

THE INFLUENCE OF THE PHYTO SANITARY TREATMENTS AND OF FERTILIZATION DURING THE VEGETATION PERIOD UPON THE WINTER WHEAT PRODUCTION IN THE WEST PLAIN

Popovici Mariana*, Bucurean Eva

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048
Oradea; Romania, e-mail: mariana_mediu@yahoo.com

Abstract

The work presents the research related to the influence of the fertilization level and of the fungicides and insecticides treatments at the Dropia and Alex types of autumn wheat in the conditions existent in the West Plain, at the Les agricultural farmland, in Bihor county, in the year 2011. For the analysis of the two types of wheat production three levels of fertilization have been applied: $N_{50}P_{60}$, $N_{100}P_{60}$, $N_{150}P_{60}$, together with the non treated variant N_0P_0 .

The fungicide and insecticide treatments applied during the vegetation period have been the following: Duett Ultra (310 g/l thiophanate-methyl + 187 g/l epoxiconazole) + (Fastac 100 g/l alpha-cypermethrin), for the first treatment in the stage of a bellows and Falcon (250 g/l spiromamine + 167 g/l tebuconazole + 43 g/l triadimenol) + Decis 25WG (25% deltamethrin) for the second treatment at the apparition of the spike. For the C_3 variant foliar fertilizers have also been applied with Folicare (19-11-24+Cu), together with the second treatment.

Key words: fertilization, foliar fertilizers, fungicides, insecticides

INTRODUCTION

The wheat production and the quality of the seeds are greatly influenced by the phyto sanitary of the seed tree, reason for which, in order to prevent important losses and quantity decreases the cultures meant for seed production must be treated against the foliar diseases of the spike as well as against the pests that appear during the vegetation period. (Bărbulescu and collaborators 2002, quoted by I. Păcurar, 2007).

In order to protect the autumn wheat's culture and in order to obtain high productions an important role is played by the fertilization of the culture with chemical fertilizers when preparing the land for being sown and during the vegetation. During the vegetation period foliar fertilizers are also used together with the above mentioned ones.

The main foliar diseases that affect the wheat cultures are: Cereals' mildew (*Erysiphe graminis*), wheat septoria (*Septoria spp.*), black rust (*Puccinia graminis*), fusariosis (*Fusarium spp.*), wheat helminthosporiosis (*Helminthosporium tritici repentes*).

The pests that can produce important damage in the wheat cultures and especially in the seed tree's lots, where the germination and the cultural

value of the seeds are affected, are the following: cereals' bed bugs (*Eurygaster spp.*), the straw's red worm (*Haplodiplosis marginata*), (*Agriotes spp.*) and the humpbacked cockroach (*Zabrus tenebrioides*).

The foliar fertilizers are mainly and especially applied in the fraternity moment and in the staw apparition moment and due to the content of copper that it has it protects the plant against any disease that might occur.

In what the autumn wheat is concerned, in order to prevent and to destroy the disease and pest attacks during the vegetation period an important role is played by the chemical treatments applied at the warning period or the moment one notices that the number of the larvae or of the adults over takes the economical damage level (EDL). These treatment are performed by terrestrial or aerial means.

MATERIAL AND METHODS

The study related to the effect of the fertilization and of the treatment with insect fungicides applied to the wheat lots during the vegetation period has been done on Les farmland , Bihor county, in the year 2011.

The fertilization of the culture had been done with complex fertilizers at the realization of the culture, in autumn, and during the vegetation the nitrogen and the Folicare foliar fertilizers have been applied (19-11-24+Cu).

The fungicides used to destroy the diseases have been :Duett Ultra,Falcon 460EC, applied in two treatments : I applied before the bellows stage and the second one after the flowering which has been combined with foliar fertilizers.

In order to notice the effect of the applied treatments a lot of wheat has been used as a witness variant, it was not fertilized and not treated.

The analyzed factors have been:

- Factor A-the type of wheat

A₁- Dropia

A₂- Alex

- Factor B- fertilization with the following doses:

B₁- N₀P₀;

B₂- N₅₀P₆₀;

B₃-N₁₀₀P₆₀; B₄-N₁₅₀P₆₀

- Factor C- treatments applied with fungicides and insecticides

- C₁-Non treated

C₂-I-Duett Ultra(310 g/l thiophanate-methyl + 187 g/l epoxiconazole)0,5 l/ha +Fastac 10EC(Fastac100 g/lalfa-cipermetrin), 0,1 l/ha

II-Falcon(250 g/l spiroxamine + 167 g/l tebuconazole + 43 g/l triadimenol) 0,75 l/ha +Decis 25WG(25% deltametrin), 0,15 l/ha

C₃-I-Duett Ultra(310 g/l tiophanate-methyl + 187 g/l epoxiconazole) 0,5 l/ha +Fastac 10EC(Fastac100 g/lalfa-cipermetrin), 0,1 l/ha

II-Falcon(250 g/l spiroxamine + 167 g/l tebuconazole + 43 g/l triadimenol) + 0,75 l/ha + Decis25WG (25% deltametrin) 0,15 l/ha + Folicare (19-11-24+Cu), 4kg/ha

The culture technology applied to the two types of wheat has taken into consideration the culture requests of the wheat, on a luvic brown soil, in the conditions existent in the West Plain.

-the sowing has been done in the optimum period 10th – 20th October.

- The fertilization with chemical fertilizers has been done periodically: in autumn, when the soil was prepared and complex fertilizers with phosphorus have been applied and in spring 2/3 percentage of the nitrogen dose has been applied.

- in order to destroy the weeds which represents a vector of the pathogen agents' carrier herbicides have been applied post emergent when the weeds have been in the stage of rosette and when they only had 2 -4 leaves.

- in order to destroy the foliar diseases and the pests, two combined treatments have been done, with fungicides and with insect – fungicides and for the C₃ variant , at the second treatment, foliar fertilizers have been applied as well.

The weather conditions for the year 2011 have been favorable with optimum quantities of rainfall in the period April - May that have favored the development of the plants and of the wheat spikes as well.

For the analysis of the interaction between the fertilizer level (B factor) and the applied treatments (factor C) B₁ C₁ variant has been chosen as a witness and it was not fertilized and without herbicides for each of the wheat types (factor A).

RESULTS AND DISCUSSIONS

The influence of the fertilization level and of the phyto sanitary treatments upon the Dropia autumn wheat production

The study regarding the level of fertilization and the phyto sanitary treatments upon the Dropia type of wheat production in the year 2011, level presented in table 1, has emphasized the favorable effect of combining the level of fertilization with the treatments applied with fungicides and insect fungicides and also the effect of combining these with foliar fertilizers.

Table 1

The influence of the fertilization level and of the phyto sanitary treatments upon the Dropia autumn type of wheat in Les, Bihor county, in the year 2011

Type of wheat (Factor A)	Dose (Factor B)	Treatments applied (Factor C)		Production		Differences
				kg/ha	%	
Dropia	B ₁ -N ₀ P ₀	C ₁	Non treated	3500	-	-
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	3860	110.28	+360
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	4020	114.85	+520
	B ₂ - N ₅₀ P ₆₀	C ₁	Non treated	3680	105.14	+180
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	3950	112.85	+450
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	4370	124.85	+870
	B ₃ -N ₁₀₀ P ₆₀	C ₁	Non treated	4150	118.57	+650
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	4560	130.28	+1060
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	4920	140.57	+1420
	B ₄ -N ₁₅₀ P ₆₀	C ₁	Non treated	4330	123.71	+830
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	4750	135.71	+1250
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	5280	150.85	+1780

The wheat production obtained at the Dropia type of wheat in the year 2011 presents significant production excess at increased doses of applied fertilizers and phyto sanitary treatments in comparison with the witness (non fertilized and without herbicides). The highest wheat production has been obtained through the fertilization with doses of N₁₅₀P₆₀ and two treatments: I- Duett Ultra +Fastac, II-lea, Falcon +Decis 25WG + Folicare in a quantity of 5280kg/ha in comparison with the witness of only 3500kg/ha realizing a production excess of +1780kg/ha.

Analyzing the wheat production in the case of a gradual fertilization but without phyto sanitary treatments it shows a production excess from 105.14% in case of using some doses of N₅₀P₆₀ up to 123.71% in the case of applying some doses of N₁₅₀P₆₀.

In case of applying the phyto sanitary treatments the production excess is of 110.14%, in the case of the non fertilized variant and it reaches to 135.71% at the variant fertilized with N₁₅₀P₆₀.

By applying foliar fertilizers at the second fungicide and insecticide treatment the production excess, in the case of non fertilization is of 114.85%, and of 150.85% at the variant fertilized with N₁₅₀P₆₀.

The influence of the fertilization level and of the phyto sanitary treatments upon the Alex autumn type of wheat

Table 2 presents the production obtained at the Alex type of wheat and the production excess in the case of fertilization with graded doses of fertilizers and if applying two phyto sanitary treatments and in the C₃ variant foliar fertilizers are applied beginning with the second treatment.

Table 2

The influence of the fertilization level and of the phyto sanitary treatments upon the Alex autumn type of wheat in Les, Bihor county, in the year 2011

Type of wheat (Factor A)	Dose (Factor B)	Treatments applied (Factor C)		Production		Differences
				kg/ha	%	
Alex	B ₁ .N ₀ P ₀	C ₁	Non treated	3750	-	-
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	3960	105.60	+210
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	4120	109.86	+370
	B ₂ - N ₅₀ P ₆₀	C ₁	Non treated	4180	114.13	+430
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	4560	121.60	+810
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	4880	130.13	+1130
	B ₃ .N ₁₀₀ P ₆₀	C ₁	Non treated	4250	121.42	+750
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	4760	136.00	+1260
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	5380	153.71	+1880
	B ₄ .N ₁₅₀ P ₆₀	C ₁	Non treated	4730	126.13	+980
		C ₂	Duett Ultra +Fastac Falcon +Decis 25WG	5580	148.80	+1830
		C ₃	Duett Ultra +Fastac Falcon +Decis 25WG + Folicare	5960	158.93	+2210

In what the Alex type of wheat is concerned, the variants gradually fertilized but not treated from a phyto sanitary point of view are superior to the Dropia type of wheat from 114.13% in the case of fertilization with N₀P₀ to 126.13% in the case of fertilization with N₁₅₀P₆₀.

The production obtained through fertilization and phyto sanitary treatments has got production excess comprised between 810kg/ha in the case of fertilization with N₅₀P₆₀ and 1830 kg/ha in the case of fertilization with N₁₅₀P₆₀.

The use of the foliar fertilizers applied at the same time with the second phyto sanitary treatment, combined with fertilization also brings a production excess from 130.13% in the case of fertilization with N₅₀P₆₀ to 158.93% in the case of fertilization with N₁₅₀P₆₀ in comparison with the witness and non treated variant N₀P₀ (B₁x C₁).

In the case of the non fertilized variants, but variants treated phyto sanitarly the production excess is of 105.60% at the non fertilized variant still treated phyto sanitary with Duett Ultra +Fastac,Falcon +Decis 25WG(B₁x C₂)and it reaches to 148.80% at the variant fertilized with N₁₅₀P₆₀ and treated with Duett Ultra +Fastac,Falcon +Decis 25WG(B₄x C₂).

In what the Alex type of wheat is concerned, the production excess is superior to the Dropia type of wheat. The highest production has been obtained in the case of fertilization with N₁₅₀P₆₀ and treatment with: I- Duett Ultra +Fastac, II-lea Falcon +Decis 25WG + Folicare, being of 5960 kg/ha at the Alex type of wheat in comparison to 5280 kg/ha in the case of the Dropia type of wheat.

CONCLUSIONS

The study done for the Dropia and Alex types of autumn wheat in the year 2011 regarding the fertilization with chemical fertilizers and the phyto sanitary treatments applied during the vegetation period and their combination with foliar fertilizers have emphasized the favorable effect of these upon the wheat production in comparison with the non fertilized and non treated witness variant.

The phyto sanitary treatments applied to the two types of wheat have favored the development of the plants in optimum conditions with significant effects on the production. The foliar fertilizers applied together with the second phyto sanitary treatment have amplified the production excess for the both types of wheat.

The wheat production obtained at the Dropia type of wheat, at the variant fertilized with doses of N₁₅₀P₆₀ and two treatments with Duett Ultra +Fastac and Falcon +Decis 25WG + Folicare has been of 5280kg/ha in comparison with the witness variant of 3500kg/ha, realizing a production excess of +1780kg/ha.

At the Alex type of wheat the variant fertilized with doses of N₁₅₀P₆₀ and two treatments with Duett Ultra +Fastac and Falcon +Decis 25WG + Folicare the obtained production was of 5960kg/ha, in comparison with the witness variant of 3750kg/ha realizing a production excess of 2210kg/ha.

The gradual fertilization, at the non treated variants, through the three levels of fertilization (N₅₀P₆₀, N₁₀₀P₆₀, N₁₅₀P₆₀) brings production excess in comparison with the witness variant from 180kg/ha to 830kg/ha for the Dropia type and from 430kg/ha to 980kg/ha for the Alex type.

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