



Neem, cold weather, and hard water

Posted by [Peter Fisher](#)

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[Peter Fisher](#)

[Neem, cold weather, and hard water](#)

March 31, 2017 12:40AM

Registered: 10 years ago

Posts: 82

I have been using neem for a few years, but this year had an unpleasant experience. Last week, when I went to clean out my tank after spraying my orchard with neem and liquid fish, at double strength, I discovered most of the neem oil in granular sticky form clinging to the side of my tank. It was in the upper 40s outside, and my usual preparations (letting well water in 5 gallon pails warm indoors for a couple of days to about 68 degrees, so that my 25 gallon spray tank had only warmish water in it, plus the neem and soap mixed in probably 100 degree water before adding) apparently were insufficient. I consulted with the friendly folks at Ahimsa. They said cold weather and hard water are a bad combination and suggested I soften the water with citric acid. They didn't know the proportions.

I assume I do not want to use the softened water from the indoor tap; I never use that on my gardens or plants, so why would I spray it on my fruit trees; my understanding is that there are salts that remain in softened water.

So: Anyone used citric acid? In what form, and what proportions?

I also found that the Neem had re-solidified in the gallon container while sitting at room temp for a few days, before I got the rest parcelled out into batch-sized containers. So this batch of neem at least is solidifying below 70 degrees, not below 60 degrees, which I had thought was the threshold. Which means that warming the water to 68 degrees is also not doing enough. Not sure how to get 25 gallons to 75 or 80 degrees easily, or how to keep it warm long enough to finish spraying.

The neem has been stored in a cooler at about 38 degrees since last summer when I purchased it.

Turkey Creek Orchard

Solon, Iowa (zone 5A)

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[David Maxwell](#)

[Re: Neem, cold weather, and hard water](#)

March 31, 2017 04:27AM

Registered: 11 years ago

Posts: 197

Interesting! You are correct that water run through a water softener, (at least the kind into which you pour salt), has a low concentration of NaCl, (salt), essentially in much the same concentration as the calcium salts were in the unsoftened water. (All that is happening in the water softener is that an ion of sodium is being substituted for an ion of calcium.) There is NaCl in the water, but I seriously question whether the concentration is high enough to make a particle of difference to your trees. (If you water your plants with your softened water every week, the salt may conceivably build up in the soil over time. But the amount of salt deposited by a few sprays is, I would suggest, trivial.

Now, the concept of citric acid as a softening agent is a bit mysterious to me. We need a real chemist here. What is happening with your hard water is that the calcium salts in the water, (which I think are largely CaCO₃) are giving up their calcium ions to form (insoluble) calcium soaps with the fats in the spray. In order to prevent this, the calcium has to be either removed from the water, (what is happening in the water softener, and potentially with the citric acid, (see below), or trapped in some other compound with a higher affinity for the calcium than the fatty acids in the neem oil. Calcium citrate is apparently largely insoluble in water. I suppose that if one were to add a quantity of citric acid equivalent to the amount of CaCO₃ in the water, one might precipitate out, (as an insoluble sludge) the calcium, leaving the water "soft". But it is important to note that I am wildly incompetent here, and these musings have no more validity than the inchoate ramblings of a dotty old man. Translation: Don't pay me no mind.

[Broomholm Orchard](#)

Zone 5b in Nova Scotia

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[Peter Fisher](#)

[Re: Neem, cold weather, and hard water](#)

April 02, 2017 07:27PM

Registered: 10 years ago

Posts: 82

Needed to do a trunk and ground saturation with 2% neem for greater and lesser peach tree borers yesterday so I went ahead and used softened warm tap water which worked well. So maybe that will become my early spring cold weather solution. Unless someone tells me that's not a good idea.

Turkey Creek Orchard
Solon, Iowa (zone 5A)

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[Jason MacArthur](#)

[Re: Neem, cold weather, and hard water](#)

April 11, 2017 12:34PM

Peter-

In your successful trip to the orchard was the water you used softened with citric acid or softened tap water?

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[Nick Segner](#)

[Re: Neem, cold weather, and hard water](#)

April 12, 2017 11:44PM

We had a similar issue, as we have very hard water as well.

Registered: 6 years ago
Posts: 28

Registered: 9 years ago
Posts: 49

Water temp is not the problem, however. Once emulsified with the soap, we mix the neem directly into 100 gallons of cold water and it does not come back out of solution.

We are fortunate to have two wells, each in it's own aquifer. One is very high in nitrates, the other very high in minerals. So we just switched to using high nitrate water rather than the hard water.

Sounds like you got this worked out but I'm also curious how you solved your issue.

Nick

Wildcat Valley Farm
Zone 8b
Olympic Peninsula Rainshadow
Port Angeles, Washington

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[Elliot Dembner](#)

[Re: Neem, cold weather, and hard water](#)

April 13, 2017 12:14AM

NICK, re emulsifying neem prior to adding cold water. I have tried to mix the neem with "hot water" and then adding the cold water to my 16 gallon sprayer. However, i still

Have a waxy residue left on the bottom of the sprayer tank when finished spraying. I followed Michael's ratios of soap to mixture. Pls advise what quantities of soap do you mix in with the neem to get it fully emulsified? And do you heat some water to mix with soap and neem? If so how hot? Thanks.

Registered: 9 years ago
Posts: 11

scotts valley, ca
zone 9b

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[Nick Segner](#)

[Re: Neem, cold weather, and hard water](#)

April 17, 2017 10:16PM

Elliot-

Registered: 9 years ago
Posts: 49

The neem should be mixed with the soap and mixed vigorously to emulsify. Only after that should it be added to water. From my experience, at that point, after emulsification, it doesn't matter the water temp. Cold water works great! Hard water is another issue..

Nick Segner

Wildcat Valley Farm
Zone 8b
Olympic Peninsula Rainshadow
Port Angeles, Washington

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[Elliot Dembner](#)

[Re: Neem, cold weather, and hard water](#)

April 20, 2017 12:09AM

THANKs. Perhaps i was adding toooo much soap to the neem. Do u follow Michael Phillips mix proportions recommendation of 2.5 oz neem with a generous. Teaspoon of soap emulsifier for 4 gallon sprayer? I use a 16 gallon sprayer on a cart which i pull and it is powered by car battery.

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[Michael Phillips](#)

[Re: Neem, cold weather, and hard water](#)

April 20, 2017 02:38AM

Registered: 9 years ago
Posts: 11

Moderator
Registered: 11 years ago
Posts: 621

I hope folks will focus on the hard water aspects of mixing neem here. Elliot is trying hard to shift this into a conversation about emulsifying basics, and that's fine, and discussed [here](#) and [here again](#) in the forum. What I would love is for someone with hard water to provide the right dose of citric acid (lemon juice) to make hard water amenable for mixing pure neem oil. Softened water obviously works (thanks, Peter) but others need to know how to do this without that option. Please don't overlook the suggestion to use a [synergistic mix](#) that includes karanja oil. Much can be said for keeping true to the subject line so our discussions stay on task!

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

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[Peter Fisher](#)

[Re: Neem, cold weather, and hard water](#)

May 08, 2017 05:24AM

Registered: 10 years ago

Posts: 82

Today I sprayed with Neem (the spring holistic spray number 3, at petal fall) with hard well water. The water had sat overnight indoors so it was probably around 65 degrees, as was the air temperature. I added a cup of lemon juice in 25 gallons. There was still some floating undissolved neem, and some residue to be cleaned at the end, but not anything like what I had been dealing with earlier. This was not a controlled experiment, however, since the weather was considerably warmer, though everything else was pretty much the same. I will try 2 cups of lemon juice next time.

Turkey Creek Orchard

Solon, Iowa (zone 5A)

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[Jason MacArthur](#)

[Re: Neem, cold weather, and hard water](#)

May 10, 2017 03:54AM

Registered: 6 years ago

Posts: 28

So after numerous unsuccessful attempts at getting neem onto my trees I seem to have hit upon a formula that works, though I will admit that I changed two variables at once. I was tired of failure though, and the thought of coming back from the orchard again with a sprayer full of chunks of neem was enough to make me throw the scientific process to the wind.

I started with water softened through a cartridge style water softener. This 10" cartridge fits into a standard water filter housing which I adapted to garden hose thread and then simply ran hose water through into the sprayer. I also added 1 cup of citric acid to my 30 gallons of spray water. I did not check the pH of the spray water but went on gut feeling that this amount of citric acid wouldn't drop the pH so much that it would cause foliar damage. The temperature of the water I used was probably around 50° F.

The long and short of it is that this worked- I did not have the distinct pleasure of scraping all the neem oil I put into the spray tank back out with a spoon. The only downside is that I've been reusing the neem oil following failed spray attempts- now that I'm actually applying it I'll have to buy more!

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