Oregon Small Farm News

Oregon State University Small Farms Program

In This Issue:

Fall Pasture Management: Plant, Root Growth, & Soil Fertility 2
Function and Selection of Cover Crops 3
Fresh Shell Bean and Dry Bean Variety Trial 4
Small Ruminant Medication: How to Stay Within the Law 7
Seasonal Changes Affect Poultry 9
Forage Production Under Agroforestry System 10
Farm Profile: Reill Farm of Lincoln County 14
You've Grown it, Now What 16
Calendar 18

Oregon State University OSU Extension Service

OSU Extension Service Small Farms Staff

Garry Stephenson
Small Farms Program
Coordinator
Corvallis, OR 97330

Sam Angima
Small Farms Program
Lincoln County
29 SE 2nd Street
Newport, OR 97365
541-574-6534

Nick Andrews
Small Farms Program
Clackamas & Washington Counties
15210 NE Miley Road
Aurora, OR 97002
503-678-1264

Melissa Fery
Small Farms Program
Benton, Linn, & Lane Counties
1849 NW 9th Street
Corvallis, OR 97330
541-766-6750

Melissa Matthewson
Small Farms Program
Jackson, Josephine, & Douglas Counties
569 Hanley Road
Central Point, OR 97502

Chrissy Lucas
Small Farms Program Assistant
1849 NW 9th Street
Corvallis, OR 97330
1-800-365-0201

Cover Photo:

The Reill Farm near Toledo, OR. Read more about Reill Farm on page 14.

Photo by Sam Angima, Oregon State University Extension Service Small Farms Program

Layout by:
Chrissy Lucas, Oregon State University Extension Service Small Farms Program

Fall Pasture Management: Plant, Root Growth, & Soil Fertility

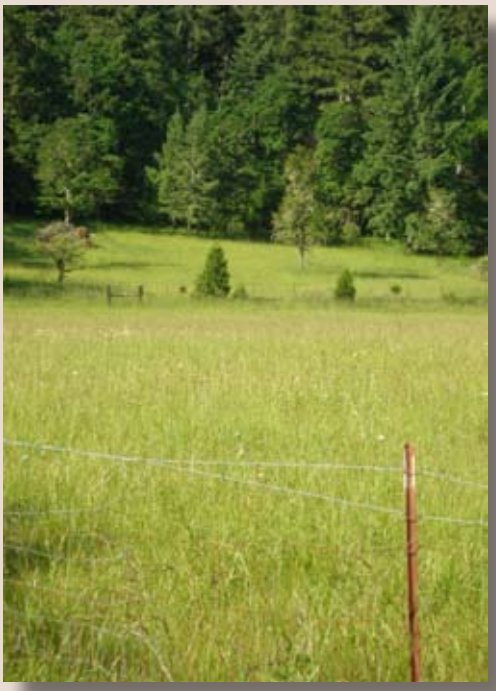
Proper pasture management is a year round effort. Fall is one of the most critical periods for western Oregon pastures, as well as central and eastern irrigated pastures. Management during the fall affects the ability of pasture plants to over winter, determines when new growth begins in the spring, and how much forage will be produced over the entire season. Overgrazing or excessive forage harvesting in the fall inhibits pasture plants from rebuilding their root system and forming new shoots for spring growth.

Two major plant activities occur during the fall: root regeneration and the formation of new shoots. Typically, plants go through a cycle of root shedding during the summer. The fall is a time when root systems are rebuilding. Shoots or growing points for next season's forage growth are also developing in the fall. The shoots need a steady supply of nutrients and protection from stress. Allowing plants to store carbohydrates is essential for these activities. The lower stems or crown are the major storage area for carbohydrates in pasture grasses and provide protection for new shoots. In most pasture grasses the crown is the bottom 3-4 inches of the plant. If pastures are grazed or mowed lower than 3-4 inches stubble height in the fall the carbohydrate reserves are reduced and the new shoots are starved. The following spring these shoots will grow slower and will have fewer roots to support them.

The management practices outlined above are from *Pasture Management: Understanding Plant and Root Growth in the Fall* by forage management veterans Gene Pirelli and Steve Fransen. It is available at: http://extension.oregonstate.edu/yamhill/pdf/late_summer_fall_pasture_ver2.pdf

Fall is also a good time of year to take soil samples to test the fertility of your pasture's soil. Early fall is a time to apply nutrients to correct any deficiencies the soil test revealed. Fertilizer guides and fertility information for pastures are available at: http://smallfarms.oregonstate.edu/fertility-management

For additional information on managing pastures, check out the other pasture management segments of the Oregon Small Farms website at: http://smallfarms.oregonstate.edu or immerse yourself in Oregon State University's Forage Information System at: http://forages.oregonstate.edu.



A Willamette Valley Pasture
Photo provided by Melissa Fery

Function & Selection of Cover Crops

By: Melissa Fery

When selecting a cover crop for a particular field, keep the end in mind. How does the crop need to function? Are you in need of a permanent crop like grass to stabilize soil and reduce erosion? Or perhaps you're looking for a crop to increase soil organic matter and supply a nitrogen source in the winter, between cash crops? Maybe you need a summer cover crop to help control and suppress weeds before planting a cash crop in the fall?

Crimson clover used as a cover crop at Sauvie Island Organics. *Photo provided by Nick Andrews*

Cover crops provide many benefits to cropping systems. In Western Oregon, cover crops are typically planted in the early fall to provide cover during the winter months. Most often cover crops are not grown for harvest, although some growers will harvest fava beans or other cover crop seed. Often referred to as "green manure", winter crops are grown and turned under for soil improvement. Cover crops can improve soil tilth and structure which in turn improves water infiltration and reduces compaction. Cover crops can also help control erosion, suppress weeds, maintain soil organic matter, and provide pollen and nectar for beneficial insects.

Another benefit occurs with nitrogen-fixing legumes that provide a nitrogen source for the following crop, reducing fertilizer costs. Some common nitrogen-fixing cover crops grown in Oregon are red, crimson and subterranean clover, field pea, common and hairy vetch, and fava bean.

Crops like buckwheat or sorghum-sudan are considered summer cover crops, which are used to suppress weeds and "clean" up the soil before planting a cash crop.

A "catch" crop is another function for cover crops, such as rye grain or other deep rooted grasses. These crops catch excess nutrients left after harvesting a cash crop and help prevent leaching of nutrients into ground or surface water.

Permanent cover crops, like creeping red fescue, perennial rye grass and other grasses are often planted between rows of perennial crops, like berries or grapes. These cover crops help reduce soil erosion, catch nutrients and excess irrigation, and improve soil quality.

Good cover crops have the following characteristics; fast germination and emergence, good seedling vigor, competitiveness with other plants, tolerance to adverse conditions, ease of suppression, inexpensive establishment and they require minimal management. Cover crops perform best when seeded early in the fall, to allow for adequate rainfall, good soil conditions, and some warmer weather for early establishment. Irrigation, if available, may be utilized after planting to encourage germination and early growth.

One challenge with winter cover crops is killing the crop and preparing a seedbed for the spring cash crop to follow. Some cover crops like wheat are fairly easy to kill mechanically. Conventional herbicide application in the early spring is an effective method to initiate killing the cover crop, but not in certified organic systems. Other cover crops such as spring oats and sudan grass are susceptible to winter kill, which begins to degrade the biomass, creating better conditions for incorporation into the soil. Most cover crops should be allowed to decompose in the soil for at least a couple weeks before planting a cash crop.

Selecting a cover crop to match the specific needs of the cropping system is accomplished by looking at all options and keeping the end result in mind. Consider equipment needs, timing of planting and harvesting and the benefits of a specific cover crop.

Grass used to protect soil between rows at Carlton Plants. *Photo provided by Melissa Fery*

For more information about cover crops and incorporating them into your farming practices, check out the Oregon Small Farms website, where there are links to Oregon State University's cover crop publications and other resources. http://smallfarms.oregonstate.edu/improving-soil-quality-crops

Fresh Shell Bean & Dry Bean Variety Trial

By: Carol Miles, Liz Nelson, Lydia Garth, and Erin Klingler,
Washington State University, Vancouver Research & Extension Unit,

Introduction

Dry beans (*Phaseolus vulgaris*) have been a staple food crop throughout the world for centuries and today, along with other grain legume crops, they continue to be a primary source of protein for the majority of people worldwide. In the United States, the primary market classes of beans grown are Pinto, Kidney, and Navy. These beans are grown predominantly by large-scale farmers and it can be difficult for small-scale farmers to be cost competitive. However, there are many lesser-known bean varieties that are not available through the main market that can easily be grown by small-scale farmers throughout Washington and Oregon as well as other regions of the country. These varieties are either heirloom varieties within the main market classes or are colored/patterned varieties that are in classes of their own. In my program I refer to these as 'niche market varieties' because they are not produced on a large-scale for the commodity market.

Niche market dry bean varieties are not commonly available and so tend to fetch a higher price in the market. They are gaining in popularity among chefs and consumers because of their rich flavor attributes. Dry beans are well suited to small-scale production because they are relatively easy to produce, harvest and store. In addition, a single dry bean crop can be harvested at several growth stages to produce three distinctly different crops: 1) green beans, 2) fresh shell beans, and 3) dry beans. Harvesting green beans or shell beans from a dry bean crop is a way for a farmer to diversify crop production while maintaining a single crop. Fresh shell beans and colored/patterned dry beans can also be high-value ($5-6 per pound). While not many bean varieties are suitable for green bean and dry bean production, many varieties are suitable for both fresh shell and dry bean production. Photos and yield descriptions of all the dry bean varieties we have evaluated for green bean, fresh shell bean, and dry bean production in southwest Washington over the last 7 years are on our program web site http://vegetables.wsu.edu/NicheMarket/BeanVarieties.htm.

In this study we evaluated 34 dry bean entries for fresh shell and dry bean production at the Washington State University Vancouver Research and Extension Unit in 2006 and are repeating this study in 2007. Preferred characteristics for fresh shell beans include large bean size, large pod size, and a large number of beans per pod. White bean color tends to be preferred for fresh shell beans while varieties in the Cranberry market class are also common. Beans that have a color pattern or a pink color may also be desirable. Entries in this study include common varieties from seed companies and breeding lines from Phil Miklas, USDA-ARS Washington, and Jim Kelly, Michigan State University.

Materials and Methods

The study design is the same both years and includes 2 adjacent identical sets of plots, one for shell bean evaluation and one for dry bean evaluation. Plots are 2-rows wide and 10 feet long. Spacing between rows is 2 feet, and spacing in the row is 2 inches. Plots are arranged in a randomized complete block design with 4 replications. Beans were planted May 15, 2006 and May 16, 2007. The field is managed using organic practices.

Figure 1: Symptom of halo blight (*Pseudomonas syringae* pv. *phaseolicola*) on bean leaves; this disease also infects pods and seeds. *Photo provided by Washington State University*

To measure fresh shell bean yield, 10 plants were harvested from the center of each plot when pods were fully formed and starting to turn yellow. To measure dry bean yield, the center 5-feet of both rows was harvested in each plot for a total of 10-row-feet. For both fresh shell and dry beans, number of pods per plant, pod length, number of beans per pod, and bean yield and size were measured. In this article, only some of the data will be presented and discussed. Our full report is available at http://vegetables.wsu.edu/BeanReport06.pdf.

In order to limit the incidence of halo blight (*Pseudomonas syringae* pv. *phaseolicola*), the primary disease affecting our bean field trials in southwest Washington (Figure 1), we converted our bean field from overhead to drip irrigation in 2006. By pegging the drip tape in the bean

Figure 2: a) Drip tape was pegged down approximately every 20 feet. b) Cultivating beans with drip tape pegged in the bean row.
Photo provided by Washington State University

row (Figure 2a) we are able to cultivate the field for weed control once a week (Figure 2b). By eliminating overhead irrigation, we were able to limit the moist humid environment in the bean canopy that favors halo blight development, and in 2006 we saw no halo blight in our field. Halo blight is a serious bacterial disease that can be seed-borne and can affect next years crop if you plant seed collected from infected fields. Copper sprays can slow the development and spread of halo blight in the field but will not eliminate the disease. To learn more about halo blight symptoms and control options, see the Pacific Northwest Disease Management Handbook halo blight information http://plant-disease.ippc.orst.edu/disease.cfm?RecordID=123.

Results

Fresh shell beans. The overall mean number of days to harvest was 96 (Table 1). Matterhorn, PS01-207-2-b3, Red Hawk, Black Calypso and Jacob's Cattle were the earliest to mature (93 days), while Cannellini and both Flageolet varieties were the latest (101-102 days). All three late varieties had slow emergence due to the cool soil conditions at planting. The overall mean yield was 720 g (per 10 feet row). Vermont Cranberry, White Marrow and French Flageolet Flaro were the highest yielding, while Supremo, Jacob's Cattle and Black Calypso were the lowest yielding. Plant stand in all Cannellini plots was extremely low (data not shown) and yield data was not collected. Overall mean 100-bean weight was 94.6 g. PS01-207-2-B3, Tongue of Fire, and PS01-203-2-B3 (all Cranberry types) had the largest 100-bean weight while both Flageolet entries had the smallest.

Dry beans. The overall mean number of days to harvest was 113 (Table 1). PS01-203-3-B3 and Roma II were the earliest to mature (109-110 days), while USWK-CBB-16, Vermont Cranberry, Supremo, and White Marrow were the latest (116 days). The overall mean yield for 10-feet row was 535g. The highest yielding entries were all Great Northern type: USGN-5(842.8), Matterhorn (811.9), and ABL 6 (810.9). The lowest yielding entries were Red Coat Soldier (276.3), Jacob's Cattle (315.7), and Tongue of Fire (352.4). The overall mean weight of 100 beans was 49 g. Entries with the greatest 100-bean-weight were Supremo (70.5), PS01-207-2-B3 (65.3), USCR-15 (63.8) and Tongue of Fire (62.3), while both Flageolet entries had the smallest beans (23.5 and 26.6). Plant stand for Cannellini was extremely low in all plots (data not shown) and yield data was not collected.

Discussion and Conclusions

For fresh shell bean production, Cannellini and Flageolet are generally preferred because of their association with southern European cuisine. In this study Flageolet was high yielding due to a high number of pods per plant (data not shown), however bean size was significantly smaller than the overall study mean. White Marrow had a large bean size, was very high yielding, and had the largest number of beans per pod (data not shown), however, emergence was low due to cool soil conditions. Cannellini, Flageolet and White Marrow tend to be sensitive to cold soils and in this study germination and plant stand were significantly reduced due to this issue. In 2007, we have delayed the planting of these varieties by 2 weeks (May 31) to avoid this problem.

The Cranberry market class is also commonly used for fresh shell bean production, and PS01-207-2-B3, Tongue of Fire and PS01-203-2-B3 had the largest 100-bean weight. However, except for Vermont Cranberry, yields of all Cranberry entries tended to be below the overall mean. Supremo produced the largest beans, but yield was very low due to a low number of pods per plant (data not shown).

These results indicate that many dry bean varieties can be grown successfully for fresh shell and dry bean production in southwest Washington and similar environments. Several dry bean varieties have desirable characteristics for fresh shell bean production and growers can select varieties based on characteristics that are most desirable in their marketplace.

A major constraint to small-scale dry bean production is the lack of affordable and scale-appropriate equipment. In our program we have developed a dry bean thresher and a bean seed cleaner suitable for up to several acres of dry bean production. See our program web site for a description of this equipment, http://vegetables.wsu.edu/NicheMarket/smallScaleThreshing.htm.

	Days to Harvest		Yield (g)		100 Bean Weight (g)	
Entry	Shell	Dry	Shell	Dry	Shell	Dry
Great Northern						
ABL 6	94	114	727	811	85.0	44.8
Beryl	97	114	592	653	65.8	31.2
Belneb-RR-1	100	115	1090	660	72.0	37.1
Great Northern	100	112	832	562	63.5	33.0
Matterhorn	93	115	684	812	77.3	36.6
Orion	95	113	536	720	70.3	38.0
PS01-145-4-2-B2	97	112	667	636	85.3	44.3
USGN-5	98	114	676	843	76.5	41.1
White kidney						
Beluga	98	114	560	554	100.5	52.2
Cannellini	101					
USWK-CBB-16	99	116	699	680	86.0	46.3
Cranberry						
95-8186C	95	111	629	605	113.8	56.5
Capri (old Coral)	94	113	548	477	121.5	57.9
Cardinal	94	113	687	502	117.8	59.0
PS01-203-3-B3	94	109	695	404	129.0	59.0
PS01-207-2-B3	93	112	505	419	131.8	65.3
Thort	95	111	507	469	102.0	52.5
Tongue of Fire	95	112	777	352	129.5	62.3
UI-686	96	112	716	648	112.5	61.2
USCR-14	94	111	447	363	99.0	53.8
USCR-15	96	111	709	631	120.0	63.8
Vermont Cranberry	98	116	1393	475	88.5	43.2
Supremo	94	116	337	473	128.5	70.5
Soldier						
Red Coat Soldier	98	112	729	276	91.3	47.5
Soldier	95	112	672	499	115.8	61.1
Dark Red Kidney						
Montcalm	94	112	682	408	92.0	52.5
Red Hawk	93	111	478	461	91.0	47.6
Flageolet						
French Flageolet-Flagrano	102	114	881	507	45.3	23.5
French Flageolet-Flaro	102	115	1138	585	50.8	26.6
Others						
Black Calypso	93	115	356	433	87.0	54.1
Jacob's Cattle	93	111	354	316	117.0	59.3
Marrow Fat	96	112	795	586	78.3	37.8
Roma II	94	110	816	371	84.0	45.2
White Marrow	99	116	1307	532	98.8	55.1
Mean	**96**	**113**	**720**	**535**	**94.6**	**49.1**
p-value	**0.0000**	**0.0185**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Table 1: Days after planting to harvest, yield (grams) of 10-row-feet, and weight (grams) of 100 beans harvested at fresh shell and dry bean stages at WSU Vancouver REU in 2006.

Wintertime Management for Small Acreage Cattle Farms

OSU Extension Service Small Farms Program is hosting a workshop and farm tour relating to what small-scale cattle ranchers need to know about wintertime management.

Speakers include:

- Dr. Aurora Villarroel, DVM, MPVM, Dip.ACVPM, will be discussing herd health issues
- Gene Pirelli, Associate Professor, Livestock and Forages agent will talk about wintertime pasture management and grazing
- Melissa Fery, Instructor, Small Farms Program, will share information about keeping farms healthy and facilities management

The workshop will take place on, Saturday, October 20th at the Linn County Extension Service Office in Albany, Oregon. Presentations begin at 9:00 a.m. At 12 noon, the group will travel to Lingfarm near Aumsville, Oregon for a box lunch and farm tour. Vans will return to Albany at 4:00 p.m.

Registration for this workshop is $10 per person. Registration information is available on-line at smallfarms.oregonstate.edu or by contacting Chrissy Lucas at (541) 766-3556.

Small Ruminant Medications: How to Stay Within the Law

By: Dr. Susan Kerr, WSU-Klickitat County

How would you feel if you received this notice from the U.S. Food and Drug Administration about a tissue residue violation in a food animal product you marketed?

> *A goat sold for food on or about Sept. 30, 2007, is adulterated within the meaning of Section 402(a)(2)(C)(ii) of the Food, Drug and Cosmetic Act. Analysis of tissues disclosed the presence of fenbendazole at 2.4 ppm in the liver. The tolerance level for this drug in goat liver is 0.8 ppm. Our investigation revealed that you are responsible for this violation.*[1]

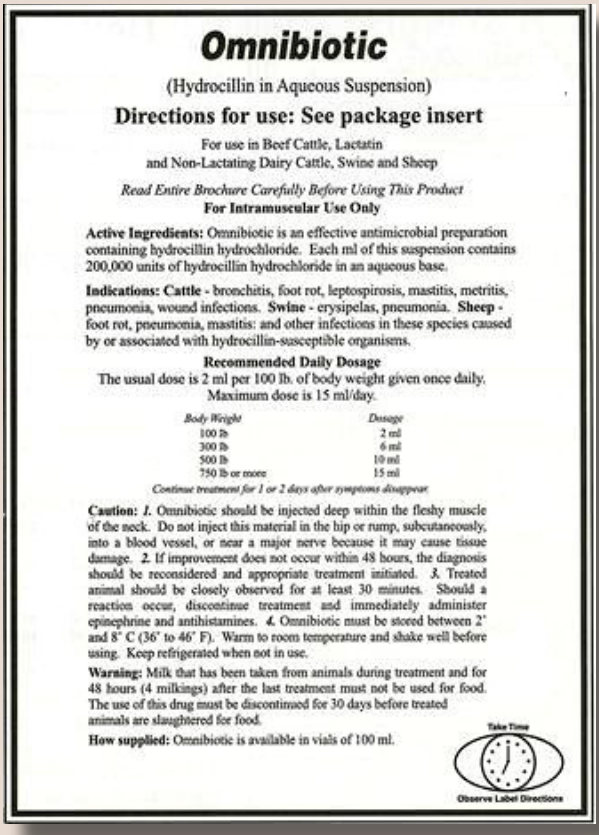
Unfortunately, very few medications are approved for use in goats and sheep. Indeed, "a critical shortage of approved animal drugs for minor uses and minor species exists because of limited sales opportunity, low profit margins, and the high capital investment necessary for bringing a drug to market."[2]

What, then, are small ruminant producers to do when their animals need treatment? Without proper treatment, animals will experience pain and suffering and some may die; producers will experience increased expenses, decreased revenues and other economic hardships. Yet use of animal medications in unapproved species and in unapproved ways can lead to dangerous medication residues in food animal tissues that enter the food supply.

On Label and Extra-label Drug Use (ELDU)

All medication labels contain information about conditions for which the medication is indicated, how much to give an animal, how long to give the medication, how to administer it, how long to withhold animal products from the food supply and so on. Using an over-the-counter or prescription medication exactly as indicated on the label is called "on label drug use." Any deviation from the medication's label directions, whether giving a higher dosage of the medication, dosing for a longer duration, using the medication in a different species, using it for an unlisted illness, administering using a different route, etc., is called "extra-label drug use" (ELDU).

Without the involvement of a licensed veterinarian, ELDU by producers is illegal and a violation of the federal Food, Drug and Cosmetics Act. Many producers unwittingly violate this important act, which was enacted to help protect consumers. "Extra-label use of drugs by non-veterinarians in food-producing animals is a significant public health concern and a contributing factor in illegal residues in edible animal tissue."[3]



Omnibiotic

(Hydrocillin in Aqueous Suspension)

Directions for use: See package insert

For use in Beef Cattle, Lactatin and Non-Lactating Dairy Cattle, Swine and Sheep

Read Entire Brochure Carefully Before Using This Product

For Intramuscular Use Only

Active Ingredients: Omnibiotic is an effective antimicrobial preparation containing hydrocillin hydrochloride. Each ml of this suspension contains 200,000 units of hydrocillin hydrochloride in an aqueous base.

Indications: Cattle - bronchitis, foot rot, leptospirosis, mastitis, metritis, pneumonia, wound infections. **Swine** - erysipelas, pneumonia. **Sheep** - foot rot, pneumonia, mastitis: and other infections in these species caused by or associated with hydrocillin-susceptible organisms.

Recommended Daily Dosage

The usual dose is 2 ml per 100 lb. of body weight given once daily. Maximum dose is 15 ml/day.

Body Weight	*Dosage*
100 lb	2 ml
300 lb	6 ml
500 lb	10 ml
750 lb or more	15 ml

Continue treatment for 1 or 2 days after symptoms disappear.

Caution: *1.* Omnibiotic should be injected deep within the fleshy muscle of the neck. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve because it may cause tissue damage. *2.* If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. *3.* Treated animal should be closely observed for at least 30 minutes. Should a reaction occur, discontinue treatment and immediately administer epinephrine and antihistamines. *4.* Omnibiotic must be stored between 2° and 8° C (36° to 46° F). Warm to room temperature and shake well before using. Keep refrigerated when not in use.

Warning: Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the last treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

How supplied: Omnibiotic is available in vials of 100 ml.

Take Time

Observe Label Directions

The item presented in this image is copyrighted material of the Sheep Learning Laboratory Kit from The Ohio State University Curriculum Materials Service, http://cms.osu.edu. Used with permission.

Requirements for Legal ELDU

Congress passed the Animal Medicinal Drug Use Clarification Act (AMDUCA) in 1994. This act amended the Food, Drug and Cosmetics Act and made ELDU legal given certain conditions:

1. ELDU is legal only under the supervision of a licensed veterinarian
2. A valid veterinarian-client-patient relationship exists
3. The veterinarian has

diagnosed the animal's problem
4. No labeled medication exists that will treat the problem OR labeled medications will not be effective if used according to label directions
5. Treated animals are identified and all treatment-related information is recorded
6. The veterinarian has made a determination of the market withholding period for all animal products from the treated animal
7. Only FDA-approved animal or human medications can be used
8. ELDU is for disease treatment purposes only, not for production or reproduction purposes. ELDU rules also apply to medications delivered in water but not in feed. Cost is another factor that does not warrant ELDU.
9. ELDU is not permitted if it will cause a drug residue in food and pose a public health risk
10. Specific medications are completely banned for use in food animals. These include Chloramphenicol, Clenbuterol, Diethylstilbestrol (DES), Dimetridazole, Ipronidazole, other nitroimidazoles, Furazolidone, nitrofurazone, other nitrofurans, Sulfonamide drugs in lactating dairy cattle (except approved use of sulfadimethoxine, sulfabromomethazine, and sulfaethoxypyridazine), Fluoroquinolones, Glycopeptides (example: vancomycin), Phenybutazone in female dairy cattle 20 months of age or older.[4]

A medication's withdrawal or with-holding period is the amount of time after the last treatment with the medication that all food products from the treated animal (meat, milk, eggs or other products) must be held from market until residues of the medication have fallen to acceptable levels in all tissues. Withdrawal periods are established by medication manufacturers through tissue residue studies using the label directions. ELDU of any medication can cause tissue residues with unpredictable medication clearance rates.

A Valid Veterinarian-Client-Patient Relationship is Essential

Several key factors must be present for a valid veterinarian-client-patient relationship to exist:
1. A veterinarian has taken responsibility for making judgments about an animal's health and treatment and the client has agreed to follow the veterinarian's instructions.
2. Through examinations or farm visits, that veterinarian is personally acquainted with the animal's care and environment.
3. That veterinarian has enough knowledge about the animal(s) to at least make a preliminary diagnosis of the animal's problem.
4. That veterinarian is available or has made provisions for emergency service in case of unforeseen reactions or treatment failure.

Avoiding Illegal Medication Residues

No matter what type of medication is administered to a food animal, producers must make and keep accurate records. These records should be kept for two years or the animal's lifetime, whichever is longer. The FDA may ask to review such records in the event of an illegal tissue residue situation. The information below must be recorded for every treatment on every animal:
• Date(s) of treatment
• Name of product and its active ingredient
• Product manufacturer
• Product's lot and serial number
• Dosage given
• Route and location of administration
• Withdrawal period (days or hours)
• Name of person who administered the product
- Animal identification
- Species treated
- Condition treated (pneumonia, foot rot, etc.)
- Length of treatment (for example, "5 days")

• If ELDU, record of veterinarian's name and contact information

ELDU Label Requirements

If a veterinarian recommends ELDU, the following information must be included on a label attached to the medication. Such a label must also be attached to any prescription medication used on-label or extra-label:
• Date
• Producer's name and contact information
• Veterinarian's name and contact information
• Medication's name
• Directions from the veterinarian (dosage amount, route and duration)
• Warnings or cautions
• Withdrawal period for meat, milk, eggs or other animal-derived food products
• Animal's species and name or number

Key Steps to Prevent Illegal Medication Residues

- Identify and track treated animals
- Properly store, label and administer all medications and medicated feed
- Make and keep excellent records

More Quality Assurance Issues

To decrease the possible transmission of disease-causing prions between ruminants, many mammal-origin protein sources are prohibited from use in ruminant diets. Prions are believed to be the disease agent that causes transmissible spongiform encephalopathies such as Scrapie (sheep and goats), Bovine Spongiform Encephalopathy (BSE or "mad cow" disease in cattle) and Chronic Wasting Disease (deer and elk). The only mammalian by-products allowed to be included in ruminant feed are blood and its by-products, milk products, pure porcine or equine protein products and gelatin. Keep feed tags for five years. Do not let sheep or goats consume cat or dog food because these feeds contain protein sources outlawed for ruminants.

Injections should be given in the neck whenever possible. Always inject subcutaneously instead of intramuscularly when both administration routes are allowed according to label instructions. Always check for withholding information about the substance being injected—some vaccinations have a required withholding period.

Conclusion

Despite the lack of many approved medications for sheep and goats, producers can both stay within the law and treat their animals if they remember to abide by extra-label drug use procedures and work closely with a licensed veterinarian within a valid veterinarian-client-patient relationship. Proper animal identification and record keeping practices also go a long way toward avoiding illegal medication residues in marketed products.

The Minor Use and Minor Species Animal Health Act (MUMS) passed by Congress in 2004 encourages pharmaceutical companies to create medications to prevent and treat rare diseases in major species (cattle, horses, dogs, cats, swine and poultry) and common diseases in minor species (all other species). Let's hope reaction to MUMS will translate into more approved and effective medications for small ruminants in the years to come.

Resources and References

www.fda.gov/opacom/laws/fdcact/fdctoc.htm
www.fda.gov/cvm
www.avma.org/reference/amduca/amduca1.asp
www.fda.gov/ora/compliance_ref/cpg/cpgvet/cpg615-200.html
www.avma.org/reference/amduca/amduca1.asp
www.avma.org/issues/drugs/mums/brochure.pdf
http://aquanic.org/news/1999/drugprog.htm
www.colostate.edu/programs/SSQA/chapter_3.htm
http://www2.luresext.edu/goats/library/field/DawsonA05.pdf

[1] Adapted from wording in U.S Food and Drug Administration Compliance Policy Guide, Compliance Policy Guidance for FDA Staff, CHAPTER 6, SUBCHAPTER, 615 Sec. 615.115 Extra-label Use of Medicated Feeds for Minor Species, April 4, 2001.
[2] JAVMA News, Sept. 1, 2004.
[3] U.S. Food and Drug Administration/Office of Regulatory Affairs Compliance Policy Guides, Sec. 615.200, "Proper Drug Use and Residue Avoidance by Non-Veterinarians" (CPG 7125.37), 1993.
[4] Extralabel Drug Use (ELDU): An Informational Outline of the Animal Medicinal Drug Use Clarification Act (AMDUCA), American Veterinary Medical Association, 2006.

Delicious Goat Recipe

(Submitted by Sam Angima)

2 pounds of stew meat (small one-inch cubes)
Pressure cooker
¼ salt
1 teaspoon curry powder
1 large onion
2 medium tomatoes
1 medium red or green bell pepper
½ cup chopped cilantro
1 cup water
2 teaspoon olive oil

Add olive oil to the pressure cooker pan (you can use a pan if you have no pressure cooker) on a hot stove and add the onions. Stir and let cook for 2 minutes. Now, add red or green bell peppers and let cook for one to two minutes, add cilantro and chopped tomatoes and curry powder, stir and let cook for 2-3 minutes. Now add the chopped goat meat and ¼ teaspoon of salt and stir intermittently for about 3 minutes. Cover and let cook for another 2 minutes. Add 1 cup water, stir well and pressure cook for 10-12 minutes; remove from heat source and cool pan to release pressure. (If you do not have a pressure cooker, use a covered pan and cook on medium heat for 30-40 minutes). Check to make sure meat is fully cooked. Add more salt to your liking and serve with rice or pasta or potatoes.

Seasonal Changes affect Poultry

By: Jim Hermes, Extension Poultry Specialist

As we move into the fall months, cool weather will soon arrive, and the rain will once again fall in western Oregon. There are special considerations for the poultry flock during these months of changing conditions.

First of all, make sure your birds have a place to get away from the rain. Chicken don't like the rain and will prefer to mostly remain under cover, especially with hard rains. Make sure that roosts are available for your birds, so they don't have to sleep on the wet ground. Cold temperatures are usually not of concern for adult chickens in most of Oregon. It takes temperatures well below freezing to impact their health.

In the fall, chickens will begin to change their eating habits. Because the weather is cooler, their feed consumption will increase. In order to stay warm, they need to burn more calories. Also, chickens that have been on the range or pasture during the spring and summer will find far less feed in that same pasture. The grass and weed seeds as well as the insects will be gone. As fall progresses, the pasture or range will green up as the temperature cools and rains irrigate them, but chickens receive nearly no nutrition from eating grass. It is the seeds and insects that they are after, and since they will be mostly gone, they will turn to the feeders for nourishment. In this time of dependence on prepared feeds, it is important to limit supplementation with scratch or table scraps to no more that about 15 to 20% of their total daily consumption.

With the rain, chickens may encounter standing water. Drinking water from the ground can lead to the infection of pathogens and parasites. Intestinal round worms are a common problem in chickens drinking from standing water. Worm infected chickens will generally appear healthy but seem to always be hungry and eating but remain skinny for their breed. You may also observe worms in their droppings. Wormers are available that will generally take care of the problem. When using wormers, strictly follow the label directions for safe used of these compounds.

"Mud balls" on chicken feed can also become a problem when chickens are walking on wet flooring. Because of their scratching behavior, soil and manure can collect on the birds' claws and the ends of their toes. If allowed to grow large, they inhibit walking and can result in broken toes. In severe cases, the ends of their toes will die and fall off. The mud balls can become nearly as hard as cement and difficult to remove. It is best to watch for the problem and remove the balls when they are small.

The primary impact of season change from summer into fall is a reduction in egg production. Chickens are stimulated to lay eggs by day length. Long days and increasing day lengths encourage egg production. As we move from summer into fall, day length declines from about 16.5 hours per day to a low of eight hours per day in December. Declining and short day lengths will result in reduced egg production in most hens. Some hens may completely stop laying eggs. During this period, many will molt, a process to lose their old worn out feathers and grow new ones.

To reduce the effects of reduced day length on egg production, artificial lighting can "fool' the chickens to remain in production. Lights in the chicken house that keep the day length at above about 14 hours per day will keep hens laying well through the fall in winter months. Only low wattage lights are needed, a single 25 to 40 watt bulb on a timer that turns the lights on before sunset and off at about 10 pm is sufficient.

With some attention to management requirements, the poultry flock will remain healthy and productive throughout the fall and into winter.

Forage Production Under Agroforestry System

By: Sam Angima

One year ago I wrote an article about agroforestry being an option for small scale farmers who may have forestry land that is not is not currently providing any income until harvest time (Figure 1). In 2007, we set up some on-farm forage trials in a thinned forest in Harlan Oregon and gathered forage production data that I want to share with you in this article. In the context of this article, agroforestry is defined as "a land-use system that combines agriculture and forestry technologies to create a more integrated, diverse, productive, profitable, healthy, and sustainable land-use system especially beneficial to the small scale farm". For basics about agroforestry, check our website; http://smallfarms.oregonstate.edu/sites/default/files/Small_Farm_News_Nov22_0.pdf

Figure 1: Livestock Grazing under agroforestry system. *Source National Agroforestry System*

Just like most of western Oregon, the farm site where this forage trial is located gets about 50-70 inches of rainfall each year. The soils are classified as Eilertsen silt loams *(Fine-silty, mixed, mesic Ultic Hapludalfs)* with a pH of 5.5, and cation exchange capacity of 15 (NRCS web soil survey). Those familiar with land capability classes, this site has class 2c (c stands for cold climate limitation). The dominant grass species in this site are perennial rye grass, orchard grass and some indigenous species.

In winter 2007 we set out some 21 test plots *(Figure 2)* under two different scenarios. The first nine are set under a thinned 25-year old Douglas fir forest (current tree density about 300 trees to the acre) and the second set of 18 are under 55-year old trees that are ready for harvest and at the same tree density. The remaining 3 plots are the control plots that are set out on a sunny patch that does not get shade. The aim of this setup was to see whether we can still raise some good forage under the trees even under older trees that still provide some light to the understory for forage production.

The grower fertilized this field at the same time he fertilized his other fields in April with 50-75 pounds of nitrogen per acre using urea. Forage was harvested *(Figure 3)* when the grower indicated he was ready to

Figure 2: Initial setup of the forage trial plots. *Photo by Sam Angima*

Figure 3: Dense forage on test plots ready for harvest in May 2007. *Photo by Sam Angima*

release his livestock to graze. Therefore this data indicates the actual forage that animals can consume at specific times during the year. Three to four inch stubble was left to support photosynthesis after harvest to allow grass growth. Our first harvest was in May and the second one was in August.

Figure 4: There is enough grass biomass to support livestock nutrition, especailly during the summer months. *Photo by Sam Angima*

The forage results were a surprise to us *(Figure 4)*. From the soil survey, this area can produce up to 3 tons/acre of hay under full sun with good management. We were able to harvest about 2 tons/acre under the 25 year trees and over 1 ton/acre under the 50 year old trees in two cuttings by August 2007. The control plots growing in sunny areas produced excellent forage at nearly 3.5 tons/acre during the same period. These results are only 2/3 of the year (*see Table 1 below*) and we expect to harvest one more time before the end of the 2007.

Site	Fertilizer N Applied (lbs/acre)	May 2007 harvest (tons/acre)	August 2007 harvest (tons/acre)	Total forage harvested (tons/acre)	Extrapolated for 2007 (tons/acre)
Under 25 yr trees	75	0.73	1.19	1.92	2.83
Under 55 yr trees	75	0.43	0.63	1.06	1.56
No trees	75	1.42	2.05	3.47	5.12

Table 1: Forage harvest (dry basis) under different agroforestry settings in 2007, Harlan, OR.

From this data, if we took the average year-round stocking rate of livestock for good pasture for Western Oregon of one beef cow to two acres (*this is also equivalent to roughly 3-4 sheep per acre*), you could essentially, under good management, have half the stocking rate under an agroforestry system of one cow/calf for 4 acres and be able to get some income under maturing forest stands. There are many circumstances that can affect this estimate. These may include your local climate, size of land, topography, investment of time, and of course your local soil conditions. However, what these results are indicating is that utilizing local resources on your farm can get you some income rather than waiting for over 40 years to harvest trees to get income. For more information on using agroforestry systems visit the national agroforestry center website http://www.unl.edu/nac/

On-Farm Variety Trials Training & Dry and Shell Bean Field Day

Hosted by:
Organic Seed Alliance,
USDA Risk Management Agency,
Washington State University, Oregon State University, and
Ayers Creek Farm

Location: Ayers Creek Farm, Gales Creek, Oregon
Date/Time: Sept 19th, 2007, 9:00am-3:00pm, lunch included

Come visit Ayers Creek Farm for a day of variety trials, taste testing, and production & marketing information. OSA, WSU, OSU, and Ayers Creek Farm are teaming up to offer a two-part, on-farm field day. During the first half of the day, OSA will deliver a workshop on how to conduct on-farm variety trials, including an in-field evaluation of sweet potato and drying pepper varieties. The training will be followed that afternoon by a dry and shell bean field day delivering results of WSU bean trials, the OSU bean breeding program, the Small Farms Extension program, and practical bean production and marketing information from Ayers Creek and 41st Avenue Farms.

This two-part field day offers an opportunity to gain new skills, see and taste varieties first-hand, and learn from the experience of growers, university specialists, and seed professionals. Please visit www.seedalliance.org or call (360) 385-7192 for more information and to register today. Registration is free, but pre-registration is required.

Mark Your Calendars

2008 Small Farms and Farm Direct Marketing Conference February 16th OSU Alumni Center

Watch the OSU Small Farms web site for registration information.

2008 will mark the 8th anniversary of OSU Extension's Small Farms and Farm Direct Marketing Conference, which consistently draws 250+ participants from across the state. The conference addresses emerging alternative agricultural marketing options, innovative production practices and systems, food policy and community food security. We believe that this conference contributes to the vitality and sustainability of the small farm sector in Oregon by offering educational outreach and providing networking opportunities to the diverse contributors to the state wide food system.

Interfaced with regional Risk Management Agency conference, the program has been expanded into a larger facility.

Keynote Speaker: Fred Kirschenmann

The keynote speaker for the 2008 *OSU Extension Small Farm and Farm Direct Marketing Conference* is farmer and academic, Fred Kirschenmann. A longtime leader in national and international sustainable agriculture, Kirschenmann holds a doctorate in philosophy from the University of Chicago, and has written extensively about ethics and agriculture. He has served on several national and international boards, including the USDA's National Organic Standards Board. He served as director of the Leopold Center for Sustainable Agriculture at Iowa State University from 2000 to 2005.

Kirschenmann is from south central North Dakota where he manages his family's 3,500-acre certified organic farm. He took over management of the family farm in 1976 when his father became ill. By 1980, the farm was certified organic, one of the early operations to make the transition. The farm is a natural prairie livestock grazing system that combines a nine-crop rotation of cereal grains, forages, and green manure. Kirschenmann Family Farms has been featured in national publications including *National Geographic*, the *Smithsonian*, *Audubon*, *Business Week*, the *LA Times* and *Gourmet* magazine. In 1995, Kirschenmann was profiled in an award-winning video, "My Father's Garden," by Miranda Productions, Inc.

Farm Profile: Reill Farm, Lincoln County

By: Sally Reill

The small farm of John and Sally Reill sits in a valley located in Lincoln County, Oregon, about 7 miles east of the Pacific Ocean. Though the property is 4 acres, the deer fenced growing area is not more than a ½ acre. Over the course of 18 years they have built an intensive growing area currently consisting of 27 raised beds about 40" wide by 14' to 21' long, mostly made of salvaged 2" X 12" redwood planks. In 2001 they built a 20' X 30' double poly wall greenhouse. There is a large area for growing squash, berry patches and a half dozen apple trees.

Sally and John Reill pose in front of their green house which they use to start transplants during winter. *Photo by Sam Angima*

Sally has been gardening for 40 years and is a 20 year veteran Master Gardener, active in the local chapter. Her interest in growing food crops goes back to childhood. Her father had a large garden to which he carted chicken manure from the chicken ranch across the road. John also came by his interest in growing vegetables early. He remembers growing a small garden as a child and visits to a family farm, as a teenager he worked on a small farm. A mutual interest in gardening brought them together.

After John retired from the Oregon State Parks Department he was looking for something to keep busy and supplement the retirement income. He had recently learned the art of welding and was making garden trellises and steel garden art, which he wanted to try selling at the Saturday Farmer's Market in Newport. Sally decided to grow a few extra vegetables and take them along. They started in 2002; the locally produced vegetables sold quickly and were usually gone by 10:00 in the morning. They also sold cut flower bouquets. It was there that they met the proprietor and chef of a trendy, and very popular, Italian Restaurant in Newport, "April's at Nye Beach". At first Chef April bought whatever was available that she could use, including flowers, stressing locally grown and fresh ingredients on her menu. Soon she was ordering vegetables during the week and picking them up on Saturday morning at the market. The following year she was asking if special crops could be grown for her. After 4 years of taking everything they could produce to market, they could no longer produce enough to continue at the Market and satisfy the needs of the restaurant. In 2005 they decided to grow exclusively for one customer, and continue growing garlic for two other customers as well.

John does much of the heavy work, building new beds and filling them with trucked in topsoil, and composted livestock manure from the Lincoln County Fairgrounds. Bone meal, rock phosphate and seed meals are added. The farm is about 95% organic, much of the fertilizer coming from their small flock of chickens. He also designs the cloches and builds steel supports for things like cucumbers and beans. Tomato cages are made of circles cut from high tensile 6' field fence, which holds up well to the weight of the plants. Cages are staked in place with 6' steel fence posts. Sally starts all the seeds in the greenhouse and plans what and when to plant, estimating when space will be available to transplant the seedlings. Seeds are started in pots in commercial mix on a heat mat or a

John Reill shows how he grows corn in raised beds. *Photo by Sam Angima*

sand box with a soil heat cable, and then moved to a bed in the greenhouse for growing and finally to a cloche or cold frame for hardening off. All crops including those normally considered as direct seeded, such as beets, are started in pots and transplanted allowing for more uniform spacing and doing away with the need to thin. Sally also grows around 100 tomato plants, as well as many other vegetables and ornamentals, for the annual Master Gardener Spring Plant Sale.

OSU Extension personnel do farm visits to understand grower needs. *Photo by Sam Angima*

Irrigation is by hand watering. Crops are continually being harvested, rotated and replanted so drip systems are not practical and sediment in the stream water used could clog emitters. Overhead watering would promote disease too in the cool climate. One big benefit of hand watering is that all the plants get a good visual check at least once a week for developing problems.

The biggest challenges in the maritime climate are pests and diseases which favor the frequently damp weather. Pests such as slugs and flea beetles can ruin a crop quickly which makes timing of plantings important since there is sometimes no good way to control them without ruining the crop. Fungal diseases are a problem, particularly for tomatoes and squash; organic preventative sprays are a must.

The crops grown are very diverse; arugula, endive frisee, chives, kale and escarole start the season. Coming later are beets, fennel, onions, parsley, chard, squash and Italian green beans. More tender items such as a variety of tomatoes, basil and English cucumbers are grown in the greenhouse and three cloches. Garlic is a big crop, around 800 bulbs a year take up 3 or 4 beds. Once the garlic is harvested in July, succession plantings of seasonal vegetables are made to keep a constant supply coming. The restaurant also uses apples for special deserts.

Sally makes flowers into miniature bouquets for each table and large bouquets for the reception and window areas. The varieties proven most useful are Zinnias, Sunflowers, Rudbeckias and other perennials. Bouquet fillers include such things as garlic scapes, dill seed heads and herbs, making them interesting and unique.

The vegetables are picked and delivered once or twice a week depending on season and demand, and to ensure freshness. The Reills stress very high quality in their produce. This arrangement has worked out well for both the farmers and the restaurant. The restaurant can serve fresh in season food and the farmers are not tied down to a weekly Market.

Sally offers this advice for farmers who have a limited space: Producing a large quantity of quality vegetables in a small space requires intensive gardening practices and rapid turnover of crops with attention to timing, soil fertility and prevention of problems. For those who would like to grow for restaurants she advises that once initial contact is made, get to know the chef, find out what types of vegetables suit the cuisine being served, search out the best varieties, buy good seeds, ask what size vegetables are preferred and concentrate on what you can grow successfully. Finally always offer only the best quality, if produce doesn't look good, it is chicken food on the Reill Farm.

Growers at the coast utilize "cloches" to gain heat units in order to grow warm season vegetables. *Photo by Sam Angima*

You've Grown It, Now What?

A brief introduction to post-harvest food handling

By: Chip Bubl, Oregon State University, Columbia County

Savvy consumers have high expectations. They want their meat, produce and processed food products to be nice looking, nutritionally sound, good tasting and free from microbial risks. The small farmer can capitalize on these expectations by consistently delivering the best possible product. Most locations have direct consumers, stores and restaurants willing to pay for quality. But quality isn't easy to achieve. Careful attention to detail is required from pre-planting decisions through final sale.

A post harvest marketing and management plan begins with decisions about product selection, farming techniques and marketing strategies. For example, if you are selling onions, do you plan to store them? What percentage and for how long? The answers to those questions, along with your knowledge of the market, will guide your variety selections. You wouldn't grow exclusively "sweet Spanish" onions if you want to be selling onions in February. Other onion cultivars have much better storage characteristics.

Production practices influence the incidence of certain defects like green-skinned potatoes, garlic without outer "skins" and green shoulders on carrots. A successful farmer learns to recognize the most common defects and address their causes.

Someone selling lamb would need to know what their consumers/buyers want, i.e. whole small live lambs for celebrations, prime cuts like legs and chops, grass-fed only, etc. Those answers might well determine breed raised, time of lambing, feeding and management decisions, and processing options.

Fruit is generally harvested at the right balance of sugars and acid and the proper eating texture. *Photo by Garry Stephenson*

Production cycle pests (insects and diseases), nutritional deficiencies and human pathogen contamination can have a major impact on crop quality and storage life. A good plan to manage those problems will make the harvest more productive, leading to less field cull and better post-harvest quality. The amount of produce that is culled before packing and sale represents a significant financial loss due to wasted production input costs and wasted harvest, handling, culling and disposal costs.
Grower post-harvest objectives are fairly succinct:

- Maintain the quality of the harvested product through sale and consumption
- Prevent harmful microbial contamination

Post-harvest issues may include

- Quality of the product at harvest
- Damage during harvest
- Post-harvest labor requirements and management
- Need for cooling and/or further processing
- Need to ripen the crop after harvest (e.g. winter pears)
- Time between harvest and sale
- Storage risks
- Relative costs of post-harvest technologies
- New technologies
- Regulatory issues (meat and other processed products)
- Liability concerns

Microbiological contamination has been much in the news recently. There are a number of human pathogens that can contaminate fresh produce. Most are introduced by contaminated irrigation water, fresh manure in production fields, or poor worker sanitation at harvest or post-harvest processing. Once

introduced, these pathogens can be difficult to remove. References cited at the end of this article will help guide your thinking on this crucial subject. Prevention strategies need to be implemented in every operation. These are often called "good agricultural practices" (GAP) plans. See the references for more information on GAP.

Winter pears require cold storage before they can go through the ripening process.
Photo by Lynn Ketchum, OSU Extension and Experiment Station Communications

Specialty growers are often selling unique varieties that don't ship well. The reason such crops don't ship is that they are tender and must be handled with great care all through the harvest and sale process. Harvest equipment may have to be modified to reduce bruising. Special bins or crates may be needed. Farm labor must be trained to handle tender crops. Compensation rates for picking tender crops must account for the care required.

In general, most vegetables and fruits are chilled after harvest to lower their respiration rates. This helps to maintain eating and nutritional quality and lower decay loss. Humidity in storage can be manipulated to maintain a fresh appearance. Berries, which are often quite fragile, are best picked early in the day to minimize their "field heat". There are a lot of techniques to remove field heat from fruits and vegetables. Certain vegetables are commonly chilled by "icing", others by quick transport to a properly sized refrigeration unit and some are "hydro-cooled".

However, sub-tropical vegetables or fruit (including tomatoes) are easily damaged by temperatures under 50-55 degrees F. This is called chilling injury. It is important to know the temperature and humidity requirements for the crops you grow.

Fruit is generally harvested at the right balance of sugars and acids and the proper eating texture. Further ripening is not desirable. However, winter pears require cold storage before they can go through the ripening process. Other fruit may benefit from some controlled ripening as well.

Ripening is a complex process where starches are converted to sugars and the fruit starts to soften. There is a naturally produced plant growth regulator called ethylene that is central to the process. As fruits ripen, they give off increasing amounts of ethylene. This stimulates ripening of surrounding fruits. Decaying fruit will produce increased amounts of ethylene ("a rotten apple will spoil the bunch") which also stimulates ripening. Stored winter fruit is held at or near 32 degrees F to slow respiration and the ripening process. Controlled atmosphere storages (impractical for the small farmer) chill the fruit, lower the atmospheric oxygen content to further slow respiration and may also "scrub" ethylene from the storage facility. Ethylene can also cause potatoes to sprout and carrots to turn bitter. If you are storing fruit, some segregation from other produce within refrigerated facility may be needed.

A diverse produce mix and varying storage times can complicate the management of your facilities. Get to know the best techniques to handle your produce mix and how to work around the sometimes competing requirements of different produce items.

The decision to store and market produce over a longer time frame has risks, challenges and rewards. The risks are primarily from loss of product quality in storage and selling prices that are not as good as you budgeted. With the movement of food from great distances, summer apples in New Zealand or other Southern Hemisphere locations compete with stored U.S. apples from the previous fall. Grower challenges often involve smaller deliveries to a number of sites. The expense of maintaining refrigerated storage is also an increasing

problem. Most grocers won't hold much inventory so they make you store and deliver the product. The rewards come from selling your produce at a premium when other local produce is unavailable. The premium has to be large enough to cover the increased costs, storage loss and the like.

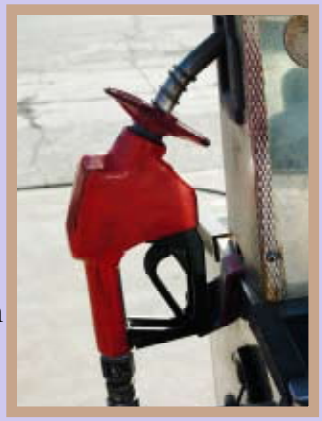
There are excellent resources to guide you in the design of facilities and equipment appropriately sized for your operation. If you are certified organic, your certifying agent may have specific suggestions for you that go beyond or interpret the national organic standard as it relates to post-harvest concerns. Of particular importance are rules on pre-plant manure applications and the use of specific disinfectants in the packing line.

Food technologists in universities and private industry have created a lot of innovations in fresh packaging tools and techniques including a variety of permeable films, new container styles, and many other products. Some of this technology is adaptable to small farmers.

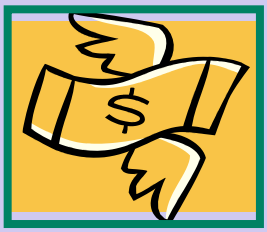
Further processing of fruits or vegetables into storable products like jams, pickles, frozen packages and other items requires substantially more investments in equipment and after-harvest labor. Specialty product processing is regulated by the Food and Drug Administration on a federal level and by the Oregon Department of Agriculture's Food Safety Division in Oregon. Your ODA contact can be of great help in discussing your ideas and getting information about safe commercial food processing.
This has been a very brief introduction to post-harvest handling. For more information, check out these resources:

1. A great introduction to post-harvest technology: http://attra.ncat.org/attra-pub/postharvest.html
2. A good web site from N. Carolina State: http://www.bae.ncsu.edu/programs/extension/publicat/postharv/
3. Good information for both organic and non-organic growers: http://anrcatalog.ucdavis.edu/pdf/7254.pdf
4. Also from California: http://postharvest.ucdavis.edu/
5. The USDA "encyclopedia" on post-harvest handling and storage: http://usna.usda.gov/hb66/contents.html
6. OSU Food Innovation Center in Portland: http://fic.oregonstate.edu/
7. OSU Department of Food Science and Technology in Corvallis: http://oregonstate.edu/dept/foodsci/extservices/ext_index.htm
8. Oregon Department of Agriculture, Food Safety Division: http://egov.oregon.gov/ODA/FSD/index.shtml
9. Good Agricultural Practices (GAP) handbook: http://www.sfc.ucdavis.edu/pubs/articles/foodsafetybeginsonthefarm.pdf

Conserving Fuel on the Farm



U.S. farmers spent $5.84 billion on diesel fuel and $2.30 billion on gasoline in 2005. While there is little you can do to change the price you pay for fuel, you can take steps that will reduce fuel consumption and save money. A new publication provides useful tips to help you start saving fuel on your farm today. Many are free or low-cost measures that can provide immediate savings. Others have an associated cost, but offer a cost-effective payback. The publication focuses on energy conservation in three areas: fuel storage, vehicle operation and maintenance, and field practices. For instance, did you know a 300 gallon storage tank can lose about 120 gallons each year from evaporation? You can reduce that loss to about 15 gallons. The publication tells you how to do this and many other methods to save fuel. Conserving Fuel on the Farm is available from ATTRA (Appropriate Technology Transfer for Rural Areas) at: http://attra.ncat.org/attra-pub/PDF/consfuelfarm.pdf



Calendar

September

22 - Irrigation for Small Landowners
Workshop will cover the range of irrigation options for small landowners, from overhead systems to micro-sprinklers. Southern Oregon Research and Extension Center. 569 Hanley Road, Central Point, OR. For more information contact Melissa at (541) 776-7371. ***$20***

27 - Rural Living Basics
Rural residents to learn the basics of drinking water, well, and septic systems to protect your family's and animal's health, your homestead investment, and the safety of groundwater resources. 6:30 PM - 8:30 PM. Monroe High School Library, Monroe, OR. You must register, contact Chrissy at (541) 766-3556. ***FREE***

October

10 - Pasture Management 101
Topics will include improving pasture productivity, fertilizing and liming soils, rotational grazing, pasture renovation techniques and wintertime management. Space is limited to15 participants. 9:00 AM - 12:00 PM. OSU Benton County Extension, 1849 NW 9th Street, Corvallis, OR 97330. To register contact Chrissy at (541) 766-3556. ***$5***

16 - Soil Fertility Building Blocks
Learn the basics of soil composition and how to develop a soil fertility management strategy appropriate for your soil types and farm operation. 4:00 PM - 8:00 PM. 569 Hanley Road, Central Point, OR. For more information contact Maud at (541) 776-7371. ***$10***

20 - Wintertime Management for Small Acreage Cattle Farms
Workshop and farm tour relating to what small-scale cattle ranchers need to know about wintertime management. 9:00 AM - 4:00 PM. OSU Linn County Extension Service Office, Albany, OR. To register contact Chrissy at (541) 766-3556. ***$10***

27 - Introduction to Beekeeping
Apiarist Karen Peteros will outline the basic principles and practices of keeping bees. 1:00 PM - 4:00 PM. Wilson Lane Apiary. 257 Wilson Road, Ashland, OR. For more information contact Maud at (541) 776-7371. ***$5***

Please visit our website http://smallfarms.oregonstate.edu/events for more Fall and Winter events.

Want to add your event to our calendar then please submit your information at http://calendar.oregonstate.edu/advanced/list/extension-smallfarms/ "Click the Submit an event button." Events have to be approved and will not immeadiately post. If you have questions please contact Chrissy Lucas at Chrissy.Lucas@oregonstate.edu or 541-766-3556