Tree Row Volume and Micronutrients

Posted by Jason MacArthur

Jason MacArthur

Registered: 6 years ago
Posts: 28

Tree Row Volume and Micronutrients

April 26, 2017 01:35PM

This year for the first time I am using MicroPak as a source of micronutrients. MicroPak has a label rate of 1 pint/acre for foliar feeding. I have done some basic calculations to ascertain that I will not be over applying boron using this product, which I thought I would put out there either to be corrected or perhaps to help some one else out.

My orchard is planted entirely on dwarfing rootstocks planted 6' X 12'. Many of my trees are only in their 2nd leaf, some in their 12th, and some in between, but experience tells me that this early in the season, which is 1/2" green on the early stuff, I probably have a dilute application volume of around 50 gallons/acre.

I have a long documented history of boron deficiency in my orchard, but am also paranoid about applying excessive amounts, so I am using 1 lb. Solubor/ 100 gallons dilute spray as a reference for safe application. (See for example [www.tfrec.wsu.edu]) This equals .2lb actual boron/100 gallon. Note this is a single pre-bloom spray, whereas MicroPak may be used multiple times leading up to bloom.

MicroPak has a density of 9.8 lbs./gallon and contains .6% boron, so contains .059 lbs. boron/gallon. Therefore, to equal the recommended safe level of boron application one would have to use (.2/ .059)= 3.4 gallons of MicroPak/100 gallons in a single application, far exceeding any interpretation of the label rate.

In fact, I am tempted to conclude that MicroPak may provide a maintenance dose of boron but is probably not appropriate for making up a deficiency, which seems right since this is not what it was designed to do.

Since my orchard is 1/5th of an acre I use about 10 gallons to spray the entire thing to runoff. At the label rate of 1 pint/acre I would apply 1 pint(16 oz.) * .2= 6.2 Tbl. MicroPak to cover the orchard. I will stick with this rate since it does not exceed any safe level of application, at least for boron.

My question is how does this amount vary with Tree Row Volume? Surely applying 1 pint/acre for an acre of standard trees and 1 pint/acre for an acre of young dwarf trees is a very different thing? It would seem to me that a label rate of 1 pint/acre is not very useful and should include some metric of volume. But to others using this or similar products it appears, barring a major mistake in my math(!), that the label rate is safe across a broad range of orchard applications.

Jason MacArthur

Mike Biltonen

Registered: 11 years ago
Posts: 298

Re: Tree Row Volume and Micronutrients

April 26, 2017 02:26PM

Jason,

Interesting questions, and ones that I've pondered myself.

1. You can probably spray MicroPak 4-6 times per year with no threat of overdosing the trees. Of course, using tissue analysis or sap analysis can help properly track and dial in what's needed...and when/if you're getting close to the edge. Solubor @ 1lb/acre doesn't put you at risk of toxicity either. Boron is not very stable in the soil, meaning it moves rather quickly with water and as it is taken up by the tree. But boron is SO critical to proper root growth and calcium uptake by the tree. And as we've discussed elsewhere, you have plenty of boron in the soil, its just not making it into the tree. Think biology to solve that problem.

2. **TRV.** Back in the olden days, spray recommendations were often made in a "per 100" basis. That is, you applied a certain amount of a material per 100 gal TRV. However, and it was never fully explained to me, the EPA didn't like that and wanted all labeled rates to be on a per acre basis. Now, that makes great sense when you're dealing with basically a two dimensional crop like grass or soybeans, but once it goes three dimensional [like a tree canopy], then it doesn't make sense - as you pointed out. However, from a tree fruit perspective, all labeled per acre rates are based on a industry standard "300 gallon tree." So if one wants to do the math, you back calculate the per acre rate to determine the per 100 rate. This approach can only be strictly applied to products with an EPA approved label, which MicroPak doesn't since it is considered exempt. That said, MicroPak has a "per 100" rate of 5.3 oz/100 gal TRV. The 6.2 tbl rate you arrived at is

about 3.1 fluid ounces. That is being applied to a 1/5 of an acre - meaning that you are just about spot on for the "1 pint per acre rate." If you wanted to apply the per 100 rate to your orchard [based on my TRV calcs], you need to apply about 1/3rd of that, or one ounce. Micropak is safe and designed to be applied over the course of the season. In this way you can spoon feed your trees as opposed to just one big dose at the beginning of the year.

I would check your TRV calculations for the orchard. Although you don't give all the dimensions of the orchard - all tree sizes, etc - I come up with a dilute TRV of greater than 50. But I could be missing something.

Mike Biltonen, Know Your Roots
Zone 5b in New York
Reply Quote

Jason MacArthur
Re: Tree Row Volume and Micronutrients
April 26, 2017 03:06PM
Registered: 6 years ago
Posts: 28

Mike-

As far as my dilute TRV of 50 that is based simply on experience- two trips with a full backpack allow me to cover everything to runoff(what fun!). Remember, many of my trees are in 2nd leaf with few branches, and of course they really don't have leaves at this point in the season. When I do the calculations I get a dilute TRV of something more like 108 gallons. I think working with a hand pumped backpack sprayer on dwarf trees there is so little overspray it might affect this rate a great deal.

So if the label rate works out to 5.3 oz./100 gal TRV I sprayed at several times that rate this past weekend, but so far all of my tissue hasn't turned black! In the future I'll stick with the lower rate of 5.3 oz/100 gallon TRV.

Jason
Reply Quote

Ian Graham
Re: Tree Row Volume and Micronutrients
May 03, 2017 12:30AM
Registered: 10 years ago
Posts: 59

sorry, newbie question: what is TRV?

Old 99 Farm and permaculture site
Dundas ON 5b
Reply Quote

Mike Biltonen
Re: Tree Row Volume and Micronutrients
May 03, 2017 12:52AM
Registered: 11 years ago
Posts: 298

TRV is Tree Row Volume and is way to calculate the total canopy volume of an orchard and match a spray to the size of trees (a 3 dimensional structure) as opposed to a 2 dimensional acre. For orchards (or any 3 dimensional canopy volume) it goes like this:

43,560/between row distance (e.g., 43,560/20'=2,178) linear feet per acre.

times tree width and tree height. (e.g., 10', 15') or 2178 x 10 x 15 = 326,700 cu ft of canopy volume. The general rule of thumb is 1 gal of spray per 1000 cu ft of canopy volume. So in this example it would be 326 gallons of spray required to cover an acre to "dilute" or runoff. It has other implications, such as when applying materials recommended in "per 100 gal TRV" rates or when back calculating from per acre rates (generally made based on a 300 gal per acre basis).

It goes beyond that technically, but in terms of knowing approx how much spray is needed or should be required to cover your orchard, this is a good approach.

Mike Biltonen, Know Your Roots
Zone 5b in New York
Reply Quote

Newer Topic Older Topic
Print View RSS