Organic Production and Marketing Newsletter

J. J. Ferguson,
Editor
Professor and Extension Horticulturist
UF/IFAS - Horticultural Sciences Dept.
PO Box 110690/
Gainesville FL 32611-0690
jjfn@ifas.ufl.edu

The purpose of this newsletter is to provide production/marketing information about organic and related sustainable farming practices.
Contributions are welcome.

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This web site is maintained by Susie Lonon.

James J. Ferguson

Horticultural Science Department
University of Florida
UF/IFAS

Professor and Extension Horticulturist
P.O. Box 110690 / 2111 Fifield Hall
Gainesville, Fla. 32611-0690
PH: 352-392-1996 x302
FAX: 352-392-5653
Email: jjfn@ifas.ufl.edu

My program, including extension, research, and teaching responsibilities, focuses on sustainable and organic fruit crops farming systems, especially citrus nutrition with controlled-release fertilizers, poultry litter, other non-synthetic materials and alternative weed management methods. Sustainable agriculture, organic farming, and the more consumer-oriented ecolabeling movement pose social, political, and economic options, important not only to farmers and consumers but also to more conventional growers and consumers who may, by choice or regulation, come to incorporate many of these sustainable concepts and practices as well. Details and additional information are available at the below links.

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Organic Express

You've heard of Community Supported Agriculture with consumers fronting cash to a local farmer at the beginning of the production season in exchange a for weekly pickup of fresh , sometimes even organically grown produce. The next step in tailored produce marketing, developed by Paul Johnson, founder of Organic Express, features home delivery of boxed organic produce averaging $25-$35/box but ranging up to $100/box, ordered via an internet account and paid by credit card.

The full produce inventory lists 50-70 items and customers can order *a la carte* or take the standard seasonal mix based on seasonality and availability of produce. Based in San Francisco but now expanding to Los Angeles with a total of 5,000 customers in both cities, Organic Express has successfully exploited a market niche, using internet/credit card ordering systems, the growing interest in organic food, and the kind of personalized delivery service reminiscent of big city grocers in the first half of the twentieth century. But who's at home to accept deliveries?

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Organizing Country Stores

If you own a small, economically challenged country store built before 1927, do I have a deal for you. In a New York Times article (11/28/04) on "Vermont's Country Stores Organize to Face Threats," 55 independent store owners have joined the Vermont Alliance of Independent Country Stores. Started several years ago with state grants and sustained by annual $50. member fees, the Alliance, along with the Vermont Grocers Association, serves as a support network, a sounding board and a marketing tool. Members can market themselves on the Alliance web site (http://www.vaics.org) and purchase inventory, even when they only want to order a few gallons of milk at a time instead of the large supply ordered by supermarket chain stores, big box stores and even convenience stores. Plus you might even get to walk to the store, pet the dogs, walk the creaky wood floors, and have coffee on the front steps. Good example of organizing to maintain businesses in a rural atmosphere.

Another survival strategy I've heard about concerns a fruit tree nursery that used to sell a large portion of its inventory to chain stores. Once the chain store asked the nursery to maintain and take back unsold stock and to accept payment only after the trees were sold, the nursery closed out its fruit tree inventory to produce only woody ornamentals that could be marketed more easily elsewhere.

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Low-Carb Potato

With 1/3 fewer carbohydrates that a conventional russet potato, the new SunLite spud may be available February, 2005. Developed jointly by the University of Florida, Florida potato growers and the Dutch seed company HZPC Holland BV, 2,000 to 2,500 acres will be planted in 2005, with more acreage to be planted when the seed supply increases. The potato is round to oval, has cream-colored skin and light yellow flesh. It can be grown from Florida City to Jacksonville from January through June and can go from the field to supermarket shelves in two to five days, making it fresher than potatoes stored in coolers for months. The low-carb potato has 13.93 carbohydrates per 100 grams, or 30 percent less than the 19.87 grams in the industry's standard, the Russet. A half-cup serving has 10.9 grams of carohydrates, compared with 15.5 carbohydrate grams for a cooked Russet potato.

I have not been able to obtain a published description of the breeding process but newspaper accounts indicate that this potato was developed using traditional breeding methods.

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Super Size Me

Morgan Spurlock, best know for dining three squares a day on MacDonalds cuisine in his movie, “SuperSize Me,” will deliver the keynote speech at The Organic Trade Association’s 2005 Chicago Trade Meeting, “All Things Organic”. According to The Organic Trade Association Spurlock’s presence will “help put a spotlight on the general trend of overconsumption and unhealthy eating patterns in our country and will offer a challenge to the food industry on how to responsibly market its products particularly to children”.

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Show Me the Data!

In the movie “Jerry Maguire” Cuba Gooding, playing a football player wanting more media coverage from his agent, Tom Cruise, demands “Show me the money!” Presented with claims that organically grown food is more nutritious or more healthful, agricultural scientists have asked ”Show me the data.”

In reply, The Organic Trade Association developed an affiliate organization in 2002, The Organic Center for Education and Promotion. Its mission is to “communicate credible, science-based organic benefits to the public, resulting in greater awareness and use of organic products, the conversion of agriculture to organic methods, and improved health for the Earth and its inhabitants”.. (http://www.ota.com/about/organiccenter.html) The Center has funded the below three studies, due in 2005, focusing on the impact of organic farming methods and food processing technologies on the antioxidant and polyphenol content of food:

1) A Comparison of Lycopene and Other Phytochemicals in Tomatoes Grown under Conventional vs Organic Management Systems conducted by the World Vegetable Center in Taiwan

2) A Comparison of Strawberry Fruit Quality from Organic and Conventional Farms by Washington State University

3) New Approaches to Measure the Impact of Farming Systems and Technology on Food Quality at Tufts University

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First Virus to Infect Red Imported Fire Ants Discovered

The first known virus to infect the destructive and costly red imported fire ant (RIFA) was recently discovered by Agricultural Research Service scientists. RIFA, *Solenopsis invicta*, currently infests about 300 million acres in the United States. Although RIFA is native to South America, it thrives here because of a lack of natural enemies. Fire ants cost Americans hundreds of millions of dollars annually. The ants occasionally kill young, unprotected livestock and wildlife, and they inflict a painful sting that is sometimes deadly to humans.

Steven M. Valles, an entomologist with the ARS Center for Medical, Agricultural and Veterinary Entomology (CMAVE) in Gainesville, Fla., and colleagues at CMAVE and the Agriculture Research Service (ARS) Horticulture and Breeding Research Laboratory in Fort Pierce, Fla., have identified a new natural enemy of RIFA.

A survey in Florida locations found that approximately 23 percent of RIFA nests examined were infected with SINV-1. The virus infects all fire ant castes and stages of development, and Valles was able to successfully transmit the viral infection to uninfected fire ant nests.

Brood in infected colonies died within three months during laboratory studies, but the effect of the virus on field populations is still being evaluated, according to Valles, who is in CMAVE's Imported Fire Ant and Household Insects Research Unit.

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Business Updates (The Packer 11/23/04)

Uncle Matt's Organics - Reporting its sixth year of business with continued growth well above the industry average of 20%, Uncle Matt's farms more than 400 acres of organic citrus in Florida. The company offers fruit juice in bilingual labels for the Candadian market and miniwatermelons also grown in Florida. (http://www.unclematts.com/healthyplanet.html)

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Business Updates (The Packer 11/23/04)

Sunny Valley Organics - Producing organic tomatoes, cucumbers and bell peppers in Nogales, Arizona in 100 greenhouse acres, Sunny Valley Organics is preparing its first shipment of honeydews, watermelos, and cantaloupe, grown in the Mexican state of Sonora.

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Status and Preliminary Research on Non-Synthetic Herbicides for Organic Production

Organic growers have consistently ranked weed management as one of their most important production problems and have used a variety of methods including flaming, hot water treatments, solarization, cultivation, mowing, mulching, and cover crops to control weeds. Non-synthetic herbicides may also be used in organic production. However, these non-synthetic herbicides are restricted (must be approved by the grower's organic certifying agency), suggesting that other cultural practices like cover crops and mowing be used first.

Procedures for identifying and registering non-synthetic herbicides for possible use in organic production are complex, involving federal and state laws and regulations as well as national and local organic certifying agencies. Our purpose is to explain this process and to review preliminary research on several non-synthetic herbicides.

The Organic Materials Review Institute

The National Organic Program establishes general standards for certification procedures and inputs that are used in organic farming and processing but does not maintain a list of trade name products. The Organic Materials Review Institute (OMRI), a non-profit organization, fulfills this function, charging “certifiers, growers, manufacturers, and suppliers for an independent review of products intended for use in certified organic production, handling, and processing under the USDA National Organic Program standards.” OMRI approval is an ongoing process. That is, products may be added or deleted, depending on continual product evaluation.

Note also that OMRI reviews products in terms of their ingredients but not in terms of their effectiveness or federal and state registration. Furthermore, products listed by OMRI, like herbicides, must also be approved by the local organic certifying agency if such products are restricted. Another option for pesticide manufacturers to market their products to organic growers is to ensure that the ingredients of their products conform to national organic standards, without going through the OMRI, fee-based approval process.

Minimum Risk Pesticides

All pesticides (including herbicides), be they conventional pesticides or those listed by the Organic Materials Review Institute for use in organic farming, must either be registered by the Environmental Protection Agency (EPA) or be exempted from registration. The federal law governing pesticide registration is The Federal Insecticide and Rodenticide Act (FIFRA). Under section 25 (b) of FIFRA, “minimum risk” pesticides are exempted from EPA registration because such pesticides contain compounds that are classified as Generally Regarded as Safe (GRAS) and can be used on food crops without the pesticide label listing all possible crop uses.

Another important distinction for pesticide registration or exemption is made between “active” and “inert” pesticide ingredients. An active ingredient is intended to kill, poison, or repel a pest whereas an inert ingredient, listed separately, is not intended to affect a target pest. Active ingredients must be listed by name and percentage (by weight). All other (inert) ingredients must be listed by name but not necessarily listed separately by percentage weight. Tables 1 and 2, respectively, contain the current list of allowed active and inert ingredients of minimum risk pesticides under Section 25 (b) of FIFRA.

For example, the product label for Matran 2, an herbicide listed by OMRI, contains the statement: “This product has not been registered by the US Environmental Protection Agency. Biorganic® represents that this product qualifies for exemption from registration under the Federal Insecticide, Fungicide, and Rodenticide Act.” The active ingredient for Matran 2 is Clove Oil (45.8%), found in Table 1 with “Other Ingredients” or inerts listed as “Water, Lecithin: 54.4%," found in Table 2.

Another more controversial example is acetic acid or vinegar. Acetic acid has been used by researchers at relatively high concentrations (about 20%) to control weeds and could presumably be used to manage weeds in organic farming systems. But the classification of acetic acid as an inert or secondary ingredient (Table 2), rather than as an active or primary ingredient, in herbicides (Table 1) has prevented its registration as an herbicide in some states like Florida. If a company developed an herbicide with acetic acid as an active ingredient, tolerances for food crops for this compound would have to be established - a costly process. Two acetic acid herbicide formulations are registered in Florida: Natures Glory Weed and Grass Killer® a 6.25% ready-to-use concentration and a 25% concentration requiring dilution. Both formulations are registered in Florida for use on ornamental plants and turf, farm yards, rights of way, etc. for a range of grass and broadleaf weeds but not for food crops, because as mentioned above, tolerances have not been established. However, inert ingredients can be included in minimum risk herbicides at high enough concentrations to have an herbicidal effect. This is exactly what has happened, with some manufacturers directly or indirectly claiming herbicidal properties for materials containing an undefined concentration of acetic acid.

State Regulation of Minimum Risk Herbicides

A product fulfilling FIFRA requirements as a minimum risk herbicide and listed by OMRI may not be exempt from state registration or other regulatory requirements. The Florida Department of Agriculture and Consumer Services (FDACS), Division of Agricultural Environmental Services, and the Bureau of Pesticides (http://www.flpesticide.us/) maintain an on-line Florida Registration Tracking System that lists pesticides registered in Florida as a minimum risk pesticide according to section 25 (b) of FIFRA. For example, non-synthetic herbicides like Matran 2 and Xpress are listed by OMRI (http://www.omri.org/crops_generic.pdf) and are found in the FDACS Registration Tracking System but other non-synthetic herbicides may not be so listed.

OMRI had listed Alldown®, Matran 2®, and Xpress® as all contact or burn down herbicides. However, as of 10/25/04, only Matran 2 and Xpress were listed on the OMRI product web site (http://www.omri.org/crops_alpha.pdf) (Table 3). Alldown is mentioned here because it was OMRI approved when the research described below was conducted. The active ingredients of Matran 2 and Xpress are essential oils (the oil obtained after extracting highly aromatic cells from a plant by distillation), with Matran 2 containing clove oil and Xpress containing both clove and thyme oil plus acetic acid and other ingredients. Both clove oil and thyme oil contain phytotoxic compounds and have been reported to kill johnsongrass, common lambsquarters, and other grasses and broad leaf weeds. Xpress contains acetic acid but as an inert ingredient at an undefined concentration (Table 3). Alldown, another non-synthetic herbicide, also contains acetic acid. However, acetic acid is not listed as an active ingredient allowed in minimum risk herbicides (Table 1). Therefore acetic acid cannot be registered as an herbicide and cannot be recommended for weed control for food crops by Extension faculty. Such recommendations are based on several years of field research, usually funded by the pesticide manufacturer. Unfortunately, many small companies producing pesticides and other materials for possible use in organic production do not have the financial resources to fund such research.

Alldown, Matran 2, and Xpress have been applied to grasses and broadleaf weeds in Kentucky and Florida (Table 4). Alldown applied at high rates (40 to 70 gallons per acre) killed from 82 to 100% of Kentucky bluegrass turf in that state within 24 hours but within five weeks all the turf recovered, compared with 7% recovery of turf treated with Roundup®. More variable results were reported from Florida, with Alldown, at 40 gallons per acre providing inconsistent control of grasses and broadleaf weeds in one trial but in another experiment (rate per acre not specified) providing 70% control within one week, declining to 60% in three weeks. Both tests were conducted on former pasture land as a weed control trial with no host crop. Note also that Alldown was applied at full product concentration. Further testing is being conducted this year.

In Florida, Matran 2 provided 70% control in one case, declining to less than 60% within three weeks. However, when weeds were tilled before herbicide application, Matran 2 provided up to 75% control within five weeks. In both Florida trials Xpress did not provide uniform weed control.

USDA researchers have also used acetic acid to control weeds but at higher concentrations (up to 20%) than are found in food-use acetic acid or vinegar (3-5%). When acetic acid was applied at about 6 to 13% concentrations as a directed spray or broadcast at different times, broadleaf weeds were suppressed during the potato growing season in West Virginia but nutsedge and other grasses were only temporarily controlled. In sweet pepper fields, higher concentrations of acetic acid (18%) provided better control but only for about a month. Using 5 to 20% acetic acid concentrations as basal and foliar sprays on corn and soybeans, early-season sprays afforded greater control of younger weeds than later, seasonal sprays but at the cost of some crop damage (Table 4).

USDA researchers also advise that due to the corrosive nature of acetic acid, spray equipment should be taken apart and individual components such as O rings should be rinsed well after using herbicides containing acetic acid. Note also that acetic acid concentrations over 11% can cause burns upon skin contact.

Summary

Active and inert ingredients allowed in minimum risk herbicides are clearly defined under federal laws but the percent composition of inert ingredients is not clearly defined, allowing for inclusion of compounds with some herbicidal effect. Two non-synthetic herbicides listed by OMRI are also registered for use in Florida but preliminary research has indicated varying efficacy. Acetic acid has been used as an herbicide in experimental trials but is not now registered as the active ingredient in an herbicide because of lack of data on tolerances in food crops.

Table 1. Active Ingredients Which May Be in Minimum Risk Pesticide Products Exempted under section 25(b) of FIFRA. Appendix A PR Notice 2000-6	
1. Castor Oil (U.S.P. or equivalent)	17. Linseed Oil
2. Cedar Oil	18. Malic Acid*

3. Cinnamon* and Cinnamon Oil *	19. Mint* and Mint Oil*
4. Citric Acid*	20. Peppermint* and Peppermint Oil*
5. Citronella and Citronella Oil	21. 2-Phenethyl Propionate (2-phenylethyl propionate)
6. Cloves* and Clove Oil*	22. Potassium Sorbate
7. Corn Gluten Meal*	23. Putrescent Whole Egg Solids (See 180.1071**)**
8. Corn Oil*	24. Rosemary * and Rosemary Oil*
9. Cottonseed Oil*	25. Sesame* (includes ground Sesame plant stalks) (See 180.1087) and Sesame Oil*
10. Dried Blood	26. Sodium Chloride (common salt)*
11. Eugenol	27. Sodium Lauryl Sulfate
12. Garlic* and Garlic Oil*	28. Soybean Oil
13. Geraniol	29. Thyme* and Thyme Oil*
14. Geranium Oil	30. White Pepper*
15. Lauryl Sulfate	31. Zinc Metal Strips (consisting solely of zinc metal and impurities)
16. Lemon grass Oil*	
* These active ingredients are exempt for use on all food commodities from the requirement of a tolerance on all raw agricultural commodities at 40 CFR 180.1164(d).	

Table 2. Appendix B PR Notice 2000-6. LIST 4A Minimal Risk Inerts. Parentheses indicate exemption from tolerance as inerts if all the conditions set forth in the text and tables shown for the particular substance at 40 CFR 180.1001(c), (d) and/or (e) are met.

Acetic acid (c, d, e)	Carrots
Agar	Casein (c)
Alfalfa	Cheese
Alfalfa meal	Chlorophyll
Almond hulls	Cinnamon (d)
Almond shells (c)	Citric acid (c, e)
Alpha cellulose (c)	Citrus meal (c)
Apple pomace (c)	Citrus pectin
Attapulgite-type clay (c, e)	Citrus pulp
Beef fat	Clam shells
Beeswax (c)	Cloves (d)
Beet powder	Cocoa
Bentonite (c)	Cocoa shells (c)
Bicarbonate (c)	Cocoa shell flour
Bone Meal	Cod liver oil (c)
Bran	Coffee grounds (c)
Bread crumbs	Cookies
Calcareous shale (c)	Cork
Carbon dioxide	Corn (d)

Calcite (c)	Corn cobs (c)
Calciumcarbonate (c,e)	Corn flour
Canary seed	Corn meal (c)
Cane syrup	Corn oil (c)
Cardboard	Cornstarch (c)
Carrageenan (c, d, e)	Hearts of corn flour
Corn syrup (c, e)	Hydrogenated vegetable oils
Cotton	Honey
Cottonseed meal	Invert sugar (c)
Cottonseed oil (c)	Invert syrup (c)
Cracked oats	Kaolinite-type clay (c, e)
Cracked wheat	Lactose (c)
Dextrin (c, e)	Lanolin (d)
Dextrose (c, e)	Lard (c)
Dolomite (c)	Latex
Douglas-fir bark, ground (d)	Lecithin (c)
Egg Shells	Lime
Eggs	Limestone
Edible fish meal (c)	Linseed oil
Edible fish oil (c)	Malt flavor
Flour (wheat, d)	Meat meal
Fuller's earth	Meal scraps
Gelatin	Medicated feed
Glue, as depolymerized animal collagen	Mica (c)
Glycerin (glycerol; c, d, e)	Milk
Granite (c)	Millet seed
Graphite (c, d, e)	Mineral oil, U.S.P. (c, e)
Ground oats	Molasses (c)
Guar gum (c)	Montmorillonite-type clay (c, e)
Gum arabic (c)	Nitrogen
Gum tragacanth	Sawdust
Gypsum (c)	Seaweed
Nutria meat	Shale
Nylon	Soapstone (c, e)
Oatmeal (c)	Sodium (c)
Oats (c)	Sodium chloride (c)
Olive oil	Sorbitol (c, e)
Onions	Soybean hulls
Orange pulp (as pomace c)	Soybean meal
Oyster shells	Soybean oil (c, e)
Paper (fiber; d)	Soy flour (c)

Paprika	Soy protein (c, e)
Paraffin wax	Sucrose (c, e)
Peanut butter	Sugarbeet meal
Peanut oil	Sunflower seeds
Peanuts	Tallow
Peanut shells (c)	Vanillin (d)
Peat moss	Vermiculite
Pecan shell flour	Vitamin C
Pectin	Vitamin E
Polyethylene film (c)	Walnut flour
Polyethylene pellets , edible	Walnut shells (c)
Potatoes	Water
Pumice	Wheat (d)
Raisins	Wheat germ oil
Red cedar chips	Whey
Red dog flour	Wintergreen oil (c)
Rice	Wool
Rice hulls	Xanthan gum (c, e)
Rubber	Yeast
Rye Flour	
Safflower oil	

180.1001 (c) = exempt for both growing crops & crops after harvest
(d) = exempt for growing crops only
(e) = exempt for animal applications only
Please Note: List 4A, "Minimal Risk Inerts" (Appendix B of this notice) is updated on a continuing basis.
Current versions are available on the Pesticides Web site at http://www.epa.gov/opprd001/inerts/inerts_list4.pdf

Table 3. Herbicides approved by Organic Materials Review Institute (OMRI).

Herbicide	**Active ingredients (%)**	**Estimated cost/gallon ($)**	**Manufacturer**
Matran-2	Clove oil: 45.6 Other (lecithin, water): 54.4	79.60	Encore Technologies, Minnesota
Xpress	Thyme oil: *10.4* Clove oil: 10.1 Inert ingredients: 79.5 (acetic acid, molasses, water)	84.00	BiohumaNetics, Arizona

Table 4. Weed control with OMRI-approved herbicides (Matran 2 and Xpress) Alldown and acetic acid.

Location (Date)	**Crops**	**Treatments**	**Results**	**Authors**
Florida (2004)	pasture	Three nonsynthetic, postemergence, contact herbicides (Alldown, Matran 2 and Xpress) and corn gluten meal applied preemergence and flaming,	With no pretreatment or with mowing as a pretreatment, flaming provided 97% weed control after 1 week, declining to 79% after 3 weeks. Alldown (undiluted) and Matran 2 (20%) provided 70% control within 1 week, but control declined to less than 60% by 3 weeks. With tillage as a pretreatment, corn gluten meal, Matran 2 (20%), and flaming	Chase, C.A., J.M. Scholberg, and G.E. MacDonald. 2004. Preliminary evaluation of nonsynthetic herbicides for weed management in organic orange production. Proc. Fla. State Hort Soc. In press.

		applied after a mowing or tillage pretreatment or with no pretreatment	provided 68-75% control within 5 weeks. Xpress gave inconsistent results.	
Florida (2004)	pasture	Three nonsynthetic, postemergence, contact herbicides plus an adjuvant (Alldown, Matran 2 and Xpress) compared with glyphosate (Roundup Pro).	Alldown (100% concentration at 40 gallons per acre), Matran 2 (10% at 5 gallons per acre), Xpress (7.5-15%) at 7.5-15 gallons per acre provided inconsistent weed control compared with glyphosate (5% Roundup Pro).	Ferguson, J.J. 2004. Evaluation of organic herbicides. HortScience. 39: 876. Abstract.
Iowa (1999)	Kentucky bluegrass	Alldown at 10, 20, 30, 40, 50, 60, and 70 gallons per acre compared with Roundup (label rate) and an untreated control.	10 to 40 gallons per acre killed from 13 to 73% of turf within 24 hours but within one week, from 93 to 57% turf had recovered, respectively. 40 to 70 gallons per acre killed from 82 to 100 % of turf within 24 hours but within 5 weeks 100% of turf recovered compared with 7% treated with Roundup.	Bingaman, B.R. M.J. Howieson, and N.E. Christians. 1999. Alldown natural herbicide study. http://turfgrass.hort.iastate.edu/pubs/ turfrpt/2000/alldown.html
West Virginia (2003)	Potatoes	Vinegar (Acetic Acid: 6.25 or 12.5%) as directed spray or broadcast early, late, or early + late.	Broadleaf plaintain and yellow wood sorrel counts lower in vinegar-treated plots than in nontreated plots during the growing season. Yellow nutsedge and orchardgrass were suppressed for two to three weeks but regrew later.	USDA: Chandran, R.S., M. Stenger, and M. Mandal. Abstract. Effect of vinegar on potato weed control. Northeastern Weed Science Society.
West Virginia (2002)	Sweet peppers	Vinegar (acetic acid: 4.5, 9.0, and 18%); corn gluten (20, 40, and 80 lbs/1000ft^2)	Directed application of vinegar (4.5, 9.0, and 18%) provided >90% control of carpetweed, Canada thistle, yellow wood sorrel, common purslane, common lambsquarters, smooth pigweed, and velvet leaf and 50% control of yellow nutsedge when applied at 18% concentration. However, 1 month after treatment, only 20 to 30% weed control was obtained compared with untreated plots. Corn gluten applied at 80 lbs/1000 ft^2 reduced weed counts 78% three weeks after treatment and 32% 2 months after treatment	Chandran, R.S. Evaluation of vinegar and corn gluten for weed control in field-grown sweet pepper. Northeastern Weed Science Society.
	Corn, soybeans	Vinegar (acetic acid at 10 and 20%) sprayed (early treatment) to base of corn planted in rows (40 days old) and soybeans (55, 61, and 80 days old) Vinegar (acetic acid at 10 and 20%) sprayed (late treatment) to base of corn (55 days old) and soybeans (68, 74, and 93 days old) Vinegar (acetic acid at 10 and 20%) foliar and basal spray in replicated plots Vinegar (acetic acid at 10 and 20%) sprayed at 30, 60, and 90 gallons/ acre	5-35% corn injury. Giant foxtail control ranged from 100 (early spray) to 55% with late spray. Pigweed control ranged from ranged from 99% (early spray) to 55% (late spray). 5 to 45% soybean damage, especially on younger plants. More corn damage with foliar spray at 20% concentration 20% acetic acid at 90 gallons per acre did not control weeds > 50 days old	Radhakrishnan, J., J.R. Teasdale, and C.B. Coffman. Agricultural applications of vinegar. Northeastern Weed Science Society.
2001		0.0, 5.0, 10.0, 15.0, and 20.0 % vinegar sprayed on common lambsquarters, giant foxtail, velvetleaf, and smooth pigweed (22, 29, and 35 day-old plants) and Canada thistle (30, 40, and 50 days old) Weed foliage in greenhouse experiments	5 and 10.0 % concentrations more effective on younger weeds but 15 and 20% more effective on older weeds. 15 and 20% concentrations killed 90-100 % of all weeds. 5% concentration provided 100% top kill of Canada thistle with some root regrowth	RadhakrishnaK. J., J. R. Teasdale, and C. B. Coffman. Vinegar as a potential herbicide for organic agriculture. Northeastern Weed Science Society

Matran 2 and Xpress are listed by the Organic Materials Review Institute (OMRI). Alldown was listed as of 10/25/04 (http://www.omri.org/crops_alpha.pdf).

Organic Production and Marketing Newsletter

January 2005

Upcoming Meetings

January 21-23, 2005: Practical Tools and Solutions for Sustaining Family Farms

Hilton New Orleans Airport Hotel

Sponsored by the Southern Sustainable Agriculture Working Group “Innovative Production, marketing, and organizing strategies for those committed to sustainable food systems in the South”

Registration before Dec. 20: $115.00

Room Rates :$72.00 (double) http://www.ssawg.org/conference-exhibits.html

Questions: Toni McLaughlin at ssawgconf@bellsouth.net or call (225) 654-2017

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Institute of Food and Agricultural Sciences, P.O. Box 110180
Gainesville, FL 32611-0180 | Phone: (352) 392-1971

UF UNIVERSITY of FLORIDA

HORTICULTURAL SCIENCES DEPARTMENT

IFAS
Institute of Food & Agricultural Sciences

Horticultural Sciences Department
1117 Fifield Hall
PO Box 110690
Gainesville, FL 32611-0690
(352) 392-1928
Fax:(352) 392-5653
or 392-6479 Chairman's office

The Chronicle of Higher Education ranks the UF Horticultural Sciences Department Number 1 in the USA!