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THE PROMISING RANGE OF FRUIT AND BERRY CULTURES FOR SELF-PICKING BY VISITORS OF FARMSTEADS AND COUNTRY FARMS

The providing by farmsteads and country farms of Belarus services in self-picking fruits and berries by visitors during all vegetative season is possible by using the range of plants, providing a uniform, continuous, and the maximum period of ripening and picking of fruit. In addition, each culture must have a high taste, valuable biochemical composition and the maximum size and weight parameters of fruits; characterized by high adaptability to climatic conditions and to have a simple agricultural techniques of cultivation; provides the maximum economic benefit from the sale of fruits and berries, as well as possible from the sale of planting material and recreational visits of plantation.

The assortment of fruit and berries cultures to create a plantations by the principle of a “green conveyor” are included in order to ripening: honeysuckle (*Lonicera caerulea* L.), strawberry (*Fragaria* L.), cherry (*Prunus avium* L.), highbush blueberry (*Vaccinium corymbosum* L.), red currant (*Ribes rubrum* L.), black currant (*Ribes nigrum* L.), white currant (*Ribes niveum* Lindl.), raspberry (*Rubus idaeus* L.), blackberries (*Rubus caesius* L.), apple (*Malus domestica* Borkh), pear (*Pyrus communis* L.) and cranberry (*Oxycoccus macro-carpus* (Aiton) Pers.). In addition to attracting agrotourists in assortment may be included other plants are in demand, including not widespread culture in Belarus – silver cherry (*Elaeagnus multiflora* Thunb.), kiwi fruit (*Actinidia* Lindl.), dogwood (*Cornus mas* L.).

Key words: agrotourism, farmsteads, country farm, fruit and berries, honeysuckle, highbush blueberry, cranberry.

Introduction. The organization of specialized farms which gives the tourists the ability to harvest fruits and berries is a widely demanded and profitable type of agrotourism abroad. In Belarus owners of farmsteads and peasant farms which provide its services mostly in a short period of time when the fruits of a limited number of cultures ripen are involved into the development of that kind of commercial activity. Scientific substantiation of the range of fruits and berries, allowing continuous period of product harvesting of the maximum duration, is needed for creation of the facilities allowing the farms to function during the whole vegetation season. Wherein each culture of perspective plants should maximally meet the following conditions:

- 1) have high taste qualities, saturated biochemical composition and maximum weight and size of fruits;
- 2) characterize with high resistant to different weather conditions and have a simple way of cultivation, ideally not involving using chemical fertilizers and pesticides;
- 3) ensure maximum economic profit through high price of finished products and minimized labor costs and production funds;
- 4) have a good reproduction ability and characterize with high decorative qualities for providing additional profit from planting material implementation and recreational farm attending.

Main part. Fruit and berries assortment formation for landing plantations according to principle of green forage chain was carried out based on

State Register of Plant Varieties, 2015 [1], literary sources analysis and personal experience in cultivation of certain species. Cultures, selected for using in farmsteads and peasant farms, are being mentioned in this article according to their ripening conditions, each with a short list of advantages and disadvantages, agrotechnics specialties and a list of recognized plant varieties.

Honeyberry (*Lonicera caerulea* L.) ripening at the end of May starts the harvesting season. The plant is a deciduous shrub growing to 0.8–2.5 m tall with the diameter of 1.5–3.0 m. Productivity of honeyberry varies from 1 to 4 kg of berries per bush. Fruits of most varieties have cylindrical shape, blue color and a strong waxy film. Average weight varies from 0.8 to 1.3 g. Their taste is sweet and sour with a little bit of spicy bitterness or, less frequently, without it [2].

Easiness and success of honeyberry cultivation are defined by: soil conditions, simple farming techniques, high frost resistance of bushes and blossoming flowers (–50° and –7° respectively) during the winter period and comparative resistance to fungal diseases. Not simultaneous ripening, high crumble ability and soft consistency of berries are the disadvantages. However, the last fact, conditioning transportation difficulties may be considered positive due to exclusive monopoly of farmsteads and peasant farms owners on the market of fresh honeyberries [2].

For plantations the following commercial recognized varieties are recommended: Indigo, Zinri

and Sinichka, garden cultivation varieties such as Goluboe vereteno, Nizhegorodskaya rannaya, Lakomka, Vasilevskaya, Morena, Krupno-plodnaya, Leningradskiy velikan, Nimfa, Kamchadalka. Bokcharskiy velikan, Doch velikana, Strizhevchanka i Vostorg are the perspective varieties of Russian selection [1].

Using the whole range of early, mid and late varieties you can provide continuous consumption of honeyberry till the end of the July.

After a week or two of honeyberry fruiting at the first decade of July strawberry (*Fragaria L.*) swoops up the berry season. Production of industrial landings of that berry culture varies from 5 to 12 tons per hectare. Average berry weight is 7–13 g. The taste is sweet and sour with a specific clear strawberry fragrance [2].

Straw, black plastic film or agrotexile should be used as mulching material during strawberry landing for consumers independent harvesting. That agrotechnical trick is good not only for protecting the space between plants from weeds, but also for maintenance of berry production cleanliness. Short 2–3 year period of cultivating crop and low resistance to fungal diseases during the years with high rainfall are the disadvantages.

For commercial cultivation it is recommended early-ripening cultivars of strawberries: Kokinskaya rannaya, Kimberly; middle-ripening: Festival, Desnyanka, Kokinskaya, Venta, Red Coast, Vicoda, Vima Zanta, Ducat, Vikasima, Slavutich; late-ripening: Zenga-Zengana, Vima Tarla; remonant: Vima Rima and Albion. Alfa is a perspective sort of Russian selection for cultivation on the territory of Belarus.

After short but, as a rule, very heavy fruit-bearing of garden strawberry in the end of June-the third decade of July cherries ripens (*Prunus avium L.*) Industrial productivity of cultural plantings is from 20 to 32 tons per hectare. Average weight of berries colored from pale-yellow to dark-red color ranges from 4 to 7 g. Fruit consistency is thick, flavor is sweet or sour-sweet with its own peculiar cherries aroma [2].

Cherries cultivation is perfect for its relatively high cost in comparison with other species of cherries and good stable demand for berries during the whole period of ripening. But at the same time epiphytotic, cherries leaf spot, monial burn, clasterosporios and fruit rot are highly dangerous for successful cherries cultivation. It's also difficult to provide purity of cherries products because of diseases spread.

Wide using of the whole cherries cultivars variety strains weather and climate conditions of different regions of our country. Among 9 cultivars of cherries for commercial cultivation Vityaz, Medunica, Naslszhdenie, Ovstyjenka, Iput, Gronkovaya,

Gascines, Subarovskaya, Tutchevka – only 3 cultivars are zoned on the entire territory of Belarus [1].

From the middle of July till the end of August also till the end of September while using late-ripening cultivars highbush blueberry (*Vaccinium corymbosum L.*) ripens. The plant looks like a bush with the height from 1.3 to 2.0 m and diameter from 1.2 to 1.7 m. Productivity of this culture changes from 2.2 to 5.6 kg per bush. Planting productivity reaches 10 tons per hectare. Average weight of blue with wax bloom, globular or light flattened berries are 0.9–2.6 g. Fruits characterized by dessert sour-sweet or sweet-sour taste expressed with a greater or lesser extent of blueberry.

Economic prospects of highbush blueberry plantations is determined by maximal retail price of 1 kg of berries – 70–95 thousands of Belarussian rubles and favorable for business formation forecast of high demand saving on production in the future among all cultures, produced in Belarus. Implementation necessity of huge vested interests in creating plants and covering great costs of maintaining and care of plantings in their operation constrain development of this culture.

Bluecrop, Nortland, Elizabet, Erdiblu, Jersey, Blueeta, Veymoot, Denis Blue, Collinz, Hardey Blue are recognized varieties for commercial cultivation and homestead – Duke and Patriot for home cultivation [1].

Black currant (*Ribes nigrum L.*), red currant (*Ribes ribrum L.*) and white currant (*Ribes niveum Lindl.*), and also gooseberry (*Ribes uvacrispa L.*) ripen in July and the first part of August. It's desirable to use stem forms of plants seem to be small trees for agrotourists attraction to data collection of cultures. The latter is received by grafting cultivars onto single golden currant sprouts (*Ribes aureum Pursh*) on the height of 80–100 cm from the ground surface. Appropriate agrovchicles firstly aimed at picking and providing its cleanliness it also allows to increase stability of plants to diseases and vermin.

Recognized varieties of commercial cultivation of black currant in Belarus are Katushka, Pamyat Vavilov, Ceres, Zagadka, Klussonovskaya, Naslednitsa, Titania, Almyai, Gagatai, Krivyai, Claudia, Belorusochka; red currant are Darling, Rondon, Lonker Van Tets, Fertedi, Krasnaya Andreythenko, Krinichka; gooseberry are Malachite, Belorusski, Masheka, Korral, Ruvolt, Severnyi Kapitan, Berendei. Additionally for the creating of plantations more than 20 cultivars of *Ribes*, recommended for home cultivation can be used [1].

With all the ease of currant and gooseberry cultivation their essential disadvantage is the low-cost of berry products. For this reason usual raspberries (*Rubus idaeus L.*), black raspberry (*Rubus occidentalis L.*) and blackberry (*Rubus cae-*

sius L.) cultivation is much more profitable from an economic side.

Life form of these plants are shrub with upright, accurate or creeping sprouts. Fruit is a knot of ossicles, conditionally called berry. The raspberry weight of knot of ossicles changes from 2 to 10 g, blackberry from 2 to 20 g. If raspberry taste are delicate, sweet-sour with aroma, so other sorts of blackberry have sour-sweet taste with pleasant bitterness. Raspberry plants productivity reaches 9–12 tons per hectares, blackberry plants – to 20 tons per hectare.

In order to provide additional facilitation for raspberry and blackberry picking it is necessary to grow them onto trellises. Shoots must be either bended to the ground or shoveled cold-resistant cultivars to protect aboveground part of blackberry from winter freezing.

Recognized variety of raspberry for commercial cultivation are: Meteor, Balzam, Alenushka, Dvoynaya, Babye leto, Zeva Herbsternte, Heritage; for home cultivation: Nagrada, Lazarevskaya, Hercules, Bryanskoye divo, Maroseyka, Ruby Necklace.

The only recognized variety of blackberry for home cultivation in Belarus is Agavam [1]. Such cultivars as Tornfrie, Loch-Ness, Darrow, Triple Crow, Karaka Black and Black Sateen are known for their quality and yield potential.

The variety of horticultural crops – apple trees (*Malus domestica* Borkh) and pear trees (*Pyrus communis* L.) should be represented by early ripen cultivars that allow consumption right after harvesting. There are also some recognized varieties for commercial cultivation of apple trees with the good summer and summer-fall ripening period that are worth mentioning: Papirovka, Mechta, Helena, Jubilar, Kovalenkovskoye; of pear trees – Superletnyaya and Dychmyanaya [1].

It is reasonable to use new and minor crops that will please esthetic and gastronomic interests of tourists and attract more of them. For instance rare in Belarus oleaster, gum (*Elaeagnus multiflora* Thunb.) or silver cherry can diversify variety of fruit-berry plants that ripen from the end of July till the end of August. The plant is an upright and wide-branching bush up to 3 m height. Berries are ruby with silver-white spots on their long peduncles, pulp is flavored and juicy and has original sweet and sour taste with slight astringency. Weight of berries is between 1 and 2 g. Productivity of 6–8 years old plants reaches 8 kg. Lack of recognized variety of oleaster in Belarus is lies in the need of seedlings to create garden beds.

The period from mid-August till the end of September is actinidia ripening time (*Actinidia Lindl.*), or “mini-kiwi”. The plant is a liana of length from 3 to 20 m. Weight of cylindrical and flattened berries changes from 2 to 6 g. They got

sweet and sour taste with pineapple flavor. Plant's productivity differ from 2.5 to 15 kg [2]. Two varieties of it are recommended for home cultivation they are big-fruited Kievskaya and Prevoshodnaya [1].

Cornus is another rare for Belarus berry crops (*Cornus mas* L.). It is a bush or a tiny tree which is about 2–3.5 m tall. In mid-September ripe fruits take dark-red color and sour-astringent taste with strong aroma. Weight of berries changes from 2 to 6 g. Productivity can reach 20 kg per plant. Recognised variety of cornus for home cultivation are Coral Mark, Vidybeckiy, Neshniy, Luckyanovskiy, Helena, Eugenia [1].

It is possible to complete the season of home harvesting of berries with the big-fruited cranberry (*Oxycoccus macrocarpus* (Aiton) Pers.) that ripen in the period from the first half of September to the early October. Productivity of vegetative bush changes from 0.4 to 2 kg/m². Average weight of oval red berries is between 0.7 and 1.9 g. They have sour taste with bitterness which reminds of cowberry [2].

Solid spangled with berries cover of bush is not only decorative but also allows us to collect berries with the help of different designed combs. After the snow melts harvesting of certain varieties of plants at spring may seem to agrotourists extraordinary and attractive activity at the same time. Berries at this time become more juicy and partly lose their common bitter and sour.

To create plantations it is advisable to use recognized varieties for commercial production such as Ben Lir, Mac Farlin, Pilgrim and Stevens, and Hoves and Franklin for home cultivation [1].

Cultivation of drupes such as plum (*Prunus domestica* L.), cherry-plum (*Prunus cerasifera* Ehrh.), cherry (*Prunus cerasus* L.) and apricot (*Prunus armeniaca* L.) is not easy considering their hypersensitivity to fungal diseases and inconstant fruiting as spring frosts damage plant's flowers. Creation of guelder-rose (*Hippophae rhamnoides* L.) plantations, dog-rose (*Vaccinium vitis-idaea* L.) plantations and half highbush (*Vaccinium corymbosum* L. × *V. angustifolium* Ait.) and lowbush blueberry (*V. angustifolium* Ait.) plantations does not pay itself from the economic point of view due to low cost of those plant's fruits. Agrotourists won't be interested in use such berries in terms of home harvesting because of their small and lightweight berries. And also they have to be included in the prospect plants list and have favorable terms for cultivating as well as demand for abovementioned crops.

Conclusion. Home cultivation of many different fruit-berry crops for tourists is the first step towards creating a new type of agrotourism in Belarus that leads to the development of spatial, micro-plot plantations and its approbation.

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