



Silicon: Foliar vs. Soil Application

Posted by [Brittany Kordick](#)

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[Brittany Kordick](#)

[Silicon: Foliar vs. Soil Application](#)

January 28, 2021 05:26PM

Registered: 4 years ago

Posts: 211

In recent years we have applied foliar silicon in the form of Sil-Matrix throughout the fruit sizing window. I've become increasingly interested in expanding our applications, starting soon after greentip, lasting until the leaves harden off, with the idea that the growing leaf cuticles have more constant and more consistent protection during the primary infection windows for so many of our arch-pathogens. We really like the Sil-Matrix formulation, but of course, there is huge added expense to upping the ante like this. I'm interested in playing around with bamboo teas at some point to see if we could find a way to meet our needs in a more localized, less expensive fashion, but that's not going to happen anytime soon, and in any case, it would take a lot of trialing and testing to convince us that a bamboo tea would give us the same bang we get for our rather large silicon buck with Sil-Matrix.

I recently discovered Wollastonite, a mined calcium silicate, that we would apply similarly to lime (1.25 times your recommended lime rate, according to application instructions). This option appeals for many reasons: we could apply it now, during the off-season, and silica/silicon is one less thing we have to worry about in our spray mix during the growing season; it's WAY less expensive; we'd also be applying some calcium at the same time.

Wollastonite is being touted for its silicon content, with the usual testaments to how supplemental silicon strengthens cell walls and stimulates a plant's natural immune responses. The company cites plenty of studies in its tech sheet to show how soil-applied silicon beneficially affects crops. However, I must admit, with all the recent debate over calcium mobility within a plant, I'm doubtful that soil-applied silicon versus foliar-applied silicon is entirely apples to apples. But even if we got a nice baseline with a winter soil application of silicon, and could reduce our foliar applications, either in rate or frequency, that would help.

Anybody out there have any experience with Wollastonite, or any thoughts about its potential virtues/vices?

Thanks

[Kordick Family Farm](#)

Westfield, NC

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[Brittany Kordick](#)

[Re: Silicon: Foliar vs. Soil Application](#)

February 15, 2021 09:59PM

Registered: 4 years ago

Posts: 211

We talked to a grower rep at Vanderbilt Minerals to try and get some of the answers to our questions concerning Vansil wollastonite and its calcium and silicon availability, so just passing along what we found out:

Wollastonite is calcium silicate, and is not a soluble form of silicon. It is intended for long-term release. Calcium silicate has a pH of 10-11 and requires acidic soil to break down and release the elements. It's great for long-term, cumulative availability, much like rock phosphate. But it's self-limiting in the sense that, if you have acidic soil, and you're adding this very alkaline material to it, it will eventually be raising your soil pH to the point that the elements will no longer be able to be made available (but by then, you may have met your targets, depending on why you're applying it). We have an average pH of 6 in our orchard right now, and in addition to being after more of an immediately available silicon source, we are not interested in having quite such a heavy basic effect on our pH.

We're looking at AgSil, potassium silicate, as more of a readily available soil-applied source of silicon, but odds are we'll be sticking with Sil-Matrix and applying mostly foliar silicon in the short-term.

[Kordick Family Farm](#)

Westfield, NC

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[Michael Phillips](#)

[Re: Silicon: Foliar vs. Soil Application](#)

March 07, 2021 04:22PM

Moderator

Registered: 11 years ago

Posts: 621

There's a growing consensus amongst crop consultants that foliar silica doesn't make much headway according to plant sap analysis. This is a difficult but important mineral element to "get right" as far as electrical conductivity. Oft times excess aluminum in the soil blocks what we hope to shift on the silica front, and in this regard there's a biological component (as always!) to the puzzle. There's also the question of economics as Brittany points out – spending yet more dollars on products that while well-intended don't really seem to do anything.

Let me quote Ewan Campbell, a New Zealand farmer/consultant, who's put in a good twenty years on the silica question:

"We tried many differing mineral supplements, to no avail until we started spreading volcanic sands onto the paddocks. These sands are a product of the type of volcanic eruptions that engulfed this land relatively recently. They have a significant silica component that has been exposed to great heat and pressure. This silica becomes available to the soil / plant environment when it is exposed to silica-solubilising soil bacteria. As we introduce the hydrated silica sand we are observing around a 200ppm decrease in extractable aluminium per year in our soil test results. Along with this the NO3 Nitrate and NH4 Ammonia are held in the soil in equilibrium at a more balanced level of around 10ppm each which is very adequate to run a high producing property without synthetic nitrogen inputs."

More of Ewan's writings can be found on the [EcoFarm Aotearoa](#) website

I saw a slight bump in last season's sap results from applying silica-rich fermented plant extracts of *Equisetum arvense* (aka horsetail) and seeded nettle. I'm coming to understand that foliar applications can be as much a "reminder" to the plant to send a signal to soil microbes as to what's needed above. Another product called [CropSIL from Nuvia Technologies](#) may find it's way into orchard trails here this year as monosilicic acid is being found to be more promising than other silica presentations. Still, it's hard to get away from notions that energetic sand deposits and some plant-based alchemy may really be where silica magic lies for our trees.

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

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[Brittany Kordick](#)

[Re: Silicon: Foliar vs. Soil Application](#)

March 12, 2021 10:12PM

Registered: 4 years ago

Posts: 211

This is interesting, and frustrating!, info -- thank you. After much deliberation, we decided to apply AgSil to our apple trees this season, starting at budswell/greentip with a soil application intended to build up a reservoir for the trees, continuing with at least two foliar applications during bud/bloom, and then see where we stand via plant sap analysis. For us, while AgSil contains far more potassium than we'd like to be applying regularly (0-0-32), particularly as we wade deeper into the calcium paradigm now that we know that potassium levels can play an ultimate role in calcium availability, we are equally leery of applying very alkaline silicon-containing products that may raise the soil pH, like CropSIL. Perhaps one would have to alternate products like these two with each other, so you don't get to the point of having to cut either one because of the incidental "side" effects of adding silicon in this more conventional (as opposed to fermented teas) manner.

At any rate, reading the information you provided made me feel better about applying at least our first silicon application to the soil rather than the foliage. We're now at silvertip, and since AgSil is slated to be the next thing we spray in the orchard, I spent the morning working out how we might apply it to the ground using our airblast sprayer. I feel pretty good about the calibration, spread, and overall coverage, but my mother had an interesting observation as we discussed timing and methods: so being that we have such a healthy orchard floor, and being that our grasses, etc. are no longer dormant either, we are going to essentially be applying AgSil as a foliar spray to our orchard floor . . . and where does that leave the trees? Even if we had applied it to the soil, say, 3 weeks ago, when grasses, etc. were still more or less dormant, that silicon reservoir we're fostering in the our orchard soil is presumably going to be supporting a lot of orchard floor before the trees get to take their cut.

Of course, it's all about the orchard as an overall environment, but just one more thing to make us feel like, to large extent, we may be throwing a lot of money at a problem (\$250/fifty lb bag, to be exact), and may not see the effect we're going for. At least with the foliar apps, you're applying it mostly to the trees themselves.

Tangentially related, we're also curious about grinding up bamboo and mulching with it as a long term silicon source . . . maybe next year.

[Kordick Family Farm](#)

Westfield, NC

Zone 7a

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