



EM following Lime Sulfur?

Posted by [Terence Welch](#)

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[Terence Welch](#)

[EM following Lime Sulfur?](#)

February 04, 2014 09:25AM

Registered: 11 years ago

Posts: 15

We will be spraying our apples with lime sulfur as a delayed dormant spray at 1/4" bud stage. We haven't stepped off the holistic cliff yet, but we sprayed Neem/EM/Fish in the fall. We will spray lime sulfur soon, as our spring is very early this year in coastal Central California. The question is, once we have dropped a bomb on the foliage with lime sulfur, how soon can we come back and spray EM? How long will the lime sulfur effects linger, and cause mortality of the bacteria in the EM?

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[Michael Phillips](#)

[Re: EM following Lime Sulfur?](#)

February 05, 2014 06:57PM

Moderator

Registered: 11 years ago

Posts: 621

Terence's question needs context. He grows in a relatively warm place where scab conidia can readily overwinter in the buds. These "secondary spores" are in place in the apple tree solely because there was a sufficient wetting period in the fall months after harvest. Odds are likely that conidia are a potential issue at Fruitilicious Farm every spring. But given a dry fall and dry winter ... not necessarily so.

Now let's ask an equally-important question: What does lime sulfur do to abate this situation? Calcium polysulfide has an "eradicant edge" lasting 24 to 36 hours after application. This chemistry is systemic, burning into leaf tissue to undo the start of actual cell infections. Any protective effects after this result from the sulfur portion remaining in solution, I suspect, thus acting like micronized sulfur in altering enzyme dynamics for conidia hyphae. That suggests up to a week of effectiveness here before the sulfur grains are spent. I would really like to know how lime sulfur chemistry affects conidia-in-waiting. Dormant pathogens are protected by a lipid coating until warmth and moisture launches an attempt by the disease organism to access food resources in growing tissue. We know at that point that lime sulfur is effective ... but is it relevant before? I think a better case can be made for copper as a delayed dormant application for this purpose as it's far more persistent. Success in the past indicates one of two things: These delayed dormant applications work as envisioned or they weren't necessary at all.

Now let's bring in the biology aspect. Every fungicide spray by definition diminishes important fungal connections in the soil. Every fungicide spray, whether chemical or conventional organic. Every fungicide spray. The continuous use of such completely undoes the "arboreal food web" as well. Biological Reinforcement -- be it in the form of effective microbes, compost tea, or a plethora of organism products -- is designed to initiate recovery in this respect. Holistic oomph takes a few years to achieve in orchards undergoing biological transition, primarily due to weakened soil connections. But let's say a grower is fully investing in balanced nutrition, woodsy organic matter, and specifically stewarding the mycorrhizal system. Does a single early application of lime sulfur at delayed dormant cross a biological line? I think probably not but then again regular habits should always be examined. I know another grower who uses hydrogen peroxide at this point in the season to zap things back to a clean slate. What do those photosynthetic and lactic acid bacteria (and numerous yeasts) in EM experience on the leaf surface, treated or untreated? That's what lies at the heart of Terence's question. The thing is that only growers will research core questions like this ... and we are such a skeptical few.

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

Edited 1 time(s). Last edit at 02/06/2014 03:14PM by Michael Phillips.

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[Michael Phillips](#)

[Re: EM following Lime Sulfur?](#)

February 08, 2014 07:05PM

Moderator

Registered: 11 years ago

Posts: 621

I found this passage regarding the chemistry of lime sulfur:

Lime sulfur is an eradicator that acts by killing fungi on contact. For example, lime sulfur can be used during the dormant season to kill overwintering fruiting bodies (cleistothecia) of grape powdery mildew. At dormant season rates, it would be phytotoxic to young plant tissues during the growing season.

So apparently dormant spores are subject to lime sulfur's mode of action, applied at higher concentrations, whatever that may be. It's hard

to track down enough detail to address the question being asked here: How long does the activity of LS continue before it's safe for beneficial organisms to become reestablished? That presupposes a few things:

Delayed dormant LS completely eradicates all conidia-in-waiting.

A clean orchard experiences little risk from spore build-up on ground level until after tight cluster.

This is "time enough" to reestablish competitive colonization.

Biological reinforcement contains important natural allies now eradicated by LS.

There are tens of thousands of species involved in canopy colonization. Effective microbes don't begin to deliver such diversity though maybe properly-made compost tea comes closer. Both are suggested if an "allopathic touch" severely alters the scene on the surface of plant tissues, assuming the grower now wants to proceed with holistic methods.

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

Edited 2 time(s). Last edit at 05/07/2014 01:37PM by Michael Phillips.

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[Todd Parlo](#)

[Re: EM following Lime Sulfur?](#)

February 12, 2014 05:55AM

Registered: 10 years ago

Posts: 301

A good question might be : is there a practical method of determining the density, type, and health of any particular microbe in the canopy. Labs can assess presence with methods like microscopy, culturing, incubation, Enzyme-linked Immunosorbent Assay (ELISA) (this is a cool one), and dna fingerprinting.

If it has been applied to beneficials in orchard canopies, I haven't come across it, but it certainly is possible. With this in hand, a program could test the impact and longevity of the damage of any given practice on any fungi, bacteria, etc (good or bad for that matter). Perhaps that level of scientific expertise and infrastructure is available and affordable. If not it sure sounds like a good doctoral thesis, doesn't it?

Those of you out there who have access to the peer reviewed journal sites through their university may be a big help in finding out if studies were done. (Alas, the rest of us plebs can't afford the high price of published science.)

[Walden Heights Nursery & Orchard](#)

Zone 3 in Vermont

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[Michelle and Chris McColl](#)

[Re: EM following Lime Sulfur?](#)

February 15, 2014 12:42PM

Registered: 11 years ago

Posts: 49

We should start by saying we hate using lime sulphur. On the question of "How long does the activity of LS continue before it's safe for beneficial organisms to become reestablished?" we offer the following observation:

We use lime sulphur as a last resort, if scab has become established on foliage in the spring - this usually occurs a few weeks after petal fall, when the fruitlets are about pea-sized. We have never used it in the dormant period (we use bordeaux mixture instead), so we can't comment on its longevity early in the season. But it certainly has longevity in late spring/early summer, when applied as a 1% solution, to the point of run-off.

We say this, because we have observed that to eradicate scab (in our environment), we need a bright sunny day with temperatures close to 30 degrees C. If we don't see some leaf burn, the scab on the foliage remains active. We generally spray the 1% lime sulphur within a week of first seeing scab on the foliage, because we are worried about it spreading onto the fruit. But the weather is often not quite hot enough that early in the season, no leaf damage occurs and the scab remains active, threatening to spread onto the fruitlets at the next shower of rain. We keep going with the "continuous sulphur bath" approach, trying to protect the fruit. And then sooner or later, we get that hot day, maybe in the mid 30's, and there is so much leaf scorch (and fruit scorch) it makes you feel sick. But at least we know the scab has been annihilated, and the fruit that is okay will generally remain okay.

The point here is that the scorch on the leaves and fruit can occur up to three weeks (and probably longer) after the 1% lime sulphur spray. So it does remain active on the leaf for weeks (at that time of year, at least). Makes you wonder what it is doing to the biology all that time?

Kalangadoo Orchard

On the "other side" in South Australia

Edited 1 time(s). Last edit at 02/15/2014 12:54PM by Michelle & Chris McColl.

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[Susan Fancy](#)

[Re: EM following Lime Sulfur?](#)

April 09, 2014 05:59PM

Registered: 10 years ago

Posts: 20

We're around the corner from a conventionally managed orchard, and inherited some real issues with unmanaged trees when we purchased our place and started working with them 5 years ago...but we are finding that if disease pressures are not high we can get the job done with Neem, compost tea, fermented teas, tons of good soil love and we need supplemental foliar nutritional sprays still, soil is recovering and this takes time, Oxidate (hydrogen dioxide), Serenade (Baccillus) Kaligreen (baking soda, we use it with Nu Film or Stylet oil), and Regalia (giant knotweed extract, which strengthens plant's immune system. Made for grapes originally but label is broad spectrum and we have used it in many places with great results). It depends on the year, humidity and rainfall.

We started with these gentler products, but did not find that in some cases we could get whatever disease we were battling out of the orchard. So we relied upon sulfur or lime sulfur, and copper. We also absolutely hate to use these, but especially for peach scab, plum brown rot, and blotch/flyspeck we have not been able to get the stuff out of the orchard otherwise. Last year we tried 4 ish sprays of some of these chemicals and found that the blotch evaporated, the scab and rot were MUCH less but we still have to work on those again this year. But for us, other disease pressures can be maintained just with Neem, compost tea, and fermented teas and sometimes some of these other products. Cheers, Susan

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[Ian Graham](#)

[Re: EM following Lime Sulfur?](#)

May 07, 2014 06:27AM

Registered: 10 years ago

Posts: 59

Dealing with peach leaf curl in my 1 acre mixed orchard where I am using the holistic spray regime. likewise asking the question when to follow LS with EM or even visa versa.

Ian G

Old 99 Farm

Dundas ON

5b

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