

The effect of residual corn herbicides on soybean injury and yield when seeded in the same season.

Summary by: Mike Cowbrough, OMAFRA (Guelph)

The wet 2019 planting season may have caused some producers to be in a situation where a corn herbicide was applied in anticipation of being able to plant. However frequent rainfalls and unfit soil conditions have placed them in a position where it's too late to plant corn and soybeans will be planted instead. Although some soil applied herbicides can be used in both corn and soybean (e.g. Dual II Magnum, Focus, Frontier Max and Zidua), most residual broadleaf herbicides used in corn could cause unacceptable levels of crop injury and yield loss if soybeans were to be planted.

In Ontario during the mid-2000's, the University of Guelph conducted nine field studies over a three-year period to evaluate the effect of residual corn herbicides on soybean injury and yield when planted in the same season. Soil applied corn herbicides, that were popular at the time, were applied at 6,4,2 and 0 weeks before planting soybean. In general, the risk of crop injury (Table 1) and yield loss (Table 2) decreased the longer the interval was between herbicide application and soybean planting.

Table 1. Soybean foliar injury (%) at 4 weeks after emergence caused by residual corn herbicides that were applied at 6,4,2 and 0 weeks before soybean planting.

Weeks before planting	% Visual Injury to Soybeans at 4 weeks after emergence			
	Converge	Primextra II Magnum	Callisto + Primextra II Magnum	Marksman + Frontier
6	11	2	0	1
4	16	1	0	16
2	30	2	4	41
0	35	2	14	90

Table 2. Soybean yield (percentage of weed-free control) when residual corn herbicides were applied at 6,4,2 and 0 weeks before soybean planting.

Weeks before planting	Soybean Yield (% of weed-free control)			
	Converge	Primextra II Magnum	Callisto + Primextra II Magnum	Marksman + Frontier
6	86.3	95.4	100	100
4	82.5	98	100	96.4
2	65.6	97.5	100	79.2
0	57.6	100	97.6	46.2

Take-aways from this study:

- The soil applied herbicides “Converge” and “Marksman + Frontier” offered the greatest risk in terms of causing significant soybean injury and yield loss.
- The longer the duration from corn herbicide application to soybean planting, the less soybean injury and yield loss was observed.
- The decision to plant soybeans after a corn herbicide has been applied should be made after consulting with the herbicide manufacturer, crop insurance adjuster and your trusted agronomist.

The entire published scientific manuscript can be read here:

<https://www.nrcresearchpress.com/doi/pdf/10.4141/cjps10110>

Citation: Nader Soltani, Hamid R. Mashhadi, Mohsen B. Mesgaran, Mike Cowbrough, Francois J. Tardif, Kevin Chandler, Robert E. Nurse, Clarence J. Swanton and Peter H. Sikkema. 2011. The effect of residual corn herbicides on injury and yield of soybean seeded in the same season. *Can.J.Plant Sci.* 91: 571-576