BERRY SPECIES VARIETIES CLASSIFICATION ON GROWTH AND PRODUCTIVITY INDICATORS

CLASIFICAREA SOIURILOR SPECIILOR BACIFERE DUPĂ INDICATORII DE CREŞTERE ŞI PRODUCTIVITATE

BARBAROŞ MIHAIL, CIMPOIEŞ GHEORGHE
The State Agrarian University of Moldova

Abstract. *The basic parameters of growth, photosynthetic activity, biological efficiency, productivity of various grades of berry cultures in intensive plantations have been investigated. On the basis of the lead researches classification of grades of wild strawberry, raspberry and black currant on investigated parameters with the purpose of use of the most productive and adapted to soil-climatic conditions of Republic Moldova and intensive technology of cultivation has been lead.*

Rezumat. *Au fost studiaţi indicatorii de bază ai creşterii, activităţii fotosintetice, productivităţii biologice şi utile ale diferitor soiuri ale speciilor bacifere în plantaţiile intensive. În baza investigaţiilor efectuate a fost efectuată clasificarea soiurilor speciilor bacifere după indicatorii studiaţi în scopul folosirii celor mai productivi în diferite condiţii de cultură şi condiţii pedoclimatice ale RM.*

For reception of high planned crops of qualitative berries in conditions of Republic Moldova it is necessary to use those grades which are is better adapted to soil-climatic conditions, have high potential of efficiency, demand less expenses at cultivation, suitable for the mechanized harvesting (a currant black, a raspberry). Thus it is necessary to consider the basic parameters of growth, biological and economic efficiency, an opportunity of maximal use soil-climatic conditions and suitable for intensive technology of cultivation [1-5]. Carried out researches also are devoted to the decision of these problems.

MATERIALS AND METHODS

Were investigated (1992-2006) the basic parameters of growth and efficiency of the zoned and perspective grades of wild strawberry, raspberry and black currant efficiency with various potential.

Following dozes of fertilizers have been investigated: during full fructification - nitrogen on the planned crop's eve of berries considering carrying out of active forms by plants and a level fertility ground; the control - without fertilizer.

At planting 80 t/hectares of manure + P360K270 are brought. Ground - chernozem ordinary, an irrigation - regulars. Researches have been lead by modern techniques used in intensive fruit growing.

RESULTS AND DISCUSSIONS

On the basis of the lead researches key parameters of growth, development and efficiency of berry cultures in plantations with a various level of intensity have been established.

The size of root system of berry cultures increased more intensively at young plants, and at fructifying - was flush with gradual reduction by the end of the period of operation of a plantation. The greatest parameters of root system have noted been for 3 year after planting at wild strawberry and a raspberry and 6 year at black currant. The great bulk of root system on length and weights settled down in a layer of ground 0-20 cm at wild strawberry and raspberry and 0-40 cm at black currant. At wild strawberry and the total length of annual gain at raspberry and black currants correlates quantity of rhizomes with intensity of growth of root system, as at young, and fructifying plants. Influence of grades on the size of root system and to its distribution, quantity of rhizomes and total length of an annual gain it is more expressed at young plants.

On mastered nutritious volumes as an element of structure of a plantation of root system, grades are classified on following groups: **Strawberry:** below average – Surprise des Halles; average – Red Gauntlet; high – Senga Sengana; Camarosa;. **Raspberry:** below average – Novokitaevskaia; average – Novosti Kuzmina; high – Fertodi Zamalos. **Black currant**: below average – Karelskaia, Altaiskaia Desertnaia, Ciornaia Lisavenko; average – Golubka, Minai Şmîriov, Belorusskaia Sladkaia, Seianeţ Golubki; high – Stahanovka Altaia.

On force of growth, parameters of structure of bushes and development of elevated nutritious volume, the grade of black currant are classified on following groups: below average – Karelskaia, Golubka (Height of bushes 1,0-1,1 m); average - Seianeţ Golubki, Minai Şmîriov, Belorusskaia Sladkaia, Studenceskaia (Height of bushes 1,2-1,4 m); high – Primorskii Cempion (Height of bushes 1,5-1,7 m).

The area of a sheet surface of berry cultures of young plants has increased the strengthened rhythm, and at fructifying - was took at high enough level within 2 years at wild strawberry and 5-6 years at raspberry and black currant.

On size of the area of sheet surface investigated grades can be classified on following groups: **Strawberry:** below average – Surprise des Halles (20 - 22 thousand m^2/ha); average – Red Gauntlet (25-28 thousand m^2/ha); high – Senga Sengana (35-37 thousand m^2/ha). **Raspberry:** below average - Novokitaevskaia (20 thousand m^2/ha); average – Novosti Kuzmina (25 thousand m^2/ha). **Black currant:** below average – Altaiskaia Desertnaia, Ciornaia Lisavenko, Golubka, Studenceskaia (15-18 thousand m^2/ha); average – Belorusskaia Sladkaia, Minai Şmîriov, Seianeţ Golubki, Stahanovka Altaia, Altaiskaia Desertnaia, Ciornaia Lisavenko, Golubka (25-28 thousand m^2/ha).

The greatest areas of a sheet surface of plantings it is noted in plantations of wild strawberry for the third year after planting (35,3 thousand m^2/ha).

This breed had the highest parameters of biological (cca. 10 t/ha) and economic efficiency (2,19 t/ha); level of use active radiation in the general biomass 1,2 % and in berries - accordingly have made 0,3 %.

In plantations 3 years at wild strawberry and are more senior than 8 years at raspberry and black currant the area of sheet surface, biological and economic efficiency, level of use of solar radiation have considerably decreased, that leads to an inefficiency of use such to a plantation from the point of view of results of photosynthetic activity.

On biological efficiency and operating ratio of solar radiation of a grade it is possible to classify on following groups: **Strawberry:** below average – Surprise des Halles (6 t/ha, 0,75%); average – Red Gauntlet (8,7 t/ha, 1,2%); high – Senga Sengana (10 t/ha, 1,3%). **Black currant:** below average – Karelskaia, Altaiskaia Desertnaia, Ciornaia Lisavenko (4-5 t/ha, 0,6-0,7%); average – Minai Şmîriov, Belorusskaia Sladkaia, Seianeț Golubki (7-8 t/ha, 1,0-1,2%); high – Stahanovka Altaia (9 t/ha, 1,4%).

Productivity of fructifying plantations was took at a high level within 2 years at wild strawberry and 8 years at raspberry and black currant. The further operation of such plantations does not provide reception of crops which compensated the executed expenses on care of plantings and cleaning of berries.

On the level of crop of the berries, investigated grades can be classified on following groups: **Strawberry:** below average – Surprise des Halles (14-15 t/ha); average – Red Gauntlet, Senga Sengana (24-26 t/ha); high – Camarosa (40-45 t/ha);. **Raspberry:** below average – Novokitaevskaia (2,1-2,6 t/ha); average – Novosti Kuzmina (6-7 t/ha). **Black currant:** below average - Altaiskaia Desertnaia, Ciornaia Lisavenko (4-5 t/ha); average – Belorusskaia Sladkaia, Minai Şmîriov, Seianeț Golubki, Karelskaia, Stahanovka Altaia (8-10 t/ha).

The Bookmark of plantations of berry cultures it is demanded greater capital investments: from 30 thousand lei/ha at wild strawberry up to 42 thousand lei/ha at raspberry and black currant. Use of highly productive grades promotes increase efficiency of use of capital investments and to reduction of term of their recumbent till 1 year at wild strawberry and 4 years at black currant. It allows introduction in manufacture of annual culture of wild strawberry and to reduction of term of operation of raspberry and black currant till 4-5 economic crops of berries. The common resource of efficiency of the plantation for all period of its operation makes 24-48 t berries of wild strawberry, 32-40 t berries of black currant and 24-30 t berries of raspberry.

Reception of the annual income up to 27-30 thousand lei/ha at wild strawberry, 5,7-8,2 thousand lei/ha at black currant and 2,8 thousand lei/ha at raspberry at a level of profitability accordingly 75-84 %, 28-39 % and 13 % has been provided owing to use of grades with high potential of efficiency above 16 t/ha at wild strawberry and 5 t/ha at raspberry and black currant. The highest level of economic efficiency of use of capital investments, and also manufactures of berries it is received in plantations with use of grades of intensive type:

Strawberry: – Red Gauntlet, Senga Sengana, Camarosa and Seascape; **Raspberry: – Novosti Kuzmina and Fertodi Zamalos**; **Black currant– Belorusskaia Sladkaia, Seianeț Golubki, Karelskaia and Stahanovka Altaia.**

On the basis of the received results parameters of a plantation of intensive type of wild strawberry, raspberry and black currant for reception of planned crops of berries on ground with an average level fertility have been established. Corresponding parameters for ground with other level fertility and a used grade can be received at corresponding correction of each parameter according to developed to a technique.

CONCLUSIONS

At intensive cultivation of berry cultures in conditions for reception of planned crops of qualitative berries it is necessary for Republic of Moldova to use following grades and parameters of a plantation:

Strawberry: Crop of berries - 25-30 t/ha; grade - potential of efficiency from above 35 t berries/ha; density of planting - 74-80 thousand /ha; the area of sheet surface - 30-40 thousand m2/ha; fertility ground - humus - 2,8-3 %, azotes - 4 mg/100g ground, phosphorus - 3,2 mg/100 g ground, potassium - 25-26 mg/100 g ground; fertilizer - azotes on the planned crop's eve of berries; mulching ground - black polyethylene film in a number *(in plantations from the small area - black polyethylene film, straw of wheat or barley);* biological efficiency - 15-20 t dry substance/ha; operating ratio of solar radiation in fructifying plantations - 1,8-2,3 %; the period of economic operation - 2 years.

Raspberry: Crop of berries - 7-10 t/ha; grade - potential of efficiency from above 12 t berries/ha; density of planting - 8 thousand /ha; the area of sheet surface - 20-30 thousand m2/ha; fertility ground - humus - 2,6-3%, azotes - 4 mg/100g ground, phosphorus - 3,4 mg/100 g ground, potassium - 28 mg/100 g ground; fertilizer - azotes on the planned crop's eve of berries; biological efficiency – 10-12 t dry substance/ha; operating ratio of solar radiation in fructifying plantations - 1,2-1б4 %; the period of economic operation – 8-9 years.

Black currant: Crop of berries - 8-10 t/ha; grade - potential of efficiency from above 12 t berries/ha; density of planting – 6-8 thousand /ha; the area of sheet surface - 25-30 thousand m2/ha; fertility ground - humus - 2,8-3,2%, azotes – 3,8 mg/100g ground, phosphorus - 3,2 mg/100 g ground, potassium - 27 mg/100 g ground; fertilizer - azotes on the planned crop's eve of berries; biological efficiency – 7-9 t dry substance/ha; operating ratio of solar radiation in fructifying plantations - 1,2-1б4 %; the period of economic operation – 8-9 years.

Structure of bushes for mechanized cleaning of berries: the minimal height - 1,2 m; width at the basis of a bush - 0,25-0,30 m; quantity of stalks of different age - 15-18 pieces; an arrangement of stalks - mainly vertically, seldom.

Use of the offered technique allows providing to reception of a planned crop of berries from a plantation at the minimal expenses, using as much as possible soil-climatic conditions of cultivation and potential of efficiency of grades.

REFERENCES

1. **Barbaroş M., 2005** - Sporirea productivității căpşunului, zmeurului şi coacăzului negru în Republica Moldova. Centrul editorial al UASM, Chişinău, 192 p.
2. **Cimpoieş GH., 2002** - Pomicultură specială. Colograf, Chişinău, 336p.
3. **Davidescu D., Davidescu V., 1992** - Agrochimie horticolă. Editura Academiei Române, Bucureşti, 546 p.
4. **Deriughjin I.P., Kuliukin A.N. 1998** - Pitanie i udobrenie ovosnîh i plodovîh kulitur. MSHA, Moscva, 326 p.
5. **Grădinariu G., 2002** - Pomicultură specială. Editura Ion Ionescu de la Brad, Iaşi, 414p.