INVESTIGATIONS CONCERNING SEEDS PRODUCTION TO SOME COTTON SPECIES (GOSSYPIUM HIRSUTUM SP.) UNDER AGROFIELD INFLUENCE IN THE WEATHER CONDITIONS FROM TIMISOARA IN THE YEAR 2008

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Abstract: *The main purpose of this paper is to emphasize the agrofield influence on the seeds production to three species of cotton (Gossypium hirsutum sp.): Marismas and Coko species from Greece and Canada species from North America. The experimental field was placed in Timisoara, on a soil of cambic chernozem type. The experimental factors established were:* ***Factor A****- agrofield (A1- N0P0K0, A2-N30P30K30, A3-N60P30K30, A4- N90P60K60, A5- N120P60K60, A6- N30P30K30 plus foliar fertilization);* ***factor B****- species (b1- Marismas- Greece, b2- American provenance, b3- Coko- Greece). The evolution maintenance and monitoring in vegetation of the experimental factors and its experience in totality, but also the pedoclimatic factors monitoring allowed: both the production analysis of rude cotton, strings and seeds under the soil influence, and the behaviour analysis of every species under agrofield influence. The cotton cropping was made when its capsules were completely opened at the maturity. Cropping moment in our country was considered before the first hoarfrost. After cropping the three species of cotton obtained productions of: rude cotton, strings and seeds. An important role for quality and quantity production had the three fertilized macroelements: azoth, phosphorus and potassium. To touch the established objectives through investigation, the crop fertilization different made on the three agrofields (a1-N0P0K0, a2- N30P30K30, a3- N60P30K30, a4- N90P60K60, a5- N120P60K60, a6- N30P30K30 plus foliar fertilization). The best average production of seeds obtained to Marismas species, several 1453kg/ha, face to the others species at which realized the following average production: Species Canada- 1210 kg/ha and to Coko species- 1102 kg/ha. The biggest production of seeds for the three species of cotton Marismas, Canada and Coko obtained on agrofield a4- N90P60K60 (1658 kg/ha for Marismas species, 1354 kg/ha for Canada species and 1195 kg/ha for Coko species) face to the witness variant (a1- N0P0K0). Fertilization dose until 90 kg/ha positively influenced the production of cotton seeds, the increases of production statistical being assured of significant and distinct significant on agrofields A4- N90P60K60 AND A5- N120P60K60. The foliar fertilization didn`t determined significant increases of production. The three species of cotton presented a good adaptability to weather conditions of Timisoara, in the year 2008.*

Key words: *cotton, seed production, agrofild*

INTRODUCTION

The cotton is the most important textile plant. It assures over 70-75% from the global production of vegetal strings and contributed approximate 50% to global total production of artificial and natural strings. The cotton seeds contained 20-27% semidrying oil, rich in amino-acids and compounds with phosphorus and vitamins. The cotton oil, quantity speaking occupied the fourth place in the global oil production, in competition with peanuts oil. The seeds bottom had a high content of proteins, 21,2- 29,4%, being used in the meat products, cookies and bread. But the cotton was an important source of vegetal proteins. From the cotton oil was prepared the margarine, soap, and glycerin. Some elements that remained after oil striping, caused of gossypol alkaloid (a poliphenolic dialdehyde, after BODEA, 1965), with a special toxicity degree, and were used for animals feed in moderate quantity. The elements used action in galactogenus sense, amplifying the butter percentage and one of casein from the

milk. In the last period were used also in the people feeding. Thus in a composite with wheat flour were used in bread industry, and of cakes. This large usage exists thanks to its content: 34% isoteic substances, phosphorus, calcium, complex of B vitamin. The protean concentrates obtained from seeds used to the cold meats, soups, meat conserves, to people with diabetes and in hyperglycemia (being with a small quantity in carbohydrates and reduced calories), in wine treatments, in gas drinks industry and juices, of candies and patisserie products (MUNTEAN AND BORCEAN, 2001). The seminal teguments (crusts), contained 45% cellulose and were used in the paper production and of carton packing, production of synthetic gum elastic, in plastic industry, in petrol purification, as fertilized material, but also as fodder.

MATERIALS AND METHODS

The experimental field was placed in microrelief of plane with large depression area. The soil where the experiences made was a cambic chernozem, phreatic humid (dotty gleized), decarbonate, formed on loesoid deposits, loamy – clay on clay-bearing. The bifactorial experience was placed in a field after parcels method subdivided. The experimental fields established were: Factor A- agrofield (a1- N0P0K0, a2- N30P30K30, a3- N60P30K30, a4- N90P60K60, a5- N120P60K60, a6- N30P30K30 plus foliar fertilization) and Factor B- species: b1- Marismas from Greece, b2- Canada American provenience, b3- Coko- Greece provenience. The technology applied for cotton crop was specific in great crop. The quantity and quality production of cotton seeds were strongly influenced by fertilized doses that contained the three fertilized macroelements: azoth, phosphorus and potassium. To touch the established objectives through investigation, the crop fertilization was different made on the 6 agrofields (a1- N0P0K0, a2- N30P30K30, a3- N60P30K30, a4- N90P60K60, a5- N120P60K60, a6- N30P30K30 plus foliar fertilization). The crop fertilization made using complex chemicals of type N15P15K15. For seeding were used cotton seeds from crops of the first hoarfrost. The cotton seeded in 9th May when the soil temperature maintained at least three days consequently, at 12 degrees C; the average temperature of the air minimum 13-15 degrees C, while the soil temperature at a depth of 30 cm was 10 degrees C. The cropping begun when on every plant were 1-2 capsules opened very well, with complete maturity. The cropping made between 25 September and 31 October.

RESULTS AND DISCUSSIONS

After cropping the three species of cotton obtained productions of: rude cotton, strings and seeds. The cotton lost through drying at least 11-17% from its initial weight,

So that the production weight registering made only after the loss of that humidity. In this paper were present the seeds production at the three species of cotton. Thus, for Marismas species the productions were present in table 1. Both in table 1 and in figure 1 it obtained that the rude cotton production to Marismas species were positively influenced by the azoth doses in increasing until 120 kg/ha. The biggest production obtained on agrofield A4- N90P60K60, being of 2863 kg/ha, registering an ascension of production of 597 kg/ha face to the witness. The obtained production on agrofield witness A1- N0P0K0 to Marismas species was of 2266 kg/ha. Agrofield with the smallest production of rude cotton to Marismas species was A6- N30P30K30 plus foliar fertilization, 2166kg/ha, face to the witness agrofield.

In table 1was presented the average productions synthesis of seeds (cleared of strings) for the three species of cotton under agrofield influence in the year 2008 to Timisoara. From the results analysis determined that the seeds production of cotton was positively influenced by the azoth doses level from agrofield on the all agrofields taken in investigation. On unfertilized agrofield the seeds production was of 1116 kg/ha.

Table 1

The seeds production synthesis on the six agrofields at the three species in 2008 in the weather conditions from Didactical Station of Timisoara

Factor A averages							
Factor A Agrofield	**Factor B species**			**Production kg/ha**	**%**	**Difference**	**Signification**
	Marismas	**Canada**	**Coko**				
A1	1249	1100	1000	1116	100	–	
A2	1567	1153	1004	1241	111	125	
A3	1570	1183	1120	1291	123	175	*
A4	1658	1354	1195	1402	125	286	***
A5	1470	1351	1180	1333	119	217	**
A6	1205	1122	1116	1147	102	31	

Dl 5% - 161 kg/ha, Dl 1% - 215 kg/ha, Dl 0,1% - 282 kg/ha

Factor B averages			
Factor B species	**Marismas**	**Canada**	**Coko**
Production kg/ha	1453	1210	1102
%	100	83	75
Difference	–	–243	–351
Signification		000	000

Dl 5% - 93 kg/ha; Dl 1% - 124 kg/ha ; Dl 0,1% - 163 kg/ha

On agrofield N30P30K30 the seeds production increased with 11%, the difference being of 125 kg/ha face to the witness production, that one being of 1241 kg/ha. On agrofield N60P30K30 the seeds production was 1291 kg/ha, with 23% bigger than on witness variant, the difference being of 175 kg/ha, being statistically assured as significant. The azoth doses increasing at 90 kg/ha on double dose of phosphorus and potassium will have made the production increasing, 1402 kg/ha, with 25% bigger than the witness production, the difference of 286 kg/ha being by statistically point of view assured as very significant. An increasing of azoth dose with 30 kg/ha face to agrofield A4 and the constant maintaining of phosphorus and potassium dose reduced seeds production at a value of 1333 kg/ha, with 19%smaller than witness variant, the difference of 217 kg/ha being by statistically point of view reduced as distinctly significant. The foliar fertilizer applying on a equilibrate field of azoth, phosphorus and potassium gave to a insignificant increasing of production, only with 2% face to the unfertilized witness variant, the difference being of 31 kg/ha face to that variant. Concerning the species behaviour under the seeds production aspect it observed that between the three species studied exist differences of potential. The best production was to Marismas 1453 kg/ha. At Canada species the seeds production realized was 1210 kg/ha, and to Coko species pf 1102 kg/ha, and represented 75% from Marismas species production.

Table 2

Production kg/ha of cotton seeds under agrofield influence to Marismas species in the year 2008 in the weather conditions of Timisoara

Agrofield	Production kg/ha	%	Difference	Signification
$A_1 – N_0P_0K_0$	1249	100	–	
$A_2 – N_{30}P_{30}K_{30}$	1567	125	318	***
$A_3 – N_{60}P_{30}K_{30}$	1570	125	321	***
$A_4 – N_{90}P_{60}K_{60}$	1658	132	409	***
$A_5 – N_{120}P_{60}K_{60}$	1470	117	221	**
$A_6 – N_{30}P_{30}K_{30}$ + foliar fertilisation	1205	96	–44	

Dl 5% - 156 Kg/ha: Dl 1% - 208 kg/ha, Dl 0,1% - 273 kg/ha

To Marismas species the average production of seeds (table2) was positively influenced by the azoth fertilization on agrofields with constant doses of phosphorus and potassium (of 30 kg/ha, several 60 kg/ha). On witness agrofield N0P0K0 (unfertilized) the average seeds production was of 1249 kg/ha. On agrofield N30P30K30 the seeds production could be 1567 kg/ha, with 25% bigger than production obtained on unfertilized agrofield. The production obtained was 318 kg/ha, statistically assured as very significant. In N60P30K30, the seeds production was 1570 kg/ha, the increasing face to the witness production being of 25%, and the spore of 321 kg/ha statistically assured as significant. The biggest average production to Marismas species obtained agrofield N90P60K60, 1658 kg/ha, with 32% more than agrofield production unfertilized witness, face to which was realized a production spore of 409 kg/ha that was statistically assured as very significant. The foliar fertilization determined seed production reduction in comparison with unfertilized variant of 4%, difference of 44 kg/ha being in experimental mistakes limit. A strong analysis of obtained results to foliar fertilization in Marismas species showed that type of fertilization would be cared study, and viewed if the fertilizer used had inhibit the productions formation. We take a conclusion if it made a comparison with the obtained production on agrofield with base fertilization with NPK in 30 kg/ha doses etc. every (reported 1:1:1) where the obtained production was with 362 kg/ha bigger the one in fertilized variant.

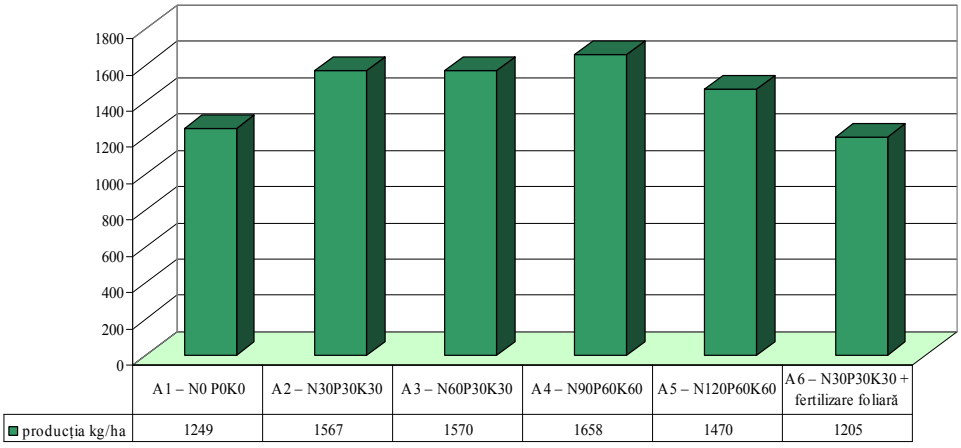

Figure 1. Production kg/ha seeds cotton under agorfield influence to Marismas species in the year 2008 in the weather conditions of Timisoara- Didactical and Experimental Station Timisoara

The seeds average production obtained on agrofield with 120 kg/ha azoth etc was more reduced with 188 kg/ha than production on agrofield N90P60K60. The conclusion was that azoth dose assured a maximum production of cotton seeds to Marismas species situated between 90 and 120 kg/ha completed with phosphorus and potassium doses of 60 kg/ha etc. every one.

The average production representation in figure 1 permitted three conclusions:

1. Seeds production to cotton species of Marismas was positively influenced by azoth fertilization.
2. Maximum seeds production to Marismas species obtained with azoth doses between 90 and 120 kg/ha etc.
3. Foliar fertilizer that vas used determine seeds productions reducing to Marismas species of cotton.

Table 3

Production kg/ha seeds of cotton under agrofield influence to Canada species in the year 2008, in the weather conditions of Timisoara – Experimental and Didactical Station of Timisoara

Agrofield	Production kg/ha	%	Difference	Signification
$A_1 – N_0P_0K_0$	1100	100	–	
$A_2 – N_{30}P_{30}K_{30}$	1153	95	53	
$A_3 – N_{60}P_{30}K_{30}$	1183	107	83	
$A_4 – N_{90}P_{60}K_{60}$	1354	123	254	*
$A_5 – N_{120}P_{60}K_{60}$	1351	122	251	*
$A_6 – N_{30}P_{30}K_{30}$ + Foliar fertilisation	1122	102	22	

Dl 5% - 199 kg/ha: Dl 1% - 266 kg/ha, Dl 0,1% - 348 kg/ha

In table 3 were presented towards analysis the average productions of seeds to Canada species and to Canada species it observed that seed productions were dependent by agrofield. In case of chemicals lack with azoth, phosphorus and potassium seeds production was only of 1100 kg/ha. At an equilibrated fertilization with azoth, phosphorus and potassium at a level of 30 kg/ha etc from every one, the seed production was of 1153 kg/ha, with 4% more than in unfertilized variant, face to which was realized a spore of 53 kg/ha statistically unassured. On agrofield on which the azoth dose was doubled at 60 kg/ha, potassium and phosphorus remaining with a constant dose of 30 kg/ha, the seeds production will be of 1183 kg/ha; with 7% bigger than the production from unfertilized variant. The spore of production of 83 kg/ha hadn`t statistically assure. The doses increasing to 90 kg/ha, several to 120 kg/ha etc and quantities doubling of phosphorus and potassium in rotational, it determined the seeds production increasing to Canada species with 23%, several 22% face to the unfertilized variant, face to which realized production spores of 254 kg/ha, several 251 kg/ha that were statistically assured as significant. In case of agrofield in which the foliar fertilization made superposed on a base fertilization with 30 kg/ha azoth, phosphorus and potassium, the seeds production increased face to the unfertilized variant with 2% and was smaller with 31 kg/ha face to obtained production on agrofield with fertilization of 30 kg/ha azoth, phosphorus and potassium etc N30P30K30.

Also in that case it confirmed the fact that foliar fertilizer used didn`t stimulate seeds production to Canada species. It determined production reducing face to the variant in which the fertilization made with NPK in doses of 30 kg/ha applied to germinal part like complex chemicals of type 15:15:15.

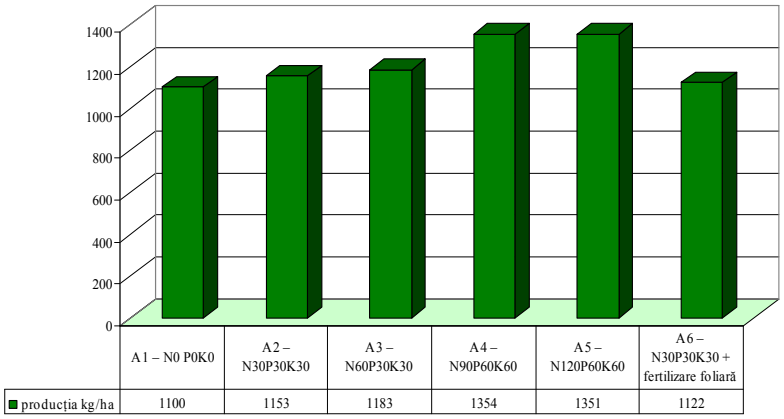

Figure 2.. Production kg/ha cotton seeds under agrofield influence to Canada species in the year 2008 in weather conditions of Timisoara- Experimental and Didactical Station Timisoara

In figure 2 were figurative represented average productions of seed to Canada species under agrofield influence. Figurative presentation of productions confirmed the fact that the maximum of seed production to Canada species obtained to azoth doses between 90 kg/ha and 120 kg/ha applied on a field of phosphorus and potassium of 60 kg/ha. From the same schedule it observed that to foliar fertilization the seed productions of Canada species were the ones obtained on agrofield N30P30K30 kg/ha in foliar fertilized variant and 1153 kg/ha inside the variant where base fertilization was made.

Table 4

Production kg/ha cotton seeds under agrofield influence to Coko species in the year 2008 in weather conditions of Timisoara- Experimental and Didactical Station Timisoara

Agrofield	Production kg/ha	%	Difference	Signification
$A_1 – N_0P_0K_0$	1000	100	-	
$A_2 – N_{30}P_{30}K_{30}$	1004	100	4	
$A_3 – N_{60}P_{30}K_{30}$	1120	112	120	*
$A_4 – N_{90}P_{60}K_{60}$	1195	119	195	***
$A_5 – N_{120}P_{60}K_{60}$	1180	118	180	**
$A_6 – N_{30}P_{30}K_{30}$ + Foliar fertilisation	1116	111	116	

Dl 5% - 107 kg/ha: Dl 1% - 143 kg/ha, Dl 0,1% - 188 kg/ha.

In table 4 presented average productions of seeds obtained to Coko species in the year 2008 under fertilization influence. Also in case of Coko species the seeds production was positively influenced by chemicals doses increasing of azoth inside of rotation. On agrofield N30P30K30 the seeds production was 1004 kg/ha with 4 kg/ha more than seeds production realized in unfertilized variants. The azoth doses increasing on agrofield P30K30 brought to production increasing with 125 face to the unfertilized, face to which it obtained a production spore of 120 kg/ha statistically assured as significant.

The seeds production increased with 19% on agrofield where it used an azoth dose of 90 kg/ha on an agrofield in which doubled the phosphorus and potassium doses (60 kg/ha). The spore of production realized in that case was of 195 kg/ha being statistically assured as very significant. In case of agrofield in which azoth dose was of 120 kg/ha on a field of 60 kg/ha phosphorus and potassium, the seeds production to coko species wiil be 1180 kg/ha with 18% bigger face to realized production in unfertilization conditions. The production spore of seed obtained to dose of 120 kg azoth was 180 kg/ha statistically assured as distinct significant. In

case of agrofield in which used combined fertilization (base NPK) and the one foliar, the seeds production of Coko species increased with 11% face to unfertilized variant, and was superior to realized production on agrofield on which base fertilization was used (N30P30K30). Production spore face to witness was of 116 kg/ha and statistically assured as significant.

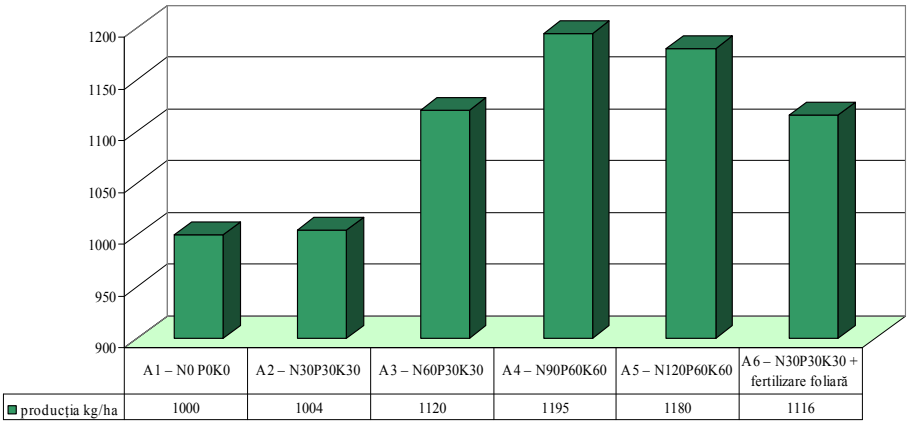

Figure 3. Production kg/ha cotton seeds under agrofield influence to Coko species in the year 2008 in weather conditions of Timisoara – Experimental and Didactical Station of Timisoara

In figure 3 were represented the average productions of seeds to Coko species. From the figurative representation it observed the fact that maximum of seeds production to Coko species it obtained with azoth doses between 90 and 120 kg/ha applied o a field of P60K30. Figurative representation of average production obtained to variant N30P30K30 plus foliar fertilization, showed that, in case of Coko species, the foliar fertilizer used stimulated the seeds production formation. That matter confirmed the fact that foliar fertilizer used had positive action face to the seeds production that it stimulated, that one being superior both the one obtained in unfertilized variant and the another one realized on base agrofield N30P30K30.

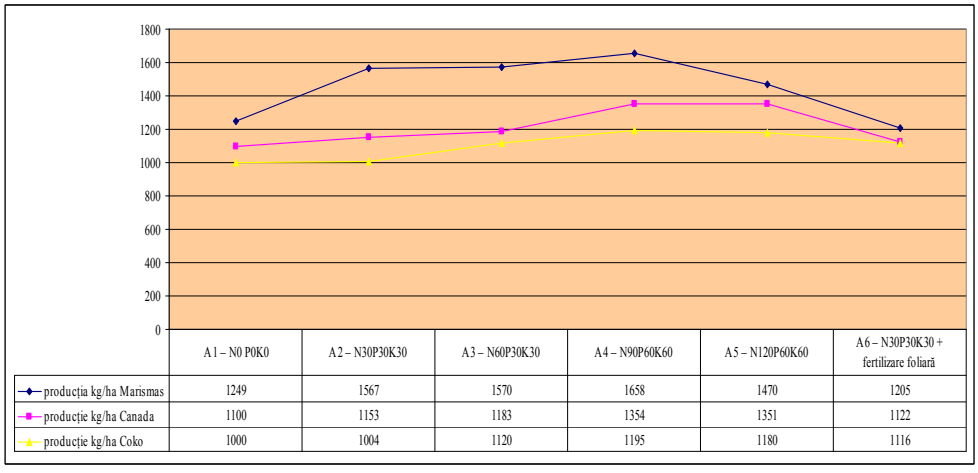

Figure 4. Production kg/ha cotton seeds under agrofield influence to Marismas, Canada, Coko species in the year 2008 in weather conditions of Timisoara – Didactical Station of Timisoara

CONCLUSIONS

1. The best average production of seeds obtained to Marismas species, several 1453 kg/ha, face to the another ones at which realized the following average productions: Canada species – 1210 kg/ha and to Coko species – 1102 kg/ha;

2. The biggest seeds production for all the three species of cotton Marismas, Canada and Coko obtained on agrofield a4- N90P60K60 (1658 kg/ha for Marismas species, 1354 kg/ha for Canada species and 1195 kg/ha for Coko species) face to witness variant (a1-N0P0K0);

3. Foliar fertilization didn`t determine significant production spores.

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