SATURDAY, 17 JUNE 2017

More about wood ash and why it seems to reduce turf disease

Before I go any further, don't be an idiot. The information I'm about to share is to peak interest and hopefully inspire some research on the use of wood ash and it's byproducts for disease control in turfgrass.

Doing any of the stuff I describe in this post would be foolish. Using home made pest control products is a great way to lose your job and as you'll see, using wood as can harm grass.
Not knowing all of the potential impacts to your grass, the environment and your applicators can result in bad things happening and can even be against the law in your jurisdiction.

What happens if someone on your crew gets this stuff in their eyes? Do you have a MSDS for the mixed solution? What if a golfer gets hurt. Just because it's natural doesn't make it safe.

Plain and simple there are a million reasons not to play around with homemade pest control products on a commercial golf course. Do so at your own risk.

So.....

After a previous blog post highlighting how Rob Wilke has gone 2 years with only his winter snow mold fungicide applications I had a number of people offer ideas of why the wood ash might be fighting disease.

One of the products of leaching wood ash is potassium bicarbonate which is a known organic fungicide. Check out the following .pdf info sheet on potassium bicarbonate or click on the link below to go to the original file. Here is another article about using potassium bicarbonate in agriculture.

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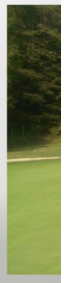

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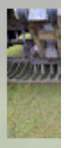

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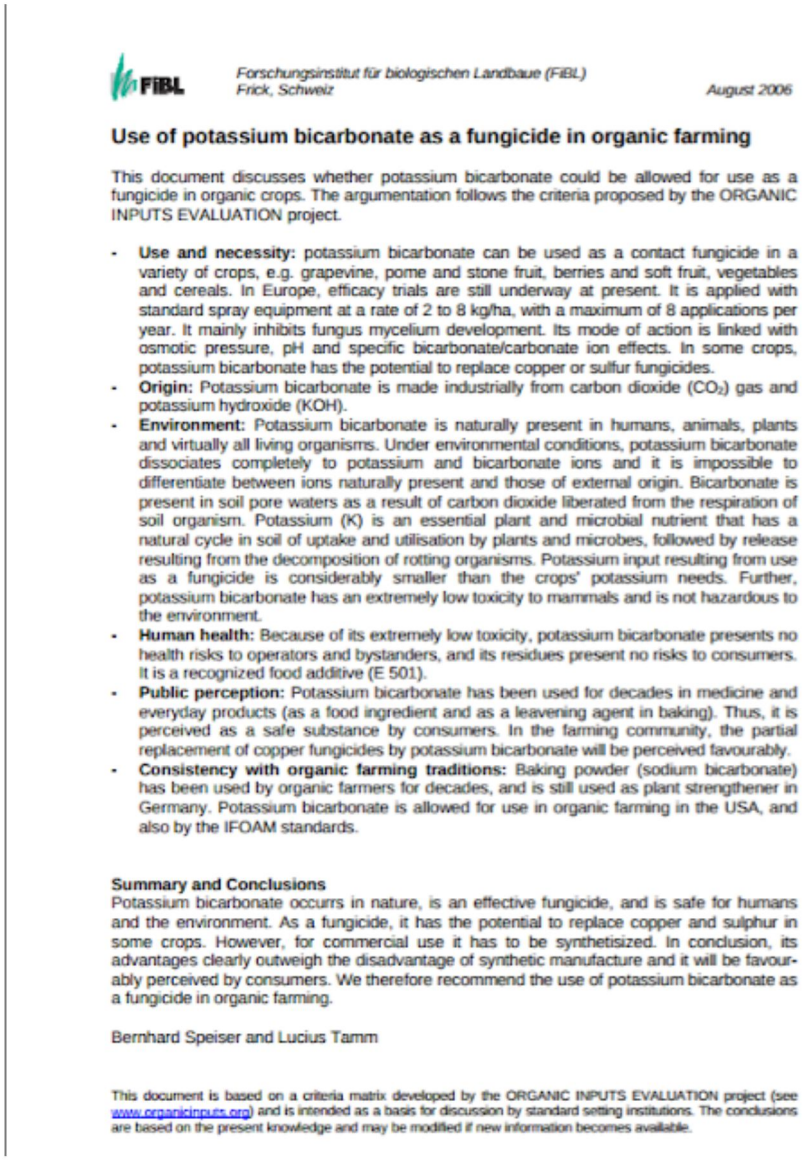

Forschungsinstitut für biologischen Landbaue (FiBL)
Frick, Schweiz

August 2006

Use of potassium bicarbonate as a fungicide in organic farming

This document discusses whether potassium bicarbonate could be allowed for use as a fungicide in organic crops. The argumentation follows the criteria proposed by the ORGANIC INPUTS EVALUATION project.

- **Use and necessity:** potassium bicarbonate can be used as a contact fungicide in a variety of crops, e.g. grapevine, pome and stone fruit, berries and soft fruit, vegetables and cereals. In Europe, efficacy trials are still underway at present. It is applied with standard spray equipment at a rate of 2 to 8 kg/ha, with a maximum of 8 applications per year. It mainly inhibits fungus mycelium development. Its mode of action is linked with osmotic pressure, pH and specific bicarbonate/carbonate ion effects. In some crops, potassium bicarbonate has the potential to replace copper or sulfur fungicides.
- **Origin:** Potassium bicarbonate is made industrially from carbon dioxide (CO_2) gas and potassium hydroxide (KOH).
- **Environment:** Potassium bicarbonate is naturally present in humans, animals, plants and virtually all living organisms. Under environmental conditions, potassium bicarbonate dissociates completely to potassium and bicarbonate ions and it is impossible to differentiate between ions naturally present and those of external origin. Bicarbonate is present in soil pore waters as a result of carbon dioxide liberated from the respiration of soil organism. Potassium (K) is an essential plant and microbial nutrient that has a natural cycle in soil of uptake and utilisation by plants and microbes, followed by release resulting from the decomposition of rotting organisms. Potassium input resulting from use as a fungicide is considerably smaller than the crops' potassium needs. Further, potassium bicarbonate has an extremely low toxicity to mammals and is not hazardous to the environment.
- **Human health:** Because of its extremely low toxicity, potassium bicarbonate presents no health risks to operators and bystanders, and its residues present no risks to consumers. It is a recognized food additive (E 501).
- **Public perception:** Potassium bicarbonate has been used for decades in medicine and everyday products (as a food ingredient and as a leavening agent in baking). Thus, it is perceived as a safe substance by consumers. In the farming community, the partial replacement of copper fungicides by potassium bicarbonate will be perceived favourably.
- **Consistency with organic farming traditions:** Baking powder (sodium bicarbonate) has been used by organic farmers for decades, and is still used as plant strengthener in Germany. Potassium bicarbonate is allowed for use in organic farming in the USA, and also by the IFOAM standards.

Summary and Conclusions

Potassium bicarbonate occurrs in nature, is an effective fungicide, and is safe for humans and the environment. As a fungicide, it has the potential to replace copper and sulphur in some crops. However, for commercial use it has to be synthetisized. In conclusion, its advantages clearly outweigh the disadvantage of synthetic manufacture and it will be favourably perceived by consumers. We therefore recommend the use of potassium bicarbonate as a fungicide in organic farming.

Bernhard Speiser and Lucius Tamm

This document is based on a criteria matrix developed by the ORGANIC INPUTS EVALUATION project (see www.organicinputs.org) and is intended as a basis for discussion by standard setting institutions. The conclusions are based on the present knowledge and may be modified if new information becomes available.

http://www.betriebsmittelliste.ch/fileadmin/documents/de/hifu/stellungnahmen/potassium_bicarbonate_organic.pdf

Here is a blog post explaining how the author makes potassium carbonate by leaching wood ash. Here is another post and even another post outlining the same process. Their process is very similar to what would happen in a compost tea brewer. The only thing that Rob is doing differently is that he isn't boiling off the water and is just using the potassium bicarbonate / compost solution.

You might notice that the above reaction makes potassium carbonate. The extra carbon comes from the air that Rob bubbles into his compost tea brewer. Some have also suggested that simply having the solution exposed to the air is enough to convert it to bicarbonate.

So with Rob's observations and this new information I am pretty sure that what is happening is that potassium bicarbonate is leaching out of the wood ash and this is acting as a contact fungicide. This would confirm Rob's observation that this substance had curative properties.

Rob Wilke
@RobWilke1

Replying to @RobWilke1 @Prograss1

it is preventative and curative. Evolutionary breakthrough as far

as I'm concerned. Saves me about 5 apps of fungicide/yr.

1:43 AM - Oct 14, 2016

See Rob Wilke's other Tweets

So since writing my last blog post on the subject I have been playing around with wood ash.

I put in a pretty bad effort last fall with rates that were hardly accurate and found signs of phytotixicity. Essentially, I was over-applying it by a lot! It seemed that after each wood ash application, I had a disease outbreak shortly after! See, it's not all rainbows and unicorns, natural products can kill your grass and probably will.

Untreated control is much greener than areas that received high rates of wood ash.

Fast forward to this spring.....

My last traditional fungicide application was last fall shortly after the above picture was taken on Nov 17th. I have never gone that far without a traditional fungicide application. It's also important to note that my troublesome greens when it comes to disease essentially died from crown hydration....so that's certainly a contributing factor to the reduced need for disease control. No grass, no fusarium. It's also important to note that I did not use wood ash on my recovering greens. We simply do not know enough about it and its potential impacts on new seedlings and spring recovery rates.

Newly seeded bentgrass greens did not receive any wood ash sprays this spring.

See, this is why we pay the big bucks for traditional pest control products, so that we can be certain that they will give us success. Needless to say, my recovering greens needed just one traditional pesticide application this May. Was it because of the no wood ash, orthe fact that they were receiving nitrogen rates well above what the growth potential would suggest I apply for normal growth on healthy grass? I am almost certain that the disease was from the elevated nitrogen rates. Don't feed the fusarium!

So is my success because of the wood ash solution? I honestly can't say for certain. I laid out a grid pattern on my practice green and there is no disease anywhere on any of the different treatment rates or control. This suggests to me that I am having more success with my other disease management strategies. Either way, it is interesting and highly coincidental that I have had this success especially with the cool and extremely wet spring we have had as well as prolonged snow and ice cover on all greens. It just says to me that maybe our issues with disease like fusarium are more self inflicted than we think. With the changes I have made over the years to the way I manage fusarium, I don't worry when a stretch of cool wet weather hits anymore.

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260 days traditional pesticide broadcast spray free on our 8th green (not including spot sprays).

I also haven't gone out with weekly applications like Rob had suggested. I'm pretty much against preventative pest control applications for diseases like fusarium or dollar spot and thought that I would apply these same principles to the wood ash solution because hey, just because it's free and natural, doesn't change the fact that it's probably a pesticide and it is designed to kill things and I like to always see a little disease out there so that I can tweak what I'm doing and better understand what impacts my management decisions might have on disease severity. What about resistance issues? Since discussing this with Rob he has also switched to only as needed.

Rob Wilke
@RobWilke1

Replying to @GetBent1869 and 3 others

I've switched to just during pressure. Working great.

♡ 3 5:49 PM - Jun 10, 2017

See Rob Wilke's other Tweets

It's also worth mentioning that Rob continues to have disease management success using wood ash (or other good management practices).

Rob Wilke
@RobWilke1

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Replying to @PenderSuper and 2 others

580 days of no synthetic pesticide on the corner of the practice green. 227 days for the rest of our greens.

♡ 4 10:07 PM - Jun 10, 2017

See Rob Wilke's other Tweets

Ok, so if this is the real deal and researchers can figure out safe rates and intervals and safe management practices for using wood ash...what are the pros and cons.

Pros:

- It's free as long as you have wood ash.
- Potentially low environmental impacts as this is exactly what would happen to ash that gets wet in nature. Aren't forest fires seen as good for the environment? It's kind of like when you burn the native areas, right?
- Kind of like tree recycling, you cut down trees that hurt turf, and use byproducts to further help the turf.
- Much lower quantity of active ingredient required than other organic pest control products like sulfur which could potentially have a lower impact on soil health etc. (total speculation on this part obviously). At 750g ash/hectare per application a 25 kg bag could last you a year or more.
- Hippies will love this. They use lye (leached wood ash) to make their gluten free, farm to table, organic, non GMO, artisanal, local, vegan hand soaps.

Cons:

- What happens if we stop supporting the companies that make, register, and test our highly effective synthetic pesticide products? If there is no market they simply stop selling these products which in my opinion, are still important and likely have less environmental impacts of many organic pest control products despite the negative press they receive. Traditional pesticides are great, I just think we could improve on how we use them a bit.
- Hippies will love this. Is it even possible to make a Hippy happy? Do you want more hippies on your golf course? 😜

So there you go. I would really like to see some university research done on this so that maybe one day we can better understand what is going on here and maybe use wood ash safely and effectively.

Posted by Jason Haines

Labels: wood ash

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