weight was about 125 g, equal in size (Figure 7).

Circular cone shape, sometimes flat cone, the widest in the peduncle half; fruits bent to the receptacle; ribbed quite weak, more noticeable to the receptacle; shaped fruits are almost symmetrical or with a slight asymmetry between the two halves, equal.

Thick, rough, tough, greasy, with a strong wax coating films that touch upon leaving traces on the fingers; when fruits are at harvest maturity, the main color is pale green, while consumers' maturity turns to yellow-green to pale yellow; blush color of the fruit is pink-carmine to carmine-red; in all the skin are dispersed evenly to gray-rusty whitish spots, which are located in densely receptacle quarter; the fruit is very beautiful.
Плодовото месо е бяло, нежно, гъбесто, меко, недостатъчно сочно, сладко, без аромат; вкусовите качества посредствени; търси се от по-невзискателни консуматори и на източните пазари.

Лодовете добиват върху неомври, съхраняват се до края на април. При съхранение сорта дава малка фира от олекване на плодовете и загниване.

Плодовете се използват за ядене в прясно състояние и за сушене.

Дървото е със силен растеж. Достига височина 8-9 м и образува характерна кълбовидна корона. Кората на стъблото и скелетните клони е сива, а на по-тънките разклонения – сивозелено-зелена. Леторастите са средно дебели, светлокафяви, с малко и дребни лещенки, овласени (Фигура 8).

Flowers are white, medium-sized. Blooms later, 5 to 8 days after early flowering varieties. It held a large number of fruit set. The variety is a good pollinator.

Infancy tree on vigorous rootstock passes slowly for 9-11 years, and in some cases even up to 20 years. The variety is susceptible to scab, which suffer mainly leaves. Grown on a seed rootstock (Kiselitsa), develops powerful trees fruiting thoroughly, but show greater tendency to
явяв т голям склонност към алтернативно плододаване. Обре р звяти възр стни дървет към 25-30 годишн възр ст при добро глед не в бл гоприятни години д в т по 700-800 kg плодове, отделни дървет — и н д 1500 kg.

Към условия на место растенето този сорт не е много взискателен, но вирее добре и д в високи добиви н з щитени мест , бог ти, дълбоки н носни вл гоемни почви при н поя в не и дост тъчно тмосферно овл жив няв не.

мборк
зходното семен че е от с. мбор но, юстен ди лско ( тоич ков и кол., 1958).
плодовете с средно едри, високи средно 49 mm, широки

 alternate fruiting. Well-developed adult trees to 25-30 years of age with better viewing in favorable years give 700-800 kg fruit, and individual trees – and more than 1500 kg.

To the habitat conditions this variety is not very demanding, but grows well and gives high yields of protected areas, rich, deep alluvial soils vlagoei irrigation and sufficient atmospheric moisture.

Yamborka
Output seedling is from. Yamborano, Kyustendil (Stoichkov et al., 1958).
The fruits are medium large, high among the 49 mm, wide
average of 60 mm and a heavy average 80 g, equal in size. Rounded conical, sometimes ovoid; fruits are symmetrical, relatively well aligned in shape (Figure 9).

The fruit flesh is snow white, crispy, slight coarse texture, very juicy, nice, with a mild flavor, refreshing, sweet-sour; good quality, good transportability.

Harvest maturity occurs in mid-September.

The fruits are kept well until March in ordinary fruit-stores. Under these conditions, they become consumers’ maturity in November and retain its taste qualities to end storage. During storage rot of soft rot.
The tree is vigorous, with dense crown at a young age and fruit-bearing age crown is rounded and not too thick because the branches are strongly tilted away from the fruit load (Fugure 10).

The flowers are white, medium size. Yamborka blooms with an average flowering apple varieties. The average duration of flowering was 8 days. The variety equal, with good germination of the pollen, and it is a good pollinator. Tree assume the fruiting after 6 years of age. The variety can be propagated by root cuttings (Soichkov et al., 1958). Yamborka does not show
показва особена чувствителност, при поливни условия обаче показва слаба чувствителност към бръшъл.

ортовете ух виц, кринянк и етовк з служ в т р е-пространствие в производствени условия показаха в месторастения с добро тмосферно овл жяв не и дълбоки отцедни почви.

ортовете ндили и мборк с подходящи към любителско отглеждане не при достатъчно твърдо тмосферно овл жяв не и н появ не, бог ти почви и 3 щенени мест.

илно р стящи с ух виц, кринянк и ндили.
много добър и добър родовитост се хърктеризир т сортовете ух виц, кринянк, етовк и мборк.
много добър и добър съхранение в плодовете с ух виц, етовк, ндили и мборк.
много добър тр нспортивност с ух виц и кринянк.
привлекателни плодове с кринянк, етовк и ндили.
ух виц и кринянк с склонни към предивременно ок плодовете при недостатъчен почвен влаж.
съхранителни струпяване не с ух виц, кринянк и ндили.

**CONCLUSIONS**

Variety Buhavitsa, Skrinyanka and Tetovka deserve to be spread in production plantations in habitats with good atmospheric moisture and deep drained soils.

Variety Kandile and Yamborka are suitable for amateur cultivation with sufficient atmospheric moisture and irrigation, rich soils and protected areas.

Vigorous growth has Buhavitsa, Skrinyanka and Kandile.

With very good and high yield are characterized varieties Buhavitsa, Skrinyanka, Tetovka and Yamborka.

With very good and good storage quality of fruits are Buhavitsa, Tetovka, Kandile and Yamborka.

With good transportability are Buhavitsa and Skrinyanka.

With attractive fruits are Skrinyanka, Tetovka and Kandile.

Buhavitsa and Skrinyanka let to preliminary dropping of fruit in low soil moisture.

Susceptible to scab are Buhavitsa, Skrinyanka and Kandile.

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