

Watermelon - sulfur trials

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I have been conducting trials that examine whether or not adding extra sulfur to watermelon increases yields or fruit quality. This is going to be a quick summary of the results for the three years of trials I have conducted so far. Seeded watermelon was used in 2 years of the study with seedless watermelon used in one year of the study. The set-up is pretty straight forward: soil samples were taken to see what nutrients were needed. Based on this we added the recommended amount of sulfur (we used different soil testing labs and used multiple samples with similar results and recs). The average amount of sulfur to add was between 15 and 25 lbs./a for the 3 trials. Once sulfur and the other nutrients were added the treatments were: 0, 10, 20, 30 and 40lbs per acre of extra sulfur being added to the plots. Petiole samples were taken and notes on first flowering, first female flowers, % fruit set, etc. were noted. To save time and because this year's results were equivalent to the first 2 years of the trial I'll only show this season's results. Crimson Sweet was the cultivar used for 2016.

Yields of watermelon were significantly greater in the 20 and 30 extra pounds of sulfur compared with the control (fig 1). Over the 3-years of trials there was no significant difference between 20 and 30 lbs. and very little difference between 30 and 40 lbs. So an average addition of 20-30 lbs. is a good starting place. Usually there was no difference in the percent sugar content of the watermelons among any of the sulfur treatments, although for 2016 the 30 lbs. of extra S was significantly greater than the control (fig 2). Thirty and forty pounds of added sulfur increased levels of sulfur in tissue tests taken during the season to adequate levels. Treatments with 10 lbs. or less of added sulfur resulted in deficient levels in the tissue tests. There were no other differences in any of the other measurements between treatments. After two trial years I quit using the 40 lbs. of sulfur treatment because that level of sulfur never was much different from the 30 lbs. treatment. I will need to do this study at additional locations for a number of years to be more confident of these results.

The reason I am talking about it now is because of what else I did this past year that I should have started 4 years ago. This year I randomly took petiole samples from watermelon fields. The one thing most of them had in common was a deficiency in sulfur (fig 3). There may have been other deficiencies such as with phosphorous or manganese or nitrogen, etc. but only sulfur was consistently found to be deficient in 52% of the samples with an additional 23% being on the low end of "low". This was not a big survey (27 fields total; 65% from the western shore, 35% from the eastern shore) and it was done during a strange weather year and S levels may have been abnormally low. Nevertheless the results of the survey surprised me, so I decided to talk about my sulfur study a little early. For now what growers should do next year, if they are not already doing this, in their watermelon fields is to take petiole samples a couple of weeks before first harvest to see where they stand.

Why does it seem that we need more sulfur in our watermelon fields then say 30 or so years ago? I think figure 4 shows one possible reason as it is the amount of sulfate sulfur deposited in rainwater in the continental U.S. We can see that the mid-Atlantic had high levels of sulfur in our rainwater (acid rain) in 1986 but in 2011 we had much lower levels of sulfur deposited from our rain water—

and that is a good thing. We just need to check our watermelon fields during the season to see if any particular field is low in sulfur.

I will take more petiole samples from watermelon fields in the coming seasons and repeat the sulfur-additions studies to see if the results hold up. I will talk about the results of the 3-year study in more detail at some of the winter meetings that are coming up. If anyone has any suggestions as to anything else I need to look at in these studies please let me know.

Fig. 1 Yield of watermelon with added amounts of sulfur (lbs/a)

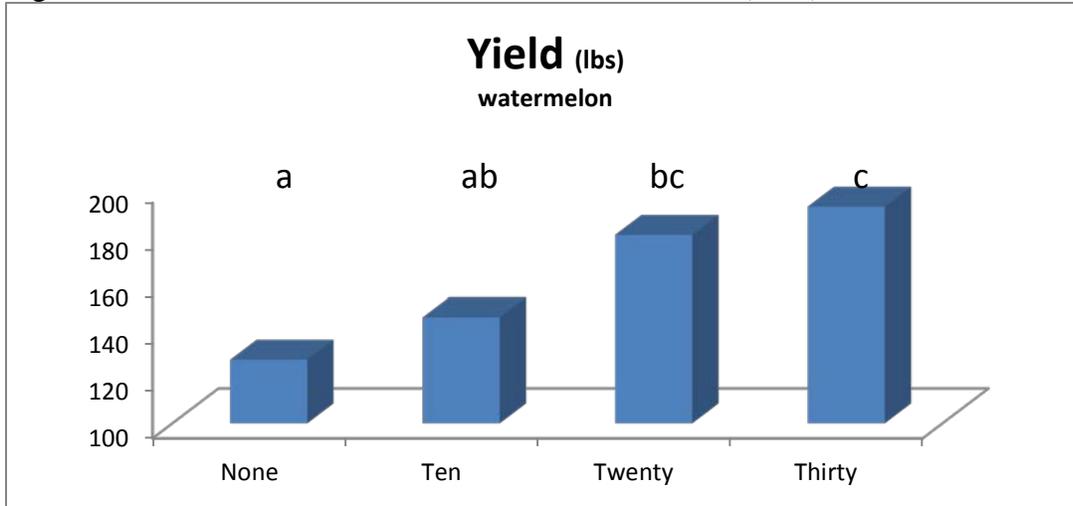


Fig. 2 Percent sugars in watermelon fruit with differing levels of sulfur added (lbs/a).

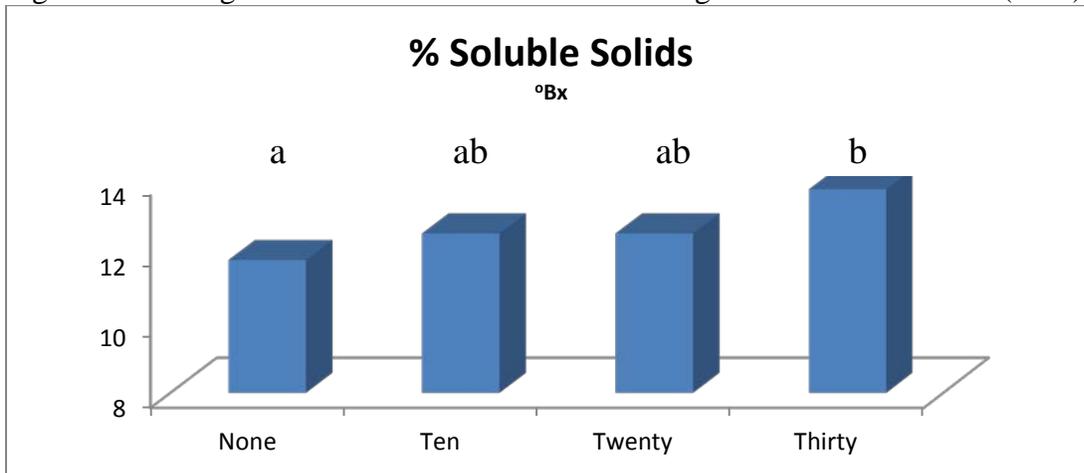


Fig. 3 Two examples of petiole nutrient sample results taken from 2 different watermelon fields in 2016.

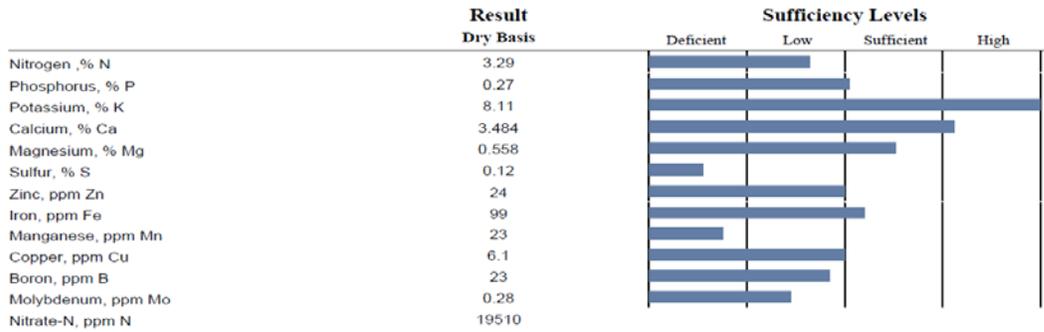
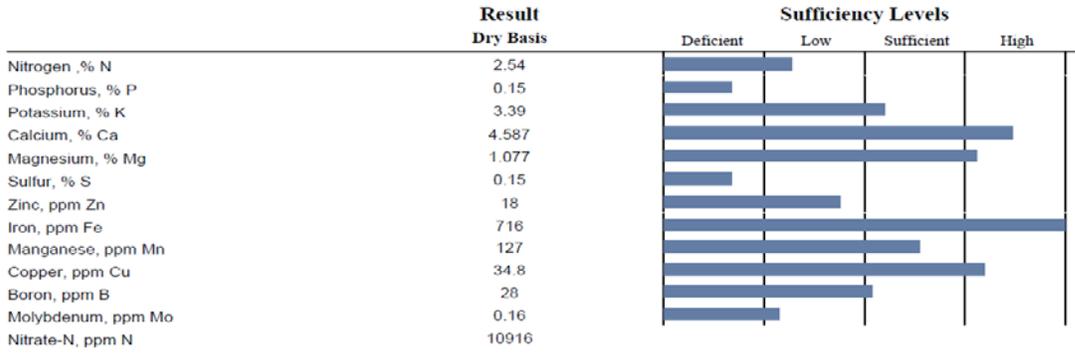


Fig. 4 Maps showing sulfur deposition in the United States in 1986 and 2011

