

# Results on the efficiency of herbicides in weeds control from the maize crop

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## INTRODUCTION

Romania is one of the largest producers of maize (*Zea mays*) in the European Union, a plant that can prove very profitable if certain requirements related to the cultivation and care of the crop are met. It has a production capacity approximately 50% higher than other cereals. Maize has a wide distribution area because it is little influenced by climate change and has high resistance to heavy rains, drought, diseases and pests. Integrated weed management is a system of integrated measures to maintain the level of weed infestation of crops below the damage. The presence of weeds in the crop is a reality, their predominance being influenced by the crop area, technological links, the preceding plant and local pedoclimatic conditions. The research focused on weed identification, crop selectivity, and controlling the weed species present by applying herbicide treatments without negative impact on the environment.

## MATERIALS AND METHODS

In the pedoclimatic conditions specific to the area at NARDI - Fundulea, the maize crop presents a high infestation (65-75%), a spectrum of characteristic weeds and a dominance specific to the area. In the maize crop, the characteristic and most representative weed species were: monocotyledons - *Setaria viridis*, *Echinochloa crus-galli*, *Sorghum halepense*; annual and perennial dicotyledons - *Amaranthus retroflexus*, *Solanum nigrum*, *Chenopodium album* and *Cirsium arvenses*. The study and control of weeds is an important research direction, because they cause damage that can affect production by up to 35% - 70%.

The experiment being located on a soil of cambic chernozem type (3.2% organic matter, 37% clay, 6.5 pH), the organization of the experiment was done according to the method of randomized blocks, with a plot area of 25 mp, in 3 replications, the amount of water used was 300 l/hectare. The herbicides used as well as the experimental variants are described in the technical data (table 2) below:



- Placement of the experience: randomized blocks
- Plot area - 25m<sup>2</sup>
- Solution: 300 l/ha
- Observations:
- Selectivity (%): 7-14-21 days after treatment,
- Efficacy (%): 21 days after treatment

Nr. var.	Herbicide treatments	Dose kg,l/ha	Time of application
1	Untreated	-	-
2	Adengo 225 g/l isoxaflutol 90 g/l tienarbazon-metil 150 g/l diprosulfamide (safener)	0,4 l/ha	Preem BBCH 00
3	ADENGO 225 g/l isoxaflutol 90 g/l tienarbazon-metil 150 g/l diprosulfamide (safener)	0,35 l/ha	POSTEM BBCH 12-13
4	ADENGO 225 g/l isoxaflutol 90 g/l tienarbazon-metil 150 g/l diprosulfamide (safener) + LONTREL clopiralid 300 g/l	0,35 l/ha+0,4 l/ha	POSTEM BBCH 12-13

## RESULTS AND DISCUSSIONS

In the maize (*Zea mays*) experience carried out in the experimental field at the NARDI - Fundulea, the crop showed a high infestation degree of -73% - weeds, extremely diversified, depending on the local pedoclimatic conditions of the years of research 2024-2025. The most representative (fig. 1) most representative weed species were: monocotyledons - *Setaria viridis*, *Echinochloa crus-galli*, *Sorghum halepense*; annual and perennial dicotyledons - *Amaranthus retroflexus*, *Solanum nigrum*, *Chenopodium album* and *Cirsium arvenses*. Results showed that selective herbicides effectively controlled the dominant weeds without damaging the maize crop.

The research focused on weed identification, crop selectivity, and controlling the weed species present by applying herbicide treatments without negative impact on the environment. Herbicide treatments must be correlated with the degree of weed infestation, the spectrum and dominance of the weeds, the timing of application, the technical potential for effectiveness and the local climatic conditions at Fundulea.

The efficacy of herbicide treatments applied to control weed species is presented in Fig.2 - Fig.4

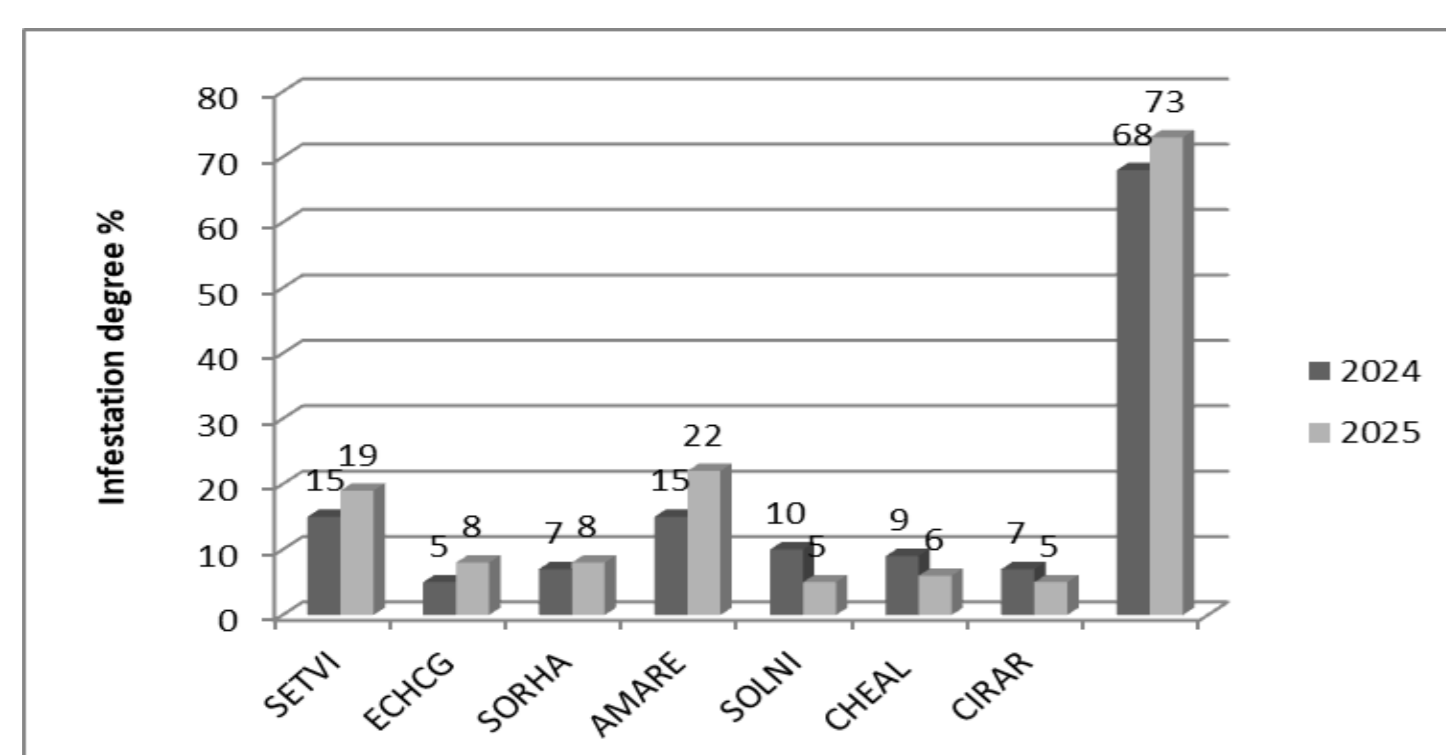


Figure 1. The infestation degree (%) with weeds

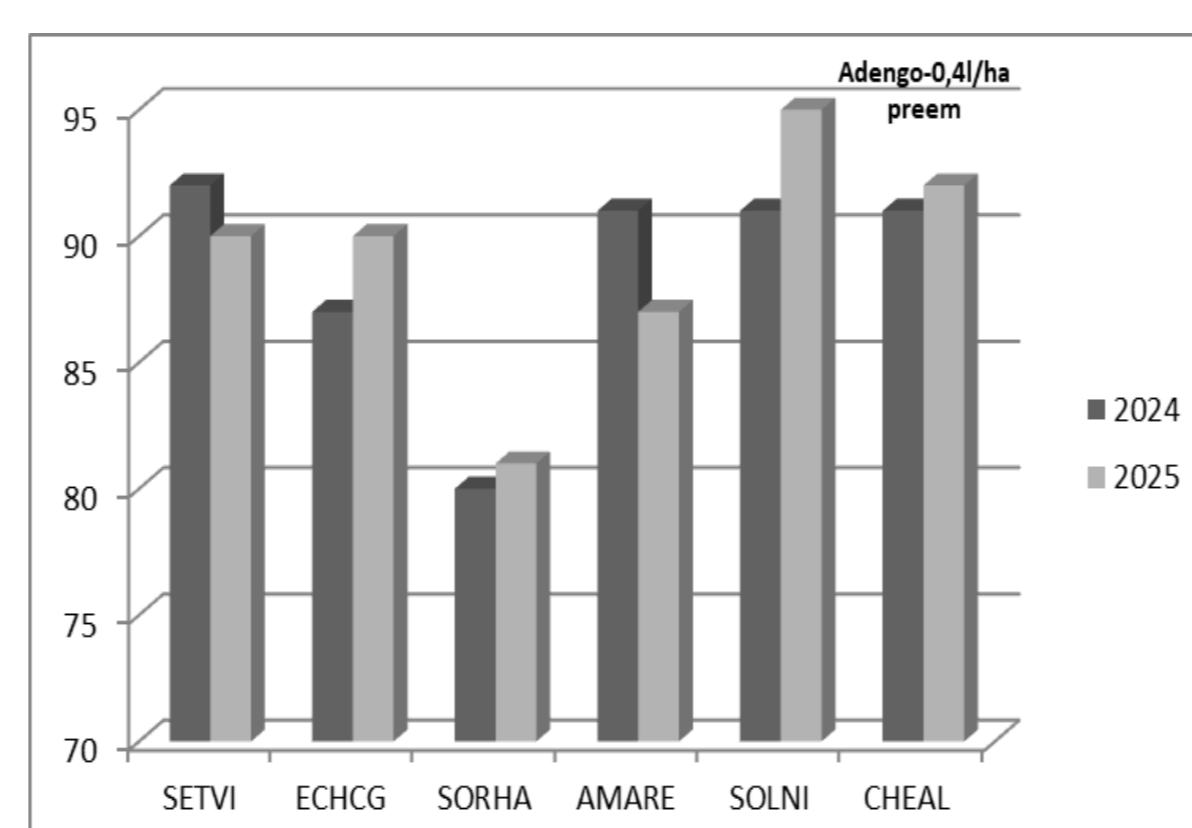


Figure 2. The efficacy (%) of the herbicide ADENGO

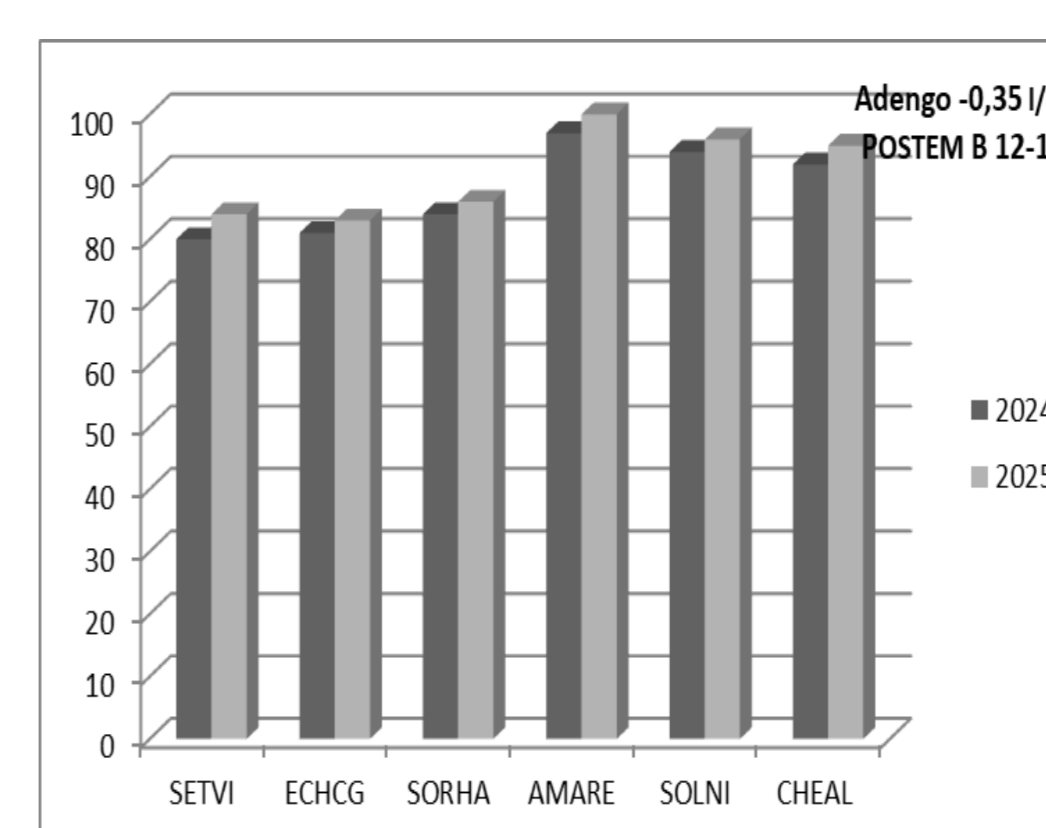


Figure 3  
The efficacy (%) of the herbicide ADENGO

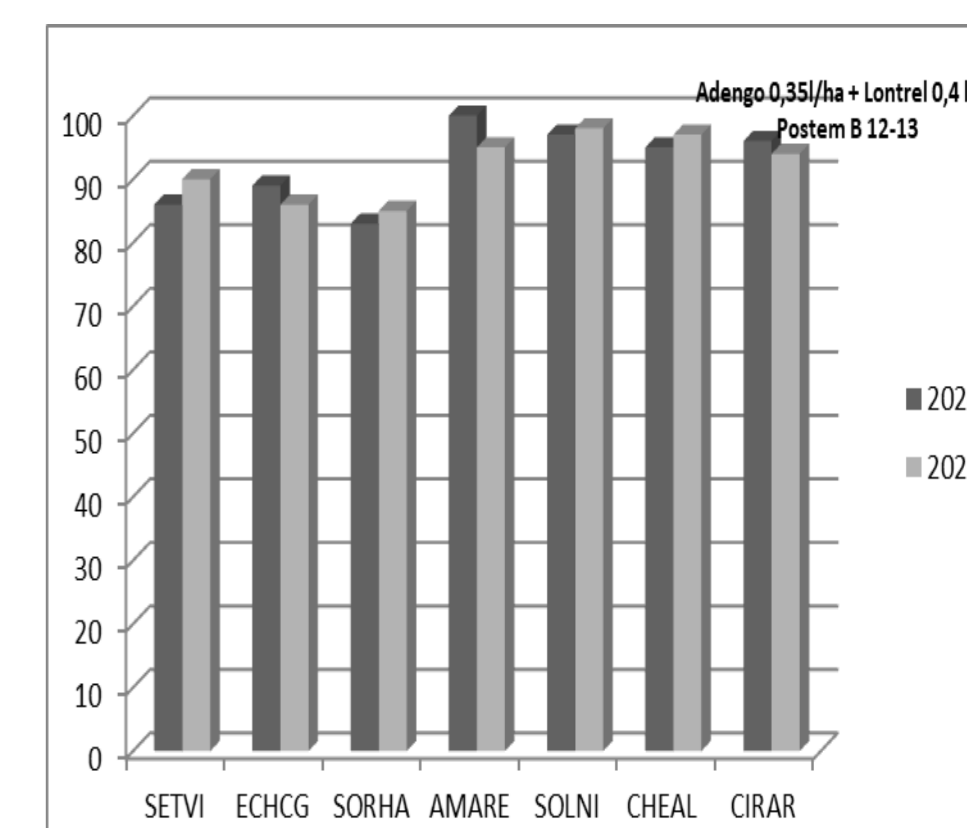


Fig. 4  
The efficacy (%) of the herbicide ADENGO + LONTREL

The presence of weeds in this culture is a reality, their predominance being influenced by the cultivation area, the technological links, the preceding plant and the local pedoclimatic conditions. Weed control is the main care work for the crop, being necessary to eliminate the competition of weed species present from the first stages of their appearance and development. The application of the preemergence (BBCH00) and post-emergence (BBCH 12-13) herbicide treatments to the maize crop was correlated with the degree of infestation, weed dominance and the recorded climatic conditions.

The preemergence application of the herbicide treatment (fig.2)-Adengo0,4l/ha- in the maize culture, a good efficacy 91-81% was recorded for the *Setaria viridis*, *Echinochloa crus-galli*, *Sorghum halepense*. The annual weeds *Amaranthus retroflexus*, *Solanum nigrum*, *Chenopodium album* they recorded an average effectiveness 89-93%.

Figure 3 shows the treatment- Adengo 0,35 l/ha, postemergence BBCH 12-13-recorded average effectiveness for weeds *Setaria viridis*, *Echinochloa crus-galli* and *Sorghum halepense* 82-85%. The annual weeds *Amaranthus retroflexus*, *Solanum nigrum*, *Chenopodium album* they recorded an average effectiveness 94-98,5%.

In the variant treated with the combination of Adengo 0.35 l/ha + Lontrel -0.4 l/ha herbicides, very good efficacy results were recorded for combating weeds present in the corn crop. The average effectiveness for weeds *Setaria viridis*, *Echinochloa crus-galli* and *Sorghum halepense* was 84-88%.

The annual and perennial weeds *Amaranthus retroflexus*, *Solanum nigrum*, *Chenopodium album* and *Cirsium arvense* recorded an average effectiveness 98-95%. Herbicide treatments applied to the maize crop (BBCH 00; BBCH14-16) did not registered any phytotoxic symptoms (EWRS scale = 0).

The chemical control of the weed species existing in the wheat culture, on the type of cambic chernozem soil from Fundulea, represents an especially important and necessary technological measure. In the field of weed control, the main objective is to reduce the degree of infestation and, last but not least, to identify the most effective combinations of substances, so as to reduce both the impact on the environment and the costs per hectare. The damage caused by weeds can be diverse and often lead to a decrease in production, an increase in costs, a deterioration in the quality of products, weeds being ideal hosts for pathogens and pests.

## CONCLUSIONS

- ❖ In establishing a weed control strategy, we must consider the following aspects: identifying the existing weed spectrum; establishing the share of weeds in the soil; effectively correlating weed sensitivity and crop tolerance; choosing the product and the optimal time of its application.
- ❖ The effectiveness of herbicide treatments, used in different doses and application times, depends on a number of factors: infestation degree soil and climate conditions technological links,
- ❖ The use of the most optimal and efficient strategies contributes to: - the growth and development stage of corn plants throughout the vegetation period. - obtaining quantitative and qualitative production at the level of the biological potential of maize hybrids.