

EXAMINING THE EFFECTIVENESS OF BIOLOGICALS AGAINST DOWNY MILDEW

Growing conditions in the East are breeding grounds for pathogens, and coupled with highly susceptible *Vitis vinifera* cultivars proves to make sustainable grape growing practices a challenge.

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DOWNY MILDEW is a challenge for all grape growers, especially on the East Coast where the disease can strike when conditions are wet, particularly when rains occur with temperatures ranging from the 60s to low 80s (°F). The pathogen for downy mildew can spread rapidly. It takes only four to six days from one round of infection until a second-generation of spores develops and new infections occur. This pathogen is one that all *Vitis vinifera* cultivars are highly susceptible to, as are certain hybrid and native cultivars.

“Susceptible cultivars require some sort of a spray program in Eastern climates,” says Wayne Wilcox, Professor of Plant Pathology and Plant-Microbe Biology at Cornell University. “The required intensity of the spray program is determined by the cultivar’s inherent level of susceptibility, weather conditions during the growing season, and the degree to which effective cultural practices are used.”

While sustainability has become a major push among winegrape growing regions out West, it’s only natural to see how their Eastern compatriots would be interested in pursuing similar goals. Growers and Cornell Cooperative Extension developed a voluntary self-assessment sustainability program called VineBalance.

On Long Island, this has been expanded to a program where growers use a third-party inspector to verify that the vineyard meets the program requirements. So, using more sustainable disease control products is a natural necessity. The trouble is, with wet growing conditions and the high probability of downy mildew, this can be a challenge for growers to achieve.



Photo Credit: Wayne Wilcox

The progression of downy mildew symptoms is seen from younger to older leaves, with yellowed or dead areas on the top of the leaves and the white spores of the pathogen on the bottoms of some visible leaves.

“Effective biocontrol products certainly fit within any sustainability push, since they help to promote the goals. But since one of the pillars of sustainability is ‘economic,’ the products must be effective,” he says. “Because the choice of effective biocontrol materials is rather limited, we’re always looking for something else to supplement what’s available now. Beyond that, a lot of growers would like to be as ‘green’ as they can while still protecting their crop effectively, whether they are part of a formal ‘sustainable’ program or not.”

STUDYING BIOLOGICALS FOR CONTROL

Wilcox has been working with several biological products to study their effectiveness against downy mildew. This includes LifeGard WG, distributed by Certis. Wilcox studied the use of Lifeguard on

‘Chardonnay,’ a highly-susceptible *Vitis vinifera* cultivar.

He compared the results of the vines treated with LifeGard to untreated vines and vines treated with conventional materials. Although he got excellent results in the first year of studying, Wilcox accidentally used a higher application rate of LifeGard. But, in the second year of the study and with the right application rate, Wilcox still saw excellent results.

“Disease pressure was almost as high in 2015, and LifeGard again provided control comparable to the best conventional materials, using the correct rate this time,” he says. “We had a drought in 2016 with very little downy mildew developing, so the results from last year didn’t tell us much.”

EXPANDING THE SCOPE

This year, Wilcox will be looking at the efficacy of several biological products



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against downy mildew, powdery mildew, Botrytis bunch rot, and sour rot. His research will again include LifeGard's effectiveness against downy mildew. He says the mechanism that is claimed to provide LifeGard's activity is a promotion of the plant's natural resistance to diseases, so he's also looking to expand the research to examine LifeGard's efficacy against other grape diseases.

An important difference, Wilcox says, between his trials and application to a typical commercial vineyard is he targets the most susceptible cultivars and high inoculum pressure.

"This does allow us to distinguish between stronger and less-strong materials. However, some of the 'weaker' materials look worse than they would in many commercial settings where inoculum carryover from one year to the next is relatively low and there are no unsprayed vines scattered throughout the vineyard from which disease can easily spread."

WHAT ELSE CAN GROWERS DO

Wilcox suggests growers be mindful about site selection and canopy management as non-chemical ways to help control disease. He suggests management practices that promote drying of fruit and foliage can help reduce disease pressure.

For those growers interested in sustainability, Wilcox says there are a few newer biological products that look promising, in addition to some of the greener conventional options. He also says that sustainable and organic approaches should view sprays as supplementing cultural control practices. But, above all he says growers, especially organic winegrape growers, should consider the susceptibility of cultivars prior to planting.

"There's not a lot of meaningful difference among cultivars if they are committed to growing vinifera grapes, but there are huge differences among hybrids and natives," he says. "If some of the relatively resistant cultivars in these groups will suit the business plan, this is the first, and often most effective, line of defense." ●