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RESEARCH REGARDING WEED INFESTATION IN WHEAT CROP AT ECOLOGIC PROD FARM, MIHAIL KOGALNICEANU - CONSTANTA COUNTY

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Abstract

Weeds are unwanted plants that grow on agricultural land, pastures, parks, gardens, industrial land, airports, etc., producing various and enormous damage. The accurate knowledge of weed infestation is currently an important tehnological sequence in integrated weed control and helps to establish differentiated strategies for reducing these very damaging species to a level that does not affect wheat production. Too many weeds on 1 m^2 raise serious problems in terms of rotation, demanding necessary agricultural machinery, chemicals, etc. Winter cereals are infested by about 147 weed species. The accurate knowledge of the infested areas and the dominant species of different fields allow the farmer to plan in advance the necessary machinery, fuel and herbicides for weed contro lwith minimal environmental pollution. Weed mapping was initiated in 1973, aiming to establish the quantitative and qualitative level of weed infestation in farms. This paper refers exclusively on weed mapping in wheat between 2010 and 2012 at a farm belonging to S.C. ORGANIC PROD LTD, the Mihail Kogalniceanu area, Constanta county. The species found were: Brassica nigra, Cannabis ruderalis, Chenopodium album., Cirsium arvense, Convolvulus arvensis, Descurainia sophia, Fumaria officinalis, Galium aparine, Lamium amplexicaule, Polygonum convolvulus, Setaria sp., Sonchus arvensis and *Xanthium italicum. The results of this paper are the subject of doctoral theme.*

Key words**:** *infested areas, weeds, wheat.*

INTRODUCTION

Weeds are unwanted plants that grow on agricultural land, pastures, parks, gardens, industrial land, airports, etc., producing various and enormous damage [1, 2].

The accurate knowledge of all sole weeding structure is currently an important link in integrated weed control and helps to establish differentiated strategies to reduce these very damaging species to a level that does not harm wheat production [4].

Too many weeds on 1 m^2 raise serious problems in terms of rotation, demanding necessary agricultural machinery, chemicals, etc.

Winter cereals are infested by about 147 species of weeds [6]. The accurate knowledge of the infested areas and the dominant species of different fields allow the farmer to plan in advance the necessary machinery, fuel and herbicides for successful action with minimal environmental pollution. Weed mapping was initiated in 1973, aiming to establish thequantitative and qualitative level of the weed infestation in farms [3].

Knowing the weeds in wheat crop is an important link in the integrated control of these species [7].

The essential elements of the mapping process are: the mapping period, the number of determinations, the correct identification and registration of the species according to a consistent method.

This paper refers exclusively on weed mapping in wheat between 2010 and 2012, at a farm belonging to S.C. ORGANIC PROD LTD, the Mihail Kogalniceanu area, Constanta county.

MATERIAL AND METHOD

The data on weed infestation were obtained by the quantitative numerical method [5].

The weed species were numbered and identified from sample surfaces (0.25 square meters).
This method is fast and sufficiently accurate. For ease and accuracy, the collected weeds were grouped by species; the average height in centimetres was appreciated and noted in the tables (photo 1).
For each of the three years of research, measurements on the weed occurrence in the wheat sown fields were performed 1-2 days before the preferred time of herbicide application by using the methodology used in weed crop mapping in Romania.
Five determinations were made for each plot sown to wheat; subsequently, the average number of weeds encountered on one square meter, the participation of each weed species (%) and consistency (%) were calculated for each species.
Based on the observations performed during the three years of research in S.C. ORGANIC PROD LTD, the Mihail Kogalniceanu area, Constanta county, a general list of common weeds, dominant weeds and weed-issue groups was established.
Weeds are the dominant species, with the highest number of individuals/one square meter; their weeding participation is equal to or higher than 60%.

Photo 1. Height measurement
Polygonum convolvulus species

RESULTS AND DISCUSSIONS

In 2012, 12 species of weeds were determined in plot A 462 in wheat crop; most of them were dicotyledonous (9 species), two perennial dicotyledonous and one of monocotyledonous annual species (Table 1).
Of these species, *Cannabis ruderalis* and *Polygonum convolvulus* were dominant, and *Setaria* sp. and *Galium aparine* were co-dominant species.
The average number of weeds per square meter was 463.2 plants.
Species with more than 60% constancy (k%) were present in most of the plot, thus determining the choice of herbicide. In this case, species with low constancy also occurred rarely in the plot.
The specification of the botanical class is an important practice since dicotyledonous perennial weeds are more resistant than dicotyledonous annual weeds in both chemical means and agro control.
It should be noted that the average species (a) and average number of weeds on a square meter plot in the survey (M) were sufficient to establish control measures for cereal grains; however, in order to have a complete picture of the situation and to estimate the assumptions, participation (p%) and consistency (k%) were required.
In 2011, 12 species were identified in the same plot, i.e. A462; it should be noted that the species *Setaria* was not present, but *Lamium amplexicaule* occurred instead (Table 2).
Cannabis ruderalis and *Polygonum convolvulus* occurred as dominant species.
The average number of weeds per square meter was 226 plants.
As seen in Table 3, in 2010, only three species were identified in A 515 plot where *Lamium amplexicaule* was dominant.
The average number of weeds per square meter was 671.2 plants.
The period 2010 and 2012 recorded a variation in the number and density of weed species, depending primarily on the plot, weather conditions, crop system, precrop and herbicides.

Table 1. Weed species in plot A 462, (26.IV.2012)-wheat after wheat; ploughing at 28 cm

Species	Phenophase Height	Measurements					Species (s) amount	Species average (a)	Participation (p%)	Constancy (k%)	Botanical class
		1	2	3	4	5					
Cannabis ruderalis	A7	184	36	268	208	120	816	163.2	35.23	100	Da
Galium aparine	A12	-	-	52	60	50	162	32.4	6.99	60	Da
Polygonum convolvulus	A8	124	136	306	84	100	750	150	32.38	100	Da
Convolvulus arvensis	A6	20	-	4	6	16	46	9.2	1.99	80	Dp
Chenopodium album	A3	-	12	12	24	16	64	12.8	2.76	80	Da
Brassica nigra	A6	12	28	24	12	16	92	18.4	3.97	100	Da
Descurainia sophia	A7	8	-	-	-	4	12	2.4	0.52	40	Da
Xanthium italicum	A4	8	-	4	-	-	12	2.4	0.52	40	Da
Setaria sp.	A1	48	12	44	80	40	224	44.8	9.67	100	Ma
Cirsium arvense	A6	-	20	32	-	20	72	14.4	3.11	60	Dp
Sonchus arvensis	A4	-	4	-	2	-	6	1.2	0.26	40	Da
Fumaria officinalis	C12	-	36	-	24	-	60	12	2.59	40	Da
		404	284	746	500	382	2316	**463.2**	99.99		

Table 2. Weed species the plot A 462, (6.IV.2011)-wheat after rape; ploughing at 30 cm

Species	Phenophase Height	Measurements					Species (s) amount	Species average (a)	Participation (p%)	Constancy (k%)	Botanical class
		1	2	3	4	5					
Cannabis ruderalis	A6	88	40	44	60	64	296	59.2	26.19	100	Da
Galium aparine	A11	4	12	4	8	4	32	6.4	2.83	100	Da
Polygonum convolvulus	A7	80	100	108	96	84	468	93.6	41.42	100	Da
Convolvulus arvensis	A5	4	4	8	8	8	32	6.4	2.83	100	Dp
Chenopodium album	A2	8	-	4	4	8	24	4.8	2.12	80	Da
Brassica nigra	A5	8	12	12	8	12	52	10.4	4.60	100	Da
Descurainia sophia	A7	4	4	4	-	4	16	3.2	1.42	80	Da
Xanthium italicum	A2	4	4	4	-	-	12	2.4	1.06	60	Da
Lamium amplexicaule	A6	24	12	28	36	36	136	27.2	12.04	100	Da
Cirsium arvense	A6	8	-	-	12	-	20	4.0	1.77	40	Dp
Sonchus arvensis	A3	4	-	-	2	-	6	1.2	0.53	40	Da
Fumaria officinalis	C11	16	-	8	12	-	36	7.2	3.19	60	Da
		252	188	224	246	220	1130	**226**	100		

Table 3. Weed species in plot A 515, (10.IV.2010)-wheat after rape; ploughing at 30 cm

Species	Phenophase Height	Measurements					Species (s) amount	Species average (a)	Participation (p%)	Constancy (k%)	Class botanical
		1	2	3	4	5					
Lamium amplexicaule	A7	400	316	352	408	452	1928	385.6	57.45	100	Da
Galium aparine	A12	272	212	280	232	184	1180	236	35.16	100	Da
Descurainia sophia	A8	48	68	32	56	44	248	49.6	7.39	100	Da
		720	596	664	696	680	3356	671.2	100		

To a large extent, weed infestation in wheat crop depended on the crop condition in the period from April to May.
Optimal uniform wheat density was an effective means of controlling the weed cover plantlet stage, resulting in their suffocation.
This was shown in certain locations where mapping was performed (the number of weeds was lower than in the areas that displayed good wheat density).

CONCLUSIONS

The weed species found were: *Brassica nigra, Cannabis ruderalis, Chenopodium album., Cirsium arvense, Convolvulus arvensis, Descurainia sophia, Fumaria officinalis, Galium aparine, Lamium amplexicaule, Polygonum convolvulus, Setaria sp., Sonchus arvensis* and *Xanthium italicum.*
The small number of species identified in most cases represented by dicotyledonous did not raise special herbicide problems.
Knowing the weeds in wheat crop is an important technological sequence in the integrated control of these species.
There was a change in the number and density of weed species according to the plot, weather and crop management.

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