RESEARCH ON THE CULTURE IN A DIFFERENT VARIETY RADISH CHERNOZEM FROM VERTIC GIARMATA, TIMIS COUNTY

Carmen BEINȘAN*, Casiana MIHUȚ**

University of Agricultural Sciences and Veterinary Medicine „King Michael I of Romania" in Timisoara, Faculty of Horticulture and Forestry*, Faculty of Agriculture**. Arad way, no. 119.

e-mail: casianamihut@yahoo.com

Abstract. *The research subject of this paper were conducted in the village Giarmata, Timis County. Giarmata village lies at a distance of 11 km from the city of Timisoara and 1.3 km from the International Airport „ Traian Vuia "Timisoara, located in north-central area of Timis County (45 ° 83 'north latitude and 21 ° 32 'east) and occupies a total area of 7150 hectares, of which 6292 ha agricultural land and 43.5 ha of forest. The soil under study is a vertic mold. According geotechnical studies in the area, soil stratifications are: topsoil from 0.2 to 0.8 m, 2.1 m local; clay earths comprising clay, silty clay, clay powders, pastes Varta-countries, humid and very wet. An important feature is the contraction of the earth clay specific high plains, depending on the humidity. Located in the west of the country, the investigated area is characterized by a moderate temperate continental climate with mild winters shorter and, being frequently under the influence of cyclones and air masses from the Mediterranean and Adriatic. Growing radishes aims raw consumption throughout the year tuberizate roots, protected crops from the field (month radishes, summer and winter) and shelter (radishes month). Radishes contain 5-8% dry month and the summer and winter mainly represented 8-11% of carbohydrates. Spicy taste of radish is due allyl sulfide and essential oils which give them food and taste great importance. Study biological material was represented by three varieties of radish: Watermelon, French Breakfast radishes and beer, Birra di Monaco. Fertilization was done differently, depending on the vegetation period of cultivated radish varieties. Mineral fertilization was done fractionated, low rules, and the organic culture applied only preliminary. The aim was to obtain quality radishes, farms during certain periods of the year. Firmness is the best indicator of maturity radishes.*

***Keywords*:** *soil, fertilizers, variety, mold vertic, radishes*

INTRODUCTION

Giarmata have the same moderate continental climate as part of Timis county. Its general features are marked by diversity and irregularity of atmospheric processes. Relations of vegetable plants with climatic occurs from seed germination stage. Thru the way temperatures are routed in the first stages of vegetation growth periods and influence plant development and production level, which is why we have carefully studied the climatic conditions of the investigated area. It is thus large differences of these weather conditions, depending on the culture system.

Findings optimum temperature for plant growth in field vegetable or protected areas relate to each phase and phenophase growth and development, with an optimum temperature and under and supraoptimale limits. Among them, in practice, should be given special attention lethal minimum temperature and biological minimum and maximum temperatures. To characterize the climate conditions were used climate data recorded and interpreted by Agrometeorology discipline in the Faculty of Agriculture.

Regarding rainfall, the annual average was 649 l / m^2, but they are unevenly distributed.

Growing radishes aims raw consumption throughout the year tuberizatios of the roots, protected crops from the field (month radishes, summer and winter) and shelter (radishes

month). Radishes contain 5-8% dry month and the summer and winter mainly represented 8-11% of carbohydrates. Spicy taste of radish is due ally sulfide and essential oils which give them food and taste great importance. The short vegetation period radishes, their cultivation system allows successive crops, the summer month and cultivating it and in protected areas. Radishes are annual plants month and the summer and winter biennial plants. Part comes from radish root tuberization month of hypocotyl thickening, and the summer and winter radish in hypocotyl and root itself.

The relationships between plant growth factors, radish seeds germinate at 2-3°C, the optimum temperature of 20-25°C, plants springing up in 4 days. Radishes are cold-resistant plants, plants resistant to -2 ... -3°C young and mature, hardened frosts -3 ... -6°C. The optimum temperature for growth is 15-16°C.

Radishes have high demands against the soil humidity (optimum 70-80% of field capacity), lack thereof, associated with atmospheric print sharp taste and roots do not grow, it lignify and become spongy. Oscillations of moisture root cause cracking, and thus they lose commercial value, particularly radishes month. Winter Radish, whose root system is deeper, more easily bear higher temperatures and drought.

Light Girl radishes have higher requirements.

Radishes claim soils with medium texture, loose, with a high content of humus and nutrients in forms easily assimilated with a pH of 6.2 to 7.4 and with good water retention capacity. Clay soils, compact, not suitable for the roots deforms and light soils, sandy, root tissues because sponges favors poor water regime.

In terms of radish crop fertilization, organic fertilizer is given prior culture (HORGOS A., 2002).

MATERIALS AND METHODS

Study biological material was represented by three varieties of radish: Watermelon, French Breakfast radishes and beer, Birra di Monaco. Experience has been placed in the field, on the territory of Giarmata, studied soil is chernozem vertic.

Watermelon Radishes. An unusual and beautiful radish, sea, known as the "Red Meat" (Fig.1). A single radish Chinese origin. The roots are 5-7 cm diameter, ball-shaped, white exterior and interior color red watermelon. The meat is crispy and light, sweet taste, perfect for salads and side dishes. It is fierceness white skin and disappears as the plant matures. It prefers cold conditions, the best growing spring and fall. In hot weather early flowering plants can enter and can not form radishes (http://lucaria.sunphoto.ro/RADISH_-_WATERMELON).

They can be sown in early spring in protected areas. Matures in 45 days.

Fig. 1 - Variety Watermelon
(http://lucaria.sunphoto.ro/RADISH_-_WATERMELON)

French Breakfast Radishes. A variety of enhanced productivity, according to the spring and autumn sowing. Root is cylindrical, with a length of up to 9 cm, purplish red color with white head, having excellent taste qualities (Fig. 2). It has very short vegetation period. Root not lemnifica. Variety is recommended for cultivation in open field(http://www.covera.ro/casa-gradina/gradinarit-exterior-interior/seminte-legume/seminte-ridichi-french-breakfast-3_1089/).

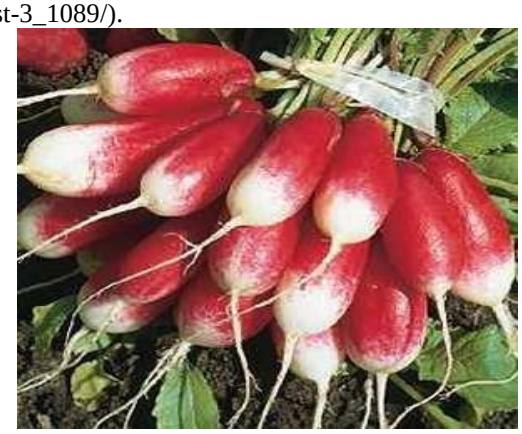

Fig. 2 - Variety French Breakfast

The amount of harvest is obtained per unit of area, so the productivity of agricultural plants depends on the entire set of environmental conditions and human influence that can change in one direction or another natural factors or characteristics of plants so as to better use of natural conditions.

Radishes beer Birra Di Monaco. It is a sort of summer vegetation period of 55 days. The root cone-shaped elongated white, crunchy and flavorful (Fig. 3).

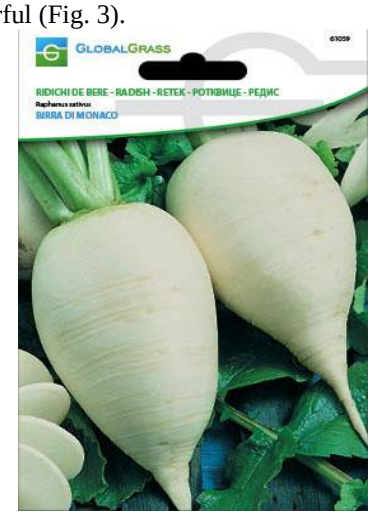

Fig. 3 Variety BIRRA DI MONACO (original) (http://www.magagro.ro)

The experiment was located on the territory of Giarmata and agro aimed influence on quality indicators in three varieties of radish.

The measurements were carried out in three stages of growth: 4.1 - 4.3 (10 to 30% by weight of made green), 7.1-7.3 (10 - 30% of the size of the radish made) and 8.9 (full ripening and the end of the growing season).

Leaf area (cm2) was determined by the parameters of the leaf. It measured the length and width of leaf lamina half the length.

Radishes correction coefficient is 0.654.

RESULTS AND DISCUSSION

In Table 1 the analytical data from gleyed weak vertic chernozem Giarmata after OSPA Timisoara.

Table 1.

Vertic chernozem analytical data, weak gleic from Giarmata, Timis
(OSPA Timisoara, 1998)

HORIZON	**Ap**	**Aphyz**	**Amyz**	**A/C**	**C/Ak**	**Cca**
Depth (cm)	**0-23**	**23-38**	**38-50**	**50-64**	**64-76**	**76-95**
Coarse sand (2,0-0,2 mm)%	1,9	2,1	1,3	1,6	1,3	1,2
Fine sand (0,2-0,02 mm) %	30,1	29,9	32,2	31,4	32,0	35,4
Dust (0,02-0,002 mm) %	25,6	26,0	24,1	25,4	25,0	27,3
Clay (under 0,002 mm) %	42,4	42,0	42,1	41,6	41,7	36,1
TEXTURE	**TT**	**TT**	**TT**	**TT**	**TT**	**TT**
Soil density (D g/cm^3)	2,65	2,68	2,70	2,72	2,72	2,72
The apparent density (DA g/cm^3)	1,01	1,48	1,39	1,43	1,46	1,34
The total porosity (PT %)	61,9	47,0	48,5	47,4	46,3	50,7
Aeration porosity (PA %)	35,2	9,5	11,8	9,8	7,9	16,0
Degree of compaction (GT %)	-19,2	9,3	6,5	8,5	10,6	0,4
Wettability capacity (CH %)	8,9	8,8	8,9	8,8	8,8	7,6
Wilting capacity (CO %)	13,4	13,2	13,4	13,2	13,2	11,4
Field capacity (CC %)	26,4	26,4	26,4	26,3	26,3	25,9
Total capacity (CT %)	61,3	33,1	34,9	33,1	31,7	37,8
Useful water capacity (CU %)	13,0	13,2	13,0	13,1	13,1	14,5
Cover. de maximum release (CCD max. %)	34,9	6,7	8,5	6,8	5,4	11,9
Hydraulic conductivity (K mm/oră)	14,0	0,96	1,20	1,0	0,95	2,20
pH (în H_2O)	6,55	7,02	7,31	7,62	8,16	8,43
Carbonate ($CaCO_3$)			0,1	0,2	2,40	17,31
Humus (%)	3,48	2,44	1,47			
Moisture %	11,64	15,36	13,64	15,29	15,05	16,68
Reserve humus (t/ha)	80,8	54,2	24,5			

Experimental results on plant size. With regard to plant height, we can see that in the development stage 4.1 to 4.3, Watermelon variety registered a higher than 13.82 cm, and in the last stage (8.9) - 29.77 cm. The lowest was recorded in French class Breakfast (19.6 cm) (Table 2 and Fig. 1.)

Table 2

Experimental results on plant height (cm)

Nr.crt.	Variety	Plant height (cm)		
		Development stage 4.1- 4.3	Development stage 7.1-7.3	Development stage 8.9
1.	French Breakfast	12,13 ± 0,35	13,93 ± 1,13	19,6 ± 0,89
2.	Birra di Monaco	13,15 ± 0,76	15,9 ± 0,58	26,4 ± 0,72
3.	Watermelon	13,82 ± 0,24	17,07 ± 1,07	29,77 ± 0,67

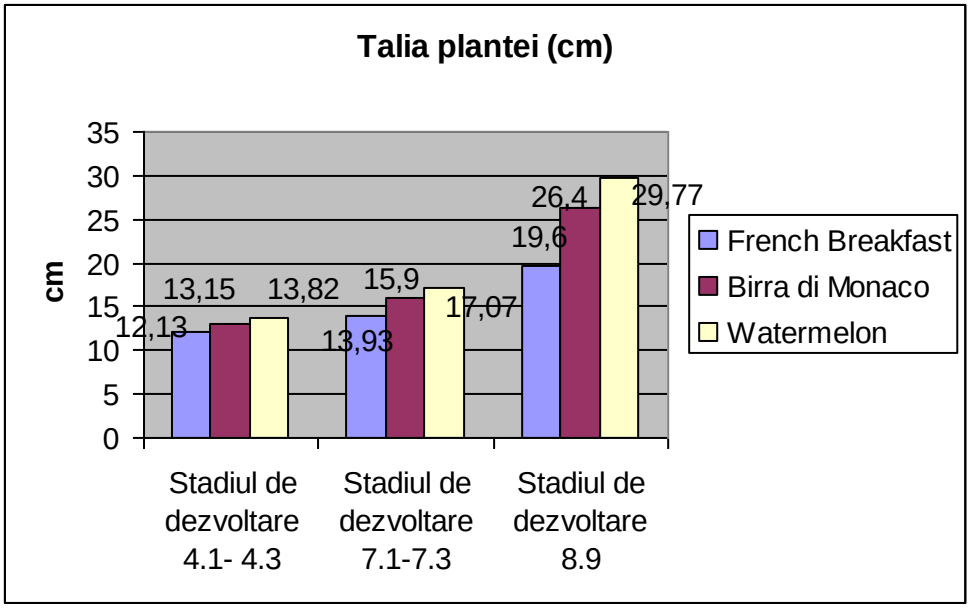

Fig. 1. Experimental results on plant height (cm)

CONCLUSIONS

With regard to plant height, it can be seen that kind Watermelon registered a greater height in all three stages studied.

The climatic and soil conditions in Giarmata, of the three varieties of radishes studied: Watermelon, French Breakfast radishes and beer, Birra di Monaco, although the size of the plants, the largest class had a variety Watermelon followed by Birra di Monaco variety, and quality earliest French Breakfast variety was followed by variety Birra di Monaco. Instead, Watermelon variety produced small roots, poor quality and their vegetation period was longer. Plant height but was higher in all stages of development.

As a general conclusion, it was noted that although Watermelon variety had the highest waist and hand vegetative soils not suited Giarmata, because the roots were poorly developed. The biggest roots were registered radishes beer Birra di Monaco, this variety can be grown successfully in terms of productivity. Therefore, we recommend that vertic chernozem from Giarmata only cultivate varieties French Breakfast and longer, radishes variety of beer, Birra di Monaco.

BIBLIOGRAPHY

1. BEINŞAN CARMEN - Plant Physiology, Ed. Eurobit, Timişoara, 2008, ISBN 978-973-620-436-4.
2. GOIAN M., IANOŞ GH., RUSU I. – Research on the development of Western Lowland soils, Work. Del. USAMVB Timişoara, vol.XXVII, part I, 1993;
3. IANOŞ GH., PUŞCĂ I., GOIAN M. – Banat-natural conditions and soil fertility. Mirton Press, Timişoara, 1997;
4. HORGOŞ A. – Special Vegetable, Ed. Agroprint, Timişoara, 2002.
5. MIHUŢ CASIANA, RADULOV ISIDORA – Soil Sciences. Ed. Eurobit, Timişoara, 2012;
6. POSEA GH. – The soils in the west of Romania. Ed. Mirton, Timişoara, 2009;

7. ŞUMĂLAN R. - Plant Physiology. Elements of applied plant physiology in horticulture. Ed. Eurobit, Timişoara, 2009, ISBN 978-973-620-496-8.
8. ŞUMĂLAN R., DOBREI CARMEN – Plant physiology, practical, Ed. Marineasa, Timişoara, 2002, ISBN 973-9485-38-3.
9. ȚĂRĂU D. ȘI COLAB. – Characteristics of ecological conditions and soil fertility restoration in western Romania. Ed. Eurobit, Timișoara, 2007;
10. ȚĂRĂU D., LUCA M., - Pannonian pedological perspective of the municipalities of Banat, Publisher Panonic, Ed. Marineasa, 2002.
11. *** www.ospatimisoara.ro
12. *** http://lucaria.sunphoto.ro/RADISH_-_WATERMELON