



Agriphage for Fireblight Control

Posted by [Brittany Kordick](#)
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[Brittany Kordick](#)
[Agriphage for Fireblight Control](#)

Registered: 4 years ago
Posts: 209

February 13, 2021 08:40PM

In case anyone was interested in experimenting with Agriphage for fireblight control this season, wanted to pass on some info we've accumulated.

Agriphage Fireblight consists of bacteriophages that specifically parasitize *Erwinia amylovora*. Phages have a special place in our hearts, as some of my mother's research background involved them, and we've been dying to try Agriphage for the past couple of years.

It's manufactured by OmniLytics, bacteriophage specialists, for Certis. Any questions about the product, go directly to the R&D guys at Omnilytics -- they really know their stuff, are passionate about their products, and want to gather as much info as possible about them. They offered to test Agriphage against anything we want to tank-mix with it, free of charge; we just send them samples.

So far, they've found copper, iron, and zinc sensitivities to be the only things you need to worry about with Agriphage. They've tested Trilogy against it, as well, and Certis is basing their assertion that neem/azadirachtin is compatible on that particular study only. Note, Trilogy has a much lower neem oil content than other products, so while we don't expect any particular sensitivity, we will have OmniLytics test compatibility on TerraNeem or pure neem oil to be sure.

Cost via 7 Springs Farm is \$515 per case (consisting of two 2.5 gallon jugs), and not normal stock, so not available without special order. We are lucky enough to live 1.5 hours from 7 Springs, so no drop shipping charges for the many cases we will use this season, but a lump \$100-200 special order shipping charge to get it to 7 Springs, then pick it up in person.

Right now, we are planning on applying Agriphage 3 times surrounding bloom, starting at green tip (we know we've got plenty of *Erwinia* out there for the phages to feast on already after a very bad fireblight year in 2020). We're hoping to mix it right in with our regular holistic cocktail mix, but a surprising component, Micro-Pak, which contains some zinc and copper, may be an issue.

FYI, and will post how it all turns out . . .

[Kordick Family Farm](#)
Westfield, NC
Zone 7a

Edited 1 time(s). Last edit at 02/13/2021 08:42PM by Brittany Kordick.

[Reply](#) [Quote](#)

[Eliza Greenman](#)

[Re: Agriphage for Fireblight Control](#)

Registered: 9 years ago
Posts: 23

February 14, 2021 09:14PM

I read somewhere that in tomatoes they were using the agriphage with skim milk powder and corn starch to lessen the effects of UV radiation and, thus, giving the phages a bit more time on the tree. Seems like Surround could be a good step in that direction in terms of phage cocktails (perhaps that's been mentioned somewhere on this forum already, my apologies if so).

I'm interested to hear how this goes for you. Good luck!

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

Registered: 4 years ago
Posts: 209

May 08, 2021 02:29PM

An update on Agriphage from the thick of extreme fireblight time in north-central North Carolina:

We are not completely out of the fireblight woods yet, but we're very pleased with Agriphage so far. After an early sprayer break, we missed out on two intended sprays back to back during bloom and prime infection time. We had done one spray just prior to greentip at that point, and have since picked up with two more orchard-wide sprays, and a couple of variety-specific ones beyond that in our historically bad fireblight trees. We didn't get our pruning completely done, as usual, and the Hewe's Crabs were one of those that missed out -- not good since they were the absolute worst hit with fireblight last year, to the point where they had zero green on the trees at the worst of it, and you can imagine how much dead wood and likely cankers were hanging out on these full-grown M111 trees. So plenty of inoculum out there, probably the most we've ever had, in spite of our heavy lime sulfur and copper and PerCarb sprays while dormant to attempt to clean up as much as possible.

Then the weather: three hard freezes during bloom, one bad hailstorm, and damaging high winds for about a week, which tore everything up pretty

good. Lots of damaged tissue, and we've been in a state of perpetual extreme fireblight warnings according to our weather station-linked NEWA modeling for the better part of 2.5 weeks now. We've got some strikes out there, but they are very minor and far less than usual (and far, far less than you would expect following last year's over the top infection rate), not very widespread, specific to high inoculum sites. It ain't over yet, but the labor saved (we haven't had time to cut out strikes, and aren't worrying about killing ourselves to keep up with them for once -- the visual infection sites seem to halt in their tracks after an Agriphage app; more than a week after a shoot goes down, there is no noticeable oozing or spread, it's just . . . dead), etc. is definitely worth the price in a fireblight-lousy orchard in our opinions.

We have enough Agriphage left to do one more spray at a lower rate, but we're going to hang onto that in case we need an emergency cleanup. Based on what we've seen, we will probably use Agriphage again next year to keep going with our bigtime fireblight cleanup, but for other orchards, I envision Agriphage as something you'd do every couple or few years after fireblight gets out of control, just for a big cleanup.

We also have some compatibility testing updates after OmniLytics tested several product samples we sent in:

So two "duh" incompatibles were lime sulfur and PerCarb; they killed the bacteriophages outright.

Several perfectly compatible mixers: Quantum Light, SeaCrop, karanja oil, TerraNeem, ReBound Manganese.

And a couple with caveats: EM-1 and HoloCal inactivated one of the three Agriphage phages at 24 hours, but it was fine at the 4, 6, and 12 hour mark. Per the tester: "My recommendation is to make sure that you mix and spray ASAP when combining AgriPhage with those two. Don't let the AgriPhage sit out in the same tank with those chemicals for too long." There is probably something in the formulations of these two products that acts to block the receptors on the phage in question. AgSil was another product that passed at 4 hours, but at 8 hours, was starting to kill phages. The tester felt it could be OK to tank-mix AgSil and Agriphage as long as you spray it immediately.

Of our three Agriphage sprays, the first was sprayed alone, out of extreme caution, since our compatibility testing wasn't finished yet. The second and third ones we risked adding mixers and Agriphage was added to our holistic mix cocktail, which contained EM-1, etc., but not AgSil.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

Edited 1 time(s). Last edit at 05/08/2021 02:35PM by Brittany Kordick.

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[Nathaniel Bouman](#)

[Re: Agriphage for Fireblight Control](#)

June 27, 2021 07:10AM

Registered: 9 years ago

Posts: 81

Thank you for this great information. I tried AG this season. Like you, I'm still checking for new symptoms. So far only the Bedan are showing strikes. They bloomed really strangely—in three stages spread over weeks. I missed spraying the last bloom and I think these are the ones that got hit. Also, I did tank mix with potassium bicarbonate once. Do you know anything about compatibility with Pot bicarbonate?

Nat Bouman

Growing cider varieties in Zone 5b

On B.118 at 18X24

Susquehanna County, Pennsylvania

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

June 29, 2021 03:21PM

Registered: 4 years ago

Posts: 209

We are not currently using potassium bicarbonate in our orchard, so did not ask OmniLytics to test it against the bacteriophages in AgriPhage. However, I would fully expect potassium bicarbonate to be devastating to bacteriophages, and definitely wouldn't tank mix AgriPhage with it. While bacteriophages are not fungi, which are particularly susceptible to potassium bicarbonate, they are "living" in a sense, as viruses, and like so many biologicals, are fairly sensitive. The closest spray component to potassium bicarbonate we use would be PerCarb, a sodium carbonate formulation used to treat bacterial/fungal infections broad spectrum; we use it when a particularly blank disease inoculum slate is desired. As mentioned in an above post, we did submit PerCarb for testing against AgriPhage Fireblight, and it killed all three phages in the blend outright upon contact. I would assume that potassium carbonate would do the same, but you never know. If you're particularly keen to do a regular mix of AgriPhage and potassium bicarbonate, I would contact OmniLytics about doing a test, or even just give them a call, as they may already know the answer to this question definitively.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

February 22, 2022 03:52PM

Registered: 4 years ago

Posts: 209

As we gear up for spring sprays and revisit our Agriphage plans, one further crucial detail to report: the bacteriophages in Agriphage will not actually replicate unless it's 60 degrees. As such, the R&D guys don't recommend spraying until it's 60-65 degrees daytime temps on average since you may not get huge benefit (a bacteriophage would literally have to land smack on an *Erwinia amylovora* bacterium to kill it; they don't move around a whole lot). They offer the caveat that temps tend to be slightly higher within blossoms, so once buds open, definitely look at applying Agriphage. For that matter, the *Erwinia* has to be not only present, but at a susceptible stage, as well, which usually doesn't happen until temps warm up.

So this year we're tweaking our plan to begin spraying closer to pink stage, rather than last year's greentip, and will be keeping a closer eye on temps surrounding application. Previously, thinking had been that, coming off a bad fireblight year in an orchard, a pre-bloom Agriphage "cleanup" spray would be beneficial. Our thinking is now more along the lines that it wouldn't do any harm, but might not do a whole lot of good until a little bit later.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

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[Nathaniel Bouman](#)

[Re: Agriphage for Fireblight Control](#)

May 09, 2022 04:37PM

Registered: 9 years ago

Posts: 81

Brittany, you described how Agriphage seemed to halt the spread of infection. I observed this as well. I missed a key moment with a late bloom in hot weather. Got some strikes. Sprayed Agriphage after the fact and the infection seemed to stop at the spur. No oozing, no canker developed, no no shepherd's crooks, despite a lot of heat and rain. The spur dried up and that seems to be it. Normally I would have pruned off the branch 18" below the strike--and I did do this on a bunch of trees but I decided to leave a few on and monitor. I did not observe any advance of the disease--and that seems to still be true nearly a year later.

Nat Bouman

Growing cider varieties in Zone 5b

On B.118 at 18X24

Susquehanna County, Pennsylvania

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2022 03:08AM

Registered: 4 years ago

Posts: 209

Glad to hear of your experience, Nat! It's become rare that we prune out any strikes in our orchard now that we're using Agriphage . . . and this is a huge deal, considering that previously for a few weeks around this time every year we were doing little else but pruning out strikes. Not only do we see fewer and fewer, but since they do just dry up and die we are happy to let that pruning wait until winter.

We asked OmniLytics to do some additional compatibility testing for us this spring and here are the results, fyi:

Howler, Lalstop G46, and Grandevo were all compatible at 24 hours. Lalstim Osmo was compatible at 1 and 4 hours, but not at 24 hours; the lab thinks tank-mixing for immediate spray would be fine on the Lalstim Osmo, just don't let it sit long.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

Edited 1 time(s). Last edit at 05/11/2022 03:12AM by Brittany Kordick.

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[Sue Haynie](#)

[Re: Agriphage for Fireblight Control](#)

May 19, 2022 05:56AM

Registered: 3 years ago

Posts: 5

This is excellent! I spoke with Daniel at Seven Springs Farm and he said to contact the "Agriphage Expert User", Brittany Kordick. 

Here's some questions a couple of us growers in New England have about working with Agriphage. (I'm waiting for my shipment of Agriphage to come in, since I was out of town when the the season's first episode of Fireblight arrived Sunday May 11, 2022 / Monday May 12, 2022.

We are expecting another episode of Fireblight this coming Sunday May 22 and Monday May 23, 2022.

Questions:

1. How many hours after a Fire Blight Episode but before another rain event should Agriphage be applied?
2. What are the MIN. and MAX. temperatures to apply Agriphage?
3. What are the intervals? (Each time after a FB Strike? when there is no rain for 24 hours? or every week after the first time you treat orchard with Fireblight?)
4. What's the coverage on leaves, flowers, branches and trunk? (Should run off be "Slow Drip" or "Fast Drip"?)
5. What is the duration of applications? For example, should Agriphage be applied on a weekly basis all summer long?
6. Have you tested tank mixing Agriphage with nutritionals such as Biotin Calcium or Boron? If so, is it recommended to tank mix these minerals?

Thank You so much for helping us New England growers, (who are experiencing this disease in Apple Trees more than ever.)

Sue Haynie

Sweet Seasons Farm

Zone 4 in northeastern Vermont

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

May 19, 2022 03:49PM

Registered: 4 years ago

Posts: 209

We are no Agriphage (or fireblight) experts, nor have we participated in any studies regarding either -- we are growers just like you who risked some skin on trying something new that there wasn't a lot of info on. I'm happy to report from the field on how it's going for us, but my "field" is in a very different part of the country than yours, with different climate, levels of pressure, and any number of variables. I hope anyone else using Agriphage out there will consider sharing their experiences here, as I have, as it serves to give us all a much more rounded picture of how to deploy bacteriophages against fireblight effectively.

Most of your questions can be most appropriately answered by contacting Certis and speaking to a rep -- it's the job of these guys to be on call for growers with questions like yours, and we spend lots of time talking to them as we try and understand and get to know a product. They know the technical aspects of their products a lot better than we do. I responded to your personal email/voicemail last night with the best answers I can give without calling a rep or scouring the Agriphage label myself, and I will post them here below.

As Todd recently noted in a different thread regarding RHAB control, using big gun packaged products can make you complacent. By the time you've done all the work of product research, product spending, work of application, etc., you don't unreasonably feel like you've done enough work here. We've been humbled this fireblight season, which we are currently at the height of in our orchard, and our thinking about fireblight control seems to evolve as rapidly as the damn bacterium itself. Our hope for this season was that our extensive use of Agriphage thus far would have reduced inoculum to the point that we could expect to see less and less incidence in our orchard going forward. Ha, if it was that easy, everyone would have these delusions of grandeur. We had almost zero blossom blight this year after keeping up with Agriphage sprays as best as we can straddling 175 different bloomtimes (and we also use Blossom Protect in our most prolific bloomers that we noticed in the past tend to be early vectors for fireblight spread, and other practices/spray components may also play a part). We were feeling tentatively cocky. Then about two weeks ago (well past petal fall on all varieties but a couple of late bloomers) we started seeing some very minimal fireblight in the orchard. And from there . . .

Long story short, we were dismayed to see surprising spread in the orchard (still nothing like what we're accustomed to, and nothing particularly devastating) from there these past two weeks. But we were applying Agriphage very intelligently and every season we feel like our understanding of fireblight improves! What could have happened? There's no way that *Erwinia* could have developed resistance to the phages that fast. We also spot treat (instead of cutting out strikes) with a little squirt bottle if we just have a strike here and there, and infections were resolving after application in this manner, so product clearly still working.

Using NEWA disease modelling data affiliated with our on-farm weather station, we pinpointed a particular date as the likely infection event for most of what we were seeing. Well, two weeks ago I monkeyed with the calibration on our sprayer in an attempt to solve some residual issues and make for more efficient sprays. I did an Agriphage application to try it out, and it went great -- I used 1/3 less tanks than I had in the past . . . and thus, applied a low-medium rate of Agriphage as opposed to our usual high rate surrounding the biggest infection event of our year so far. I didn't think of going out and applying more, just that that should be sufficient, and given that it was prime infection time, I'd follow up with a higher rate of spray soon.

As stated above, bacteriophages are not highly mobile -- they really need to land on a bacterium to annihilate it. What limited movement they have comes primarily from the replication process, after which more of them are "propelled" to new locations. So it's likely that there was a ton of *Erwinia* out there and not enough phages hitting them to take care of them before infection could ensue. We were talking about it afterwards and about how folks with low fireblight incidence in their orchards might be tempted to use low rates of Agriphage in their orchards, especially given the very high cost of the product. Ironically, if you have a relatively low population of *Erwinia*, you are even less likely to take care of it by applying a low rate of Agriphage since the phages will be less likely to come into contact with the bacteria. Thus, we plan to do more and more IPM style scouting and more high rate spot treatments to save product until fireblight infection becomes orchard-wide annually.

So the takeaway so far for this season is, yeah, don't get complacent -- Agriphage is not a silver bullet and while we may not spend weeks cutting out strikes from sunup to sundown anymore to little positive effect, in our climate we are always going to be spending weeks of our year consumed with fireblight to the detriment of all else in our orchard. The situation changes too rapidly to do otherwise. We were doing an excellent job scouting daily this year and so thrilled to see such little blossom blight, but it takes so little to get out of control, and it does it so quickly. When I spot treat, I am always amazed to see how localized infections over several shoots can be obviously traced back to a single minuscule blossom blight in the vicinity. A couple days ago, we had made an application plan to apply Agriphage immediately again to our only two "bad" infection blocks in the orchard. Woke up to a 40% chance of rain, and disturbing amounts of ooze indicating active infection in other trees throughout the orchard. Full spray it was, and fast. Moral of the story: fireblight sucks and keep up with your legwork, not just your spray apps.

Re: AgriPhage and New England Holistic Apple Orchards
Kordick Family Farm
Hi Sue,

I hope Agriphage works as well for you as it has for us! Fireblight is such a pain, to put it extremely mildly, and while Agriphage is no silver bullet, we are thrilled to have it in our arsenal. We're in the thick of extreme fireblight infection period down here, and I've thought of a few things to add to the HON thread regarding Agriphage, so I'll try and do that soon (basically, use the highest recommended rate whenever possible since the bacteriophages aren't particularly mobile; if low pressure overall, rely on spot treatments at high rates to save product). I would recommend that you call Certis and talk to a rep about any general questions you have. They can tell you much more about it technically than we can, and the more you understand about the product, the easier it will be for you to make decisions about rate, when to spray, etc. in your particular situation.

I honestly don't remember how rainfast Agriphage is supposed to be, but it generally doesn't stick around in the environment long (even if there's a high population of *Erwinia amylovora*, the bacteriophages will kill off the bacteria fairly quickly, then die off themselves once the bacteria are depleted, so if you're in a climate or situation where more *Erwinia* are moving in regularly or cankers are releasing them locally, you do need to keep applying to replenish populations). That said, circumstances will usually dictate what we do, and the other day we were spraying over the course of a stormy day when a downpour ensued. I kept spraying through it all, knowing that most of what I was doing would be washed off, but being that we had some shoot blight going and my tank was already mixed, it made sense at the time to keep going in hope that some of the bacteriophages stayed

in the canopy and did something for us before the rest of the forecast warm rain hit. Most times, it probably wouldn't, but every time is different.

Likewise, I am not aware of any upper temp range for Agriphage application -- good question for a Certis rep. Basically, if *Erwinia amylovora* is active, the bacteriophages should be, too. In our minds, 65-85 degrees is prime infection weather, and once it hits 90 degree temps regularly, fireblight slows down and may not warrant protection -- but this is what we believe we can say in our climate -- VT is a whole 'nother ballgame.

The intervals of our sprays depend on too many variables to say definitively -- sometimes a few days, sometimes a few weeks, depending on infection risk, weather, trauma events, infection observation in the orchard, etc. We plan for every 7-14 days, with some sprays occurring weeks apart, and some as few as 3 days apart, thus making for some kind of average. We try to have an extra spray's worth of Agriphage on hand beyond our expected seasonal needs in case of emergency treatment needs.

You can check with a Certis rep, but I'm remembering that the label specifies not to apply Agriphage to runoff.

As far as trunk and limb coverage, this gets into "disease theory." You can use Agriphage on cankers (but timing has to be right -- applying it in winter when *Erwinia* bacteria are latent won't do anything; they need to be active in warmer temperatures for them to be vulnerable). If you don't have cankers that you're specifically targeting with a direct spray, I wouldn't go out of my way to get coverage on non leaf/flower tissue . . . but I'm not sure it's not a good thing to hit as much of the tree in general as possible, given that *Erwinia* may overwinter in ways that are not commonly understood. Knowing your enemy is key here, and if you're not a fireblight researcher (we're sure not), that can be tough.

In NC, our fireblight pressure tends to abate by mid-June, whether it's to do with *Erwinia* life cycle or temps too consistently hot for them to thrive, or hardened-off foliage being less susceptible to infection, all of the above, we don't know. The modelling tells us that we're at extreme risk for months afterwards, but aside from a spot of shoot blight here and there, we really don't see that manifest in the orchard. Of course, if we got a hailstorm in August, that might change things. I'm really not sure how the lifecycle of fireblight would play out in a Northern climate.

We have only tested/tank-mixed with Agriphage the materials we have listed in this thread, but another great question for a rep, or you can see about doing some testing yourself and sharing what you find here.

Best of luck, and I hope you'll share your Agriphage experience in the HON thread as your season unfolds and you get your posting issues sorted out!

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

Edited 6 time(s). Last edit at 05/21/2022 03:11PM by Brittany Kordick.

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

May 19, 2022 04:02PM

Registered: 4 years ago

Posts: 209

One final Agriphage thought: we do feel like we have taken care of a lot of our residual perennial fireblight pressure (ie, cankers) at this point. Our feeling of success comes from seeing trees that were our worst "fireblight magnets" year in, year out, as some of our most pristine trees this season. Clearly, infection will always come down to weather and timing and opportunity. Likewise, some of our historically most pristine trees are some of our worst hit this season. So success in a big way, we feel, but vigilance will always be key, and it will be exceedingly difficult to anticipate infection, given all the variables involved.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

Edited 1 time(s). Last edit at 05/19/2022 04:50PM by Brittany Kordick.

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

April 24, 2023 02:12PM

Registered: 4 years ago

Posts: 209

A bit more helpful info to add to the AgriPhage file as we get into the thick of 2023 fireblight season. We posed some questions recently to a rep for OmniLytics, the company that manufactures AgriPhage, and since the answers were particularly detailed, obtained permission to just copy and paste some of our exchange here verbatim. The reference to AgriPhage and tomatoes relates to the AgriPhage product that targets specific tomato disease (the company produces several different bacteriophage based formulations targeting specific diseases in tomatoes, citrus, nuts, and stone fruit, in addition to AgriPhage Fireblight). Our fireblight season began weeks earlier than usual this year, as warm conditions brought on bloom about 2 weeks earlier than our previous earliest recorded bloom, and have stuck around past petalfall, concurrent with weekly rain events and frequent high wind days. In spite of the challenging weather, we've had great control of blossom and shoot blight in our orchard so far, but are finding that we are seeing evidence of some infection breakthrough before it is subsequently controlled by our weekly AgriPhage applications. Anyway, fyi:

Question:

"Can you give us any details surrounding the photosensitivity of AgriPhage? We're in that crazy time of spring when temperatures may regularly rise to 84 degrees for a couple days, accompanied by particularly high UV radiation, then drop into the 60s with clouds and rain for the next couple of days. For the past few weeks, we've had fairly regular patterns of five or six hot dry days, followed by one or two coolish or warm, cloudy rain days, so we're also currently in a pattern of spraying on the first dry, not windy day after the rain event, which has then usually been followed by five or so

sunny, hot days, before another rain event. We've been wondering about how the phages are faring after a few days in the bright sun, since we're hoping for at least some control leftover going into each subsequent rain event to prevent infection taking place before a control spray post-event wipes infection out. Basically, while we really don't want to spray any more than we are, we're wondering if we would be closer to zero infection actually experienced by the trees if we did apply another spray going into a rain event if we've had, say, three or four particularly sunny days since our previous spray. (Probably should mention, fyi, that we typically spray the highest rate recommended on the AgriPhage label, given our overall pressure.)"

Answer:

"We generally only see AgriPhage sticking around for 48 hours in the hot Florida sun on exposed, full sun tomato plants. In orange groves with thicker canopies we see effective surface phages 4 days out in the more shaded canopy. If they get into an active lesion, however, or find a host to attack, they stay until all the bacteria are gone from that lesion. I assume that your UV pressure is the same or a little less, so I would say that you're getting protection for 2-5 days. We've found that spraying when wet has proven to be very effective. It moves the phages around. That can be a hard one to wrap your brain around and if you're not comfortable moving equipment through the grove after a rain, we completely understand. Also, bacteriophages will kill all bacteria they encounter, so good coverage has been found to be more important than persistence. We are working with a few different companies to research products that act as sunscreens."

Question:

"We know that OmniLytics suggests that AgriPhage be refrigerated for any long-term storage, but we think we're remembering correctly that it's no longer advised that it must be refrigerated exhaustively to preserve viability (doesn't need to be transported in refrigeration or for short-term storage). We have been storing our AgriPhage in our walk-in cooler, but some electrical issues resulted in ambient storage temperatures for the past couple of weeks. Unfortunately, with recent warm days, ambient temperatures were as high as 80 degrees for hours-long stretches. We plan to use our entire supply within the next six to eight weeks, and were just curious if you could clarify OmniLytics' guidance surrounding AgriPhage and temperature at all (would you expect our particularly warm storage conditions to adversely affect the product in the short term?)."

Answer:

"Not a problem at all. We've tested the product at 25C and 30C and we still have concentration titers above the EPA minimum on the bottle after 6 months. I wouldn't carry that product over to next season, but it'll be fine to use this year."

With our success using AgriPhage in our orchard, we have been surprised, given the preponderance of buzz surrounding biological controls for fireblight lately, not to see AgriPhage included more often as a novel option. The rep also provided some clarification regarding trial data that may have relevance in this regard:

"We've found some very interesting details working with growers. Here's the thing; We have been included in 18 artificially inoculated trials with Universities here in the US. We typically see about a 70-80% reduction in disease in those trials. However, in the EU we have performed over 50 certified GEP (Good Experimental Practices) trials in NATURALLY infected trials and see numbers from 95-100%. We think phages are at a disadvantage in artificially inoculated trials. Perhaps due to clumping of cells or biofilms that inhibit phages from reaching the targeted host. It's a bit of a mystery."

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

Edited 2 time(s). Last edit at 04/24/2023 02:17PM by Brittany Kordick.

[Reply](#) [Quote](#)

[Matthew Mullet](#)

[Re: Agriphage for Fireblight Control](#)

April 24, 2023 05:05PM

Brittany,

Registered: 2 years ago

Posts: 14

Thanks for posting all of this information. I've got AgriPhage ready to use once we get persistent weather in the 70s and 80s here in Ohio and my late-blooming bittersweets are starting to get going. I was also interested in the storage piece since my AgriPhage bottles are just stored at about 55-60° in our cellar at the moment and I'd read conflicting information about that. Very interesting that spraying when wet is also an option, if not a potential best practice. I also agree that I've been surprised not to hear more buzz about AgriPhage as a potential game-changer for growers struggling with endemic fb. I certainly would rather spray AgriPhage and try to reduce managing the push and pull of competitive colonization with copper, double nickel, percarb, thyme oil etc.

Since I'm not a commercial grower and basically cider-only, my trees will either survive with dormant copper and AgriPhage / a probiotic approach or be replaced by varieties that can. To that end, I really appreciate this thread and the work you've done to keep us all informed!

Matt

Fredericksburg, OH

Zone 6a

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[Nathaniel Bouman](#)

[Re: Agriphage for Fireblight Control](#)

April 24, 2023 08:31PM

Registered: 9 years ago

Posts: 81

Yes, thanks Brittany for the continued, valuable information.

Nat Bouman
Growing cider varieties in Zone 5b
On B.118 at 18X24
Susquehanna County, Pennsylvania

[Reply](#) [Quote](#)

[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

April 25, 2023 02:05PM

My pleasure! Looking forward to hearing how AgriPhage works for you all this season.

Registered: 4 years ago
Posts: 209

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

[Reply](#) [Quote](#)

[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2023 02:40PM

FYI, for anyone thinking that Surround or any other kaolin clay product would be an ideal sunscreen to apply with AgriPhage, kaolin clay is NOT compatible with AgriPhage and will kill the bacteriophages outright in the tank mix. The theory is that the plethora of minerals are somehow to blame, but the potential for desiccation may not help either. OmniLytics has been trying to find a suitable UV protectant to pair with AgriPhage for years and are still actively looking. They've also looked at molasses and whey, but didn't have good results. For now, our strategy to try and help with the UV degradation of the phages is to break a single spray into two parts. Our blocks are situated as three rows, with the two narrow drive aisles within the block interspersed with wider drive aisles on the outside of the rows. Those wider aisles allow for greater sun exposure to the outsides of the rows, and this is where we're seeing the most breakthrough infection this year. Since we are using an airblast sprayer, we get a lot of drift through the rows. I am spraying the outer rows one day, then depending on weather forecast, going back to do the inner rows a couple or few days later to complete the spray and offer a bit of a refresher of AgriPhage without doing two separate sprays. It was also recommended that we spray in the late afternoon or evening if possible, to give the phages as much time as possible before UV radiation picks up.

Registered: 4 years ago
Posts: 209

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

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[Nathaniel Bouman](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2023 03:15PM

Wow, super valuable to know. Thanks Brittany. In your conversations with OmniLytics have you spoken about resistance at all?

Registered: 9 years ago
Posts: 81

Nat Bouman
Growing cider varieties in Zone 5b
On B.118 at 18X24
Susquehanna County, Pennsylvania

[Reply](#) [Quote](#)

[Alan Surprenant](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2023 03:35PM

Thanks for the info Brittany. Who knew that an apple grower in NC would literally (seasonally) be on the leading edge for growers further north. It's all good heads up information. Thanks. We're at full pink and some popcorn stage now- a bit different than you but right on schedule .

I hear you and your mom will be on the CiderChat podcast next Wednesday, looking forward to 'visiting' with you.

Alan

Registered: 10 years ago
Posts: 22

[Brook Farm Orchard](#)

Zone 5 in Massachusetts

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[Brittany Kordick](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2023 06:14PM

Thanks, Alan and Nathaniel. We did talk to OmniLytics about potential resistance issues last year. We had some shoot blight that really surprised us, given our spray schedule of AgriPhage and were trying to nail down where the outbreak came from. In talking to the folks at OmniLytics, we asked about the unlikely possibility of resistance (we haven't been applying AgriPhage for all that many years). They said they frequently test samples of *Erwinia amylovora* for reassessment of efficacy to ensure that the bacterium is not mutating in the field to evade the phages in AgriPhage Fireblight. They invited us to send in samples from our orchard to be sure that we were not encountering any sort of resistance and the results came back with flying colors that all of our samples were identified as the same species of *E. amylovora* and the effectiveness activity of AgriPhage against them were "excellent" to "outstanding." (Some of our samples experienced higher effectiveness even than they usually see.) This stuff definitely kills *Erwinia*; we've just got to figure out all the ins and outs of practical application in our orchard. And it has occurred to us that we will not be able to rely solely on AgriPhage in perpetuity precisely because we don't want to encourage any genetic mutation of the *Erwinia* in our orchard. So that means mixing it up with some of the other options out there . . . but nothing else has been remotely as effective against fireblight for us.

Registered: 4 years ago
Posts: 209

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

[Reply](#) [Quote](#)

[Nathaniel Bouman](#)

[Re: Agriphage for Fireblight Control](#)

May 11, 2023 07:40PM

Registered: 9 years ago

Posts: 81

Nothing has been as effective for us either. I did start using Double Nickel as another means of suppression, mostly in the hope of reducing the development of resistance. I haven't gone back to Blossom Protect. I'm concerned about the Ph of that product and the impact on the phage and I think I've read that it does nothing to actually kill off Erwinia. It outcompetes for real estate. So, if I'm trying to kill off the bacteria that were able to survive the phage to reduce the development of resistance it seems that a product that doesn't actually kill the bacteria isn't quite as good--though clearly preventing a full blown infection is preventing a lot of bacteria from developping.

Nat Bouman

Growing cider varieties in Zone 5b

On B.118 at 18X24

Susquehanna County, Pennsylvania

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