



Oregon Small Farm News

Oregon State University Small Farms Program

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Cover Photo: Coyote

Photo provided by Benton Co. AWPP

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Using Coyotes to Protect Livestock. Wait. What?

By: Randy Comeleo, Committee Chair, Benton County Agriculture and Wildlife Protection Program

Livestock losses are an unfortunate reality of ranching and the use of traps and snares is a common way to attempt to reduce predator-livestock conflict. However, one USDA study (Shivik et al. 2003) noted that for many types of predators, there is a paradoxical relationship between the number of predators removed and the number of livestock killed. Surprisingly, these researchers found that as more predators were removed, more livestock were killed.



Guard dog puppy and lambs.
Photo by Louise Liebenberg

Similarly, in a 14-year USDA study at the University of California Hopland Research and Extension Center (Conner et al. 1998), researchers found that trapping of coyotes did not reduce sheep losses. In fact, scientists found that as trappers worked more hours, more lambs were killed by predators. The unexpected results in these studies can be explained by the reproductive strategy and territorial behavior of highly social predators like the coyote.

In populations exploited by humans, coyotes compensate for reductions in population with increasing immigration, reproduction, and pup survival rates. In one study, nearby coyotes replaced removed coyotes within a few weeks (Blejwas et al. 2002)! In the words of one researcher, "Killing coyotes is kind of like mowing the lawn, it stimulates vigorous new growth." In order to sustain larger litters of pups, breeding adults are compelled to seek larger prey. Nearby sheep - usually ignored by adult coyotes in an unexploited, stable population - become a ready

source of food. Thus, a system of snares can become the machinery of a self-perpetuating cycle of death for both coyotes and sheep.

Research has also shown that the disruption of social structure caused by lethal control can contribute to increased livestock loss. Most coyotes do not kill sheep. Sheep-killing coyotes are usually older and bolder breeding adults in exploited populations trying to provide food for large litters of pups in the absence of sufficient natural prey (Jaeger et al. 2001). Because of their indiscriminate nature, snares not only kill non-target wildlife such as deer, raccoons, and birds, but they also kill “non-offending” coyotes who may simply be trying to access prime rodent habitat in sheep pastures. In fact, snares have been found to preferentially kill non-offending, subordinate - yet often territorial - pack members, rather than sheep-killing older, wiser, breeding adults (Sacks et al. 1999).

When non-offending, subordinate, territorial coyotes are killed, social structure and territorial behavior are disrupted, allowing nearby depredating coyotes (that were formerly excluded) access to livestock (Jaeger et al. 2004). In other words, “well-behaved” coyotes can actually prevent livestock losses by defending a territory which may overlap sheep pastures – effectively excluding interlopers from neighboring packs who may have learned to kill sheep. Protecting livestock by using one predator to repel another gave rise to an expression that makes predation management researchers chuckle: guard coyote (Shivik 2014, p. 74).

Predation management researchers are not the only ones who have observed this relationship between



Coyote hunts rodents not cows.
Photo provided by Randy Comeleo

killing predators and livestock losses. Writer Michelle Canfield raises grass-fed lamb in the Snohomish River Valley and told the following story about “guard coyotes” in her blog after visiting Jon Carter, an advisor to the Oregon Pasture Network, at his farm in Scio, Oregon:

The more selection pressure they face, the more they rise to the challenge and increase reproduction. So the last thing we want to do is go on a killing spree; because the population responds exactly opposite to what we'd prefer. We kill one coyote, we might get three more vying for his spot in return. Indeed, this notion was confirmed by a man I met who ran guardian dogs with his sheep, and generally left well-behaved coyotes alone.

Jon discussed a bit on living in balance with coyotes, and how he used to feel tempted to shoot any coyote he saw. Until one day he shot a coyote in the distance that was minding its own business, during a period of time when he'd had almost zero sheep losses to predators. Lo and behold, the next few weeks, he started getting “hits” from a

new coyote who had moved in to fill the now-dead coyote's niche. It convinced Jon to focus on only removing known problem coyotes, not all coyotes!

Predation management experts say that a properly implemented non-lethal predator control program should considerably reduce the need for lethal control. Therefore, lethal control should not be necessary except as a last resort to selectively target and kill a demonstrably habituated, dangerous, or chronically depredating individual.

If a pair of coyotes is not killing livestock, their dominance over the territory typically excludes sheep-killing predators and helps to prevent livestock losses (Shivik et al. 2003). Thus, the territorial behavior by a breeding pair of "well-behaved" coyotes is one of the best reasons for using non-lethal deterrents for predator management.

Recognizing what scientists, and farmers, are saying about the benefit of "guard coyotes", Benton County recently created the Agriculture and Wildlife Protection Program (AWPP). This new program aims to encourage the proactive use of non-lethal animal damage deterrents in an effort to foster the coexistence of agriculture and wildlife in Benton County.

The AWPP funds educational outreach and expert consultation services and a merit-based, cost share, reimbursement grant program. Agricultural operations in Benton County that wish to prevent conflicts with wildlife may qualify for up to \$5,000 in reimbursement grant funds for the purchase of proactive non-lethal wildlife deterrents to protect livestock and crops.

To learn more about the program and apply for a grant, visit the AWPP website at: <https://www.co.benton.or.us/awpp>. 

Literature Cited

Blejwas, K. M., B. N. Sacks, M. M. Jaeger, and D. R. McCullough. 2002. The effectiveness of selective removal of breeding coyotes in reducing sheep predation. *Journal of Wildlife Management* 66:451-62. <https://nwrcontentdm.oclc.org/digital/collection/p16473coll8/id/13647/>

Conner, M. M., M. M. Jaeger, T. J. Weller, and D. R. McCullough. 1998. Effect of coyote removal on sheep depredation in northern California. *Journal of Wildlife Management* 62:690-99. http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/98pubs/98-24.pdf

Jaeger M. M. 2004. Selective targeting of alpha coyotes to stop sheep depredation. *Sheep & Goat Research Journal* 19:80-84. http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/04pubs/jaeger041.pdf

Jaeger, M. M., K. M. Blejwas, B. N. Sacks, J. C. C. Neale, M. M. Conner, and D. R. McCullough. 2001. Targeting alphas can make coyote control more effective and socially acceptable. *California Agriculture* 55:32-36. https://digitalcommons.unl.edu/cgi/viewcontent.i?article=1599&context=icwdm_usdanwrc

Sacks, B. N., M. M. Jaeger, J. C. C. Neale, D. R. McCullough. 1999. Territoriality and breeding status of coyotes relative to sheep predation. *The Journal of Wildlife Management* 63:593-605. <https://www.jstor.org/stable/pdf/3802648.pdf>

Shivik, J. A. 2014. *The Predator Paradox – Ending the war with wolves, bears, cougars, and coyotes*. Beacon Press, Boston, Massachusetts. http://www.amazon.com/The-Predator-Paradox-Cougars-Coyotes/dp/0807084964/ref=cm_cr_pr_product_top

Shivik, J. A., A. Treves, P. Callahan. 2003. Non-lethal techniques for managing predation: primary and secondary repellents. *Conservation Biology* 17:1531-37. http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1266&context=icwdm_usdanwrc

Japanese Agricultural Innovation Stories

By: Toshihiko Nishio

Translated and edited by: Shinji Kawai, Faculty Research Assistant, Department of Horticulture and Alice Formiga, Assistant Professor, eOrganic Director

Improvements in agricultural technology and breeding helped struggling Japanese farming communities in the early 20th century. In the 1990s, Dr. Nishio Toshihiko, a Japanese rice breeder and scholar, published over 150 stories about these innovations. Many of the cultivars and techniques he discussed in the stories are familiar to Americans, such as the Fuji Apple, the 20th Century Asian pear, and vegetable grafting. By showing how these discoveries derived from careful observation, patience, and in some cases, serendipity, we hope that farmers will realize how ordinary people can contribute to the advancement of their local agricultural communities and beyond. This is the first in a series of stories to be featured in *Oregon Small Farm News*.

Born in a Garbage Dump: the “20th Century” Asian Pear

The “Nijisseki” or 20th Century” Asian pear was discovered in 1888 by a thirteen-year-old farm boy named Kakunosuke Matsudo in the village of Yatsushira (now called Ohashi, Matsudo City). This cultivar, which would take the twentieth century by storm, was then a small, rugged looking seedling that he spotted in the garbage dump of a neighboring relative. The story began when the boy decided to take the distinctive seedling home, and transplant it in his family’s orchard.

The Matsudo district had been a pear growing area since the Edo Era (1603-1868) and Kakunosuke’s family had recently started a pear orchard. Kakunosuke was probably influenced by his family’s enthusiastic plans to pursue a bright future by growing pears.

Kakunosuke’s real contribution came later, however, with his careful nurturing of the tree and his decision to introduce this superior cultivar to the public. The seedling was susceptible to diseases such as alternaria black spot (*Alternaria kikuchiana*). If Kakunosuke had not kept it healthy, it would surely have died off. But after 10 years, the tree finally bore fruit. When Kakunosuke tasted it, he found that it was sweet and juicy. He immediately named it “Shin Daihaku” or “New Large White”, and he resolved to make it more widely available. This new cultivar would surpass the popular heirloom known as “Daihaku” or “Large White”.



The “Nijisseki” or 20th Century” Asian pear. Photo provided by Shinji Kawai

In 1904, the well-known agricultural magazine Kohnoh Zasshi, published an article entitled “The Introduction of an Amazing Pear Cultivar, Shin Daihaku”: “It is a pleasure to have the opportunity to introduce this new cultivar to the public. We believe that it will be grown in many regions, it will be rigorously marketed and it will boost the happiness of the people by pleasing their taste buds...its taste is superb, sweet and juicy. It is almost as sweet as European pears, and does not leave any fleshy residue in the mouth. It should truly be called the perfect pear”.

While this praise may have been excessive, the pear must really have exhibited outstanding flavor. In 1904, it was renamed “20th Century” by the editor-in-chief of the Kohnoh Zasshi magazine, Torajiro Watase, after consultation with Tomochika Ikeda, a professor at Tokyo Imperial University. Since the Russo-Japanese war had just broken out, other names such as “Triumphant” and “Victory Song” were suggested; however, they settled on “20th Century”.

Kakunosuke sold seedlings from his orchard, which he renamed Nishiki ka-en, or Brocade Orchard. He sent fruit to experts at agricultural colleges, and he exhibited his pears at trade shows. After “20th Century” became famous, many high-ranking agricultural officials visited his orchard. Because of these visits, the surrounding roads were improved, which was a boon to local residents.

Once the Russo-Japanese war ended, the acreage of “20th Century” increased nationwide, assisted by the booming economy. At the end of the Meiji Era (1868-1912), plantings of the variety spread in Tottori, Okayama, Nara and Niigata Prefectures. At the time, one seedling cost 25 sen, while the “Chojuro” pear that was released around the same time cost only 4 sen. In spite of its high price, “20th Century” sold very well.

While running his nursery business, Kakunosuke also published his writings in order to promote the fruit tree industry. He produced “Grape Cultivar Descriptions” that was also a catalog for his nursery, and this journal was published until 1943. Later, the name changed to “Grape and Pear Descriptions” and then “Fruit Descriptions”. These journals contained his essays on the fruit industry and cultural techniques.

Tottori Prefecture and the Ina District of the Nagano Prefecture are well-known “20th Century” production areas. Planting in the Tottori Prefecture began in 1904 with ten seedlings that Eiji Kitawaki of Matsuho Village purchased. In the Ina district, Tadakatsu Momosawa of Iijima Village had already planted 4 acres by 1925.

A negative trait of “20th Century” is its susceptibility to alternaria black spot. At the time, Bordeaux mix

spraying was common, but Tottori and Nagano prefectures have less rainfall during the spring, so less spraying was required there. By contrast, planting acreage in the Chiba Prefecture, where rainfall is excessive, increased very little. Once disease control in the region was established, however, the planting acreage rapidly increased. Better spray timing and the use of waxed bags to cover the fruitlets enabled better control. The latter idea was developed by

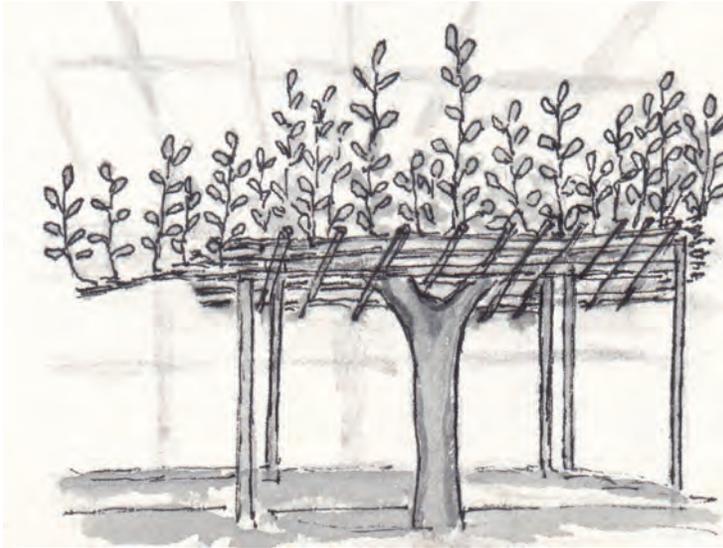
Umenojo Bokura, who was a technician at the National Agricultural Research Station of the Ministry of Agriculture and Commerce.

The “20th Century” pear reached its peak planting acreage, to over 6,000 hectares between 1972 and 1988, when it was the most popular Asian pear cultivar. Currently, it is the third most

planted pear after “Kosui” and “Hosui”; however, these cultivars were bred from “20th Century”, so Kakunosuke’s achievement continues to shine.

The original tree was designated as a national monument in 1935. Kakunosuke had passed away during the previous year at the age of 59. He was known as a diligent and kind man, who enjoyed sharing hard liquor with visitors! The tree was described by a teacher at the Chiba Horticulture High School, Taizo Miki, in 1930:

“The tree was trained on the pergola, and the trunk circumference 40 cm above the ground was 90 cm. The main stems initiated from 1.5 m high, and the canopy spread 7.6 m from east to west, and 7.9 m from north to south. Due to its advanced age, there were not many new shoots, and it appeared to be declining in health. The peak of its production was approximately 1918 and the tree produced 1,500 fruit, but it was reduced to 800 by 1930”.



A drawing of the 20th C tree.
Photo provided by Shinji Kawai

In 1944, the tree was burned in an air raid along with the entire orchard. It survived for a few more years, and died in 1947. A monument stands on the site. Due to land reform in the postwar era, the area became residential, and now the location is barely recognizable in spite of place names such as 20th Century Hill and Former Pear Town. There is a small playground called 20th Century Park which is a nice gathering place for children.



The Yabukita Tree.
Photo provided by Shinji Kawai

Although traces of “20th Century” are disappearing, local residents keep the memory of Kakunosuke alive. In 1990, an exhibition in his honor took place at the Matsudo City Cultural Center, which lasted for seven weeks. Today, there is a special exhibition room devoted to the pear cultivar, in which a burned fragment of the original tree attracts visitors. Matsudo residents take pride in the fact that the “20th Century” was discovered in their city. 🍷



Adjustable Height Washing Station

Vegetable Packing Shed Website



OSU Small Farms is working with Josh Volk, author of Compact Farms, to develop a small-scale vegetable pack shed and furniture.

The project website is live and includes links to:

- Josh’s furniture designs and construction details
- Pack shed design resources
- Post-harvest handling and storage resources
- Storage building and construction resources

Project updates and workshop announcements will be posted on the website.

<http://smallfarms.oregonstate.edu/vegetable-packing-shed>



Adjustable Height Packing Table



Tote Washer Prototype



Take Action RIGHT NOW to Management Tansy

Ragwort

By: Melissa Fery, Small Farms Program, Oregon State University Extension Service

Tansy ragwort, *Senecio jacobaea*, is a noxious weed that causes alarm for most cattle producers and horse owners. The poisonous alkaloids in this plant causes irreversible liver damage to animals (and humans) if consumed. All of its parts are toxic, with the highest amount of alkaloids in flowers then leaves, roots and stems and the plant remains toxic when dried in hay.

In the summertime, with showy yellow flowers standing tall, tansy ragwort is easy to identify and seeing it prompts people into action. The problem is that in July and August, management options are few and landowners are often discouraged by the recommendation given to manually dig and bag up the plants to take to the landfill.

In the spring however, there are several effective management options. Right now is time of year to walk through your fields and identify tansy ragwort. If tansy was a problem on your property last year, you will likely find young plants. Right now, plants are actively growing at the rosette stage with ruffled dark green leaves that may have a reddish tinge.

Biological control is working right now too. The commonly known cinnabar moth will be seen later in the year, but right now the ragwort flea beetle, *Longitarsus jacobaeae* is out in force and devouring tansy plants. The adults feed on the leaves and the larvae damage the roots. Look for these golden to light brown colored beetles on and under the leaves of the plants. If you find them on your site, consider leaving some tansy ragwort as a food source, especially in areas that may not impact your livestock.

Sheep can also help manage tansy ragwort, as they are known to tolerate the toxic alkaloids. However, they may choose to graze other desirable plant species before consuming large amounts of tansy. Nevertheless, grazing sheep on your property will help with long-term weed management.



Tansy Ragwort Rosette RIGHT NOW.
Photo by Melissa Fery

Since the ground is moist and the plants relatively easy to pull, right now is the time to manually remove tansy. Tansy spreads vegetatively, so be sure to remove the fleshy taproot otherwise, the plant will regrow. Right now, these young plants could be added to a hot compost system, buried or added to a burn pile. Mowing is not a suggested management practice as it stimulates more vegetative growth.

If you have a large infestation, you may choose to apply an herbicide. All of the broadleaf herbicides labeled for tansy ragwort are most effective on young, actively growing plants. If you would like to spray to help manage tansy you need to do it right now. Oregon spring weather is unpredictable; plan ahead and watch for a window of calm, dry weather to spray. The Pacific Northwest Weed Management Handbook includes a list of labeled herbicides for tansy ragwort: <https://pnwhandbooks.org/weed>.

Finally, the truth of the matter, which is tansy ragwort infestations are often the worst in overgrazed pastures with bare or compacted soil. Along with managing weeds this spring, also consider ways you can manage pastures that will enhance forage growth for the long haul. Information about pasture and grazing management is available at: <http://smallfarms.oregonstate.edu/pastures>. Start planning, right now, if you are considering replanting your pasture in the fall. 🐛



Tansy Ragwort Flea Beetles a Biological Control working RIGHT NOW.
Photos by Melissa Fery



SOIL/TISSUE SAMPLING & NUTRIENT MANAGEMENT FOR ORGANIC BERRY PRODUCTION SYSTEMS



THURSDAY, APRIL 19 - 2:00 PM TO 4:00 PM

INSTRUCTOR:

Javier Fernandez-Salvador
OSU Extension

LOCATION:

Minto Island Growers
3394 Brown Island Rd S
Salem, OR 97302

TOPICS:

We'll discuss best practices for soil and tissue sampling, how to interpret test results, and how to develop an organic fertility program. Our case study will be organic berries.

DIRECTIONS:

From downtown Salem, take River Rd South. Turn Right on Brown Island Rd, cross the railroad tracks, pass the nursery on the right. Continue following signs to the farm stand, which will appear on your right after the tall trees. Look for a white canopy and brown pole building.

COST:

\$15 - cash and check at the event.

Online Registration: secure.oregonstate.edu/smallfarms-events/register/168

For more information and to RSVP, contact Victoria Binning at 503-373-3774 or victoria.binning@oregonstate.edu

CSA Marketing: Three Tips for Increasing Membership

By: Maud Powell, Small Farms Program, Oregon State University Extension Service

Many farmers report that CSA shares have become increasingly difficult to sell over the past five years. With an uptick in farmers markets during the past decade and the advent of online buying clubs, local foods are easier to purchase than ever. Additionally, certified organic produce can be found more readily, including in big box stores. Companies like Blue Apron and Sun Basket deliver fresh ingredients to the doorsteps of their customers. As a result of all these trends, many farmers report that recruiting CSA members is challenging. In my own experience of marketing a CSA for thirteen years, I've tried out all kinds of marketing schemes and strategies. Following are the three easiest and most effective steps I've found to building a strong, loyal customer base.

Develop workplace partnerships.

One great option for recruiting members is to partner with businesses, organizations, institutions or agencies, especially those that work in the fields of health and wellness. Examples include local health clubs and doctors' offices. Potential CSA customers include staff and health club members or medical patients. Churches, Lions Clubs, and other community organizations are other options. Many mid and large-sized companies have wellness programs or human



Photo provided by Maud Powell

resource staff who are looking for ways to improve the health and well-being of their employees. These businesses will promote CSAs to their staff and patrons, especially if offered a small discount and on-site pick up options. For more information on setting up workplace partnerships, take a look at Just Food's toolkit, *Farmer Resources: CSAs at Work*: <http://www.justfood.org/farmer-outreach/farmer-resource-csa-work>

Build a Social Media Campaign

These days, CSA marketing requires an online presence, including social media sites with regular posts and paid advertising. For more detailed information, the Land Connection offers a free Social Media Starter Kit, along with webinars on social media marketing and sample content: <https://thelandconnection.org/farmers/social-media->

marketing-resources. Farmers overwhelmed at the idea of creating and maintaining a social media presence should consider hiring help or else asking a CSA member savvy in social media marketing to trade for their services.

A few things to keep in mind:

- Regular posts (1-2 times per week) are important
- In order to show up in peoples' Facebook feed, you'll need to pay for targeted advertising
- Very short video clips are popular
- Use social media to tell the story of your farm
- Build the number of "likes" and "followers" through incentive campaigns

Promote word-of-mouth Advertising

Existing CSA members may be the best form of advertising of all, as they can influence their friends

and neighbors and tell a personal story of what it means to belong to a CSA. Most people are bombarded by marketing campaigns throughout the day, on their phones, computers and other media. A recommendation from a trusted friend or neighbor will stand out. Consider offering incentives to your members for recruiting their friends, either with a discount on their share, a free t-shirt or hat, or some other form of recognition. Give your loyal members a nudge by either asking them to forward a recruitment email or sharing social media posts. They are usually glad to do it when asked.

For a more comprehensive list of tips on marketing your CSA: <http://memberassembler.com/hub/marketing-tips-for-farmers> 

New OSU Extension Service Publications

SEM 9192, Oregon's Home Baking Bill: Residential kitchen exemption for baked goods and confectionary items

Lauren Gwin

New. In 2016, the Oregon Legislature passed a law that allows people to produce certain baked goods and confectionary items in their home kitchens and sell them directly to consumers without having to obtain a food establishment license or undergo an inspection from the Oregon Department of Agriculture. This publication answers frequently asked questions about the Home Bakery Exemption.

EM 9192-S, Oregon's Home Baking Bill: Excepción de cocina residencial para productos de panadería y confitería

Lauren Gwin

New. En 2016, la legislatura de Oregón aprobó una ley que permite a la gente producir ciertos productos de panadería y confitería en sus cocinas domésticas y venderlos directamente a los consumidores sin tener que obtener una licencia de establecimiento de alimentos o someterse a una inspección del Departamento de Agricultura de Oregón. Esta publicación contesta algunas preguntas frecuentes sobre la "Home Bakery Exemption" (excepción para panaderías caseras).

Find these online at <https://catalog.extension.oregonstate.edu/>

Results of 2017 WSU-Mount Vernon Grain Pea Trial

Dr. Susan Kerr, WSU NW Regional Livestock and Dairy Extension Specialist

Livestock producers such as dairy farmers feed their animals complex rations, usually on a least-cost nutrient basis. This means they meet animals' nutritional requirements using the most cost-efficient feeds they can obtain. This addresses two aspects of farm sustainability: animal welfare (meeting animals' nutritional needs) and financial success (reducing expenses to increase profitability). Livestock nutritionists are constantly adjusting the rations their clients feed based on the cost and availability of ingredients; farmers make recommended ration changes gradually to not upset critical populations of intestinal digestive microbes.

The Problem

The preceding background information was presented to help readers understand a regional dilemma: dairy farmers have come to rely on canola meal for ration balancing, but it has become increasingly more expensive and less available. Canola meal is a valuable by-product of the canola oil seed industry, containing 28 to 42% crude protein, depending on processing (Table 1.) However, its cost has risen from \$112/ton in 1998 to \$350/ton in 2018 (USDA ERS, 2017; USDA AMS, 2018). Also, it must be trucked into northwestern WA either from eastern WA or Portland.

A Little about Peas

Dry peas (a.k.a. field peas, Photo 1) are a cool season annual crop well suited to northwestern WA. They can be seeded directly into previous crop residue in

mid-March to mid-May or whenever soil temperature is over 40°F (O'Neal, 2017). Cold-tolerant varieties can be planted in the fall as a cover crop or to produce dry peas for livestock or humans. In areas with dry summers, fall planting can result in higher yields due to earlier spring growth, earlier bloom, and earlier harvest; there will be more nitrogen fixation, as well (O'Neal, 2017).

In Washington State, 90,000 acres of dry edible peas were planted in 2016. They yielded an average of 2.4 tons per acre, brought an average of \$12.30/cwt, and were valued at \$317 per harvested acre (Mertz, 2017).

Benefits of Peas

Peas have the potential to be a beneficial rotational crop for many reasons:

- They are an alternative to summer fallow and another option for crop rotation
- Peas can be inter-seeded with corn, oats, barley, or other crops to boost protein content of hay and haylage
- They are a legume and will fix atmospheric nitrogen to improve soil fertility
- Peas have a taproot that can help reduce soil compaction and improve water and nutrient movement
- They can mature by mid-August so a fall crop or cover crop can still be planted
- Peas can be combined to save harvesting labor; equipment is available locally

Variety	TDN %	CP %	NDF %	ADF %	Fat %	Starch %
Fava	78	30	19.0	10.0	4.5	36.0
Flex	78	22	19.0	9.0	4.0	39.0
Admiral	79	22	13.0	8.6	4.0	39.0
Dundee	78	25	21.0	11.0	3.5	35.0
(canola meal)*	72 - 75	28 - 42	12.9 - 25.4	9.7 - 16.2	2.0 - 19.5	5.1

Table 1. Comparison of chemical analysis results: 2017 pea variety trial and canola meal values.

*Provided for comparison to peas. Nutritional content depends on process used to extract oil. Sources: Neiberger et al., 2016 and Canola Council of Canada, 2015.

TDN - total digestible nutrients; an overall measure of energy contained in a feedstuff, CP = crude protein, NDF = neutral detergent fiber; low number desirable and associated with greater feed intake by livestock, ADF = acid detergent fiber; low number desirable and associated with higher feed (fiber) digestibility



Dry peas immediately after harvest and shelling.

Photo provided by Susan Kerr



WSU-NWREC field pea trial, Aug. 17, 2017.
Photo provided by Susan Kerr

- Post-harvest aftermath can be baled, tilled in, or grazed
- The low moisture of dry peas facilitates long-term storage as a feed commodity

Are Peas the Answer?

Hoping for a high-protein feedstuff they could grow locally for more control over price and availability, dairy producers in northwestern WA wondered about the suitability of dry peas. Peas were grown in northwestern WA for decades until local processing ceased around 2010. Nevertheless, pea planting and harvesting equipment is still available in the area, as are growers with experience in and historical knowledge of pea production. Could these resources support a mini-resurgence of the northwestern WA pea industry as a source of high protein livestock feed?

WSU-NWREC 2017 Pea Variety Trial
Faculty at the WSU-Northwestern Research and Extension Center (NWREC) conducted a dry (grain) pea variety trial in 2017 with three pea varieties and one bean variety. Funding was provided by the Northwest Agricultural Research Foundation (\$2,037). Seed was provided by John De Vlieger (Fava and Dundee

varieties), Skagit Farmers Supply (Flex), and Albert Lea Seed (Admiral). Pre-planting and post-harvest soil data is available for those interested. Pre-emergent herbicides treflon (1 pint/acre) and dual magnum (1.5 pint/acre) were incorporated pre-planting. Fertilization was 18 lbs of nitrogen per acre and 60 lbs of phosphorus per acre at the time of planting. Production data are presented in Table 2; chemical analysis by variety is contained in Table 1.

Growing Season Observations and Comments

All seed varieties emerged and grew well. They thrived in the 2.9% organic matter, 6.8 pH soil with less than 3" of rainfall throughout the growth period. Chemical analysis content provided in Table 1 shows all pea varieties compared favorably with canola meal with respect to energy content, crude protein, and fiber digestibility.

Black aphids attacked the fava beans, but it was unknown if this affected productivity. The major

Variety	Planting rate	Planting date	Harvest date	Precipitation over growing season	Production (tons/acre)
Admiral	200 lbs/acre	05/10/2017	08/18/2017	2.45"	2.5
Dundee	200 lbs/acre	05/10/2017	08/18/2017	2.45"	1.5
Flex	200 lbs/acre	05/10/2017	08/25/2017	2.45"	1.9
Fava	180 lbs/acre	05/10/2017	09/15/2017	2.73"	2.4

Table 2. WSU-NWREC 2017 pea variety test plot details.

challenge, however, was Canada geese: they moved through the fields in an orderly fashion from east to west, devouring all peas they encountered. Fortunately, data could be collected from the western side of each plot because these areas had not yet experienced any goose damage (Photo 2). Fava beans matured later than peas. The literature suggests pea production may be improved by planting a mixture of varieties; that was not done in this trial.

Conclusions

With their high protein content and positive environmental effects, peas are once again a crop worth considering for northwestern WA, this time as a locally-produced livestock feed. To increase the likelihood of success, growers will need to conduct soil tests and probably raise soil pH (peas do not perform well in acidic soils) and have a plan to mitigate effects of grazing geese. Additional studies of how grain peas could contribute to high-value crop disease control, soil quality, nutrient cycling, reduction of livestock feed costs, and a myriad of other factors would be excellent candidates for SARE on-farm research project funding. 

References and Resources

Canola Council of Canada. 2015. Canola Meal Feeding Guide. https://www.canolacouncil.org/media/516716/2015_canola_meal_feed_industry_guide.pdf

Mertz, C. 2017. Washington Annual Statistical Bulletin. USDA National Agricultural Statistics Service, Northwest Regional Field Office, Olympia, WA. https://nass.usda.gov/Statistics_by_State/Washington/Publications/Annual_Statistical_Bulletin/2017/WA_annual%20bulletin%202017.pdf

Neibergs, J.S., J.P. Driver, and D.A. Llewellyn. 2016. Valuing Canola and Camelina Biodiesel Byproduct Meal As A Livestock Protein Supplement. <http://extension.wsu.edu/benton-franklin/wp-content/uploads/sites/27/2013/07/Valuing-Canola-and-Camelina-Meal-FS193E-pd.pdf>

O'Neal, S.D. 2017. Pest Management Strategic Plan for Pulse Crops (Chickpeas, Lentils, and Dry Peas) in the United States. Western Integrated Pest Management Center, Bozeman, MT. https://ipmdata.ipmcenters.org/documents/pmsps/2016PulsePMSP_Final.pdf

USDA Economic Research Service. 2017. Canola meal: Supply, disappearance and price, U.S., 1991/92-2016/17. [Canola meal: Supply, disappearance and price, U.S., 1991/92-2016/17](https://www.ers.usda.gov/publications/pub/?icon=canola-meal)

USDA Agriculture Marketing Service. 2018. Pacific Northwest Weekly Feedstuffs. MS JO_GR215 Portland, OR. Mar 6, 2018. USDA Market News. https://www.ams.usda.gov/mnreports/jo_gr215.txt

Living on the Land Class Series offered in Marion County!

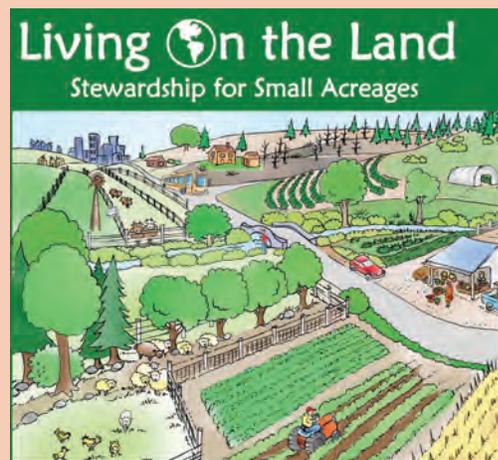
Living on the Land is a workshop series tailored for small acreage landowners and those new to managing land. OSU Extension Service in Marion County and the Silverton Grange #748 are sponsoring the five-part series.

The classes will be held on Tuesday evenings from 6 to 8 PM, beginning May 8 and concluding on June 8 at the Silverton Grange located at 201 Division St. NE, in Silverton, just off of Water St. Topics include Stewardship Planning, Woodlands & Riparian Area Management, Pasture and Manure Management, Wells & Septic Systems, Soils and Weed Management.

The registration fee for the entire series is \$30.00 per person or \$45 for two partners from the same farm or property. Alternatively, you may choose to register for individual workshops at \$10 each.

Registration information is available online at <http://smallfarms.oregonstate.edu/mid-valley/events>

For more information or to request a registration form, contact Victoria Binning at 503-373-3774 or victoria.binning@oregonstate.edu



Food Roots in Tillamook Opens Local Food Storefront

Contributed by: Food Roots



Food Roots has expanded its FarmTable project into a year-round storefront on Main Avenue in Tillamook. FarmTable is a farm direct consignment project that connects small-scale Tillamook County farmers, fishers, ranchers and other food and agricultural producers and their products directly to consumers through a Main Ave. storefront.



Lainie Koch, Food Roots Coordinator, displays honey from Hebo, Oregon, beekeeper, Annaliese Moeller.
Photo provided by Food Roots

“In our rural community where food production is our roots, this storefront is both timely and relevant for people to reconnect with their local food system,” said Lauren Sorg, Food Roots Executive Director. “FarmTable was a dream of our late founder, Shelly Bowe, who passed away in June 2017 after a battle with ALS. I know she’d be so happy to see it in its fruition.”

Open year-round, FarmTable is now stocked with everything from raw honey, pasture raised eggs, cheese, meat, seafood, herbal teas, plants and more. Additionally, this location is now a CSA pick-up location for three Tillamook County farms beginning this May, and through November.

FarmTable is also a participant of the [Visit Tillamook Coast's North Coast Food Trail](#), which launches on April 14th and stretches from Cannon Beach to Lincoln City.

For more information, visit our website at www.foodrootsnw.org.

FarmTable is sponsored by amazing community partners at De Garde Brewing.



Photo credit: Shawn Linehan

Vegetable Variety Field Day

Mark your calendars for the NWREC summer vegetable variety field day on September 11, 2018.

Featured crops include: tomato, pepper, cucumber, lettuce, carrot, eggplant, winter squash.

For more information visit:

<http://smallfarms.oregonstate.edu/nwrec-2018-vegetable-variety-field-day>



Photo credit: Shawn Linehan



Calendar

April

24 - Renovating Pasture and Hay Ground

Determining need for renovation, Matching forages with soil conditions, and Planting techniques. 6:00PM-8:00PM. Lane Community College, 4000 E. 30th Avenue, Building 17, Room 309, Eugene, OR. Contact Melissa Fery at 541-730-3538 to register for this class. **\$15**

May

8 - Haying and Grazing Management

How grass grows, Rotational grazing Ranch Resources – water, fencing, etc., Planning for hay harvest, and Haymaking on the West Side 6:00PM-8:00PM. Lane Community College, 4000 E. 30th Avenue, Building 17, Room 309, Eugene, OR. Contact Melissa Fery at 541-730-3538 to register for this class. **\$15**

8 - Living on the Land - Stewardship Planning

Living on the Land is a workshop series tailored for small acreage landowners and those new to managing land. There are 5 classes in the series. 6:00PM-8:30PM. Silverton Grange #748, 201 Division St NE, Silverton, OR. 503-373-3774 to register or <http://smallfarms.oregonstate.edu/mid-valley/events> **\$10/class, \$30 for series, OR \$45 for 2 farm partners**

15 - Living on the Land - Woodland and Riparian Area Management

Living on the Land is a workshop series tailored for small acreage landowners and those new to managing land. There are 5 classes in the series. 6:00PM-8:30PM. Silverton Grange #748, 201 Division St NE, Silverton, OR. 503-373-3774 to register or <http://smallfarms.oregonstate.edu/mid-valley/events> **\$10/class, \$30 for series, OR \$45 for 2 farm partners**

22 - Living on the Land - Pasture and Manure Management

Living on the Land is a workshop series tailored for small acreage landowners and those new to managing land. There are 5 classes in the series. 6:00PM-8:30PM. Silverton Grange #748, 201 Division St NE, Silverton, OR. 503-373-3774 to register or <http://smallfarms.oregonstate.edu/mid-valley/events> **\$10/class, \$30 for series, OR \$45 for 2 farm partners**

Check our online calendar at for the most up to date events

<http://smallfarms.oregonstate.edu>

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 immediately post. If you have questions please contact Chrissy Lucas at Chrissy.Lucas@oregonstate.edu or 541-766-3556