

**PRACTICAL ASPECTS REGARDING
THE USE OF NON-WOVEN TEXTILES AS MULCHING
MATERIALS FOR A COMPARATIVE SWEET PEPPER
CROP (*Capsicum annuum L.*)**

**ASPECTE PRACTICE PRIVIND UTILIZAREA TEXTILELOR
NEȚESUTE CA MATERIALE DE MULCIRE LA O CULTURĂ
COMPARATIVĂ DE ARDEI GRAS (*CAPSICUM ANNUUM L.*).**

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Abstract. *Technical method of “mulching” assume covering the soil between rows and plants on rows with different materials (straws, shredded paper, plastic, unwoven textiles etc.). This protective, simple and with a wide aplicability method offers various benefits concerning yield’s precocity, quality and quantity, soil structure maintenance and water conservation.*

The goal of this paper is the productive estimation for some sweet pepper cultivars (Albatros, Belladonna, Gypsy, Shy Beauty, Export) when these crops are mulched with plastic materials and unwoven textiles.

Rezumat. *Metoda tehnică de “mulcire” presupune acoperirea solului între rânduri și între plante pe rând cu diverse materiale (paie, hârtie, plastic, textile nețesute etc.). Această metodă protectivă, simplă și cu o largă aplicabilitate oferă variate avantaje cu referire specială la precocitatea, calitatea și cantitatea producției, păstrarea structurii solului și conservarea apei din sol.*

Scopul lucrării de față este estimarea producției pentru câteva soiuri de ardei gras (Albatros, Belladonna, Gypsy, Shy Beauty, Export), în condițiile mulcirii acestor culturi cu materiale plastice și textile nețesute.

The variety, as a production factor, has a major contribution in qualitative and quantitative yield increase. Some authors consider that the variety is decisive for an intensive crop.

The study regarding some cultivars behaviour in certain pedoclimatic conditions and different cultivation systems is one of the main preoccupation for specialists.

Mulching is an important method for obtaining healthy crops and it has several advantages: it reduces the need for tillage and the use of weed-control chemicals, water is conserved (mulches reduce the evaporation of soil moisture by lowering the soil temperature), it prevents the formation of soil crusts and drastic fluctuations in soil temperature. In the same time, mulch keeps the soil cooler in summer and warmer in winter, improving both root growth and nutrient availability. At the end of the growing season, organic mulches can be tilled into the soil to further increase the organic matter content and the water-holding capacity of the soil.

The aspects presented above motivated us to study the behaviour of some new sweet pepper hybrids in the conditions of Iasi county.

MATERIAL AND METHOD

Researches were carried out in 2006, in field and in an ICLF Vidra 5,4 plastic tunnel from University of Agricultural Sciences and Veterinary Medicine Iasi, Faculty of Horticulture.

During experience, were followed the mulching effects with two materials (*unwoven textiles* in two variants) and *black plastic* on a sweet pepper (*Capsicum annuum L.*) crop.

The characteristics of sweet pepper hybrids that were used during experiences are presented below:

Albatros F1 is a very early indeterminate hybrid with extremely high yield potential. The plant is vigorous, with short internodes. Side shoot (sucker) forming ability is poor. Fruits are tapered, 3-4-lobed. The fruit color is white with yellow undertone, becoming bright red at biological ripeness. Fruits are 100-120 g in weight, 6-7 cm in diameter, 10-12 cm in length, with a wall thickness of 5-6 mm. This variety features an outstanding fruit-setting ability and intermediate heat resistance. Recommended for very early greenhouse and open-field production

Belladonna F1 is a very early-maturing hybrid. The plants are vigorous, with a compact, indeterminate plant habit allowing very easy harvest. Produces a high percentage of 4-lobed, thick-walled (6-7 mm) fruit. The blocky bell-shaped fruit average 9-10 x 8-9 cm in size and 160 - 200 g in weight and are very uniform. The fruit color varies from ivory at industrial ripeness to yellow at complete physiological ripeness. Resistant to tobacco mosaic virus (Tobamo virus P0). Particularly suited for early spring, summer and autumn production in glasshouses, as well as for cultivation in plastic film greenhouses, under plastic cover and in the open field for fresh market.

Gypsy F1 is a very early and extremely productive hybrid. Matures 60 days after transplanting. Plants have a compact growth habit and a height of 45-55 cm. Fruits measuring 10x6 cm, have a great flavor and are light-yellow at industrial ripeness and red at biological ripeness. Resistant to tobacco mosaic virus. Recommended for very early production in glass greenhouses, plastic film greenhouses and in the open field

Shy Beauty F1 is early-maturing hybrid with vigorous plants and excellent yield potential. Fruits are blocky, thick-walled. The fruit color is ivory at industrial ripeness and red at biological ripeness. Suitable for fresh market and processing. Resistant to tobacco mosaic virus (Tm2) and bacterial spot. Recommended for cultivation in glass greenhouses, plastic film greenhouses and in the open field.

Export is a early-maturing hybrid. Plants have a height of 45-55 cm. Fruits are 75-110 g, with a wall thickness of 5-6 mm.

During experience, were followed the mulching effects with two materials V_2 (*unwoven textiles* in two variants V_2, V_3) and V_4 *black plastic* on a sweet pepper (*Capsicum annuum L.*) crop.

Unwoven textiles were manufactured at S.C. Fibresin S.A. Iași and in their composition are jute - 80% and polypropylene - 20%. There were two variants of unwoven textile: $V_2 = 160\text{g/m}^2$ and 3,07 mm thickness and $V_3 = 160\text{g/m}^2$ and 3,32 mm thickness. Variant V_1 was a unmulched crop.

The experimental variants were settled in randomized blocks with 4 repetitions and each of them with 7 plants.

The crop from plastic tunnel was established at 24th April (*Table 1*) by planting the seedlings according to the following scheme:

$$55+70+110+70+110+70+55/30 = \text{cca } 43215 \text{ pl/ha (6 rows)}$$

The sowing and transplanting were made in 340 cm³ plastic pots.

It must be mentioned that during the vegetation period, there were not used chemical fertilization and tillage.

Table 1

Dates regarding the establishment and evolution for sweet pepper crops

Sowing	February 16 th
Germination	February 27 th
Transplanting	March 9 th
Planting	April 24 th

RESULTS AND DISCUSSIONS

The results obtained after total yield (t/ha) determination was made at cultivars are presented below, in the tables 2,3,4,5 and 6.

Table 2

Total yield (t/ha) of Albatros cultivar depending of mulch materials used

Variant	Yield	% of V_m	Difference (t/ha)	Significance
V ₄	47,81	175,74	20,58	XXX
V ₃	43,21	158,82	15,98	XXX
V ₂	36,21	133,09	8,98	XXX
V ₁	27,23	100	0,0	

DL 5% = 2,7 t/ha

DL 1% = 4,1 t/ha

DL 0,1%= 6,6 t/ha

Table 3

Total yield (t/ha) of Belladonna cultivar depending of mulch materials used

Variant	Yield	% of V_m	Difference (t/ha)	Significance
V ₄	52,46	185,51	24,15	XXX
V ₃	45,86	162,19	17,55	XXX
V ₂	38,40	135,69	10,09	XXX
V ₁	28,31	100	0,0	

DL 5% = 1,4 t/ha

DL 1% = 2,1 t/ha

DL 0,1%= 3,4 t/ha

Table 4

Total yield (t/ha) of Shy Beauty cultivar depending of mulch materials used

Variant	Yield	% of V _m	Difference (t/ha)	Significance
V ₄	39,37	172,81	16,56	XXX
V ₃	34,45	151,32	11,64	XXX
V ₂	28,46	125,00	5,65	XXX
V ₁	22,81	100	0,0	

DL 5% = 1,0 t/ha

DL 1% = 1,6 t/ha

DL 0,1%= 2,5 t/ha

Table 5

Total yield (t/ha) of Gypsy cultivar depending of mulch materials used

Variant	Yield	% of V _m	Difference (t/ha)	Significance
V ₄	46,91	183,92	21,45	XXX
V ₃	38,64	151,37	13,18	XXX
V ₂	31,16	122,35	5,7	XXX
V ₁	25,46	100	0,0	

DL 5% = 1,4 t/ha

DL 1% = 2,2 t/ha

DL 0,1%= 3,5 t/ha

Table 6

Total yield (t/ha) of Export cultivar depending of mulch materials used

Variant	Yield	% of V _m	Difference (t/ha)	Significance
V ₄	36,02	174,76	15,43	XXX
V ₃	30,02	145,63	9,43	XXX
V ₂	25,81	125,24	5,22	XXX
V ₁	20,59	100	0,0	

DL 5% = 1,7 t/ha

DL 1% = 2,5 t/ha

DL 0,1%= 4,1 t/ha

Analising the dates regarding total yield, we found that the best results were at variant V₄ (black mulch) and the following hybrids: Belladonna (52,46 t/ha), Albatros (47,81 t/ha) and Gypsy (46,91 t/ha). The values of total yield fluctuated from 52,46 t/ha (cultivar Belladonna, variant V₄ - black mulch) to 20,59 t/ha (cultivar Export, variant V₁ – unmulched crop).

Regarding unwoven textiles used for mulching, total yields were between 45,86 t/ha (cultivar Belladonna) and 30,02 t/ha (cultivar Export) for variant $V_3 = 160\text{g/m}^2$ and 3,32 mm thickness and between 38,40 t/ha (cultivar Belladonna) and 25,81 t/ha (cultivar Export) for variant $V_2 = 160\text{g/m}^2$ and 3,07 mm thickness.

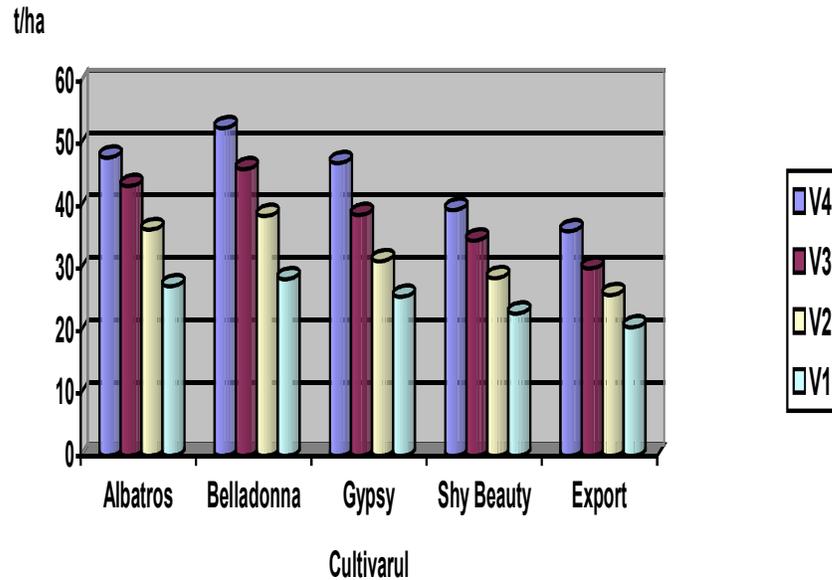


Fig. 1. The yield variation determined by mulch material used for the following cultivars: Albatros (A), Belladonna (B), Shy Beauty (C), Gypsy (D), Export (E)

CONCLUSIONS

1. The biggest total yields were at Belladonna (52,46/ha) and Albatros (47,81 t/ha), hybrids that were mulched with black plastic;
2. Referring to those two types of unwoven textiles, the most important total yields were obtained at cultivar Belladonna (45,86 t/ha recorded at variant with unwoven textile - 160g/m^2 and 3,32 mm thickness and 38,40 t/ha for variant with unwoven textile - 160g/m^2 and 3,07 mm thickness).
3. It has been shown that black plastic mulch had the best results for sweet pepper crop.
4. The unwoven textiles chemical composition assure a superior grade of biodegradability, having an obvious ecological quality.

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