Upright Dieback *vs.* Uprights Dying Back

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Nearly every cranberry grower in Wisconsin has experienced problems with scattered unthrifty vines and even large areas of dead uprights in otherwise healthy plantings. Sometimes the problem can be traced back to a clearly defined trauma such as herbicide misapplication or frost injury. But often these cases of vine and upright death are of unknown origin. When growers, crop consultants, and researchers try to diagnose the cause of the problem, the term "upright dieback" frequently is mentioned. In fact, some use "upright dieback" as a catch-all term for any problem that causes uprights to die back. This causes confusion because there is a specific malady known as **upright dieback** that is distinct from other causes for **uprights dying back**. What is the difference between upright dieback and uprights dying back? The short answer is: Upright dieback is *probably* a disease, whereas uprights dying back is a symptom brought on by a number of biotic (living) and abiotic (non-living) factors. The longer explanation follows.

Upright Dieback—the "Disease"

Upright dieback has been called a disease because several fungi, most notably *Phomopsis vaccinii* (also called *Diaporthe vaccinii*), can be isolated from vines with symptoms. Also, we know that various species of *Phomopsis* are pathogens on other woody plants such as blueberry, grape, and peach. However, all of the criteria required for a fungus to qualify as a pathogen have not been met for *Phomopsis* on cranberry. The criteria are that the fungus must be:

found in association with the affected plant.

isolated from the affected plant and grown in pure culture.

re-inoculated onto a healthy plant and symptoms reproduced.

re-isolated and grown again in pure culture.

With *Phomopsis* on cranberry, we get hung up at step number three. Despite this technical difficulty, we will assume that the pathogen *Phomopsis vaccinii* causes the disease known as upright dieback.

Symptoms of Upright Dieback:

Yellow-orange-bronze-brown (*not* bright red) uprights

Superficially resembles early stages of cottonball tip blight

Dead uprights often scattered among healthy uprights (salt and pepper pattern)

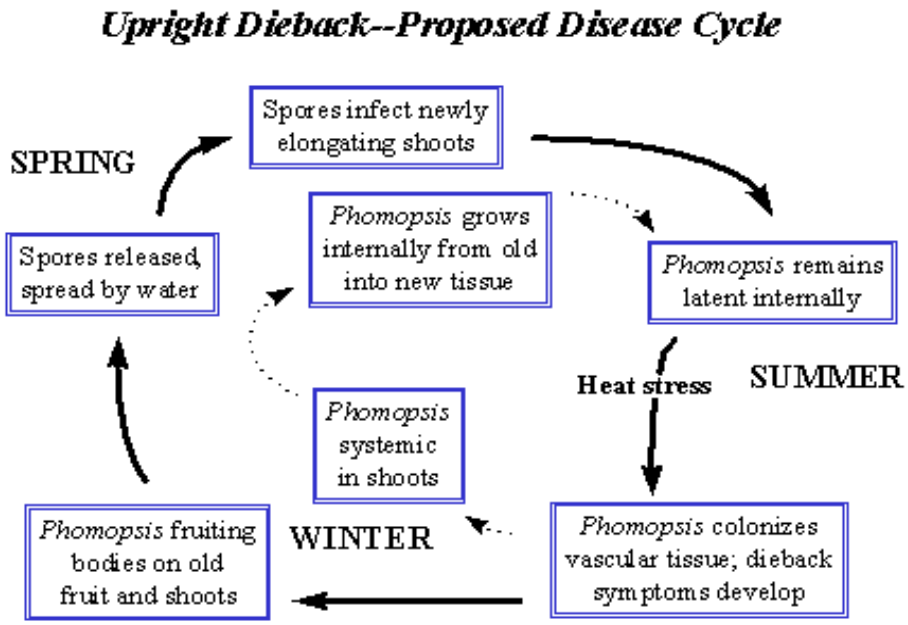
Can occur in patches in young beds

Roots not affected

Runners and uprights do not appeared chewed

Disease Cycle

The disease cycle for upright dieback is poorly understood. However, based on when and where *Phomopsis* is detected on vines, when symptoms appear, and when chemical control seems to work best, a disease cycle is proposed below.



Phomopsis overwinters in the form of fungal fruiting bodies on old fruit (viscid rot) and dead shoots. It may also overwinter internally in dormant vines. In the spring, spores ooze out of the fruiting bodies and are spread by rain and irrigation (frost protection) to newly elongating, succulent shoots. Exactly where on the new tissue infection occurs is not known, but chemical control has been most effective when shoots show about ½ inch of new growth. *Phomopsis* that overwintered in vines may grow internally into new tissue. After new growth is invaded, infections remain latent (dormant) for several weeks. During this period, *Phomopsis* can be isolated from healthy-looking vines. Later in the summer, as vines become stressed from heat and perhaps the burden of bearing fruit, *Phomopsis* comes out of latency and colonizes vascular tissue. As the food- and water-conducting tissues are invaded, uprights turn yellow and eventually die back. During fall, the fungus forms fruiting bodies on dead tissues where it overwinters.

Control of the Disease Upright Dieback

Because we know so little about the disease cycle of upright dieback, control has been difficult. Cultural practices that minimize stress, especially during the hot summer months as fruit begin to size, will give the plant the upper hand and probably help keep *Phomopsis* in a latent phase. This would include adequate (but not too much) irrigation, weed control, and adequate but not excessive nitrogen fertilization. Bravo Weather Stik (formerly Bravo 720; EPA Reg. No. 50534-188) is available for upright dieback control by special registration until December 31, 1999 unless revoked by EPA. Limited research and grower experience has shown that the most effective time to spray is when most shoots show about ½ inch of new growth. Bravo does not control upright dieback if applied later than early bloom—by this time the fungus has apparently invaded shoots and is out of reach of protectant fungicides. Fungicides will not cure upright dieback.

Uprights Dying Back—Common Symptom with Numerous Causes

The disease upright dieback is only one of numerous reasons for uprights dying back. Other potential causes are:

herbicide or other pesticide injury

drought

heat

too much water (wet feet)

winter injury

nutrient deficiencies

biotic factors such as insects or other fungi (*e.g.*, girdler, *Phytophthora*)

combination of factors

Diagnosing the Problem

So how do you know whether you have upright dieback, the disease caused by *Phomopsis vaccinii*, or uprights dying back from who knows what? This is one of the most difficult questions in cranberry pathology. First, be completely honest with yourself and with your crop consultant or university contact about what has or has not happened in the way of irrigation, herbicide application, etc. Observe the pattern of vine death. Does it have the classic salt and pepper scattering characteristic of upright dieback? Large dead patches are usually not attributed to *Phomopsis* upright dieback. What time of year are you seeing uprights starting to die back? Symptoms from *Phomopsis* infection usually show up in mid to late summer. Dead uprights and defoliation during May and June are probably because of something else (winter injury?). For a small fee you can submit declining (not dead) vines to the University of Wisconsin Plant Pathogen Detection Clinic. However, even this might not provide a conclusive answer—there are a lot of fungi other than *Phomopsis* that

grow out of declining vines. But if *Phomopsis* is abundant, then chemical control the following year might be justified.