



Mid-Columbia Small Farms & Acreage Newsletter

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Dear Small Farmer and Landowner,

Welcome to the November/December Issue of the Small Farms and Acreage Newsletter. In this issue we have two very good articles that will be of interest to small farmers. The first is the second in a series on spray drift by Dr. Paul Jepson, Coordinator of the OSU Integrated Plant Protection Center on impacts of weather on spray drift. Management of spray drift is a critical issue in using pesticides safely.

A second article by [Susan Kerr, WSU-Klickitat County Extension Director](#), [Linda Williams, Klickitat County 4-H Program Assistant](#) and [Brian Tuck, Wasco County Extension Agent](#). is a list of useful resources for those interested in small-scale greenhouse and poultry production and management. A number of the resources are available on the internet. If there is anyone who does not have access to the internet and needs help obtaining the resources, they are encouraged to contact their local Extension Office for help.

As you review this issue, if you should have any questions about any of the information found in the newsletter or questions about small farming, please give us a call. You can contact your local county extension office at the numbers found on the top of this page. Again, please let us know how we can be of help to you.

Also as a reminder, if you receive this newsletter electronically, please make sure you let us know whenever you change your e-mail address so we can make sure you remain on the mailing list.

Sincerely,

Brian V. Tuck
Mid-Columbia Extension Agent
Oregon State University
Wasco County



Columbia Gorge Discovery Center, The Dalles

Calendar of Events

2004 October



23-24 Pacific Northwest Hydroponic Conference, 8—5, McMinnville, OR. Fee \$75 per person or \$140 per couple; includes handouts, snacks and lunch.

Information: (503) 868-7679 or visit www.MicrofarmSustainable.org.

Sponsored by USDA Risk Management Agency.

28-30 Oregon State Beekeepers Association's 2004 Fall Conference, Agate Beach Inn, Newport. Both general beekeeping and specific topics will be featured. Information: www.orsba.org; e-mail: shallotman@yahoo.com; (503) 399-3675.

29 Organic Livestock: Principles, Practices, and Prospects satellite broadcast, 10 a.m.-12:30 p.m. Presented by Washington State University, in cooperation with the National Center for Appropriate Technology, Western SARE, Oregon State University, and Oregon Tilth. Program details, registration: <http://ext.wsu.edu/noas/>.

30 "Opportunities and Challenges in Farmstead/Artisan Cheese Making," workshop, Washington State University Snohomish County Extension Education Center, 600 128 St. S.E., Everett, 8 a.m.-5 p.m. \$15 per person; registration at the door. To reserve a space or learn more about the workshop: Mike Hackett, WSU Extension Agriculture Development Faculty, (425) 357-6017 or e-mail Hackett@wsu.edu. Questions about what will be included in the workshop should be directed to Marc Bates, (509) 595-8652 or cheeseguy@pullman.com.

30 Mushrooms in the Permaculture Landscape: Growing Edible and Medicinal Mushrooms in the Home Garden, 6420 Shawn Drive, Olympia, 10—5, \$50 per person. Presented by Damein pack of Fungi Perfect (www.fungi.com) and Marisha Auerbach. Participants should bring item for potluck lunch. Information: Marisha Auerbach (360) 943-5262 queenbee@herbnwisdom.com or Damein Pack, (360) 402-7555 lunarserpent@hotmail.com.

30 Pasture management class, Gregory Forum, Clackamas Community College, 6:30-9:30 p.m. Information: (503) 657-6958, ext. 2644.

November

5 Vine and Wine, One day workshop offers introduction to viticulture and enology. 8-5, Island Lake Community Center, north of Silverdale, WA. \$40, optional lunch \$10. Call Arno Bergstrom at (360)337-7225 or awbergstrom@wsu.edu

5-6 Washington State Sheep Producers 2004 Annual Convention, Red Lion Hotel, Kelso. Registration information: WSSP, Box 3445, Omak, WA 98841, Phone (509) 826-0535.

12 Getting the Bugs to Work for You: Biological Control in Organic Agriculture, DoubleTree Hotel, Portland, OR.

For more information see website at: csanr.wsu.edu/Organic/BugsWorkForYou2004.htm or call 360-576-6030 or 509-335-3724

12-14 Tilth 30th Anniversary Conference, Columbia River DoubleTree Inn Portland. Keynote speakers Jim Hightower and Vandana Shiva. Full program and registration details available in late August. Preliminary information, call 206-442-7620 or www.tilthproducers.org/t30.htm

13-14 Wind Power Project Siting: Emerging Issues and Technologies Workshop, Embassy Suites, Downtown Portland, OR.

For more information see website at: www.awea.org/seminars or call (202) 383-2540.

16 Poultry Institute, WSU Puyallup Research and Extension Center, Allmendinger Conference Hall, 8:30-2:30. \$25 Pre-Registration before Nov. 10.

17-18 Pacific Northwest Vegetable Association Annual Conference and Trade Show, Red Lion Hotel, Pasco, WA. Information: (509) 585-5460 or www.pnva.org

18 Food Business 101 - Starting A Food Business. Entrepreneurs who want to start or expand a food related business can learn about special issues that affect food sector enterprises at the upcoming Portland Oregon Food Innovation Center (FIC)'s Food Business 101 ShortCourses. Cost of the workshop is \$50/person. For more information contact teri.hague@oregonstate.edu or call 503-872-6680

Calendar...continued

22 Final date to obtain 2005 apple, blueberry, cherry, cranberry, fresh apricots, fresh freestone peaches, fresh nectarines, grape, pear and raspberry/blackberry perennial crop insurance. Contact MPC agent for details.

December

1- 3 2004 Hermiston Farm Fair and Trade Show, at the Hermiston Community and Convention Center, 415 S Highway 395, Hermiston. Potato Seminar Wednesday; Agricultural Issues Forum Thursday morning; CORE Pesticide Program Thursday and Friday on video. Trade Show will include more than 50 exhibitors of products and services. Farm Fair/FFA Alumni Banquet Dec. 2 at Cottage Flowers. Full agenda available in mid-November.
Information: Hermiston Agricultural Research Extension Center, (541) 567-2240 or <http://oregonstate.edu/Dept/hermiston/>.



6 Good Agricultural Practices for Fruit and Vegetable Production workshop, 238 Wiegand Hall, OSU, Corvallis, 8 a.m.-4:15 p.m. \$80 per person. Information: e-mail Deborah.Yacas@orst.edu.

6-9 Oregon State University College of Forestry's "How to Dry Lumber for Quality and Profit," OSU, Corvallis.
Info: <http://outreach.cof.orst.edu/lmbrdrying/>.

January

11-13 Western Washington Horticultural Association Conference, Radisson Hotel Seattle Airport, 17001 Pacific Highway S., Information: Linda Sanford, (253) 445-4575.

16-19 91st Annual Northwest Food Manufacturing and Packaging Exposition, Oregon Convention Center, Portland. Register online: www.nwfpa.org.



Coming Events

Cider School

The Fruit Horticulture Department at WSU-Northwest Research & Extension Center in Mount Vernon is conducting two 1-week Cider School classes this November, for professional level training in techniques of hard (fermented) cider production. The initial course, "Cider Making - Principles & Practices," will be held November 8-12 and the advanced level course, "Cider Making - Science, Technology & Quality Control," will be held November 15-19.



The instructor, Peter Mitchell of Mitchell F&D Ltd., is a cider expert and trainer who specializes in providing intensive workshops, including both class material and lab sessions where participants gain hands-on experience in cider making, testing and quality control. This course work is designed primarily for commercial and potential commercial cider makers.

Details of the course syllabus, fees and registration can be found on the Mount Vernon Horticulture web page: http://mtvernon.wsu.edu/frt_hort/fruit_horticulture.htm.

If you have any questions please contact Jacky King, kingjack@wsu.edu, phone 360-848-6132

Opportunities and Challenges in Farmstead/Artisan Cheese Making

This is a unique opportunity for anyone who wishes to manufacture and sell farmstead artisan cheese. The class is team-taught by Marc Bates, the "Cheese Guy", who is most noted for teaching the art of cheese-making for almost 20 years at the Washington State University Creamery, and by Dr. Stephanie Clark, WSU Dept. of Food Science & Human Nutrition.



The workshop will be held October 30th from 8 AM to 5 PM at the WSU Snohomish County Extension Education Center located at 600 128th St. S.E., Everett, WA. Fee is \$15 per person. Register at the door. To reserve your space, contact Mike Hackett, Hackett@wsu.edu or call (425)-357-6017.

Coming Events...continued

Getting the Bugs to Work for You: Biological Control in Organic Agriculture

The WSU Center for Sustaining Agriculture and Natural Resources in collaboration with Oregon State University, is



organizing a day-long symposium on biological insect pest management. It will be held at the Columbia River Doubletree Hotel in Portland, Oregon, November 12, and is part of the Washington and Oregon Tilth Conference which is November 12-14 at the same location.

For more information go to <http://csanr.wsu.edu/Organic/BugsWorkForYou2004.htm>.

To download the registration forms go to <http://www.tilthproducers.org/T30regform.pdf>. For more information about the Tilth Conference, go to <http://www.tilthproducers.org/conference.htm>.

GOOD AGRICULTURAL PRACTICES (GAPs) for FRUIT & VEGETABLE PRODUCTION WORKSHOP

OSU is providing this workshop on December 6, from 8:00 a.m. - 4:15 p.m., to be held in 238 Wiegand Hall, OSU Campus, Corvallis, Oregon. Cost is \$80/person

About the program...

This workshop provides participants a better understanding of microbial risk and contamination of fruits and vegetables on the farm. The focus is on how to develop and implement Good Agricultural Practices (GAPs) to enhance food safety, as well as information about third-party certification and audition.

Who Should Attend?

Fruit and vegetable growers and processors, Quality assurance and food safety specialists in the fresh fruit and vegetable industry Third-party auditors, managers, supervisor and quality assurance personnel.

For more information, contact Deborah Yacas <Deborah.Yacas@orst.edu>

"Tuesdays at the Garden"

Get practical information and advice on pruning, planting, problems, and practically everything. All seminars will be presented at the Oregon Garden in Silverton every Tuesday from 1-4:30 PM from November 2 to December 14. To obtain a complete schedule of workshops please go to the following website for details http://www.oan.org/pdfdocs/garden_tues.pdf



OSU's FOOD INNOVATION CENTER STARTS A FOOD FIGHT IN PORTLAND

Is there a secret treasure hiding in your kitchen? Oregon State University's Food Innovation Center wants to know. From your granddad's homemade barbecue sauce to your own tofu concoctions, the Food Innovation Center is hosting the Portland Food Fight to bring the Northwest's best food ideas to market.

Contestants with a dream of commercializing their food product should bring their prepared food item and a \$10 entry fee to the Food Innovation Center, 1207 N.W. Naito Pkwy, on Thursday, Nov. 11. Doors will open at 8 a.m. and judging will begin at 10 a.m.

Items will be judged on criteria such as taste, aroma, appearance and market potential. The winner will be awarded a commercialization package worth \$2,500 from the Food Innovation Center. This is a chance to develop that family recipe into a commercial enterprise, with experts to help refine the recipe, identify a market, design packaging, labels and much more.

"This is not an ordinary recipe competition," said Sarah Masoni, product development manager at the Food Innovation Center. "This is a chance to create a new product for retail markets and possibly a new career as our latest food entrepreneur."

The Food Innovation Center, a collaboration between OSU's Agricultural Experiment Station and the Oregon Department of Agriculture, has a track record for helping entrepreneurs turn dreams into reality.

Coming Events...continued

Chef and restaurant owner Vitaly Paley came to the Food Innovation Center with an idea for a healthy organic nutrition bar. With help from the center's food scientists, package engineers and market researchers, the Portland chef launched Paley's Fruity Nut Evolution Bar – and three new flavors are coming soon.

You don't have to be a chef to be a food entrepreneur. Toy designer Lori Katz took her idea for tofu-based snacks to the Food Innovation Center, where they helped her develop Protons, a flavorful and healthy alternative to croutons and the centerpiece of her new company, Tofoods.

For years, entrepreneur Howard Rubin had friends tell him that his homemade lasagna was so good he should market it. A chance meeting with a specialist at the Food Innovation Center led to the development of Rubin's new commercial product, Oregon Lasagna.

"If you've been told, 'You could sell that,' here's your chance," said Rubin. "Take a risk and take advantage of this direct route to commercialization. Don't become a 'woulda, shoulda, coulda' kid."

The Portland Food Fight is just one of many activities at the Food Innovation Center to stimulate new markets for Northwest food products.

"The Food Innovation Center is a one-stop service provider for entrepreneurs, processors and distributors interested in advancing Northwest food products," Masoni said. "The Portland Food Fight is an opportunity for starting up new food products with a team of specialists who can supervise everything from marketing and packaging to business development."

For additional information about the Portland Food Fight or the Food Innovation Center, contact Sarah Masoni, (503) 872-6655, or check the website, <http://fic.oregonstate.edu>.

Resources

Publications

OSU Extension Publications

The following are new publications from Oregon State University. Please see the OSU Web Site at for more information on these and other publications at: <http://eesc.oregonstate.edu>



* EC 1566, Raccoon, September 2004. \$1.00
<http://eesc.oregonstate.edu/agcomwebfile/edmat/ec1566.pdf>

* EC 1567, California Quail, September 2004. \$1.00
<http://eesc.oregonstate.edu/agcomwebfile/edmat/ec1567.pdf>

* EM 8878-E, Vineyard Economics: Establishing and Producing Wine Grapes in Hood River County, September 2004. No charge
<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8878-e.pdf>

* PNW 533, Fertilizing with Manure, July 2000. \$1.50
<http://cru.cahe.wsu.edu/CEPublications/pnw0533/pnw0533.pdf>

* PNW 576, Tree Growth, Forest Management, and Their Implications for Wood Quality, September 2004. \$2.50

* VTP 43, Esquilar y Cultivar Arboles de Navidad (Shearing and Culturing Christmas Trees), 68 minutes, September 2004. \$33.00

Emergency Response Materials

* EM 8736-E, Preparing Your Family for Emergencies, revised August 2004. No charge <http://eesc.oregonstate.edu/agcomwebfile/edmat/em8736-e.pdf>

* EM 8864-E, It Could Happen to You: Family Emergency Preparedness Kit, August 2004. No charge <http://eesc.oregonstate.edu/agcomwebfile/edmat/em8864-e.pdf>

* EM 8865-E, It Could Happen to You: Frequently Asked Questions about Disaster Assistance, August 2004. No charge. <http://eesc.oregonstate.edu/agcomwebfile/edmat/em8865-e.pdf>

* EM 8866-E, It Could Happen to You: Food, Water, and Sanitation After a Disaster, August 2004. No charge <http://eesc.oregonstate.edu/agcomwebfile/edmat/em8866-e.pdf>

Resources....continued

* EM 8867-E, It Could Happen to You: Replacing Lost or Damaged Papers, August 2004. No charge.

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8867-e.pdf>

* EM 8868-E, It Could Happen to You: Handling Family Finances During Disasters & Emergencies, August 2004. No charge

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8868-e.pdf>

* EM 8869-E, It Could Happen to You: Insurance Coverage and Making a Claim, August 2004. No charge

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8869-e.pdf>

* EM 8870-E, It Could Happen to You: Income Tax Deductions for Property Loss, August 2004. No charge

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8870-e.pdf>

* EM 8871-E, It Could Happen to You: Federal Disaster Assistance Program, August 2004. No charge

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8871-e.pdf>

* EM 8872-E, It Could Happen to You: Disaster Rehabilitation Assistance, August 2004. No charge

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8872-e.pdf>

* EM 8873-E, It Could Happen to You: Helping Children after A Disaster, August 2004. No charge.

<http://eesc.oregonstate.edu/agcomwebfile/edmat/em8873-e.pdf>

Other OSU Publications of Interest that are available through any OSU Extension Office:

EM 8876, Vegetative Filter Strips: Near Surface Water In The Pacific Northwest, September, 2004. Cost \$1.50.

Publications from other sources

Western Profiles of Innovative Agricultural Marketing was recently published by the Western Extension Marketing Committee to highlight and examine some of the key ingredients of how several operations in the West have migrated from a traditional commodity focused business into a successful direct

marketing enterprise. This 122 page color publication with photos of the 17 enterprises studied is available at the Western Extension Marketing Committee's web site of <http://ag.arizona.edu/arec/wemc/wemc.html> and it can also be ordered online from <http://pubs1.cals.arizona.edu/sales/index.cfm> or from CALSmart, College of Agriculture and Life Sciences, The University of Arizona, 4042 N. Campbell Avenue, Tucson, Arizona 85719. Phone: (520) 318-7275, Fax: (520) 795-8508, Toll-free: 877-763-5315 (\$10 for a full-color copy).

Resources for Farmers Managing Their Crops

Under The Organic Rules. This publication is focused on the Great Lakes region, but has some good Information that can be used by Northwest organic farmers and is located at

<http://www.ipm.msu.edu/new-ag.htm>

Newsletters

Announcing the latest issue of Sustaining the Pacific Northwest - Food, Farm, & Natural Resource Systems quarterly electronic newsletter, jointly sponsored by the WSU Small Farms Team, WSU Center for Sustaining Agriculture and Natural Resources, the WSU Small Farms program, and the WSU Water Quality Management Team. This issue can be viewed or downloaded from <http://csanr.wsu.edu/whatsnew/PNW-v2-n3.pdf>.

Web Pages

West Nile Virus Resource Guide.

This is an excellent continuously updated website concerning the West Nile Virus by OSU and can be found at <http://npic.orst.edu/wnv/>



Oregon State University Press. They publish a number of useful resource books including Living with Earthquakes in the Pacific Northwest, Biological Control of Invasive Plants in the United States to name a few. The website can be found at:

<http://oregonstate.edu/dept/press>

OSU Garden Information for Northwest Gardeners website, which can be found at <http://eesc.oregonstate.edu/agcomwebfile/garden/enews/index.html>.

Resources..... continued

Grants

Wasco County Soil and Water

Conservation District Grants - \$\$ Available

Wasco County Soil and Water Conservation District continues to have funds available for grants of up to **\$10,000** for conservation projects that save soil or water or improve wildlife habitat. Cost-share rates vary from 50% to 75%, depending on the amount requested. Grants are competitive and are considered by a local panel every month and require a minimal of paper work for the applicator. Interested parties should contact Jennifer Clark at Wasco County SWCD, (541) 296-6178 x119.

Keeping in Touch

Wasco County Soil & Water Conservation District



2005 Tree Sale

The annual Wasco County Tree and Shrub Sale is in full swing and orders are being taken now until January 28. You can obtain order blanks by either calling the Wasco County Soil and Water Conservation District at 541-298-8559 ext 3, or by requesting an electronic copy from Ron Graves at ron.graves@oacd.org

Feature Articles

DRIFT MANAGEMENT: RESPONDING TO CHALLENGES FROM WEATHER AND CLIMATE

*Paul Jepson, IPM Coordinator,
Integrated Plant Protection Center, OSU*

INTRODUCTION

Clouds of spray drops are affected by wind speed and direction, humidity (which affects drop size) and atmospheric stability. Ambient meteorological conditions become the main influence on the behavior of drops and chemicals within a few seconds, and a few feet, from release by the spray nozzle. The longer the drop is traveling, the more exposed it is to ambient conditions. Drops evaporate and get smaller, and chemicals may change phase from liquid to gas, both of which may result in drift from the target site.

Knowledge of ambient conditions greatly improves your ability to avoid drift. Drift reduction will occur when chemical choice, application parameters and ambient environmental conditions are all taken into consideration.

WIND SPEED AND DIRECTION

Wind direction forecasts can let you know of potential problems, in advance (e.g. "Current Wind Conditions" at: <http://www.agriculture.com/agweather/maps/windsp.html>, or, six hourly wind forecasts for your area at "Weather Underground" <http://wunderground.com>).

Local measurements are also very helpful. Wind direction is highly variable, but a 10 minute average should adequately determine the mean direction of movement of the spray.

Small drops (e.g. 100 microns) fall very slowly relative to the speed they are carried by the wind. Low wind speeds may carry concentrated spray clouds, whereas higher wind speeds may disperse, or "dilute" the spray cloud.

Practical Implications:

- *Determine likely wind speed and direction before spraying.*
- *If sensitive areas lie downwind of your path, apply strict drift management practices, even in good spray conditions, particularly close to the sensitive area.*
- *Measure wind speed and direction during application days, to avoid surprises.*
- *Consider buffers or green barriers where drift potential is repeatedly high, but combine these with other drift reduction methods.*

HUMIDITY AND TEMPERATURE

The rate of drop evaporation depends on the chemistry of the drop and on humidity. Small drops stay in the air longer because they have lower settling velocity.

A 200 micron drop settles at 0.705 m/s, whereas a 40 micron drop settles at 0.047 m/s: one fifth the drop diameter results in one fifteenth the settling rate! At 1 m/s wind speed, a 200m drop travels 21m and a 40 micron drop 318m, following release at 15m.

Drift Management ... continued

Practical implications:

- *Low humidity creates conditions for drift. Spray at times when humidity is higher. National Weather Service hourly forecasts include humidity estimates.*
- *Combined low humidity and high temperature promote drop and vapor drift enormously. Avoid these conditions if possible, but if you must spray, maximize drop size, use all available drift management methods, and select low volatility chemicals.*

ATMOSPHERIC STABILITY

Atmospheric stability is the change in atmospheric temperature with height. Temperature falls with height under neutral conditions. The rate of change in this relationship depends on the wind and how much moisture and cloud cover there is. Temperature profiles exert control over atmospheric mixing and have a direct effect on spray drift.

Neutral conditions occur when it is windy, and there is considerable mixing of the surface air. If wind speed is not too high, these are the best conditions for spraying to minimize drift

On sunny days, warm air at ground level wants to rise through colder, denser air above it: this is known as an unstable surface layer. It creates thermals, or bubbles of rising air, that give rise to variable winds at ground level, with considerable mixing, typical of afternoon conditions. Large thermal eddies make the spray hard to control. Turbulence also increases drop evaporation rate. This is lessened by cloud cover.

At night, the ground loses heat and cools the air closest to it. This dense, cool air does not rise: this is known as a stable surface layer. Mixing is suppressed in stable conditions, and this can lead to maximum concentrations in drift plumes. Low wind speeds mean that drift deposits on the ground sooner, and drops remain larger because of higher humidity. Cloud cover again suppresses these effects.

Cloud cover may be less effective at limiting heating and cooling effects near to water bodies, and in sloped terrain, where up and down-slope flows develop.

Cool air may be trapped in Colombia Basin valleys in the mornings, particularly after clear nights. This creates an inversion that traps the spray cloud and promotes drift damage. Inversions may also arise in the winter,

when Arctic air spills down east of the Cascades, creating stable conditions to the west.

Practical implications:

- *Avoid application in stable conditions and in inversion conditions, typical of sloped terrain. Concentrated spray clouds may traverse to sensitive areas locally. The most mysterious cases of off-target damage are often explained by this.*
- *Maximize drift management techniques in unstable conditions where drop and vapor drift might be promoted through strong updrafts in unpredictable directions, and through high drop evaporation rates.*

CHOOSING LESS VOLATILE PESTICIDES

Volatile pesticides will change phase from liquid to gas from soil and plant surfaces in warm conditions, and drops will evaporate rapidly, promoting drift. We can predict pesticide losses from soil surfaces, but we can only estimate losses of soil-incorporated pesticides or pesticides on plant surfaces.

Volatility is determined by pesticide vapor pressure, but also by temperature, water solubility, adsorption to soil and plant surfaces, soil moisture content, air flow and concentration.

Losses from the soil:

- Volatilization is greater from wet soil: adsorption sites are saturated by water molecules.
- Compounds sorb to soil when water evaporates.
- Highest losses are highest from moist soils near to midday, when dew and upward movement of soil moisture combine with temperature to promote volatilization.
- Losses are low at night, and when surface layers are dry.
- Moist air passing over moist soil reduces water loss and prolongs volatilization.
- Losses drop when dry air passes over dry soil.
- Moist air can wet the soil enough to cause volatilization: it only takes a layer of water one molecule thick to cause this.
- Strongly sorbed compounds need more water to promote losses.

Drift Management ... continued

Losses from plants:

- Rain within 24h of treatment causes wash-off.
- Wind increases volatile losses.
- Temperature promotes volatilization.
- High humidity can increase adsorption by the plant, but also increase losses.
- Losses from the plant by volatilization have commonly been found to be 20% and may be as high as 75%.
- For 2,4-D-esters, small drops evaporate faster, and large drops are taken up faster by the plant.
- For 2,4-D acid, uptake can be 2.5 times more rapid than evaporation, but this uptake rate is two to three times higher than for metsulfuron or chlorsulfuron.
- Evaporation rate can be 8 times higher at 30°C, compared with 20° C.

Vapor Pressure for 2,4-D Derivatives

Derivative	Vapor Pressure mPa at 20-25°C
Iso-octyl ester	0.48
Acid	0.011-0.019
Dimethylamine salt	nonvolatile

Practical implications:

- Be aware that volatilization can be rapid from wet soil, and with humid air flows, combined with warming conditions. Avoid applying volatile pesticides near to sensitive areas when these conditions occur.
- Most pesticides can volatilize, and may become concentrated plumes if the right conditions persist. Minimize the amount applied as far as possible.
- Large drops tend to increase plant uptake as opposed to evaporation.

Sources:

Jansma, J.W., Linders, J.B.H.J. (1995) *Volatilization of Pesticides From Soil and Plants After Spraying*. National Institute of Health and Environmental Protection, The Netherlands

Personal communication with Oregon Climate Service

Thistle et al (1998) In: *North American Conference on Pesticide Spray Drift Management* pp. 64-74

Wind Energy Atlas of the United States (eg. <http://rredc.nrel.gov/wind/pubs/atlas/maps/chap3/3-05m.html>.)

POULTRY & GREENHOUSE RESOURCES FOR SMALL SCALE PRODUCERS

Brian Tuck Wasco County Extension Agent,
Susan Kerr, WSU-Klickitat County Extension
Director and Linda Williams, Klickitat County
4-H Program Assistant.

On October 9, 2004, Washington State University Extension and Oregon State University Extension Service sponsored the small-scale poultry and greenhouse workshops at the Columbia Gorge Discovery Center in The Dalles, OR. For those unable to attend, we wanted to provide information concerning useful resources for those interested in small-scale poultry and green house production. If you have any questions concerning the resources listed here, please contact the OSU Wasco County Extension office at 541-296-5494 or the WSU Klickitat County Extension office at 509-773-5817. Readers who do not have access to the

Internet at home may contact their county Extension office for these documents or access them through their public library.

POULTRY PRODUCTION

These publications are available through your local Oregon State University Extension Service Office for a small fee. Many of these publications can be downloaded free of charge from the OSU website at <http://eesc.oregonstate.edu/>.

- Brooding and Rearing Baby Chicks, PNW, 491
- Hatching Small Numbers of Eggs, PNW 478
- How to Feed Your Laying and Breeding Hens, PNW 477
- Growing Broilers in Oregon: Facts for the Potential Grower, EM 8426
- Why Did My Chickens Stop Laying? PNW 565



Poultry & Greenhouse Resources.....continued

These publications are available through your local Washington State University Extension office or may be downloaded from <http://pubs.wsu.edu>. This list includes 4-H and Extension publications.

- Poultry Leader Guide, EM4887
- Poultry Science Exhibit Ideas, EM3497
- Home Processing of Poultry, MNEF411
- National Poultry Judging Manual, NE4H460
- Brooding and Rearing Ducklings and Goslings, EB1190
- Care of a Small Flock of Chickens, EB0971
- Helpful Hints on Growing Fryers, EB0911
- Poultry Pests and Their Control, EB0912
- Small Poultry Flock Health Tips, EB 1371
- Basic Ventilation Considerations for Livestock or Poultry Housing, PNW0307
- Troubleshooting Mechanical Ventilation Systems for Livestock/Poultry Housing, PNW 0308
- Ohio State University Poultry Learning Laboratory kit



GREENHOUSES

These publications are available through your local Oregon State University Extension Service. Many of these publications can be downloaded free of charge from <http://eesc.oregonstate.edu/>

- Constructing Coldframes and Hotbeds, FS 246
- Propagating Plants from Seed, PNW 170
- Several more publications on plant propagation not listed here are appropriate for greenhouse production



Appropriate Technology Transfer for Rural Areas (sponsored by USDA) has some excellent publications for small-scale poultry producers. Their Web site is www.attra.org/publication.html. Here are a few of the titles available:

- Sustainable Poultry: Production Overview
- Small-Scale Poultry Processing
- Range Poultry Housing
- Growing Your Range Poultry Business: An Entrepreneur's Toolbox

SARE, the Sustainable Agriculture Research and Education program of the USDA, promotes small farm endeavors with through grants, research and education. A good publication on range poultry production is at <http://www.sare.org/publications/poultry/poultry.pdf>



These publications are available through your local Washington State University Extension office or may be downloaded from <http://pubs.wsu.edu>

- Propagating, Growing Grape Plants in Plastic Houses for Early Field Planting, EB 1204
- Building Hobby Greenhouses, PNW0171
- Portable Field Hoophouse, EB1825
- Crop Profile for Bedding Plants in Washington, MISC0365E



The Natural Resource, Agriculture, and Engineering Service (NRAES) has several excellent publications relating to both large and small-scale greenhouse production. These can be ordered through their website at www.nraes.org.

- Energy Conservation for Commercial Green Houses, NRAES-3
- Greenhouse Engineering, NRAES-33
- Greenhouses for Homeowners and Gardeners, NRAES-137
- Greenhouse Systems: Automation, Culture and Environment, NRAES-72
- Water and Nutrient Management for Greenhouses, NRAES-56

Greenhouse Resources...continued

Appropriate Technology Transfer for Rural Areas has excellent publications about small-scale greenhouse production topics. Their website is www.attra.org/publication.html. These are a few of the titles available:

- Organic Vegetable, Tomato and Herb Production Guides
- Root Zone Heating for Greenhouse Crops
- Compost Heated Greenhouses
- Integrated Pest Management for Greenhouse Crops

Alabama A&M also produces some very good greenhouse publications. Here are the titles and locations:

- Hobby Greenhouse Construction at www.aces.edu/pubs/docs/A/ANR-1105/
- Hobby Greenhouse Practices at www.aces.edu/pubs/docs/A/ANR-1153/
- Starting a Greenhouse Business at www.aces.edu/pubs/docs/A/ANR-0691/

University of Florida also offers a number of very good publications on greenhouse management and their Web site is <http://edis.ifas.ufl.edu/publications.html>.

Alternative Crop Trials



**Forage Trials
(Winter Triticale/Pea Mixes)**



**Oil Seed Trials
(Mustard, Sunflower, Linola & Safflower)**

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