

Influence of foliar fertilizer treatments, fungicides and insecticides on the quality of some wheat varieties

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Abstract

Wheat crops are affected by numerous diseases that have caused quantitative and especially qualitative losses in Transylvania conditions. The effect of treatments on winter varieties was studied in S.C.D.A. Turda during the year 2008-2009. Four variants (T1, T2, T3, and T4) were tested using combinations of foliar fertilizers, fungicides and insecticides on wheat varieties: Arieșan, Apullum and Dumbrava. The four variants were four important moments in vegetation phenology (the resumption of vegetation, and the brotherhood end phenophase and herbicidation, the bellows phenophase and the flowering phenophase).

Differences between applied treatments have been observed. The best results were obtained at the T1 treatment, at the application of foliar fertilizers in all four major phenological stages: insecticide at the resumption of vegetation in the spring, at the bellows stage and at the flowering stage and fungicide at the bellows stage and at the flowering stage. The crude protein values ranged between 14.4% (T3) and 15.1% (T1) at the Arieșan variety, between 13.35% (T3) and 14.30% (T1) at the Apullum variety and between 13.6% (T3) and 14.37% (T1) at the Dumbrava variety. The wet gluten content and the Zeleny sedimentation index shows small variations between treatments, the best results have been obtained also at T1 treatment.

Thus, the higher value of wet gluten content at the Arieșan variety is of 36.85% (T1), at the Apullum variety of 35.03% (T1) and at the Dumbrava variety of 35.13% (T1). For the T1 treatment, the Zeleny index has values between 49.22 ml at the Arieșan variety and 52.77 ml at the Dumbrava variety. Hectoliter mass increases through the bellows stage, the varieties T3 and T4. The foliar fertilizer treatments on the vegetation (fungicides and insecticides) provide the superior expression on biological potential of wheat varieties (production and quality).

Keywords: wheat quality, wheat varieties, foliar fertilizers, fungicide and insecticides treatment

1. Introduction

In terms of foliar diseases in Transylvania and the spike in wheat, as well as pests, are a risk factor for the stability and quality of crops. The asmedea an important link in the technology culture for the quality of crops has proved to be the rational use of foliar fertilizers [5-7].

Together with agro-technical measures such as crop rotation, planting dates, balanced fertilization,

cultivation of varieties rezintente, chemical measures occupy an important place, being the most effective means of combating diseases, pests and crop quality assurance [1-4,8,9]. In this paper we present the effect of treatment with ingrsaminte foliar insecticides fungucude and on the winter wheat quality parameters.

2. Materials and Method

Were analyzed samples of Arieșan, Apullum and Dumbrava wheat varieties of harvest in 2008 from S.C.D.A. Turda. These wheat varieties were subjected to an polifactoriale experience that the following factors and dosing.

Factor S – variety of wheat which was treated with insecto-fungicide (Yunta) following dosing:

- S1 – Ariesan;
- S2 – Apullum;
- S3 – Dumbrava.

Factor T – treatments with foliar fertilizers, fungicides and insecticides to four points in the phenology important in wheat growing season Polyfeed 19:9:19 + microe.5kg/ha foliar fertilizer was used in all 4 phenology times during the growing season of wheat.

Insecticide Calypso was used 100 ml / ha to the vegetation resumption and to the of the end of twin step, and the bellows fenofaza and flowering was used π roteus 0.4 l / ha. Fungicides used were: Sportak 1kg/ha to end of twin step, Falcon 480 EC 0.6 l / ha in bellows fenofaza and Prosaro 1l/ha in fenofaza flowering.

At the end of înfratitului has been erbicidare with Sekator OD Progress 0135 kg / ha + Esteron 0.5 l / ha and bellows fenofaza and flowering was used as adjuvant Trend 0.3 l / ha.

3. Results and Discussion

In table 1 values (mean repetition) to follow quality indicators Arieșan wheat varieties, agro Apullum and Grove under the influence. The data were statistically analyzed by analysis of variance for polifactoriale experiences.

the resumption of vegetation	fenofaza end twin step and herbicide step	fenofaza of bellows	fenofaza flowering
T1	ÎF + IS	ÎF	ÎF+FG+IS
T2		ÎF+IS	ÎF+FG+IS
T3		ÎF+IS	ÎF+FG+IS
T4	ÎF+IS	ÎF+IS	ÎF+FG+IS

Legendă: ÎF – foliar fertilizers; FG – fungicides; IS – insecticides.

Table 1. Main indices of quality baking wheat varieties Arieșan, Apullum and Dumbrava under the influence treatments

Treatments	Variety	Hectolitre mass kg/hl	Protein %	Wet gluten %	Zeleny index ml
ARIESAN	T1	75,90	15,10	36,85	49,50
	T2	75,75	14,80	35,85	48,48
	T3	77,78	14,40	34,70	47,10
	T4	77,98	14,70	35,80	49,22
X (blank)		76,85	14,75	35,80	48,58
APULLUM	T1	81,30	14,30	35,03	50,42
	T2	80,50	14,12	34,23	47,38
	T3	82,25	13,35	31,98	45,72
	T4	81,40	13,90	33,82	48,03
X (blank)		81,36	13,92	33,77	47,89
DUMBRAVA	T1	79,32	14,37	35,13	52,77
	T2	78,70	14,10	34,55	51,83
	T3	79,92	13,60	32,87	48,23
	T4	80,30	13,93	33,92	51,88
X (blank)		79,56	14,00	34,12	51,18

Table 2. Influence of the interaction between treatments and genotype in hectolitre mass

* Variant	Hectolitre mass Kg/hl	%	Difference %	Significance
T1 S1	75,90	98,8	-0,95	000
T2 S1	75,75	98,6	-1,10	000
T3 S1	77,78	101,2	0,93	***
T4 S1	77,98	101,5	1,13	***
X (blank)	76,85	100,0	0,00	Mt.
T1 S2	81,30	99,9	-0,06	-
T2 S2	80,50	98,9	-0,86	000
T3 S2	82,25	101,1	0,89	***
T4 S2	81,40	100,0	0,04	-
X (blank)	81,36	100,0	0,00	Mt.
T1 S3	79,32	99,7	-0,24	0
T2 S3	78,70	98,9	-0,86	000
T3 S3	79,92	100,5	0,36	***
T4 S3	80,30	100,9	0,74	***
X (blank)	79,56	100,0	0,00	Mt.

DL (p 5%)=0,19kg/hl, DL (p 1%)=0,25kg/hl, DL (p 0.1%) =0,33kg/hl, * T - combinations of treatments with foliar fertilizers, fungicides and insecticides to four times over the period of vegetation phenology of wheat: T1, T2, T3, T4, S - variety: S1 = Arieşan; S2 = Apullum; S3 = Dumbrava.

Table 3. Influence of the interaction between treatments and genotype in protein content

* Variant	Protein %	%	Difference %	Significance
T1 S1	15,10	102,4	0,35	***
T2 S1	14,80	100,3	0,05	-
T3 S1	14,40	97,6	-0,35	000
T4 S1	14,70	99,7	-0,05	-
X (blank)	14,75	100,0	0,00	Mt.
T1 S2	14,30	102,8	0,38	***
T2 S2	14,12	101,4	0,20	***
T3 S2	13,35	95,9	-0,57	000
T4 S2	13,90	99,9	-0,02	-
X (blank)	13,92	100,0	0,00	Mt.
T1 S3	14,37	102,6	0,37	***
T2 S3	14,10	100,7	0,10	*
T3 S3	13,60	97,1	-0,40	000
T4 S3	13,93	99,5	-0,07	-
X (blank)	14,00	100,0	0,00	Mt.

DL (p 5%)=0,09%, DL (p 1%)=0,12%, DL (p 0.1%) =0,15%, * T - combinations of treatments with foliar fertilizers, fungicides and insecticides to four times over the period of vegetation phenology of wheat: T1, T2, T3, T4, S - variety: S1 = Arieşan; S2 = Apullum; S3 = Dumbrava.

Table 4. Influence of the interaction between treatments and genotype in wet gluten content

* Variant	Wet gluten %	%	Difference %	Significance
S1T1	36,85	102,9	1,05	***
S1T2	35,85	100,1	0,05	-
S1T3	34,70	96,9	-1,10	000
S1T4	35,80	100,0	0,00	-
X (blank)	35,80	100,0	0,00	Mt.
S2T1	35,03	103,8	1,27	***
S2T2	34,23	101,4	0,47	**
S2T3	31,98	94,7	-1,78	000
S2 T4	33,82	100,1	0,05	-
X (blank)	33,77	100,0	0,00	Mt.
S3T1	35,13	103,0	1,02	***
S3T2	34,55	101,3	0,43	**
S3T3	32,87	96,3	-1,25	000
S3T4	33,92	99,4	-0,20	-
X (blank)	34,12	100,0	0,00	Mt.

DL (p 5%)=0,28%, DL (p 1%)=0,37%, DL (p 0.1%) =0,49%, * T - combinations of treatments with foliar fertilizers, fungicides and insecticides to four times over the period of vegetation phenology of wheat: T1, T2, T3, T4, S - variety: S1 = Arieşan; S2 = Apullum; S3 = Dumbrava

Table 5. Influence of the interaction between treatments and genotype in Zeleny index

* Variant	Zeleny index ml	%	Difference %	Significance
S1T1	49,50	101,9	0,92	**
S1T2	48,48	99,8	-0,09	-
S1T3	47,10	97,0	-1,47	000
S T4	49,22	101,3	0,64	*
X (blank)	48,58	100,0	0,00	Mt.
S2T1	50,42	105,3	2,53	***
S2T2	47,38	98,9	-0,50	-
S2T3	45,72	95,5	-2,17	000
S2T4	48,03	100,3	0,15	-
X (blank)	47,89	100,0	0,00	Mt.
S3T1	52,77	103,1	1,59	***
S3T2	51,83	101,3	0,65	*
S3T3	48,23	94,2	-2,95	000
S3T4	51,88	101,4	0,70	*
X (blank)	51,18	100,0	0,00	Mt.

DL (p 5%)=0,62%, DL (p 1%)=0,83%, DL (p 0.1%)=1,09%, T - combinations of treatments with foliar fertilizers, fungicides and insecticides to four times over the period of vegetation phenology of wheat: T1, T2, T3, T4, S - variety: S1 = Arieşan; S2 = Apullum; S3 = Dumbrava

Determination of quality properties of the studied wheat varieties was done using methods accepted by quality standard ISO 7970/2001.

Hectoliter mass of wheat varieties studied under the influence of treatments applied in important phenological four times during the vegetation period ranged between 75.75 kg / hl and 82.25 kg / hl (Table 2). Analyzing the results observed for the three wheat varieties studied hectoliter mass of wheat that grows under the influence of T3 and T4 treatment, the mean differences being very significant to positive.

Regarding of crude protein content of table 3 emerges as a factor in all wheat varieties studied the best quality factor is interacting with T1, with values of the variety Ariesan 15.10%, 14.30% and 14.37% for the variety Apullum the variety Dumbrava, toward the mean differences being very significant positive.

If wet gluten content were observed in almost the same variation tendency as in the case of crude protein, the highest values occurring in Ariesan variety, ranging between 34.70% and 36.85% with an average of 35.8%, followed by variety Dumbrava with an average of 34.12% and a variety Apullum average 33.77% (Table 4).

Zeleny index values recorded between 47.10 ml and 49.5 ml Ariesan variety, ranged between 45.72 ml and 50.42 ml Apullum variety and values between 48.23 ml and 52.77 ml for the variety Dumbrava. Synthesizing the experimental results (Table 5), we see that the highest values of wheat varieties studied are recorded in the interaction

with factor T1 toward the mean differences being very significant positive.

4. Conclusion

The results of wheat varieties Ariesan, Apullum and Dumbrava under the influence treatment the crop year 2008-2009, allow us to draw several conclusions: wet gluten quality index, crude protein, Zeleny index are strongly influenced by treatments but with small variations , T1 version with the highest values in terms of these parameters.

It is found and hectolitre mass variations adjustable single treatments, under the influence of T3 and T4 treatments, obtaining higher values, because the treatments were not applied phenophase bellows.

Foliar fertilizer treatments, fungicides and insecticides to vegetation provide high expression of biological potential in terms of qualities of wheat.

Wheat Variety Ariesan reacted best to the application tratamentrelor, registering positive values very significant in terms of crude protein and wet gluten, followed by variety Apullum and Dumbrava.

Foliar fertilizer treatments, fungicides and insecticides to vegetation indices were positive as ininfluntat study, asigutate results statistically.

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