



# VEGETABLE CULTIVAR AND CULTURAL TRIALS 2000

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## Changes in Vine Moisture Content and Yields Following Chemical Desiccation of Potatoes

Rapid canopy dry down following chemical desiccation is critical to timely harvesting of potatoes. The rate at which the tops die down can be influenced by; the type, amount, method and time of application of the top killer, crop vigor at the time of top kill, the cultivar and the weather conditions after application of the top killer. Limited information is available as to the potential for yields to change during the die down period.

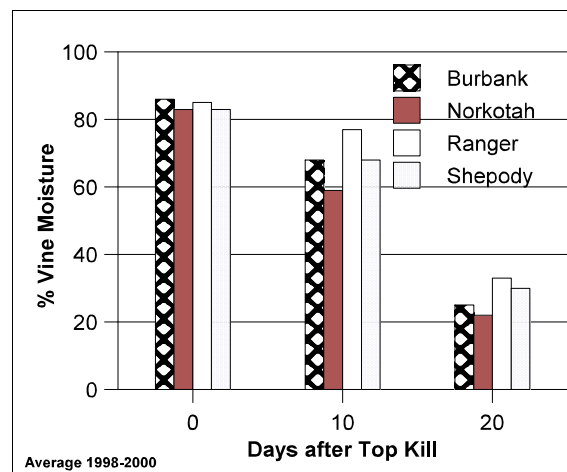
This project evaluated how several important varieties of potatoes respond to chemical desiccation. Trials were conducted in from 1998-2000 on the Department of Plant Sciences Potato Research plots located in Saskatoon. The crop was planted in mid-May. In all three years Ranger Russet, Russet Burbank and Russet Norkotah were tested, while in 1999 and 2000 Shepody was also evaluated. The crop was irrigated and standard pest management and fertility recommendations were followed. The desiccant Reglone (diquat) was applied in the first week of September at 1.0 l/a via a ground sprayer in 120 l/a of water. The plots were sprayed in the evening to maximize efficacy of the product. Seven days after the initial application of top killer, a second application was made (0.75 l/a in 120 l water). The crop was harvested at specific intervals after top-killing with a small plot harvester.

Timing of harvest;

- a) Fresh harvest (1<sup>st</sup> week of September) - this approximates the typical time of top kill for seed and table potatoes in Saskatchewan.
- B) Top-Kill + 10 days (3<sup>rd</sup> week of September) - 10-14 days after top killing represents the earliest growers can typically expect to harvest after top killing.
- C) Top-Kill + 20 days (1<sup>st</sup> week of October) - by this point, growers expect the crop should be ready to harvest. Any further delay increases the risk of frost damage.

One third of the plot was harvested at each interval. The plots for each harvest were 8 m long with four replicates of each treatment arranged in a randomized complete block design. Just prior to each harvest, three plants in each replicate for each cultivar were used to determine the moisture content of the vines.

**Results** - the rate at which the tops dried down was comparable in the three test years. The Russet Norkotah vines died back more quickly than the other cultivars - this was expected as Norkotahs are early maturing and produce a relatively small and weak plant canopy (Figure 1). Ranger Russet was the slowest to desiccated - this also corresponds with most growers experience with this cultivar. Growing conditions following application of the top killer had a significant impact on how much yields increased following desiccation. In 1998, growing conditions were excellent for several weeks after application of the top killer. Yields increased quite substantially (30%) during this period (Table 1). By contrast, conditions in 1999 and 2000 were less conducive to crop growth and there was very little change in yields following the initial application of top killer in these years. The four cultivars were very similar in terms of how much their yields changed following top killing.



**Table 1. Potato yields after top kill.**

Yield (t/ha) <sup>z</sup>			
	1998	1999	2000
Top kill	31.7	34.0	44.6
Top Kill + 10 days	37.3	36.1	44.1
Top kill + 20 days	41.4	37.6	44.6
LSD (0.05)	4.6	2.6	2.9

<sup>z</sup> Yields averaged over four cultivars

**Conclusions** - the results confirm growers observations as to the relative easy of top kill of processing type potato varieties. Cool conditions after top kill slowed desiccation, but frost accelerated drying. Contrary to expectation, the degree of yield change following application of the top killer did not increase in situations where vine kill was slow. The warm conditions conducive to rapid top kill actually appear to promote tuber bulking after top kill. By contrast cool conditions which slow top kill, may also slow translocation of assimilates into the tubers after top kill.

These results indicate that growers need to tailor their top killing strategy to the cultivar and the growing conditions both prior to and after application of the top killer.