Resistant ryegrass: a serious problem within a cropping plan

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Introduction

In the Netherlands we experience problems with control of ryegrass. At severe infestations, the yield of the crop will drop significantly and in worst cases, harvest is not possible at all.
On several sugar beet fields in the Southeast of The Netherlands, the control of grass turned out very unsuccessful in 2022, although various graminicides were applied. Based on morphology, this grass most likely is a perennial ryegrass. The grass is emerging during the whole year and seeds are formed quite rapidly. According to various advisors, more sites in the Netherlands are infected with this weed.

Table 1. Tested graminicides, with chemical group en content, and registered dosage.

productname	*chemical group*	*active ingredient*	*content*		*dosage (l or kg per hectare)*
Agil 100 EC	ACC	propaquizafop	100	g/l	1.5
Atlantis Star	ALS	mesosulfuron/iodosulfuron/thiencarbazon	45/9/22.5	g/kg	0.33
Capri Twin	ALS	florasulam/pyroxsulam	23/68	g/kg	0.275
Centurion Plus	ACC	clethodim	120	g/l	2.5
Conviso One	ALS	foramsulfuron/thiencarbazon	50/30	g/l	1.0
Focus Plus	ACC	cycloxydim	50	g/l	5.0
Fusilade Max	ACC	fluazifop-p-butyl	125	g/l	3.0
Pilot	ACC	quizalofop-p-ethyl	100	g/l	3.0
Robbester	-	esterified rapeseed oil	842	g/l	1.0

Materials and methods

In 2022 a potting trial was done to test the efficacy of various herbicides on ryegrass seeds collected from two fields with poor control of ryegrass, and a reference perennial ryegrass from a grass-seed production company. Seeds were first grown in a climate chamber and in two leaf stage, plants were placed outside.

Various ACC and ALS working herbicides with contact action were applied on 12 October 2022 in the four-six leaf stage of the grasses (table 1). In the test five graminicides were included, together with Conviso One and two cereal herbicides, namely Capri Twin and Atlantis Star. Although not included in the table, also the double dosage of each product was applied in the test. The additive Robbester was used in combination with the products Pilot, Conviso One, Capri Twin and Atlantis Star.

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Results

Results show the resistance of this collected ryegrass for nearly all tested products. Only Centurion Plus showed a moderate efficacy (figure 2). The double dosage, no results shown here, gave approximately the same results. Only the efficacy of Centurion Plus was better than the single dosage. Results from both locations of collected ryegrass were comparable (also not shown).

Figure 1. Perennial ryegrass (untreated) in potting trial on 23 November 2022.

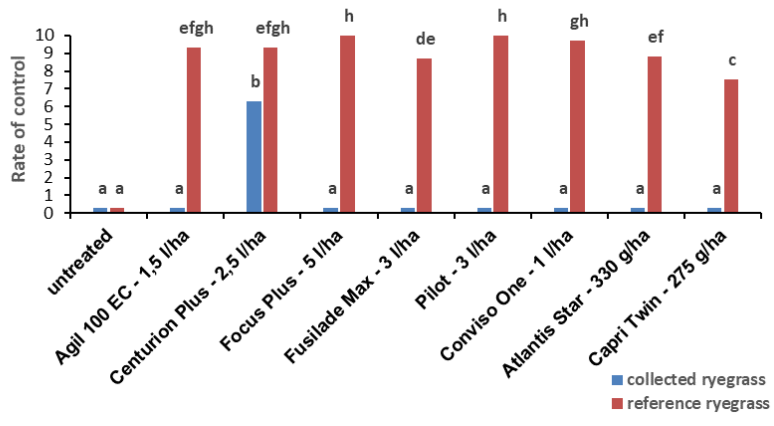

Figure 2. Rate of control of perennial ryegrass (0-10: 0 = no control, 10 = 100% control) in a potting trial in Dinteloord (NL) on 23 November 2022.

Conclusions

No effectiveness was observed with the ALS herbicides. This means, that sowing a Conviso Smart variety, is not a solution to control this weed in sugar beet. The cereal herbicides Atlantis Star and Capri Twin were also ineffective, so the use of these agents against this ryegrass is also not an option in grain. It is worrying, that both ACC and ALS herbicides are no longer effective against this perennial ryegrass.
Within the cropping plan, it is very difficult to control this ryegrass. These weeds must be controlled with an integrated approach, such as the use of other chemical groups, false seedbed, adjustments to the cropping plan, use of glyphosate and inversion tillage.