THE INTEGRATED CONTROL OVER THE GRASS RELATED TO THE AUTUMN WHEAT CROP IN THE CONDITIONS OF THE WEST DEPRESSION

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Abstract

The achievement of the wheat qualitative productions, involves the perpetual clearance of the grass from the crop itself.

The efficient control over the grass concerning the matter of the wheat crop, involves the 2-3 year crop rotation, in order to avoid, as much as possible the single crop and the practice of some agricultural and technical specific measures.

The chemical control over the grass involves the achievement of their floristic composition, in order to pursue the use of the herbicides. The types of herbicides used in this matter are set depending on the characteristics of the predominant grass, the extent of the grass over the crop and the optimal era of appliance.

In order to increase the efficiency of the herbicides, the appliance of these in particular may be well done as a combined method, so that the final productions are significant.

Key words: *herbicides, floristic composition, the grass, grass extension, Apera spica venti*

INTRODUCTION

The control over the grass related to the autumn wheat crops, involves a significant relevance, because the production and the quantity of the seeds are highly influenced by the grass extension process.

The combat of the grass involves integrated measures: the rational crop rotation, the assurance of an adequate crop rotation, specific soil work improvements for the maintenance of the crop rotation until the seeding process.

Hand in hand with the agricultural and technical measures involved, goes the chemical control over the grass through the use of the herbicides. This also represents a necessity. The type and the herbicide doses used are obtained in relation with the existing grass species, the extent of the grass and their dominance.

The efficiency in controlling the grass through the use of the herbicides depends on a series of factors: the before and after climatic treatment conditions, the maintenance of the optimal working dose per hectare, the optimal grass treatment phase and the uniform administration of the solution.

The West Depression has a high production potential, but at the same time presents a high diversity of grass species, a high infesting potential and a special competition status.

The control over the grass related to the autumn wheat, through chemical treatments, while using multiple and diverse herbicides is determined by the dominance of the grass species: the dicotyledonous annual grass and the evergreen grass (*Raphanus, Sinapis, Cirsium arvense,* etc.); the monocotyledonous grass (*Apera, Avena, Agropyron* etc).

The chemical control over the grass represents an element of maximum importance, that contributes to the enlargement of the production by reducing the competitive state of the grass.

In order to increase the economical efficiency, there is to be followed the use of the combined herbicides (based on 2-3 active substances), characterized by a large action spectrum, the reducing of the doses per hectare and the flexibility of the application era.

MATERIAL AND METHODS

The analysis and the researches were produced in the West Despression, at the farm Leş-Bihor, on a brown luvic soil, during the time period of 2007-2009. The doses and the application methods concerning the herbicides are presented in table no.3.

The effective use of the herbicides was realised with the use of a solution quatity of 300 litres of water/hectare, administrated uniformly on the field.

The control over the grass has a central role in the assurance of some maximal productions, at the level of the biological potential of the harvested wheat crops.

In order to obtain this, there must be developed some grass preventing measures, so that there would be prevented all the dominant species of grass, that might determine some relevant limitations in the production numbers, as long as they are present.

The main measures that must be taken are:

- The setting of the floristic composition of the grass from the wheat crop rotation, in order to determine the herbicides that are to be used and to set the balance between the dominant species.
- The acknowledgement of the grass species, that are both sensitive and resistant to multiple herbicides. This way, only some herbicides prevent some other dicotyledonous species, while the others prevent only monocotyledonous species.
- The action mechanism and the optimal application era. Some herbicides may be used only in the phase of the fraternal process, meanwhile others may be used until the paunch phase.
- The sensibility of the neighbouring crops towards the herbicides used to wheat, especially when the treatments are chosen to be made strictly by flight.

RESULTS AND DISCUSSIONS

The floristic composition of the grass population from the wheat crop is a diverse one, both quantitatively and qualitatively. This would be determined by the soil climate conditions, by the participation of the strawy cereals in the structure of the crop, by the fertilization level, the localization conditions, level of applied technology and the efficiency of the preventing methods.

The structure related to the extension of the grass through the teritory of the wheat (on the brown luvic soils) , during the period of time 2007-2009, is composed from the dicotyledonous grass species (75%) and the monocotyledonous grass species (15%). Concerning the problem of the dicotyledonous grass, there can be said, that the most extentive ones were the following: *Matricaria inodora, Raphanus raphanistrum, Polygonum convolvulus, Cirsium arvense, Thalpsi arvense, Chenopodium sp.*, and part of the monocotyledonous are: *Apera spica venti, Avena fatua, Agropyron repens.*

The dicotyledonous species are up to the herbiciding process in spring when the air temperature is minimum 15^{o} C, the wheat stands in the phase of the fraternal process, until the formation of the first intercallus, and the grasses are in the phase of the existance of 2-4 leaves.

The control over the monocotyledous species can be done through the postevolution use of the herbicides during spring, when the grass springs in a percentage of 50%., and the wheat situates before the fraternal phase.

The influence of the crop rotation and the fertilization over the wheat grass extension

In the middle of the discussion concerning the integrated control over the grass, the crop rotation represents the fundamental element within this kind of action.

The presence of the crop rotation as a rational crop rotation, represents an agro-technical measure, indeed efficient in preventing the grass, through the contraction of the general standard of grass extension, contraction of the soil seeds and contraction of the specific grass extent process, concerning the fact that the single crop is in favour of the specific grass extent process.

The results obtained at SCA Leş-Bihor, during the period of time 2007-2009, working on a three year crop rotation, emphasized a high standard of grass extension for the single wheat crop, at the fertilization period with $N_{100}P_{80}$ and towards the three year rotation with $N_{150}P_{80}$(table 1).

Table1

The influence of the crop rotation and fertilization
in the process of the wheat grass extension at SCA Leş(2007-2009)

Variant	Total		Monocotyledonous		Dicotyledonous	
	Grass/m^2	%	Grass/m^2	%	Grass/m^2	%
Unfertilized						
Single crop	235	100	182	77	53	23
Wheat-corn	150	100	104	69	46	31
Pea-wheat- corn	65	100	18	28	47	72
Fertilized with $N_{100}P_{80}$						
Single crop	256	100	194	76	62	24
Wheat-corn	184	100	125	70	59	30
Pea -wheat-corn	76	100	20	26	56	74
Fertilized with $N_{100}P_{80}$						
Single crop	285	100	213	74	72	26
Wheat-corn	196	100	132	67	64	33
Pea-wheat-corn	70	100	22	31	48	78

It is well acknowledged that the single crop empowers the grass extension, so that the process of grass extension with the monocotyledonous has some levels set between 74-77% in the case of the single crop, while in the case of the two-year crop rotation wheat-corn, the levels are reduced to 67-70%, and regarding the three-years crop rotation pea-wheat-corn, the percentage related to the grass extension has some significantly reduced values, reaching some of 18-22%.

The presented data result in the idea that the crop rotation assures the constraint of the grass extension, using the alternative technologies that are specific to each and every crop, the fertilization system, the different seeding eras, increasing in this way the grass prevention spectrum.

The influence of the herbicides over the attenuation of the grass extension

The integrated prevention of the grass in the wheat crop sets as a purpose the attenuation of the level of grass infestation not only for the present crop, but also for the crops that will come after it (corn, sunflower, etc.). The proper selection of the herbicides for the wheat crop represents a fine investment for the years that will follow.

In the case of the infested wheat with both, monocotyledonous and dicotyledonous species, through the use of the associated herbicides, with post evolutional application, the

number of grass per square meter may be reduced with values set between 89.7-91.8% from the total of grass and 88.5- 90.6 % in the case of the monocotyledonous grass (table 2).

Table 2

The influence of the herbicides over the attenuation of the grass extension level

No. Crt.	Variant	No.grass/variant				Difference			
		Total		Monocotyledonous		Total		Monocotyledonous	
		Grass/ m^2	%	Grass/ m^2	%	Grass/ m^2	%	Grass/ m^2	%
1	Untreated	145.0	100	95.0	100	-	Mt	-	Mt
2	Oltisan extra	95.0	66.0	92.0	97.0	-50.0	34	-3.0	3
3	Mustang	35.0	24.0	27.0	28.0	-110	76	-68.0	72
4	Laren + Cerlit	13.0	8.9	10.0	10.5	-132	91.1	-85.0	89.5
5	Assert +Oltisan extra	12.0	8.2	9.0	9.4	-133	91.8	-86.0	90.6
6	Rival 75PU+ Tomigan 250EC	15	10.3	11.0	11.5	-130	89.7	-84.0	88.5
7	Sansac	46	31	38	40.0	-99	69	-57.0	60

The highest efficiency in an ascending order is represented by the following herbicides: Assert, Laren, Rival 75PU.

Depending on the level of the grass prevention through the appliance of the herbicides, the production exceeds obtained are significant so they are held between 1,90-8,40q/ha(table 3).

Table 3

The influence of the herbicides over the efficiency and the wheat production, Leş-Bihor 2007-2009

No. crt.	Applied Herbicides	Dose/ ha g/kg/ha	The application era	The level of prevention	Production			Signfi can ce
					q/ha	%	Dif. ±	
1	Untreated	-	Post evolutional	-	33.60	100	-	-
2	SDMA 2,4D	1	Post evolutional	75	35.50	106	+1.90	-
3	Extra Oltisan	0.75	Post evolutional	94	41.00	122	+7.40	***
4	Granstar	0.018	Post evolutional	92	41.20	123	+7.60	***
5	Mustang	0.6	Post evolutional	94	41.80	124	+8.20	***
6	Cerlit	0.4	Post evolutional	95	42.00	125	+8.40	***
7	Rival superstar	0.020	Post evolutional	93	41.50	124	+7.90	***
8	Sansac	1	Post evolutional	93	41.40	123	+7.80	***
9	Super Icedin	1	Post evolutional	95	42.00	125	+8.40	***
10	Rival 75PU	0.010	Post evolutional	94	41.80	124	+8.20	***

LSD5%=4.0 LSD1%=5.2 LSD 0.1%=7.2

SDMA 2.4 D will be applied only on those soils with sensible grass (Sinapis, Cirsium, Raphanus, etc), or the grass prevention level is reduced to 75%.

CONCLUSIONS

The integrated prevention of the grass includes the specific application of the crop rotation, of the agronomical and technical work closely related to the application of the herbicides.

The efficient prevention of the grass involves the acknoledgement of the main grass species and of the level of infestation in comparison to the type of soil.

In the conditions of the West Depression, on the luvic brown soil, the dicotyledonous grass that prevail are: *Matricaria inodora, Raphanus raphanistrum, Polygonum convolvulus, Cirsium arvense, Thalpsi arvense, Chenopodium sp., etc.*

The crop rotation represents a great agrotechnical measure, also greatly efficient in the prevention of the grass. The grass extension in the wheat crops in the subject of the crop rotation, shows that the total amount of grass are being reduced in the case of the two-year crop rotation and greatly lowered in the case of the three-year crop rotation.

The chemical prevention of the grass represents a very important element in the case of the integrated prevention of the grass, that sets out for the achievement of the grass structure and of the grass extension level, all combined with their biology and ecology.

The greatest efficiency level in the case of the dicotyledonous grass prevention relates to the combined herbicides, that hold more active substances, with a large prevention spectrum as: Oltisan extra, Mustang, Icedin super, Cerlit,Rival.

The herbicides that hold a fundamental structure configured round the 2,4D have only achieved an inferior level of prevention in comparison with the achievement of the combined and granulated herbicides.

The used herbicides in order to prevent the monocotyledonous species were the following ones: Assert**,** Laren, Tomigan, with a high efficiency reaching the percentage of 90%.

The productions include significant numbers in the case of the treatements applied with combined and granulated herbicides.

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