

Effects of different herbicide treatments on common ragweed in maize (Hungary)



Gabriella Kazinczi¹, Róbert Novák², Ildikó Kerepesi¹

Department of Plant Production and Plant Protection, Institute of Plant Science, Faculty of Agricultural and Environmental Sciences, Kaposvár University, Guba S. str. 40, H-7400 Kaposvár, Hungary; kazinczi.gabriella@ke.hu;

² National Food Chain Safety Office, Directorate of Plant Protection, Soil Conservation and Agri-environment, Budaörsi str. 141-145, H-1118 Budapest, Hungary

DOI 10.5073/jka.2016.455.41

Small plot (20 m²) experiments were carried out in four replicates in order to study weed control efficacy on common ragweed; preemergent (PRE) treatments were done, when common ragweed phenological stage was 00-06 according to BBCH scale; postemergent (POST) treatments were done when common ragweed phenological stage was 12-16, according to BBCH scale]. Maize at PRE treatments was 00-05 BBCH; at POST treatments it was 14-16 BBCH.

Weed control efficacy was evaluated 1, 4, 6 and 10 WAT (week after treatments, based on cover % of common ragweed).

Seeds from the survived common ragweed plants were collected and their viability and germination percent was determined under laboratory conditions. Furthermore number of viable common ragweed seeds for a unit area was also determined (see Table 1).

Efficacy of herbicides on common ragweed greatly varied (between 60% and 98%) depending on herbicide type and application date (PRE, POST). The efficacy of PRE treatments was better in 2012, as compared to that of previous years, resulting in less or no common ragweed seed production at all. This phenomenon was in close relation with the precipitation fell some days after application time in 2012. In earlier experiments the spring was dry and in the lack of precipitation PRE herbicides – except isoxaflutole - did not give good weed control effect (Mezei *et al.* 2009; Kazinczi and Novák, 2014). In 2012, not only PRE but POST herbicides gave better weed control effect also as compared to that of the previous experiments. The effect of rimsulfuron was insufficient in all experiments. Among 20 treatments in case of 14 ones no viable seeds were developed in 2012.

Germination rates were much lower (1-5%) than viability percentages (56-89%), suggesting that majority of common ragweed seeds was in dormancy induced by dry storage conditions at room temperature.

No close relations between weed control efficacy and seed viability was observed; e.g. some herbicides with lower weed control efficacy (rimsulfuron, foramsulfuron) gave higher seed viability rates.

It is important observation that even in case of a “good weed control efficacy” (92%) viable common ragweed seeds can develop. Only in case of “very good weed control efficacy” (95-98%) no viable common ragweed seeds could develop in 2012. Based on previous experiments it is believed that only 100% weed control efficacy without producing any viable seeds is acceptable for the long term common ragweed control (Mezei *et al.* 2009; Kazinczi and Novák, 2014).

Table 1. Efficacy of herbicides in maize, and the effect of herbicides on the germination, seed viability and seed production of common ragweed

Treatments (doses according to the permission documents of herbicides)	Weed control efficacy (%)*	Germination (%)	Seed viability (%)	Number of total/ viable seeds /m ²
	2012	2012	2012	2012
dimethenamid-p PRE	92	4	56	402/225
terbutylazine PRE	92	1	62	394/244
mesotrione PRE	98	-**	-	0
isoxaflutole PRE	97	-	-	0
flumioxazine PRE	97	-	-	0
linuron PRE	92	2	70	385/270
rimsulfuron POST	60	5	85	672/571
dicamba POST	98	-	-	0
2,4 D POST	96	-	-	0
fluroxypyr POST	97	-	-	0
bentazone POST	97	-	-	0
mesotrione POST	98	-	-	0
topramezone POST	98	-	-	0
sulcotrione POST	97	-	-	0
tembotrione POST	98	-	-	0
prosulfuron POST	96	-	-	0
foramsulfuron POST	65	4	89	423/376
tifensulfuron- methyl POST	97	-	-	0
bromoxynil POST	97	-	-	0
untreated control	0	0	70	3905/2734

*weed control efficacy: 99-100%:excellent; 95-98%: very good; 90-94%: good; 75-89%: less good; under 74%: not sufficient

-**no seeds developed

References

- Kazinczi, G. and Novák, R. (eds) (2014): Integrated Methods for Suppression of common Ragweed. National Food Chain Safety Office, Directorate of Plant Protection, Soil Conservation and Agri-Environment, Budapest, Hungary
- Mezei I., Novák R., Torma M., Kovács A., Karamán J., Kazinczi G. (2009): Parlagfű elleni védekezési kísérletek kukoricában és árpában. Hungarian Weed Research and Technology 10 (1): 67-68. (in Hungarian)