PRACTICAL ASPECTS REGARDING THE EVOLUTION OF SOME BIOMETRICAL PARAMETERS AT SOME NEW COMPARATIVE LARGE-PEPPER CROP, DEPENDING ON LEAF AND MINERAL FERTILIZATION, CULTIVATED IN VEGETATION VESSELS SYSTEM –IAŞI AREA

ASPECTE PRACTICE PRIVIND EVOLUȚIA UNOR INDICI BIOMETRICI LA CULTURA COMPARATIVĂ A UNOR CULTIVARE NOI DE ARDEI GRAS, FUNCȚIE DE FERTILIZAREA FOLIARĂ ŞI MINERALĂ, CULTIVATI IN SISTEMUL VASELOR DE VEGETATIE – ZONA IASI

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Abstract. *A less study domain from plant nutrition section is represented by leaf fertilization. For this reason, this paper work bring new results of some tests made using several new leaf fertilizers, some we can call ecological, results which will complete the specialty literature.*

Rezumat. *Având în vedere importanța alimentară şi economică deosebită a ardeiului gras, studiul comportării unor noi cultivare în anumite condiții pedoclimatice şi în diferite sisteme de cultură, constituie una din principalele preocupări pentru specialişti în vederea recomandării celor mai eficiente soluții practice adaptate la condițiile specifice fiecărei zone.*

Studiul de față urmăreşte influența fertilizării combinate (radiculare şi foliare) asupra unor aspecte biometric,e, la cinci cultivare de ardei gras.

În acest scop am folosit ca îngrăşământ mineral radicular complex 15-15-15, iar ca fertilizatori foliari au fost folosiți Folisof 221, Kristalon Verde, Fertcomplex C., Biostar.

Rezultatele obținute confirmă faptul că fertilizarea combinată (foliară + minerală) determină dezvoltarea viguroasă optimă a plantelor de ardei.

Large-pepper crops are given great importance among the vegetable species cultivated in our country. The large-pepper's relatively reduced energetic value is greatly compensated by a complex chemical composition, containing many valuable vitamins, mineral salts and glucose.

The present study monitors the influence of combined fertilization (root and leaf) on some biometrical aspects from four large-pepper crops. To this end the root complex 15-15-15 was used as mineral fertilizer, and Folisof 221, Green Kristalon and Biostar Fertcomplex C. as leaf fertilizers. The results confirm the fact that combined fertilization (leaf + mineral) determine a most favorable vigorous growth of large-pepper plants.

MATERIALS AND METHODS

The experiment was carried out on the premises of the experimental field of the Agrochemical discipline of "Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine, Iasi, in vegetation vessels, using mineral fertilizer (complex 15-15-15) and

leaf fertilizers (F_{221}, Fertcomplex, Green Kristalon and Biostar) in the large-pepper crop and monitoring the effect these two combined have on the production.

The experiment organized in vegetation vessels in 2006 is bifactorial, following the randomized blocks method.

A factor (leaf fertilization, non-mineral fertilization)

a1 - F_{221}

a2 - Fertcomplex

a3 - Green Kristalon

a4 - Biostar

B factor (leaf fertilization + mineral fertilization – complex 15-15-15):

b1 - F_{221} + $N_{80}P_{80}K_{80}$

b2 - Fertcomplex + $N_{80}P_{80}K_{80}$

b3 - Green Kristalon + $N_{80}P_{80}K_{80}$

b4 - Biostar + $N_{80}P_{80}K_{80}$

The complex fertilizer 15-15-15 contains 50% ammoniacal nitrogen, 50% nitric nitrogen, phosphorus 98% soluble in citric acid, 60% soluble in water, potassium 45% total active agent, humidity 1%, granulation 1-4 mm 90%, free acidity maximum 3%. This is a chemical fertilizer with well balanced basic elements (N, P, K), used in ecological doses (minimum) recommended for large-pepper crop ($N_{80}P_{80}K_{80}$).

Table 1

Composition and Characteristics of used leaf fertilizers

Leaf fert.	CSA %	pH	N g/l	P g/l	K g/l	B G/l	S g/l	Mn g/l	Mg g/l	Zn g/l	Cu g/l	Fe g/l	Mo g/l
F221	16	6,5-7	70	70	48	0,2	9	0,2	0,5	0,1	0,05	0,2	-
Fert.	16	6.5	80	80	75	0,3	0,4	0,4	0,04	0,04	0,1	0,3	0,03
Kris.	16	6,6	180	180	180	0,025	-	0,04	-	0,025	0,01	0,07	0,004
Ecol. fert.	**pH**	**Nt %**	**Norg %**	**Mat or %**		**Polizahar., polipept, prot.**					**Vitamins**		
Bios	5,8	2	2	12		13,5					B1, B6, PP		

Recommended concentrations for organic leaf fertilizer are: 0,2-0,3% (Biostar) and between 0,5 -1% for the chemical ones, while recommended doses are 2-3 l/ha for leaf organic fertilizers and between 7-8 l/ha for the chemical ones.

The biological material used was represented by four hybrids of Capsicum annuum: Albatros, Belladonna, Gypsy, Shy Beauty.

Albatros F1 is a very early indeterminate hybrid with extremely high yield potential. The plant is vigorous, with short internodes. 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.

Mineral fertilization with the complex fertilizer 15-15-15 was carried out on May 23, 2006, one week before plantation.

Leaf fertilization was accomplished in three steps: the first fertilization before blooming, on July 4,2006; the second fertilization in the immediately following period, on July 12,2006; and the last fertilization during blooming, on July 18,2006.

RESULTS AND DISCUSSIONS

Part of the results obtained after measuring the leaf areas of the plants' leaves on variants (using the polar planmeter method) are presented in table 2, in square centimeters.

Table 2

Large-pepper production (t/ha)

Variants/ Hybrids	Gypsy		Albatros		Belladonna		Shy Beauty	
	cm^2	unfertilized diff.	cm^2	unfertilized diff.	cm^2	unfertilized diff.	cm^2	unfertilized diff.
Unfert.	2952	0	2396	0	2136	0	2464	0
F1	3120	168	2423	27	2298	162	2498	34
F2	3126	174	2447	51	2302	166	2498	34
F3	3237	285	2582	186	2289	153	2697	233
F4	3056	104	2408	12	2248	112	2498	34
M+F1	3580	628	2556	160	2599	463	2790	326
M+F2	3582	630	2689	293	2616	480	2876	412
M+F3	3621	669	2876	480	2621	485	3088	624
M+F4	3448	496	2502	106	2397	261	2652	188

M = unfertilized; F1 = leaf fertilization with F_{221}; F2 = leaf fertilization with Fertcomplex; F3 = leaf fertilization with Green Kristalon ; F4 = leaf fertilization with Biostar; M+F1 = leaf fertilization with F_{221} + $N_{80}P_{80}K_{80}$; M+F2 = leaf fertilization with Fertcomplex+ $N_{80}P_{80}K_{80}$; M+F3 = leaf fertilization with Green Kristalon + $N_{80}P_{80}K_{80}$ şi M+F4 = leaf fertilization with Biostar + $N_{80}P_{80}K_{80}$

Analysing the data present in table 2 one may note that the leaf area depends, in the first place, on the biological characteristics of each hybrid. Thus, the large-pepper hybrid Gypsy registers the largest leaf area, followed by Shy Beauty and Albatros. Belladonna is the hybrid with the smallest leaf area.

Applying leaf fertilization determines a growth of the leaf area on all variants, a maximum being registered in the case of the leaf Green Kristalon (with a difference of 669 cm2 for Gypsy, 480 cm2 for Albatros, 485 cm2 for Belladonna and 624 cm2 for the hybrid Shy Beauty).

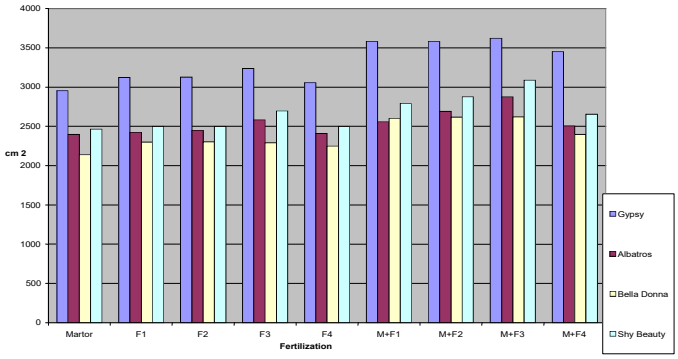

Figure 1 – The influence of fertilization on the leaf area of large-pepper plants

Mineral leaf fertilizers (F_{221}, Fertcomplex, Green Kristalon) determine greater growths of the leaf area compared to the leaf Biostar, an organic fertilizer. That is why we are entitled to state that the growth of the leaf area was caused by the mineral nitrogen present in the three fertilizers.

The basic root fertilizing obviously induces a superior growth of the leaf area, underlying once again the statement that the essential fertilization is that made through the root system, leaf fertilizers being seen only as nutritional supplement.

The differences are obvious, varying from 160cm to 669cm2 when compared to the unfertilized, in the case of combined fertilization.

Calculating the difference between the mean of the areas registered during leaf fertilization and the mean of those registered during combined fertilization, on each hybrid at a time, we can state that the best response (concerning leaf area) was given by the hybrid Gypsy (a 423 cm2 difference), then the hybrid Shy Beauty (a 303,75 cm2 difference), then the Belladonna (a 274 cm2 difference). The hybrid Albatros is situated last with a 274 cm2 difference. Consequently, the Belladonna hybrid gives a better response to the fertilization than the Albatros.

CONCLUSIONS

The leaf area is primarily determined by the genetic potential.

Combined fertilization (root + leaf) has proved to be our best option, bringing about the largest growths of leaf areas.

The Belladonna hybrid gives better responses to fertilization than the Albatros.

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