

Effectiveness of ALS-herbicides registered for cereals to control ALS-tolerant and ALS-non-tolerant weed beets

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Introduction

In 2019, for the first time in the Netherlands the Conviso Smart system was used. In this system sugar beet hybrids (e.g. variety Smart Blanca KWS) carry the specific tolerance to the ALS-inhibitor based herbicide Conviso One (a.i.: foramsulfuron/thiencarbazone-methyl). Generally the use of Conviso One in a non-tolerant sugar beet variety will control all sugar beet plants.

From 2019 the use of neonicotinoids on seeds was banned in the Netherlands. Therefore the control of green peach aphids (*Myzus persicae*) and virus yellows is a real challenge and becomes a serious threat for the cultivation of sugar beets in the Netherlands. The control of weed beet in succeeding crops is important to minimize the survival of aphids and viruses. Control of weed beet to exclude seed production is also crucial for the lifetime of the Conviso Smart system. One of the possible successive crops sown after sugar beets are cereals.

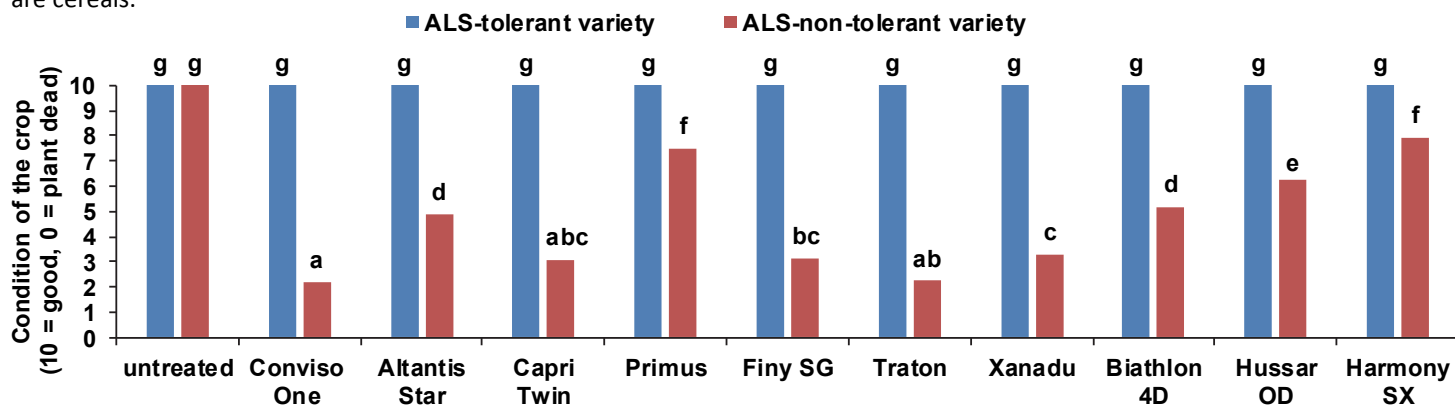


Figure 1. Average condition of an ALS-tolerant and ALS-non-tolerant sugar beet variety assessed 53 days after treatment.

Materials & methods

Since many herbicides in cereals are ALS-inhibitors, it is interesting to know if these herbicides are effective against ALS-tolerant weed beets. Therefore sugar beet plants were sown and after two weeks transferred to pots. For this an ALS-tolerant and an ALS-non-tolerant variety were used. One week before application, the plants (4th leaf stage) were placed outside on a sheltered spot. Conviso One was used as a kind of reference product. The tested commercial products are given in table 1.

Table 1. Tested products (grammes or millilitres per hectare) with used dosage.

product name	dose	active ingredient	content	unit
Atlantis Star	330	mesosulfuron-methyl/iodosulfuron/thiencarbazone-methyl	45/9/ 22.5	g/kg
Biathlon 4D	70	tritosulfuron/florasulam	714/54	g/kg
Capri Twin	275	florasulam/pyroxulam	23/69	g/kg
Conviso One	1000	foramsulfuron/thiencarbazone-methyl	50/30	g/l
Harmony SX	15	thifensulfuron-methyl	500	g/kg
Hussar OD	100	iodosulfuron	100	g/l
Finy SG	30	metsulfuron-methyl	200	g/kg
Primus	99	florasulam	50	g/l
Traton	45	metsulfuron-methyl/tribenuron	111/222	g/kg
Xanadu	100	metsulfuron-methyl/bensulfuron-methyl	40/500	g/kg



Figure 2. ALS-tolerant variety treated with test product.



Figure 3. ALS-non-tolerant variety treated with test product.

Conclusions

- There was any effect of the ALS-herbicides on the ALS-tolerant variety (figures 1/2). While on the ALS-non-tolerant variety the injuries were significant (figure 3), although there were some clear differences between the products.
- In this study Conviso One caused severe damage but most plants survived on ALS-non-tolerant variety.
- Because ALS-herbicides are not effective against ALS-tolerant sugar beet varieties, herbicides from other chemical classes are necessary to control these weed beets. Next step will be a study to test the efficacy of various other herbicides used in cereals to control ALS-tolerant varieties. Also for ALS-non-tolerant varieties this is of interest.



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