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THE BUZZ ON ASIAN LADY BEETLES

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Most growers have probably heard of the Asian Multicolored Lady Beetle, *Harmonia axyridis* (Pallas) by now, and are probably wondering what to do about it, and what it may do to their grapes, juice or wine. In this article, I will try to shed some light on what this insect is, does, and the potential threat it poses. I will draw heavily on items written by colleagues **Kevin Ker**, a private consultant in Ontario, and **Roger Williams**, an entomologist at Ohio State University, as well as other sources.

Why it's here. The Asian multicolored lady beetle, like other lady beetles or 'ladybugs' is a beneficial insect that feeds on aphids and other soft-bodied insects. It was imported to the US as a biological control agent on several occasions – first unsuccessfully in California in the early part of the century, then more successfully in the 70s and 80s in the Southeastern US. It was imported to control the Pecan aphid in Georgia, and within a few years of introduction was successfully established. It spread north in successive years, and by 1994 was established in upstate New York. It has been in the Finger Lakes for the last 8 years. Like many other imported biological control agents, it has been enormously successful in controlling pecan aphids. With this successful introduction, however, came a couple of unforeseen problems.

Problem number 1. Adults congregate in and on structures (houses, barns, etc) in the fall. They get in peoples' houses, where they are a nuisance. At our office in Penn Yan, the number 1 problem that homeowners call us about is the Asian Lady Beetle appearing in their houses. This occurs because their native habitat in Asia was mountainous, forested areas with a lot of limestone cliffs. They seek out these cliffs, and overwinter in large numbers in rock crevasses. Houses – particularly light colored ones – look like rock faced cliffs to lady beetles in the fall. This has been a minor problem in Central NY since the mid 90s.

Problem number 2. Adults feed on grapes in the late fall, and get harvested along with the grapes. When crushed with the grapes they impart a musty odor to juice or wine. This is more recent problem that has appeared in Ohio for the past couple of years, and last year caused major problems in Ontario. This is, of course, a major economic concern to both juice and wine grape growers.

The odor-causing compound. The compound responsible for off aromas is a methoxypyrazine – a very stable chemical that survives heat treatment, fermentation, filtering and fining. In other words, once in the wine or juice, it is hard to remove it by any of the methods commonly used by winemakers to clean up juice. For the lady beetle, this chemical, present in body fluids, is a defensive compound that makes them distasteful to predators. When handled (or crushed), they ooze out droplets of this orange fluid through joints at the base of their legs. This odor is detectable at very low levels, corresponding to around 29 beetles per grape lug (Roger Williams,

personal communication). In vineyards that were the source of juice tainted with ladybugs, colleagues report seeing maybe a cluster or two per post length with 20-50 ladybugs on them.

Why now? Like any other organism, the Asian lady beetle responds to an abundant food source. A new food source, the soybean aphid, was also introduced from China (accidentally) to North America within the past few years. This aphid was present in massive numbers in soybean fields in Ohio and Ontario last year. The thought is that they built up huge populations in soybeans, then moved on to grapes when the aphid population diminished. Ripening grapes provide the lady beetles with sugars to help them survive their dormant overwintering period. In Ontario, I've been told there was a large acreage of soybeans on top of the escarpment (south of the vineyard areas on the bench), and that the influx of lady beetles occurred late in the season, presumably after soybeans were harvested. In Ohio, of course, there are a lot of soybean fields.

This year: The big question in Ontario is: Will it reappear this year? No one knows. One school of thought is that the ladybug population will crash, because they were so effective in reducing aphid populations last year. If this is the case, then wine-taint problems will be reduced or eliminated – no large populations of lady beetles, no off flavors. Considering the enormous economic impact, though, Canadian and Ohio vintners are not counting on last years' population explosion being a fluke.

What about the Finger Lakes? The question on many growers and winery owners' minds is: Will it happen here? I'm going to step out on a limb and give you my opinion. I think its unlikely, but not impossible, that we will see widespread or even spotty problems with lady beetle taint in the Finger Lakes. I base that on a couple of observations: 1) This insect has been here for almost 10 years, is relatively abundant, and we haven't seen massive invasions of vineyards in late fall yet. 2) There aren't many soybeans in most of the areas where vineyards are concentrated, and no other identifiable large sources of aphids from other crops or trees. I think that our diverse patchwork of forest interspersed with vineyards makes it less likely that we will see anything out of the ordinary here. Parts of Seneca County may be an exception – more soybeans were planted this year because of unfavorable conditions for getting corn in the ground.

What are the options? As I have already mentioned, the musty aroma is difficult to remove by standard winemaking or juice processing techniques. The only reasonable solution is prevention in the vineyard. So how do you get lady beetles off clusters right before harvest? Insecticides that either kill or 'knockdown' lady beetles are one solution that comes to mind. Dr. Roger Williams, entomologist at Ohio State University, has done preliminary laboratory studies. The need to time application shortly before harvest poses a number of problems. Danitol, a pyrethroid with fast knockdown ability might be a good candidate, but it has a 21 day preharvest interval. Sevin and malathion have more reasonable 7 and 3 day preharvest intervals. Provado (imidacloprid) is the only currently-labeled grape insecticide with a 0 day preharvest interval, and has shown good 'knockdown' ability against the lady beetle. It does not kill them – they apparently recover fully a few hours afterward – but it may be effective in keeping them out of clusters just before running the harvester through. Dr. Williams will be testing various scenarios during this harvest season. An application has been made through Cornell's Pesticide Management Education Program to the NY DEC to get a special 2-EE recommendation for some of the labeled insecticides. National Grape Cooperative provided leadership in this effort. The application is pending. Among the options being looked at in Canada is the idea of somehow applying a fog from 'dry ice' to the fruiting area just before harvest. Dry ice is made up of CO₂, which can anesthetize insects briefly, and presumably knock them off clusters for long enough to harvest them first.

Bottom Line: This is a potentially serious problem that bears watching by area growers. Let's all use some common sense, however. Remember that this bug has been out there for some time, and you have probably all had small numbers in your vineyards at harvest time. Since you weren't looking for them then, you didn't notice them. Don't panic if you see a few out there. Like anything else, this is a numbers game. I might get nervous about it if I saw more than one or two clusters in my vineyard with 20-30 lady beetles on them. But finding one individual per two panels wouldn't necessarily raise my concern.

As the harvest season progresses, I will have updates in my weekly e-mail message. If you see enough in your vineyard to raise concern, please give me a call and I'll come out and take a look.

For identification: There are numerous fact sheets out there on the internet. Using a search engine such as www.google.com: type in 'Asian Lady Beetle' and you will be directed to numerous sites.

Kevin Ker's article is posted at: <http://www.brocku.ca/ccovi/news/index.html#news1>

References:

Williams, R. N and D. S. Fickle, *The Multicolored Asian Lady Beetle, A New Pest of Grapes*. Ohio Wine and Grape Short Course, 2001.

Ker, Kevin, *Questions and Answers about Harmonia axyridis (Pallas) – The Multicoloured Asian Lady Beetle*. Posted at:
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