



THE REGULAR, AND NOT SO  
REGULAR, NEWSLETTER OF THE  
GARLIC SEED FOUNDATION



# The Garlic Press

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Initial membership in the GSF is \$15/4 issues. Renewals are 8 issues for \$20. All submissions for **The Garlic Press** should be sent to GSF, Rose, NY 14542-0149 or [gardunk@yahoo.com](mailto:gardunk@yahoo.com). All medical references should be taken for educational purposes and any recommendations should not preclude consulting with a health practitioner. Please, no reprinting any material herein without written permission.

## Vinegar: An Effective Organic Herbicide

2003 Garlic Field Trials at Honey Hill Farm

by Fred Forsburg (15 Jan. 04)

I received a USDA-SARE grant in 2003 to field test the use of vinegar as an organic herbicide in garlic production. This research was directed at the in-row control of weeds only. Between-row weeding was accomplished with mechanical control. Based on USDA laboratory research, I selected 10% acetic acid vinegar as it was shown to possess greater ability to kill weeds than the ubiquitous 5% vinegar. In my research, I additionally confirmed that vinegar is OMRI compliant for organic production.

In my field trial, I found that basally applied vinegar is an effective organic herbicide. According to USDA-Beltsville researchers, vinegar kills plants by producing a breakdown of the cell membrane integrity resulting in desiccation of foliar tissue. Vinegar controlled all broadleaf weeds in my garlic but provided mixed control on grasses. This may have been due to the cool and wet conditions we experienced throughout our 2003 growing season in upstate-NY. Weed control appeared to be more successful when temperatures exceeded 70 degrees and direct sunlight was available.

For optimal effect, most weeds should be sprayed when in their cotyledon or seedling stage. Many weeds can be controlled even in full leaf but may regenerate from root reserves e.g. thistles, dandelion. Vinegar should be treated as a non-selective herbicide, and, as most herbicides, is much more effective prior to seed set.

My first application, on May 10, was applied when the garlic was at 18" height, using a drift guard to protect the garlic as much as possible. While there was damage to the lower 1 or 2 leaves in the form of tip burn, it later proved to be cosmetic. The four subsequent applications (5/20, 6/1, 6/15, 6/22) seemed to have little visible effect on the more mature garlic and I later removed the drift guard when spraying. All test plots demonstrated effective control, but those that were sprayed on both sides of the row were almost totally devoid of broadleaf weeds. With regard to the garlic crop, I saw no difference in plant size, maturity date, quality, yield, bulb size, appearance, or keeping ability between the test and control plots.

This field trial reveals a substantial saving of labor for in-row cultivation of garlic. It required 18-20 hours to manually in-

row weed half an acre. One can basally spray the same plot in 1-2 hours. **This represents a 90% reduction in labor!**

The goal in herbicide spraying is the uniform application of product on the weeds. This is achieved through the use of calibrated spraying technology and selected travel speed. Sprayer calibration is accomplished by selecting the proper combination of pressure, volume and spray pattern for the target species. Large droplets can bounce off leaves and small droplets will drift. Thus controlling droplet size minimizes drift, improves effectiveness of the product, and reduces waste. Droplet size is a function of pressure and nozzle flow rate. With no pressure-controlling mechanism, the droplet size varies constantly with pressure changes in the sprayer and a poor result is certain, along with inefficient and ineffective use of the herbicide.

To control pressure, I used a device called a CFValve (Constant Flow Valve). It provides a constant flow regardless of varying input pressure. The second variable, the nozzle provides the flow rate and pattern. The third variable, travel speed is necessary in maintaining accurate applications. Gallons per acre are a function of nozzle flow, pressure and travel speed. I used a Solo backpack sprayer with the CFValve @ 21.5 psi and a TeeJet XR11002VS nozzle. This produced a medium droplet @ 20 gallons per acre.

Five applications on a half-acre required 50 gallons of product. The purchase of a 55-gallon drum costs \$67. Thus the cost of each treatment is \$13 versus 18 hours of manual labor. Shipping cost varies based on shipping distance and is not included in the equation. At conclusion of this project, no soil pH changes were found.

Vinegar is additionally useful as a general burn-down herbicide when weeds are young and rapidly growing. At the end of the season, vinegar has an advantage over other herbicides in that it can be mixed with water and tossed with your salad. Vinegar: the incredible edible herbicide!

[We thank Fred for sharing his research. A complete version of Fred's SARE report can be found electronically at [222.sare.org](http://222.sare.org). Grant Number FNE03-461 and hard copy from GSF/ROSE (\$4.00). Fred is available for serious comments and questions at [honeyhillfarm@exite.com](mailto:honeyhillfarm@exite.com) (D.S. com)]