AGROFIELD INFLUENCE ON SEEDS WEIGHT TO SOME SPECIES OF COTTON (GOSSYPIUM HIRSUTUM SP.) IN WEATHER CONDITIONS FROM TIMISOARA IN THE YEAR 2008

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Abstract: *In that paper was investigated agrofield influence on seeds weight to three species of cotton (Gossypium hirsutum sp.): Marismas and Coko species from Greece and Canada species from North America, in the year 2008 of investigation. It was made analysis to the following characters: rude cotton weight/plant/parcel/agrofield, strings weight/plant/parcel/agrofield, seeds weight/ plant/parcel/agrofield. The experimentation made to Experimental and Didactical Station of Timisoara, the experimental field being placed on a cambic chernozem soil. Bifactorial experience was placed in the field after subdivided parcels methods. The experimental factors established were: Factor A- agrofield (a1-N0P0K0, a2-N30P30K30, a4- N90P60K60, a5- N120P60K60, a6- N30P30K30 plus foliar fertilization); factor B-species (b1- Marismas-Greece, b2- Canada American provenance, b3- Coko- Greece). Analysis of vegetation conditions for the cotton was made during the period May- October; active vegetation period between 1st May and the first hoarfrost of autumn (the cotton needed 170-180 days from germinal seeds, to the first hoarfrost falling. In the cotton cropping the terrain uniformity and the best density insurance had a great importance specific to every species. The hidric stress was very good supported by the cotton, even when that one was accentuated. The best results to all the three species of cotton investigated were obtained on agrofield a4- N90P60K60; thus the average(x) of seeds weight/plant/parcel had the following values: to Marismas species 30,84g, to Canada species 25,21 g, and to Coko species 21,83g. In agrofield A6 where besides base fertilization 30 kg/ha active substance was applied also foliar fertilization, the seeds weight on plant was inferior both one realized in unfertilized conditions, and the one fertilized at germinal part preparation with equilibrated azoth doses, phosphorus and potassium (N30P30K30). The three species of cotton presented a good adaptability to weather conditions of Timisoara, in the year 2008.*

Key words**:** *cotton, agrofild influence, seeds weight*

INTRODUCTION

Romania was situated to the north limit from the cotton crop, limit situated a few over 43 degrees latitude (Zimnicea was the best point of the south of country 43 degrees 37`07``, the annually average temperature 11,7 degrees C). Over 120 year old, cotton was known as plant of crop on Romania territory. In 1925 appeared the first official data about cotton, when registered a surface of 125 ha seeded with that plant. In the year 1995 the surface cropped with cotton was reduced, until its total drawing out from crop; in the year 1972 the cotton crop was introduced again. Cotton equally had an economical importance both for exporter countries, and for the importer ones. The cotton seeds contained 20-27% semidrying oil, rich in amino-acids and compounds with phosphorus and vitamins. Quantitative, the cotton oil placed on the fourth place in the global production of oil, its enemy being the peanuts oil. Practically speaking the cotton was an important source of vegetal protein.

MATERIAL AND METHOD

The experience placed on a terrain which appertained to Experimental and Didactical Station of Timisoara, which functioned from a judicial point of view under patronage of

University of Agricultural Sciences and Veterinary Medicine of Banatului Timisoara. The investigation made on behaviour of three species of cotton (*Gossypium hirsutum* sp.): Marismas and Coko species from Greece and Canada species from North America, in the weather conditions from the year 2008. It was made the factors monitoring pedoclimatical during the vegetation period.

Table1

The monthly average temperatures registered to Meteorological Center Of Region Banat- Crisana- Meteorological Station of Timisoara, 2008

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Year 2008	1,8	4,8	8,3	12,42	17,81	21,59	21,93	22,59	15,39	12,3	7,1	3,6
Multiannuality average	-1,6	1,1	5,8	11,2	16,3	19,4	21,1	20,4	16,5	11,0	5,6	0,8
Deviation/2008	+3,4	+3,7	+2,5	+1,22	+1,51	+2,19	+0,83	+2,19	-1,11	+1,3	-1,4	+2,8

Table 2

The cotton demands face to the temperature in different vegetation phases (degree C)

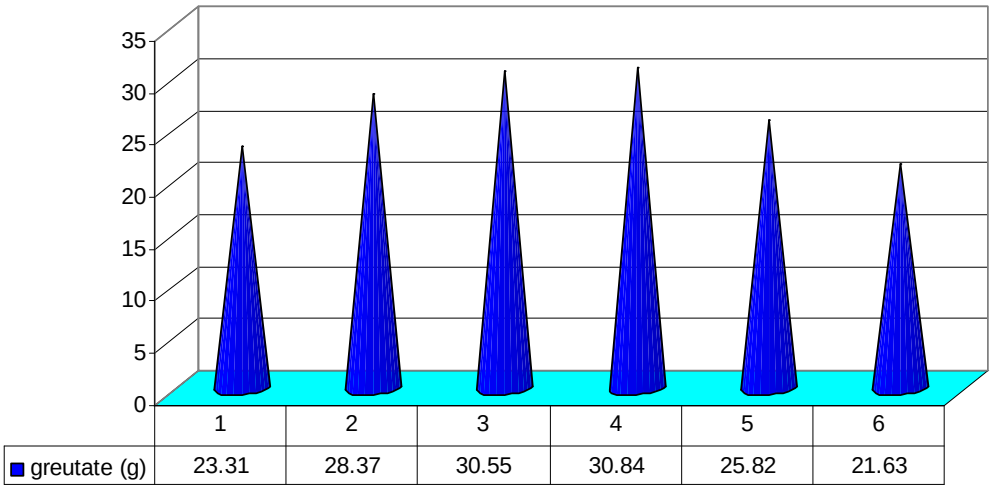
	Phases				
Temperature	**Germination Emergence**	**Plant (emergence 3-4 leaves)**	**Preflowering**	**Flowering**	**Maturity**
Minimum	12-15	15-16	19	15	12,6
Optimum	30-(34) (25-30 în sol)	25-30	25-32	23-26	25-28
Maximum	40	37(40)	37(40)	35	40(50)

For vegetation period, specific resources like, the sun shining time, the active temperature, and the effective ones, didn`t determine the significant variations in crops capacity, because of specific conditions of perimeter investigated, even if in the most critical years the minimum of specific arrearages necessary to the best photosynthesis was realized. About year 2008, it could affirm that from point of view of the low precipitations, was an year with rich precipitations in comparison with multiannuality precipitations, their sum being of 645,1 mm several 600,9 mm. The biggest quantities of precipitations registered, in the experimental year 2008, in June month (157,00 mm). The most droughty month, from that year of study (2008), was August month, registering a losing of -26,6 mm, in comparison with multiannuality precipitations. The low precipitations registered in October month (17,50 mm) encouraged the maturity period and opening of cotton capsules. The soil where the investigation has done was a cambic chernozem, humid phreatic, the phreatic water found at a depth of 1,5-2,0 m. About the temperature of the soil surface, that had in months August and September year 2008 value higher (27,59 degree C several 27,14 degree C) and the value lower in April month (14,73 degree C).

Bifactorial experience placed in the field after subdivided parcels. The experimental factors 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- Greece provenance, b2- Canada- American provenance, b3- Coko- Greece provenance. The technology applied for cotton crop was specific in great crop. An important role for production quality and quantity had the three fertilized macroelements: azoth, phosphorus and potassium. To touching the established objectives established through

investigation, the crop fertilization made different on all 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 it used cotton seed from the crops before the first hoarfrost. The cotton seeded on 9th May. The seeding realized at 50-60 cm among rows. After emergence it made density corrections on the row. The plant density control made in the same time with hoeing. The evolution monitoring and entertaining of experimental factors in vegetation and its entire experience were realized. The cropping begun when on every plant were 1-2 very well opened capsules, at a total maturity. The cropping moment was the one before the first hoarfrost falling. The cropping made between 25 September and 31 October. During vegetation period made observations: emergence, increasing, plant development (buds appearance, blooming, fecundation, fruitification formation, capsules evolution in developing, capsules maturity). After observations made it established that the date of opening the first flower in our experimental field was 18 July. The first capsule appearance was 25 July. The first opening date of capsules was 14 September. Complementary with results determination and interpretation concerning the rude cotton productions, in labor strings and seeds it made also measures concerning the quantity of rude cotton/plant, the average weight of strings on the plant, the average number of plant capsules in August, the average number of plant capsules in September, the average number of plant capsules in October, diameter of tulip base, the average height of the main tulip, the average number of main ramifications of plant. All those determinations made on the three species and on every agrofield in part. It followed the elements calculation of variants obtained from biometric measures made in the field and labor. The results interpretation obtained after results calculation obtained from statistics calculation it made through variation analysis method and response curves, realizing the following schedules.

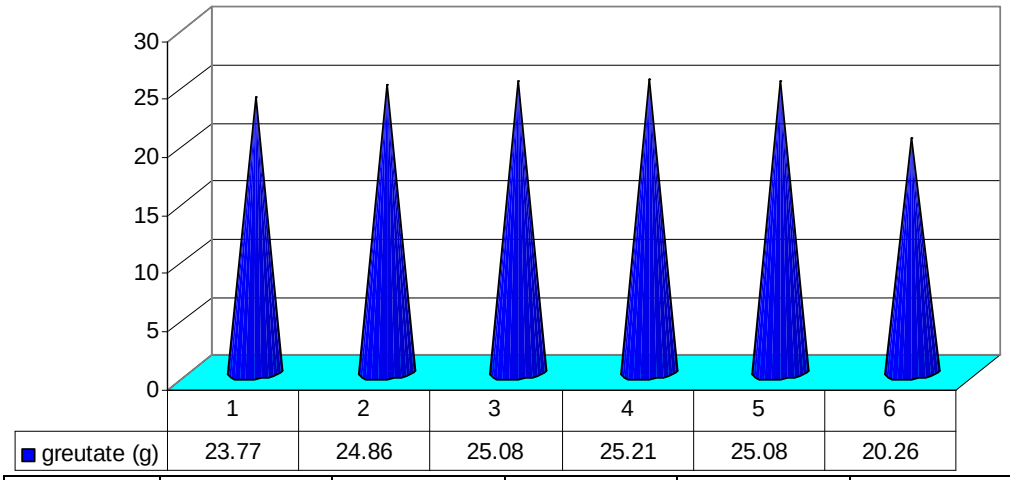
RESULTS AND DISCUSSIONS



X	23.31	28.37	30.55	30.84	25.82	21.63
S^2	13.24	10.19	28.43	6.88	36.07	48.81
S	3.64	3.19	5.33	2.62	6.01	6.99
Sx	0.36	0.32	0.53	0.26	0.60	0.70
S%	15.62	11.24	17.45	8.50	23.28	32.32

Figure 1. The weight average variation of cotton seeds/plant/agrofield to Marismas species under agrofield influence in the year 2008 in the weather conditions from Timisoara

In figure 1 were represented the results obtained for the weight average variation of cotton seeds on the plant to Marismas species under agrofield influence. It observed that character was strongly influenced by fertilization but especially by azoth dose. The biggest values of average weight of seed on plant were obtained on agrofields like N60P30K30- 30,55 g/plant and N90P60K60- 30,84 g/plant. The dose increasing of azoth in agrofield to 120 kg/ha azoth and doubling phosphorus and potassium doses, several P60K60 hadn`t an increasing of seeds production. That think showed weight of seeds to Marismas species of cotton touched big values azoth doses of 90 kg/ha, several 100 kg/ha. Besides the base fertilization was applied the foliar fertilization, the seeds weight on plant was inferior both the one realized in unfertilized conditions, and the one fertilized to germinal part preparing with equilibrate doses of azoth, phosphorus and potassium (N30P30K30).

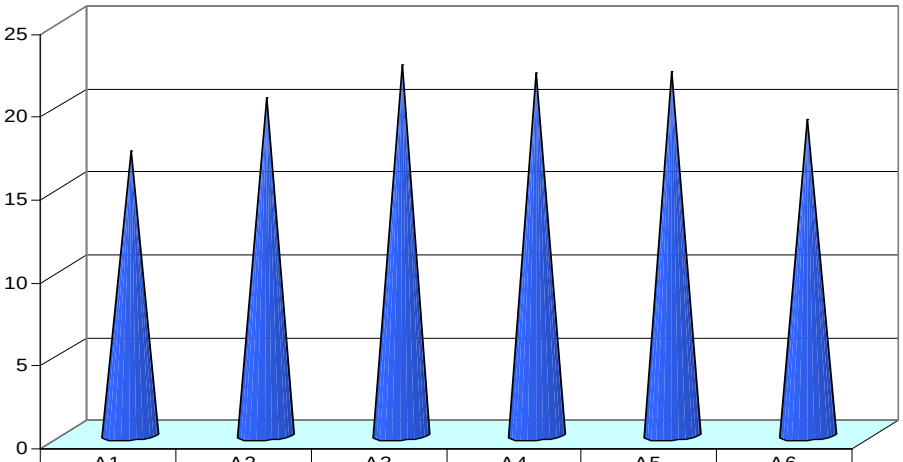


X	23.77	24.86	25.08	25.21	25.08
^{2}	66.37	22.17	27.19	24.11	36.20
S	8.15	5.21	5.21	4.91	6.02
Sx	0.82	0.52	0.52	0.49	0.60
S%	34.29	20.96	19.39	19.48	24.00

Figure 2 . The weight average variation of cotton seeds/plant/agrofield to Canada species under fertilization influence in the year 2008 in the weather conditions of Timisoara

In figure 2 were figurative presented the weight average values of seeds to Canada species under fertilization influence with azoth, phosphorus and potassium and foliar fertilizer. The schedule emphasized the fact that in case of Canada the seeds weight was dependent by agrofield and especially by azoth doses. The biggest values of average weight seeds to Canada species obtained on agrofields N60P30K30- 25,08 g/plant and N90P60K60- 25,21 g/plant.It was remarked the fact that on the agrofield with maximum of dose of azoth studied, the average weight of seeds on plant was equal with the one realized on agrofield N60P30K30. In that case the azoth dose of seeds weight maximization on the plant was about 10 kg/ha.

About foliar fertilization it observed that in case of Canada species, the same as to Marismas species the foliar fertilizer used brought to production decreasing, both face to unfertilized variant, and face to fertilized variant with azoth dose of 30 kg/ha, several agrofield N3P30K30.



X	17.09	20.36	22.3	21.83	21.89	18.97
S^2	4.73	13.69	37.17	39.51	31.09	7.31
S	2.17	3.7	6.1	6.29	5.58	2.7
Sx	0.22	0.37	0.61	0.63	0.56	0.27
S%	12.70	18.17	27.35	28.81	25.49	14.23

Figure 3. The weight average variation of rude cotton seeds/plant/agrofield to Coko species under agrofield influence in the year 2008 in the weather conditions from Timisoara

The weight average variation of cotton seeds/plant under agrofield influence to Coko species of cotton represented in figure 3. In case of Coko species the maximum average value of seeds weight on plant obtained on agrofield N60P30K30- 22,3 g/plant. On agrofields N90P60K60 and N120P60K60 the average weight of plant seeds was equal: 21,83 g/plant on agrofield N90P60K60 and 21,89 g/plant on agrofield N120P60K60. In conditions of the year 2008 the doses doubling with phosphorus and potassium in the base agrofield determined flattening of production of seeds on cotton plant Coko species. So to Coko species the maximum average weight of seeds on plant obtained at azoth doses of 60-80 kg/ha.

In agrofield case besides base fertilization with azoth, phosphorus and potassium in doses of 30 kg/ha from every of three elements was also applied foliar fertilization, the seeds average weight was superior to the one obtained on agrofield N30P30K30. That thing confirmed by the foliar fertilizer which determined the weight increasing minimization of seeds to Coko species of cotton.

CONCLUSIONS

1. The three species of cotton presented a good adaptability to weather conditions from Timisoara, in the year 2008;
2. The biggest productions and positive evolution of the character taken in study registered to all the three species on agrofield A4- N90P60K60 face to witness variant A1- N0P0K0;
3. The drought followed by a lot of rains during the summer determined low productions to Coko species face to Marismas and Canada species;
4. Foliar fertilization didn`t determine significant production spores; and also negatively influenced the evolution of character taken in study.

BIBLIOGRAPHY

1. BAILEY N. T. J. – Statistical methods in biology. The english universities press ltd, 102 Newgate street, London, E.C. 1., 1959
2. BĂLAN I.M. – Bumbacul şi cultura lui, Bucureşti, Editura de Stat, 1949
3. BĂLAN I. M. – Tehnologia culturii bumbacului, MAIA, 1974
4. BÎLTEANU GH.., BÎRNAURE V., FAZECAŞ I., CIOBANU FL., SALONTAI AL., VASILICĂ C., – Fitotehnie, Bucureşti, Ed. Didactică şi Pedagogică, 1979
6. BÎLTEANU GH., SALONTAI AL., VASILICĂ C., BÎRNAURE V., BORCEAN I. – Fitotehnie, Bucureşti, E. D. P., 1991
7. HERA C., BORLAN Z., – Ghid pentru alcătuirea planurilor de fertilizare, Ed. Ceres, Bucureşti, 1980
8. REINHARDT V. (1952) – Cultura bumbacului în regiuni noi, Bucureşti, Editura de Stat, (Moskva, 1948)
9. TABĂRĂ V., – Plante tehnice, oleaginoase ŞI textile, vol.I, Editura Brumar, Timişoara 2005
10. SMITH C. W. – Cotton (Gossypium hirsutum L.), capitol 6, în Crop Production: Evolution, History and Tehnology, 1995; John Wiley and Sons, in New York, pp. 287 – 349