

STUDIES ON CROP ADAPTABILITY OF FRUIT SHRUBS IN THE MOUNTAINS OF TRANSYLVANIA

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Abstract

Group shrubs are summarized in the following species: raspberry, blackberry, currant, barberry and blueberries. The fruit trees are cultivated for their fruit rich in sugars, acids, vitamins, pectin, mineral salts, which are used both fresh and industrialized (juice, jam, syrup, liqueur). Raspberry, blackberry, currant and gooseberry bush are from Europe and Asia, where there are in the wild flora of temperate zone. The main growing countries are the US, Canada, Germany, France, Belgium, England, Holland, Poland, Italy. In our country, culture is practiced more shrubs in the gardens of the house, but specialized plantations were established in the counties of Prahova, Bihor, Maramures, Satu Mare, Arges, Cluj, Bistrita Nasaud, Suceava and Mures.

Key words: shrubs, blackberry, Transylvania, experimental crops

INTRODUCTION

Crops of shrubs ignored in our country after 1990, began to be established increasingly more often, especially after 2007 due to programs PNDR because it proved to be a source of money, especially health accessible to all (Chira, 2008; PNDR 2007-2014).

Further references will be made, especially in culture blackberry without thorns in the mountains of Transylvania and potential of several other species in the study areas.

The varieties without thorns are sensitive to low temperatures, depending on the duration of the cold, they were affected, including fruit production at next year (Chira, 2000).

Varieties with thorns, can withstand temperatures down to -25 C, which gives this species a greater adaptation to the conditions of our country. Like raspberry, the blackberries varieties have high demands to water during fruit growth and maturation (Takeda, Peterson, 1999).

MATERIAL AND METHOD

Once you have identified potential markets and thoroughly investigated the economics of blackberry production, you must also determine the size of your operation.

Size of operation depends on the following factors:

- 1) Market potential;
- 2) Availability of suitable land;
- 3) Availability of skilled or trainable labor;
- 4) Cash available for initial investment in plants, supplies, and equipment;
- 5) Ability to manage input of resources, marketing of products, and problems as they arise (Dascalu et. al., 2014).

A successful operation requires the proper balance of the above factors to minimize risk and maximize profits.

It's best to plant blackberry shrubs in the early spring or, in warmer climates, in late fall. Blackberries were purchased bare-rooted and containerized. If your new plants are bare-rooted, shake the packing material off the roots and place the plants in a bucket of water for several hours. This keeps the roots from drying out, which you want to avoid at all means.

To plant, dig a planting hole wide enough to accommodate the roots without crowding them. Place the blackberry shrub in the hole, positioning it so that the crown of the shrub, where the stem and the roots join, is level with the surrounding soil.

The blackberry crop it was provided, from the outset with a metal trellis, made of pipe and galvanized wire with a height of 2 meters.

The blackberry comparative culture, was installed in the Sacaramb village, at 28 km from the town of Deva, in the Metaliferi Mountains at an altitude of 800 meters.

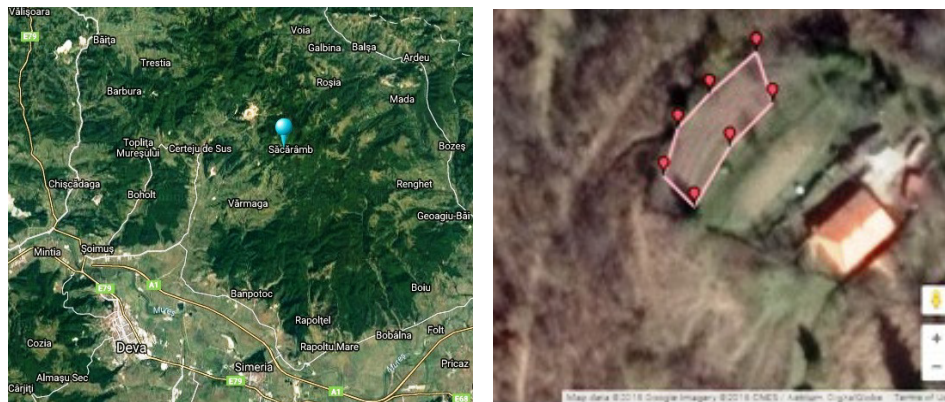


Fig. 1. The location of comparative culture

RESULTS AND DISCUSSION

Early fruiting blackberry cultivars generally ripen shortly after raspberries and, therefore, can easily extend a small fruit harvest season. Although some growers shy away from brambles because of their high labor demands, a properly managed and marketed crop can be profitable.

The success of any bramble operation requires that the grower produce high quality fruit. The quality of the product is very important when growing blackberries. Blackberries are extremely perishable and must reach their market quickly before they spoil.

Identification of readily available markets and selling the fruit at a profit are key components for success. Blackberries can be sold via pick your-own operations, roadside sales, restaurants, and retail and wholesale markets (agris.fao.org, 2006).

Some varieties can be shipped across the Romania and European plan. In all cases, fruit should be of uniform quality and sold in attractive containers. If fruit on the farm is sold, the farm stand and fields should be neat and organized. Additional valueadded products, such as jams, jellies, juices, syrups, vinaigrettes, and cobblers or prepared cobbler fillings, can increase profits.

Blackberry varieties planted in the comparative culture, were: Thornfree, Loch Ness, Thornless Evergreen and Elite.

Thornfree - this is a very fertile, late variety. It blooms from June to August. The flowers are white or pale pink. Harvest in early August to September. It produces big, black, conical-ovular shaped fruit - extremely juicy and tasty. Perfect eaten raw and processed in jams, jellies and preserves. Thornless blackberry - is the generic name of the species. Some thorns may appear on the plant.

Thornless Evergreen - medium to tall, coarse shrub, 2-10 m or more long, thicket-forming; stems 3-10 mm in diameter, ascending or arching, then sprawling and trailing along the ground, some rooting at the ends, five-angled, with stout, flattened, hooked thorn along the angles, fine-hairy when young becoming smooth. The fruits are, smooth, coherent in a black, globe to egg shaped cluster that falls with the fleshy receptacle, the berries 1-1.5 cm long.

Loch Ness - perfect for the smaller garden, British-bred blackberry 'Loch Ness' produces its firm, glossy-black, conical fruits on short, upright, thornless canes. This heavy cropper is capable of producing up to 3.6kg of fruit per blackberry bush that can be harvested from middle of August until the first frosts. It is a superior quality plants. Self fertile. Height: 2.5m. Spread: 6.5m.

Elita - is a type of blackberry, product at SCDP Cluj, like thornfree but more aromatic fruit and more vigorous growth.

When planting in 2012, they were chosen a total of 80 plants spread across varieties as follows: 50 Thornfree, 20 Loch Ness, 5 Thornless Evergreen and 5 Elite. All plants were get through in-vitro propagation. Size

at the planting and the end of the first season vegetation is shown in the table below.

Blackberry bushes need frequent irrigation, especially in the warmer seasons; at the same time, care should be taken to water so that the soil does not become saturated. This is especially true on shallow soils. Irrigation norm was 300 mc / ha, respectively for chosen area of 10.5 mc / season of vegetation (Finn, et. all., 2009).

In many temperate climates, blackberries can be successfully grown without irrigation, however to ensure high quality berries and high yields, if rain is not adequate, 3-5 mm/m square of water/week is applied. Insufficient water causes plants to produce small and dried berries.

Table 1

Size at the planting and the end of the first season vegetation

Thornfree					Lochness				
Nr.	L plant (cm)	Nr. Lujeri	Cel mai lung (cm)	Cel mai scur (cm)	Nr.	L plant (cm)	Nr. Lujeri	Cel mai lung (cm)	Cel mai scur (cm)
1	12	5	88	64	44	7	2	83	51
2	10	5	135	72	45	7	3	93	81
3	14	4	178	52	46	9	2	151	49
4	8	4	67	44	47	11	2	83	23
5	8	4	157	63	48	11	3	54	42
6	12	4	133	60	49	9	3	142	61
7	12	5	89	47	50	10	3	156	58
8	13	6	153	60	51	12	4	153	84
9	17	5	139	81	52	10	3	106	52
10	11	8	188	129	53	9	1	123	123
11	12	4	196	152	54	9	2	106	38
12	10	3	131	58	55	8	2	86	38
13	10	3	47	42	56	11	2	117	64
14	13	3	89	61	57	11	3	114	92
15	10	3	144	80	58	13	3	152	83
16	14	4	152	88	59	11	3	66	48
17	12	3	141	90	60	9	3	102	53
18	7	3	124	62	61	9	3	121	42
19	11	3	78	62	62	8	3	162	63
20	12	2	107	58	63	14	3	203	61
21	11	2	108	34	Thornfree 2				
22	14	2	160	104	64	12	4	196	72
23	12	3	67	32	65	11	2	181	63
24	9	2	161	74	66	14	4	217	82
25	11	3	163	72	67	12	3	198	94
26	13	3	163	79	68	12	2	212	68
27	12	4	138	81	69	13	2	136	74
28	10	4	186	117	70	11	2	163	81
29	14	3	176	125	Elita				
30	9	3	116	56	71	9	3	138	62
31	9	4	167	58	72	10	3	124	51
32	12	5	127	62	73	14	2	219	104

Table 1(continuation)

Nr.	L plant (cm)	Nr. Lujeri	Cel mai lung (cm)	Cel mai scur (cm)	Nr.	L plant (cm)	Nr. Lujeri	Cel mai lung (cm)	Cel mai scur (cm)
33	14	5	247	121	74	11	3	198	127
34	10	6	228	97	75	12	3	205	91
35	11	4	218	149	Thornless - Evergreen				
36	12	4	271	138	76	12	3	236	74
37	11	4	208	71	77	12	3	268	106
38	13	4	126	87	78	14	2	306	145
39	12	4	151	122	79	11	3	208	103
40	10	4	174	94	80	12	3	245	97
41	10	4	166	71					
42	8	4	166	112					
43	11	3	181	128					

Blackberries require fertilizer, but only at certain times. Is observed at the leaves. If they appear to have good green color and the plant is fruiting and growing well, you do not need to fertilize. Should you determine fertilizer is required, is need to back off the mulch, spread the fertilizer on top of the soil, incorporate his in the soil and replace the mulch. The fertilizer applied was the manure at a dose of 30 t / ha, respectively for chosen area of 1 t in the spring season.

Autumn in the first part of November, before the appearance of frost the strains that have fructified were removed from the surface, and the ones who grew up during that year were detached from wire trellis, routed as horizontal, near ground level, set by the furrows of earth and straw coated.

In terms of protection, the culture was at a few plants infested with rust orange (*Gymnoconia sp*). Affected plants were removed and burned and the ground it was disinfected. Since 2012, at the foundation, annually 2-3 plants were infested by this pathogen, they must be replaced. The assumption is that the disease was brought with planting material. Other pathogens or entomologic agents did not affected the culture.

Besides blackberry culture presented here, in the area, they were planted two other experimental crops of raspberries and blueberries. They have developed vigorously, the recorded data making a subject of future studies.

CONCLUSIONS

All four varieties studied had a large force of growth in the first year after planting, then after cuts, Thornless Evergreen and Thornfree conducted the most vigorous growth.

The largest amount of fruits per plant, was recorded the Lochness variety, followed of Thornfree variety. Lochness it registered and fruits most weighing.

The mountain area of Transylvania, it is suitable for the cultivation of fruit shrubs, blackberry and raspberry mainly growing vigorously and that ensuring a high quantity of fruit. Also, late frosts and drought can create culture problems.

Annually 2-3 plants were infested by this pathogen, they must be replaced. The assumption is that the disease was brought with planting material.

Interest in the future is to increase the cultivated area as it feels the need to commercialize and finished products

REFERENCES

1. Chira L., 2000, Cultura arbustilor fructiferi, Editura MAST, București.
2. Chira L., 2008, Cultura pomilor si arbustilor fructiferi, Editura MAST, București.
3. Dascalu M., et. all., 2014, Soil moisture study and its influences on blackberry culture for north east Moldova county, , U.S.A.M.V. Iasi, Lucr. șt., seria Horticultură, vol. 55.
4. Finn C. E., et. all., 2009, Lochness trailing blackberry. HortScience 44:2288-2290.
5. Takeda F., Peterson D. L., 1999, Considerations for machine harvesting fresh-market eastern thornless blackberries. HortTechnology Journal.
6. *** <http://agris.fao.org/agris-search/> Five years experiences in culture of blackberry cultivar Thornfree, 2006;
7. **** <http://www.pndr.ro/pndr-2007-2013.html>
8. **** <http://www.pndr.ro/pndr-2014-2020.html>