

Weeding level in grain maize in the area adjacent to the perimeter of the Barzava river

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Abstract Weed control is one of the main technological measures in maize. For these measures to be highly efficient, we need to determine the composition of the weed species and then to establish the weed control to be sued. Weeding level oscillates as follows: Gătaia – 94 weeds/m², Ghertiniş – 125 weeds /m² and Berzovia – 106 weeds /m². In Gătaia, the predominant weeds were *Amaranthus retroflexus* (15,96%) and *Chenopodium album* (12,77%). The predominant weed species in Ghertiniş were *Amaranthus retroflexus* (12,80%) and *Setaria glauca* (12,00%). In Berzovia, the predominant species were *Setaria glauca* (11,32%) and *Amaranthus retroflexus* (10,38%). The ratio between biological categories was: annual monocots 25%, perennial monocots 15%, annual dicots 35% and perennial dicots 25%. The 20 weed species belong to 10 botanical families, the most representative of which are Poaceae (8) and Asteraceae (4).

Key words

weeds, grain maize, share percentage e, biological categories, botanical families.

Agricultural crops weed strongly no matter the area where they are cultivated. The nutrition area of the plants allows weeds to develop and, in some cases, even damage completely the crops.

The segetal flora of the maize crops in Romania is extremely varied from both the point of view of the number of weed species and particularly from the point of view of the numerous possible combinations of the different biological groups. This variety can be explained by the wide diversity of the soil and climate conditions in the areas where this crop is cultivated (1).

Weeds are extremely dangerous in maize crops because maize is a poor competitor in relation to annual segetal species, particularly during the period of slow growth when it can be completely destroyed even by some annual species.

In maize, as a result of the diminution of the water and nutrient supplies, growth rate, stem diameter, the number of leaves and their area, plant weight and height decrease, and the plant turns from green into green-yellowish (7).

Knowing the structure of sole weeding is an important element in integrated weed control, a solution for agrotechnic and chemical measures to apply to reduce weed number down to levels that do not produce important damage (4).

Identifying weeding level in crops is a permanent concern for the specialists, be they researchers or academics (2, 3, 5, 6, 8): they developed in time different methods for the mapping of weeding

level – analytical, synthetic and mixed – that finally provide the most efficient weed control measures.

Material and Method

To obtain the most accurate results, we took into account both necessary material and working methods. To determine as exactly as possible the number of weeds, we chose a metric square (1x1 m), determiners, a magnifying glass, a register, situation plans. Weed mapping was done along the diagonal of each sole. The number of measurements depended on the sole size. Result interpretation was done monitoring the weed species, the biological category (botanical class) and botanical family.

Results

The year 2013 was characterised by a level of rainfall above the multiannual mean, but their distribution was uneven.

Weeding level in the three neighbouring localities had close values from the point of view of the number of weeds /m²; even the weed composition was close.

In Gătaia, the number of weeds /m² was 94. The annual dicots *Amaranthus retroflexus* and *Chenopodium album* predominate with 15 weeds/m² (15.96%) and 12 weeds /m² (12,77%), respectively. They are followed with close values *Xanthium strumarium* (9 weeds /m², i.e. 9,56%), *Setaria glauca* (8 weeds /m², i.e. 8,50%) and *Ambrosia artemisiifolia* (7 weeds /m², i.e. 7,45%) (Table 1).

Table 1

Synthesis of data regarding weeding in maize in the area adjacent to the Bârzava River (2013)

Weed species	Locality						Mean of weed species	Share (%)
	Gătaia		Ghertiniș		Berzovia			
	Weeds/m ²	Percentage (%)	Weeds/m ²	Percentage (%)	Weeds/m ²	Percentage (%)		
<i>Agropyron repens</i>	2	2.13	5	4	5	4.72	4	3.69
<i>Amaranthus retroflexus</i>	15	15.96	16	12.80	11	10.38	14	12.92
<i>Ambrosia artemisiifolia</i>	7	7.45	7	5.60	10	9.44	8	7.38
<i>Avena fatua</i>	2	2.13	5	4	7	6.60	4.67	4.31
<i>Bromus arvensis</i>	-	-	1	0.80	2	1.89	1	0.92
<i>Capsella bursa pastoris</i>	3	3.19	4	3.20	4	3.77	3.67	3.39
<i>Chenopodium album</i>	12	12.77	14	11.20	10	9.44	12	11.08
<i>Cirsium arvense</i>	3	3.19	6	4.80	7	6.60	5.33	4.92
<i>Convolvulus arvensis</i>	4	4.26	7	5.60	6	5.66	5.67	5.23
<i>Cynodon dactylon</i>	2	2.13	2	1.60	1	0.94	1.67	1.54
<i>Echinochloa crus-galii</i>	5	5.32	11	8.80	6	5.66	7.33	6.77
<i>Calinsoga parviflora</i>	3	3.19	3	2.40	2	1.89	2.67	2.46
<i>Hibiscus trionum</i>	4	4.26	-	-	3	2.83	2.33	2.15
<i>Lathyrus tuberosus</i>	3	3.19	4	3.20	-	-	2.33	2.15
<i>Lolium multiflorum</i>	5	5.32	-	-	1	0.94	2	1.85
<i>Rarippa silvestris</i>	-	-	3	2.40	1	0.94	1.33	1.23
<i>Rubus caesius</i>	2	2.13	4	3.20	5	4.72	3.67	3.39
<i>Setaria glauca</i>	8	8.50	15	12	12	11.32	11.67	10.77
<i>Sorghum halepense</i>	5	5.32	8	6.40	7	6.60	6.67	6.16
<i>Xanthium strumarium</i>	9	9.56	10	8.00	6	5.66	8.33	7.69
TOTAL	94	100.00	125	100.00	106	100.00	108.34	100.00

The number of weeds/m² in Ghertiniș was 125, higher than that recorded in Gătaia. The predominant weed

species were *Amaranthus retroflexus* (16 weeds /m², i.e. 12,80%), *Setaria glauca* (15 weeds /m², i.e.

12,00%) and *Chenopodium album* (14 weeds /m², i.e. 11,20%). *Xanthium strumarium* and *Sorghum halepense* are frequent weeds in the area, with a share ranging between 8,00% and 6,40% (Table 1).

Weeding level in Berzovia was 106 weeds /m². Predominant species have close values, with a share ranging between 9,44% and 11,32%: *Setaria glauca* (12 weeds /m²), *Amaranthus retroflexus* (11 weeds /m²) and *Ambrosia artemisiifolia* and *Chenopodium album* (10 weeds /m² each) (Table 1).

After analysing the three locations, we could see that the values were close, which allowed us to present their mean and recommend common weed control methods. The weeds with the highest share percentage were *Amaranthus retroflexus* (12,92%), *Chenopodium album* (11,08%) and *Setaria glauca* (11,67%) (Table 1).

The ratio of the biological categories had the following values: annual monocots 25%, perennial monocots 15%, annual dicots 35% and perennial dicots 25% (Table 2).

Table 2

Ratio of biological categories of different weed species in grain maize (2013)

Biological category	Number of biological categories	Share (%)
Annual monocots	5	25
Perennial monocots	3	15
Annual dicots	7	35
Perennial dicots	5	25
TOTAL	20	100.00

The share of 60% of annual weeds favours the use with high efficiency of agrotechnic methods of weed control.

The 20 segetal species belong to 10 botanical species (Table 3). The best represented species belong to the families *Poaceae* (8) and *Asteraceae* (4) (Table 3).

Table 3

Distribution of flora per botanical families in grain maize (2013)

Family	Number of species
Amaranthaceae	1
Asteraceae	4
Brassicaceae	1
Chenopodiaceae	1
Convolvulaceae	1
Cruciferae	1
Fabaceae	1
Malvaceae	1
Poaceae	8
Rosaceae	1
TOTAL	20

Conclusions

Research carried out regarding weeding level in grain maize allowed us to draw the following conclusions:

1. Weeding level in the three localities had close values from the point of view of weed species and number.
2. In Gătaia, there were 94 weeds /m², in Ghertiniş, there were 125 weeds /m² and in Berzovia, there were 106 weeds /m².

The predominant weeds were:

- In Gătaia, *Amaranthus retroflexus* (15,96%) and *Chenopodium album* (12,77%);

- In Ghertiniş, *Amaranthus retroflexus* (12,80%) and *Setaria glauca* (12,00%);

- In Berzovia, *Setaria glauca* (11,32%) and *Amaranthus retroflexus* (10,38%).

3. The mean of the three locations points out as predominant species *Amaranthus retroflexus* (12,92%) and *Chenopodium album* (11,08%).

4. Annual weeds represent 60%, and perennial weeds represent 40%.

5. The families with most weed species were *Poaceae* (8) and *Asteraceae* (4).

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