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THE ANALYSIS OF WEED COMMUNITIES FROM A RAPE CROP IN FUNDULEA (COUNT CĂLĂRAŞI)

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Abstract

Since under normal vegetation conditions in rape crops there are not treatment methods for dicotyledonous weed control, we analyzed a weed community installed in a rape field, in the specific climatic conditions of the Fundulea village (count Călăraşi). Our goal was to highlight the floristic composition, flowering period, annual/ perennial dicotyle - monocotyle ratio, bioforms spectrum, species general spread, species spectrum requirements for environmental factors and the degree of fidelity to the crop. Through spring mapping a predominance of annual dicotyledonous, flowering in spring (Lamium purpureum, Veronica pollita, Thlaspi perfoliatum, etc.) and a number of perennial species with high possibilities of vegetative propagation and summer flowering (Cirsium arvense, Convolvulus arvensis) were found. In terms of requirements for environmental factors, the species are indifferent to soil pH, adapted to local conditions: predominantly xero-mesophilic, micro-mesothermal.

Key words**:** *rape crop, species spectrum, weeds communities.*

INTRODUCTION

In addition to the direct competition for light and water, weeds' presence in a rape crop can cause difficulty of harvesting, increase the price of treatments applied to enhance the drying process of the silicva or seed infestation. In the spring, dicotyledonous weeds uncontrolled for by autumn herbicide may hinder the growth of the rape plants, which will not branch out and will produce fewer fruits [7].

One aspect of weed control is species affinity for rape crops. This "is not absolute and is determined by the agro technique used and by the effectiveness of weed management" [1] and local conditions. If we use as a landmark rape crops in the UK, frequently encountered species are: *Alopecurus myosuroides* (in our country it appears mainly in cereal crops in oak forests up to beech forests [2]), *Galium aparine, Sinapis arvensis, Sonchus asper, Matricaria perforata, Cirsium arvense* [6]. In our country, in an experience carried out to determine the influence of biotic and abiotic factors on the production of rape on red preluvosoil in the Romanian Plain, in the spaces without herbicides were identified four dicotyledonous weed species: *Sinapis arvensis, Anthemis arvense, Xanthium italicum, Cirsium arvense* and on sprayed ground, after 15 days post-treatment were recorded specimens of the following species: *Sinapis arvensis, Convolvulus arvensis*, as well as *Anthemis arvense* and *Xanthium italicum*, the last two as a result of reinfection [5]. Spring through mapping we can assess the effectiveness of treatments applied in the fall and predict the subsequent weed and establish measures to limit the negative effects due to weed presence. In this paper we envisioned an analysis of weed communities identified by mapping in the spring, in the conditions specific to the town of Fundulea (Calarasi county).

MATERIAL AND METHOD

Field research was conducted during April 2011 in a rape crop (hybrid Hexagon) established the previous autumn, on a field in the BASF company's land. All species encountered in the experimental variants were recorded and the weed community was analysed in terms of plant composition, class and life span, groups (according to the classification system developed by C. Chirila [1]), biological forms, the phytogeographical

element and ecological requirements [4]. In terms of local conditions, the land located in the Fundulea area (Calarasi county, in the eastern part of the Romanian Plain, in the area of separation between the South Baragan and Vlasiei Plains, on the stream of Mostiştea), is located on a cambic cernosiom soil type, under continental climate, with an average temperature of 10.5° C and rainfall of 571 mm.
The scientific denomination of the species and their systematic classification was made according to the classification of V. Ciocârlan [3].

RESULTS AND DISCUSSIONS

Weed species recorded during the spring mapping, together with their biological features are noted in Table 1.
In terms of floristic composition, the weed community is represented by 21 species classified in 12 families. The species distribution on families was as follows: four species of the family *Brassicacea* respectively *Asteraceae*, 3 species of *Scrophulariaceae*, one species of *Papaveraceae* family, *Caryophyllaceae*, *Amaranthaceae*, *Fabaceae*, *Apiaceae*, *Geraniaceae*, *Convolvulaceae*, *Boraginaceae*, *Rubiaceae*.
It is worth noting that representatives of the *Poaceae* (*Gramineae*) family were missing, and that the presence of species from other families is consistent with the general information on cormophytes weeds in Romania [1].
This observation is complemented by data on species' range according to class and life: 16 out of 21 species are dicotyledonous annual and 5 are perennial dicotyledonous, the monocots being absent (Table 1). In terms of species distribution according to biological form, therophyte species predominate (9 species) and species undergoing annual life cycle, from germination to the formation of new seeds in one growing season and undergo unfavourable periods as seeds. These are followed by the hemytherophyte group (7 species) which includes bisannual and winter annual species. The hemicryptophytes are represented by three species, and geophytes species and those with intermediate behaviour (hemicryptophyte - geophytes) by one specie each. These are groups that are perennials with vegetative buds located right at the soil surface or with perennating stems located in the soil (Table 1).
This data is supplemented by weed classification according to their response to specific control measures [1]. The following distribution of weed species groups was identified (Table 1):
Group 1 weeds with very early spring flowering and short growing season: 1 species.
Group 2, weeds with early flowering and long growing season, sensitive to 2,4-D: 1 species.
Group 3, weeds with early flowering and long growing season, medium resistant to 2.4-D: 1 species.
Group 4, Spring weeds resistant to 2.4-D: 6 species.
Group 5, spring weeds from the family *Brassicaceae* (*Cruciferae*), with early flowering, susceptible to 2.4-D, resistant to trifluralin: 2 species.
Group 7, weeds of the *Fabaceae* (*Leguminosae*) family, capable of recovery after herbicide: 1 species.
Group 8, summer weeds, nitrophilous with optimum development in hoes crops: 1 species.
Group 11, biennial weeds: 3 species.
Group 21, weeds with taproot: 1 species.
Group 23, weeds with root with buds: 3 species.
Analysis shows that the community includes three cosmopolitan species, with general spread in the world overall, two species are adventives, 9 species are Eurasian confirming that this category is best represented in the flora of our country [4], a species is of Europe, one is Pontic-Caucasian, one is circumpolar and one central European.
By grouping species according to soil moisture requirements, the predominant species are identified to be the xero-mesophilous species (they vegetate well on dry-moist - moist soils) - 10, followed by mesophilous species (require moist up to wet soils) - 9 and in small numbers the xerophile species (vegetation on dry- dry-moist soil) -2 (Table 1). In terms of the temperature factor requirements, for most species of weeds vegetate appropriately at temperatures between 4.5 and 7.5^{o}C-12, followed by those with wide requirements from the heat factor - 5 and those with higher

requirements from air temperature, ranging from 7.5 to 10.5°C -3. One species exhibits low temperature requirements (Table 1). As a response to the soil reaction factor, most species (11) show a large ecological amplitude, followed by species that grow on soils with pH between 6.8-7.2 (8) and those that can withstand a pH range of 6-6.8 (2) (Table 1).

Table 1. The main biological characteristics of the weed species encountered in spring mapping in the experimental field of BASF in Fundulea – Calarasi county

No. crt.	Scientific name/ Family	Class/ Life span	Biological form	Group of weeds	Areal	Ecological characteristics		
						U	T	R
1.	*Papaver rhoeas* **Papaveraceae**	Da	Th - HTh	4	Eua	**3**	**3.5**	**4**
2.	*Stellaria media* **Caryophyllaceae**	Da	Th -HTh	4	Cosm.	**3**	**0**	**0**
3.	*Amaranthus retroflexus* **Amaranthaceae**	Da	Th	8	Adv.	**3**	**3**	**0**
4.	*Vicia sativa* **Fabaceae**	Da	Th-HTh	7	Eua	**3**	**0**	**0**
5.	*Daucus carota* ssp.*carota* **Apiaceae**	Da	Th-HTh	11	Eua	**2.5**	**3**	**0**
6.	*Descurainia sophia* **Brassicaceae**	Da	Th	5	Eua	**2.5**	**2.5**	**4**
7.	*Capsella bursa-pastoris* **Brassicaceae**	Da	Th	5	Cosm.	**3**	**0**	**0**
8.	*Thlaspi perfoiatum* **Brassicaceae**	Da	Th	1	Eua	**2**	**3**	**4**
9.	*Cardaria draba* **Brassicaceae**	Dp	H	23	Eua	**2**	**4**	**4**
10.	*Geranium pussilum* **Geraniaceae**	Da	Th-HTh	11	Eur	**2.5**	**3**	**0**
11.	*Convolvulus arvensis* **Convolvulaceae**	Dp	H-G	23	Cosm	**2.5**	**3.5**	**3.5**
12.	*Anchusa ochroleuca* **Boraginaceae**	Dp	H	-	Pont-cauc.	**1.5**	**4**	**4**
13.	*Lamium amplexicaule* **Lamiaceae**	Da	Th	3	Eua	**2.5**	**3.5**	**0**
14.	*Veronica hederifolia* **Scrophulariaceae**	Da	Th	4	Eua	**2.5**	**3**	**4**
15.	*Veronica persica* **Scrophulariaceae**	Da	Th	4	Adv.	**3**	**4**	**4**
16.	*Veronica polita* **Scrophulariaceae**	Da	Th	4	Eua	**2.5**	**3.5**	**4.5**
17.	*Galium aparine* **Rubiaceae**	Da	Th	4	Cp	**3**	**3**	**3**
18.	*Senecio vulgaris* **Asteraceae**	Da	Th-HTh	2	Cosm.	**3**	**0**	**0**
19.	*Cirsium arvense* **Asteraceae**	Dp	G	23	Eua	**2.5**	**3**	**0**
20.	*Lactuca serriola* **Asteraceae**	Da	Th-HTh	11	Centr.-eur.	**1.5**	**3**	**0**
21.	*Taraxacum officinale* **Asteraceae**	Dp	H	21	Eua	**3**	**0**	**0**

Da- annual dicotyledonous; Dp – perennial dicotyledonious; Th – Therophyta; Th-HTh – Hemytherophyta; G – Geophyta; H – Hemicryptophyta; Adv. – adventive; Cosm – cosmopolite; Centr.-eur. – Central Europe; Cp – circumpolar; Eua – Eurasia; Eur. – Europe; Pont.-cauc. – Pontic-Caucasian; U 1.5 – xerophile; U 2; U 2.5 – xero-mesophilous; U 3 – mesophilous; U 4 – meso-hygrophilous; T 0 – eurytherme; T – 2.5 microtherme; T3; T3.5 – micro – mesotherme; T 4 – moderate termophilous ; R 0 – euriionic; R 3; R 3.5 – acid neutrophilous; R 4 – weak acid - neutrophilous

CONCLUSIONS

The 21 species of dicotyledonous plants, results of the floristic composition analysis from the spring mapping, shows that the weed community contains species from the major families with representatives in Romania's flora. The lack of monocotyledonous weeds, highlighted by the relationship between species depending on class and life span, is due to pre and post-emerging treatments applied in the autumn.

Therophyta species dominate the classification based on biological form and most of them belong to groups of spring weeds with varying degrees of sensitivity to 2.4 D. Analyzing the general spread of weed species with their requirements to environmental factors shows that they are adapted to a continental climate with warm summers and low rainfall.

Spring mapping, accompanied by weeds' species biological features analysis provides the data necessary to establish a weed control strategy for rape crops.

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