

Andy's Advice

## **Dicamba and Glyphosate Damage in Russet Burbank Seed Potatoes**

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There has been a lot of talk about dicamba injury in soybean and other crops this past year because of the release of dicamba-tolerant soybean, or the RoundupReady® 2 Xtend® soybean. However, dicamba is not new and has been in use for decades in cereal crops, pastureland, and as a weed burndown. For the past two growing seasons, we have been gathering data to determine what effect does dicamba and glyphosate have on Russet Burbank seed tubers.

When the mother plant is exposed to dicamba or glyphosate those herbicides can translocate to tubers and be stored in the tubers until the next growing season. Previous work has reported that glyphosate or dicamba residues can carryover in seed. However, there has not been any reports on the effects of dicamba and glyphosate affecting the plant at the same time. The objective of our study was to determine the effects of planting Russet Burbank potato seed tubers from mother plants that were exposed to three rates of dicamba (0.1, 0.6, and 2.6 oz/a), three rates of glyphosate (0.2, 1, and 5 oz/a) and the combination of dicamba and glyphosate during tuber initiation the previous growing season.

Daughter tubers were planted back near Oakes and Inkster, North Dakota in 2016 and 2017, at the same research farm they were grown the previous year. The highest rates of dicamba (2.6 oz/a), glyphosate (5 oz/a) and the combination caused 17 to 72% reduction in emergence and 23 to 57% reduction in total yield when compared to the non-treated check. Dicamba applied at 0.6 oz/a, reduced yield 11 to 33%. Total yield reduction, when glyphosate and dicamba were applied to mother plants, were attributed to a delayed and reduced stand. Dicamba and glyphosate can reduce emergence and total production when residues are carried over in seed potatoes. Other research has shown the later in the bulking stage a mother plant is exposed to glyphosate, the greater the damage will be when daughter tubers are planted back the following growing season.

It is important to protecting seed potato crops from herbicides injury. Some suggestions are:

- Talk to your neighbors and let them know you are growing potatoes and they are sensitive to many herbicides.
- Place signs around the field to reminder neighbors you are growing a seed crop that is sensitive to herbicides.
- Train employees about proper spraying techniques, tank cleaning and how to identify injury symptoms.
- Scout fields regularly, especially walking field edges looking for herbicide damage.
- Dedicate a sprayer for potatoes, only using potato friendly herbicides.
- Plant borders around the field to protect the crop from potential drift.

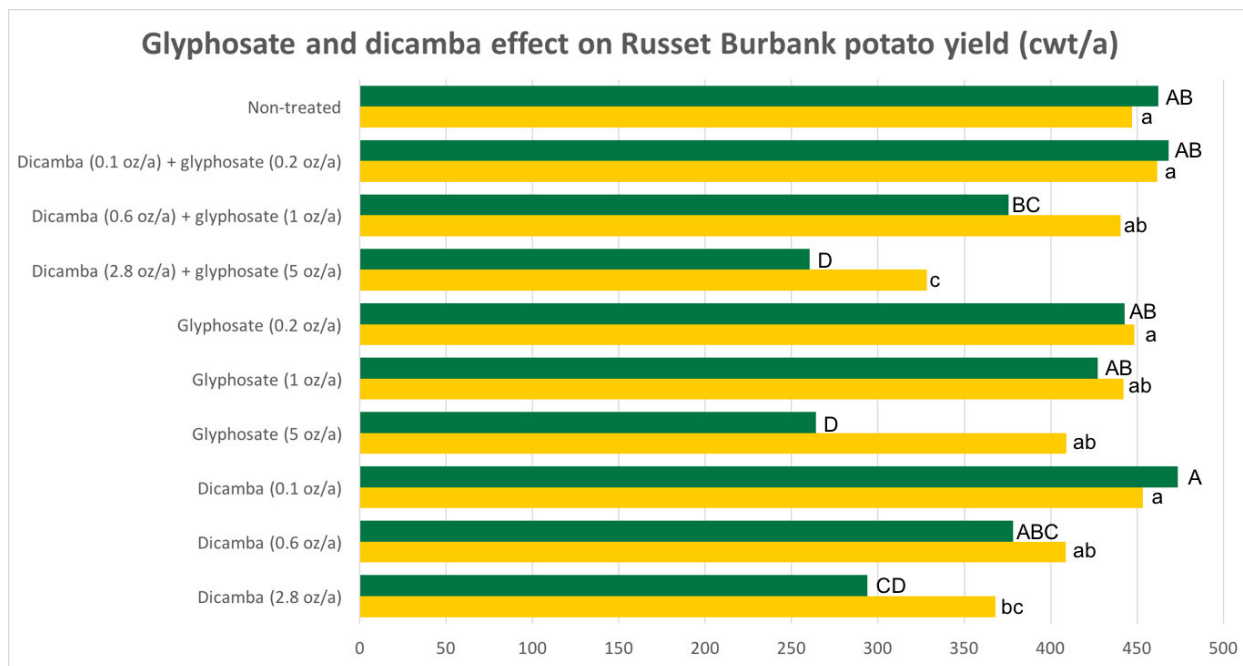


Figure 1. Effect of glyphosate, dicamba and glyphosate + dicamba on Russet Burbank mother (yellow bar) and daughter crop (green bar).

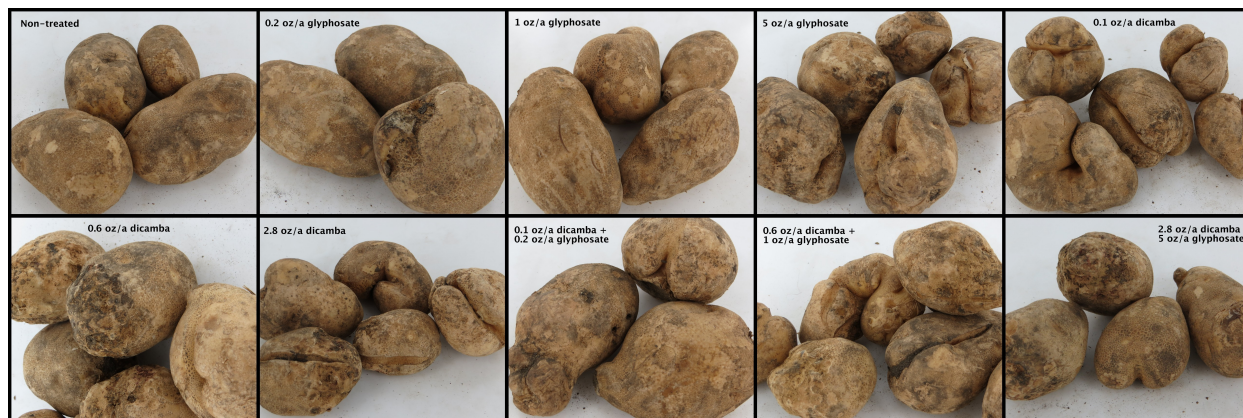


Figure 2. Malformations of daughter tubers from glyphosate and dicamba injury that occurred at tuber initiation.



Figure 3. Examples of plant distortions when planted with seed with dicamba and glyphosate residues in the seed pieces.