

Grape Update 2006-10

The grape varieties 'Bluebell', 'Clinton', 'Frontenac', 'Prairie Star', 'Sabrevois' and 'Valiant' were planted in 2006 from dormant rooted cuttings. It was pretty dry that season and we watered our plants as needed. I applied wood chips in-row to conserve moisture and reduce weeds. All of the plants grew and looked great. Our technicians set all of the trellis posts.



In spring 2007, each plant was pruned to 10-12 inches tall. The trellis wires were put up by the end of April and then we waited for warm weather and growth. The NDAWN weather records don't indicate very low temperatures, but we had two freeze events in the vineyard after shoot and leaf growth started. Long, 12-14 inch shoots were wilted and had to regrow after the May 16th freeze.



The plants were stressed and during cellular repair the grape crown gall organism, *Agrobacterium vitis*, was activated and produced hormone-like compounds within the injured area. This initiated an overgrowth of knobby tissue on the lower, overwintered areas of many of the canes. These bacterial compounds permanently alter cambium cell growth and will eventually choke off the flow of nutrients in the plant. The only solution is to prune below any suspected crown gall-affected areas.

Crown Gall Evaluation Date: 7/27/07

	Replaced ^a	HAVE CG	OK	Total
Bluebell	0	7	9	16
Clinton	4	9	3	12
Frontenac	4	5	7	16
Prairie Star	2	7	7	16
Sabrevois	2	11	3	16
Valiant	1	12	3	16
	13	51	32	96

14% 53% 33%

a. Poor/dead plants were replaced with heeled-in reserves.



A. vitis is not known in soils that have not previously grown grapes – the bacterium is introduced into a vineyard through the planted cuttings. *A. vitis* is only known to affect grape plants after stressful events.

http://www.nysipm.cornell.edu/factsheets/grapes/diseases/crown_gall.pdf



In 2008, all plants showing crown gall symptoms were pruned to below that area. This action really compressed the vigor each plant had gained in two seasons into just a small number of new shoots. Growth from the remaining shoots this year was tremendous; new shoots that sprang out of the canes were already $\frac{1}{4}$ - $\frac{3}{8}$ inches in diameter, plants grew about 6 inches every-other day and by the end of the season had $\frac{5}{8}$ -inch diameter shoots with 7-inch internodes. I was impressed with their vigor! I have to admit my ignorance here for others to learn a lesson. I didn't know it at the time, but the shoots that came rocketing out each spring were actually "bull canes".

In these early years, I pruned the plants according to most grape literature, so that one or two buds were allowed to grow up into canes that would eventually become the plant's trunk. When the canes reached the top wire, I nipped them off and trained the lateral shoots into the future cordons. However, each spring, the cordons would be dead and the trunk buds were injured, sparse or dead. I didn't know what was wrong.

In my defense, I asked a long-time grape grower to look at my vineyard and tell me if these were the bull canes that I had heard mentioned at meetings. He said 'not quite'. When I attended the Cold Climate Conference, I stood up in front of everyone, two years in a row and explained this condition. They told me to keep doing what I had been doing! Finally, in spring 2010, Dr. Paul Domoto of Iowa State University Extension spoke at the NDGGA annual meeting; he said (in summary) 'If your 1-year growth is bigger than about $\frac{1}{4}$ th inch, you probably have bull canes.' Now I finally knew what was going on.

With his advice I began to 'de-vigor' the grapes. In spring 2010, I left almost all live growth on the vines. We trained five to seven canes per plant into a fan shape. In the fall, the most moderate canes were laid onto the ground and pinned down to ensure some survival. A very snowy winter insulated all the growth and in the spring, we began to bring the canes back up onto the trellis.



Winter. I want to step back here and briefly describe the past three winters in Carrington. '08-9, '09-10 and '10-11 saw record amounts of snow followed by record flooding across the state.

You may think of North Dakota as a place with a lot of winter and snow, but we are actually a dry climate and large amounts of snow are unusual.

The snow blows in from our flat, mostly treeless landscape and piles up in sheltered areas like the orchard and arboretum. In 2010-11 we had just the right winds and the snow drifts were to the top of our grape trellis and near the top of our 8-ft deer exclusion fence. The weight of that melting snow was hard on both of them. I will leave you with some pictures that speak for themselves.

