



Hard Cider? Kill Some Weeds With It!

By Dr. John Stier, Department of Horticulture, University of Wisconsin-Madison

The buzz in the weed world this summer has been all about vinegar. Earlier this spring several scientists from the United States Dept. of Agriculture (USDA) in Beltsville, MD, published a report that vinegar could be used to kill weeds. The scientists tested "vinegar" concentrations ranging from 5 to 30% on weeds commonly found in corn fields: velvetleaf, pigweed, lambsquarters, foxtail, and Canada thistle. Both greenhouse and field trials were conducted.

The results showed that young weeds could be killed with "vinegar" concentrations as low as 5%. Older weeds required greater concentrations of "vinegar". Canada thistle, often difficult to control chemically due in part to the hairy leaf surface that prevents adsorption of chemicals, was especially easy to kill. And killing occurred quickly—just two hours to

kill the top growth.

And cost? The scientists calculated broadcast applications of 20% "vinegar" could cost as low as \$65 per acre. That's comparable to or even better than some conventional herbicides.

Vinegar can of course be made from fruits or grains. Apple cider vinegar is just one type. Vinegar is readily available from a number of sources. In some cases it is sold as an herbicide; other suppliers sell it for a variety of purposes.

The Wisconsin DNR conducted a test using vinegar this summer for controlling creeping charlie (*Glechoma hederacea*) [sic] and Canada thistle (*Cirsium arvense*) at Lake Wissota State Park. The project used 12% vinegar. Like the USDA project, thistle and creeping charlie leaves turned brown within 2 hours (nettles were unaffected). Six days after application the smaller thistles were dead along with the creeping charlie. The only "visible problem" associated with the vinegar was that it also affected non-target plants such as the grass. However, turf managers familiar with glyphosate and other non-selective herbicides should not have a problem as long as selectivity is not expected or desired.

Best of all vinegar is relatively safe for humans and the environment. This spring the EPA invited summary comments on use of acetic acid and salts and listed a preliminary report on toxicity (safety) of the product. Ultimately vinegar could be viewed by the EPA and other agencies or groups as a replacement for conventional herbicides.

If you are by now thinking this is too good to be true just bear with me and maintain an open mind. As with many things that go to popular press without peer review and full disclosure there are considerations that may not at first be evident.

Canada thistle, creeping charlie, and almost all other turf weeds are perennials. The vinegar is essentially acting as a non-selective contact herbicide. The top growth may be killed but new growth is likely to occur from structures such as creeping rootstocks, stolons, and rhizomes. Repeat applications may sufficiently weaken the weed to the point that it dies, but multiple applications of non-selective herbicides eventually denudes the ground of all vegetation. Erosion and associated problems may result.

Another oversight is the reporting of the rate of vinegar concentrations. In reality it is not the concen-



**Delivering
Total Solutions**



**Programs Tailored to Fit
What You Need**

Contact Simplot Partners:
Cubby O' Brien: (630) 514-8754
or fax to: (262) 742-5147

www.simplotpartners.com

© 2001 J.R. Simplot Company. All rights reserved.

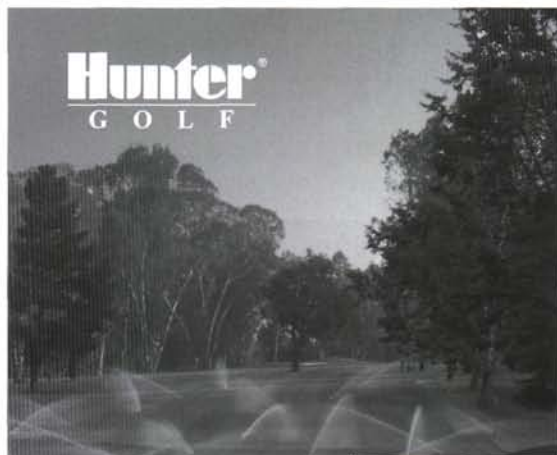
tration of vinegar that was tested so much as it was the concentration of acetic acid. Acetic acid (or more correctly the acetate ion) is the "active ingredient" in vinegar. Somehow, though, "acetic acid" does not sound as safe as "vinegar", so people desirous of a "natural" herbicide call it vinegar. I suggest consumers be extremely wary of any product that relies on "doublepeak" to sell itself.

There is more to the story than simply raiding the food pantry at home for weed control products. Vinegar purchased in the grocery store contains approximately 5% acetic acid. Vinegar with greater concentrations of acetic acid must be purchased through special suppliers. When I did a quick calculation of vinegar costs based on the retail price of a gallon of vinegar containing 20% acetic acid the actual cost ranged from \$500 to \$1000 per acre depending on if a spray rate of 1 or 2 gallons per thousand square feet was used. Since the DNR study sprayed the weeds to the point of runoff even the 2 gallon rate may be insufficient.

Like all pesticides, vinegar has a Material Safety Data Sheet (MSDS). The MSDS gives the boiling point

(244 F), autoignition temperature (427 C for acetic acid), and other technical data. Listed on the MSDS under Unusual Fire and Explosion Hazards was the following: "Toxic gasses and vapors may be released in a fire involving concentrated vinegar". The short term exposure limit was described as "15 ppm for 15 minutes". The document stated the vapors could irritate the respiratory tract and to "avoid inhalation". Skin contact could result in mild injury and burns when vinegar contained 11% acetic acid or greater, and that some individuals could suffer dermatitis even from dilute solutions. Even more worrisome was the statement "Eye contact: May cause severe burns and permanent corneal injury from concentrated vinegars. May be followed by blindness. High vapor concentrations may result in conjunctivitis." Another part of the label stated "Do not flush to streams or sewers." Sounds like a MSDS for a "toxic" pesticide.

I'm not trying to make light of the safety hazards of vinegar; on the contrary, it could have a useful role in weed control. The point is that nothing is absolutely and inherently without hazards (read the MSDS for water). Consider the following situation: in September



Professional Irrigation System
Repairs, Renovations, New Construction

ONE CALL HANDLES IT ALL JOHN DEERE LANDSCAPES

You're working to keep your course 100 percent playable throughout the season. Now there's a new team member ready to provide the irrigation supplies, service and support you need to achieve that goal – John Deere Landscapes. With a nationwide network of branches and staff, John Deere Landscapes has the professional expertise and equipment to solve any site challenge. Call today: 800-642-3706.

- Irrigation Systems Featuring Hunter Golf** Reliable rotors, valves, central control systems, maintenance radios
- Pump Stations** Customized for your course
- Fountains and Landscape Lighting** AquaMaster and Oase fountains, Vista Professional Outdoor Lighting
- BoardTronics Controller Board Repairs** Replace outdated Toro® and Rain Bird® controller boards: 888-855-9132
- Direct Sales** Quantity shipments of landscape products and nursery stock: 866-880-9380
- More Than 220 Branches Nationwide**



JOHN DEERE
LANDSCAPES

www.JohnDeereLandscapes.com

On-Site Consultation: 800-642-3706

mass media in Wisconsin reported a UW-Madison study found ultra-low levels of a conventional broadleaf herbicide fed to mice reduced the litter size (interestingly enough, higher doses did not affect reproduction). In interviews the researcher stated that people should use vinegar and ammonia to kill lawn weeds instead of conventional herbicides. Simply telling people to use alternative compounds for weed control is too simplistic. There are no valid techniques nor do sufficient information exist to make a general recommendation for many if not all alternative products.

The purpose of the USDA research was ultimately to develop products for weed control in organic farming. Its important to keep this fact in mind: growing row crops for yield is different than maintaining a permanent turf for quality. In row crop production it is usually most important to control weeds early in the life cycle of the crop. Once the crop has grown sufficiently for leaves to cover the soil surface, weed germination and competition with the crop is minimized. The USDA scientists have a valid approach to developing a product useful for organic farmers. Does that mean vinegar is appropriate and useful for weed control in all settings? Not at all. The problem is that the EPA, through the Food Quality Protection

Act, and groups against conventional pesticides view vinegar as a safe and logical alternative for weed control. Hopefully reason will prevail and vinegar can take its place on the herbicide lists without replacing conventional products. I just wouldn't want to bet on it.

References

- Anonymous. 2002. The Vinegar as an herbicide information page of the Sustainable Agricultural Systems Laboratory.
<http://www.barc.usda.gov/anri/sasl/vinegar.html>.
- Anonymous. 1997. Vinegar MSDS.
<http://greensense.net/vinegarmsds.html>.
- Anonymous. 2002. Robust summaries & test plans: acetic acid and salts.
<http://www.epa.gov/chemrtk.c13102tc.htm>.
- Cavieres, M. F., J. Jaeger, and W. Porter. 2002. Developmental toxicity of a commercial herbicide mixture in mice: I. Effects of embryo implantation and litter size. *Environ. Health Perspectives* 110:1081-1085.
- Lueck, Stacy. 2002. Use of vinegar as an herbicide on weeds within and around the shoreline restoration site at Lake Wissota State Park. Wisconsin Dept. of Natural Resources. Interim report, 10 July 2000. ♻

NEED A LOW COST SHELTER FOR GROUNDS EQUIPMENT OR GOLF CARTS?

CONSIDER A HOOP BUILDING



**All
Around**
CONSTRUCTION

Call 715-335-4945

- Available in widths from 30 to 50 feet
- No limit to the length
- Fifteen year warrantee
- Fast easy erection
- They don't sweat like a metal building

Metal buildings also available with Steel of Pole Framing