

# *Plant Science Says*



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## **A History of Peas in the Gallatin Valley By Norm Weeden**

It was about 1982, soon after I started as a crop geneticist at Cornell University, that I began hearing about pea and bean varieties from Gallatin Valley Seed Company. The two breeders I met from this company (later to become incorporated into Rogers Brothers Seed Company) were Dr. Calvin Lamborn and Dr. Paul Moser, but both of these individuals worked near Twin Falls, Idaho (no 'Gallatin Valley'). Not until I interviewed for a position at Montana State University did I realize that the Gallatin Valley in Montana was the original home of the Gallatin Valley Seed Company and has had an impressive and instructive history in pea production.

At the beginning of the 20<sup>th</sup> Century, commercial pea production centered in the states of New York and Michigan. However, continued reseeding of peas, as well as the relatively wet summers had led to a build-up of pathogens and other pests in these regions that significantly reduced yields. In 1911, William Davis was sent to the Gallatin Valley by the Jerome B. Rice Seed Company (Detroit, MI) to investigate the possibility of growing peas as a rotation crop. It turned out that because of the relative lack of soil pathogens, the long winters causing virtual elimination of virus vectors such as aphids, and the dry summers that greatly reduced incidence of mildew and other foliar pathogens, peas did extremely well. In addition, this legume crop increased soil nitrogen for subsequent grain crops. By the next year approximately 75% of the nation's commercial pea crop was grown in this

region, and in 1913, 17,000 acres of peas were planted and the Gallatin Valley Seed Company was founded. The Gallatin Valley had become the "pea capital of the nation".

The planting, harvesting, and cleaning of peas represented an important boost to the economy of the valley. Clearly the planting and harvesting of peas represented an alternative to the grain crops typically grown in Montana, but the cleaning and grading operations at the seed processing facilities centered in Bozeman provided extended employment opportunities for many residents. As is the case with Montana's current seed potato industry, in these early days, because of the high quality of the seed, most of the pea crop was packaged and sold to growers and distributors in eastern states.

However, the continued excellent harvests and profitable federal contracts for the pea crop during World War I convinced entrepreneurs such as T. B. Story and L. L. Brotherton to form the Bozeman Canning Company in 1917. The facility on N. Rouse Avenue opened in 1918, producing over 16,000 cases of canned peas. In the next decade the facility grew and by 1926 was packing nearly 8 million cans of peas annually and providing year-round employment to hundreds of workers. Production of canned peas shrank slightly during the depression years, but the facility still provided good jobs for an important portion of the population in the Gallatin Valley, including many women who became the primary wage earner in the family.

## A Guide to Quality

### INTRODUCTION

Our first loose-leaf style seed catalog was presented in 1950 and proved to be a handy guide to the high quality pea and bean varieties we produce for use by vegetable processors. We trust this edition will be equally useful.

Assembled in this booklet are a few photographs of our research laboratory, greenhouse, and pea and bean breeding grounds followed by varietal pictures and descriptions of the pea and bean types we currently offer.

The varietal descriptions have been assembled from our trial ground records over a period of years. In some cases it has been necessary to supplement this information with data provided by canners, freezers, and experiment stations.

Specific data for peas and for beans may be found on the pages labeled: "Foreword—Peas," and "Foreword—Beans."

Varietal performance may vary from one season to the next and from one locality to another due to differences in environment or cultural practices. Since the data given is subject to such variables it cannot be guaranteed but is given in good faith and may be used for comparisons between varieties described in this booklet.

An important goal of our plant breeders is the production of varieties resistant to particular disease organisms, insects, or other growing hazards. It is important to define the terms used in discussing a variety's ability to withstand these conditions.

**IMMUNE:** Capable of remaining completely free from damage due to a particular disease organism, insect, or environmental situation.

**RESISTANT:** Able to survive and produce a crop when attacked by a particular disease organism, or insect, or exposed to certain adverse growth conditions, although yield and quality may be affected under severe infection, infestation, or conditions.

**TOLERANT:** Capable of producing a crop under moderate infection, infestation, or particular adverse environmental condition but may be seriously damaged under severe attacks unless satisfactory supplementary control measures are used.

**SUSCEPTIBLE:** No ability to withstand attack by a particular disease organism, or insect, and easily damaged by adverse environmental conditions.

It must be borne in mind that disease organisms and insects are known to change by cross-breeding and mutation, thus new or variant forms may appear which can cause injury and loss to varieties previously considered to possess some degree of resistance. In the descriptions given in this booklet a statement of disease resistance for a variety is intended to apply only to the race or strain of the disease organism recognized by plant pathologists at the time the descriptive sheet was released.

Be sure to see the last pages in this booklet for described at the end of the handbook are a few of our very newest pea and bean varieties that will be ready for release in the near future.

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Gallatin Valley Seed Co.

**GALLATIN VALLEY SEED CO.**

TWIN FALLS, IDAHO

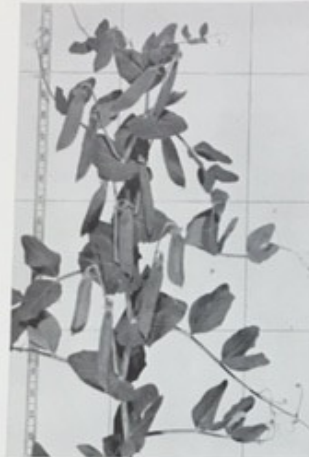
JANUARY 1964

A page out of the Gallatin Valley Seed Company catalog for 1964.

World War II and increased demand for canned peas provided another stimulus to the pea industry of the Gallatin Valley, and in 1944 the canning facility's production peaked at nearly 9 million cans of peas. Unfortunately, the continued demand (and good profits) for peas caused the pea crop to be planted more intensively than was ideal from an agronomic point of view. Pathogens began to build up, particularly in the soil, shortly after the war. Some of the original founders of the industry had either died or moved on to other interests, particularly the possibility of freezing rather than canning food products. When Fusarium wilt became sufficiently widespread in the fields of the Gallatin Valley to cause significant crop losses in the early 1950's, growers began to look for alternative planting options. Interestingly,



## PEAS - FOR FREEZING NWR Hyalite



This is our near-wilt resistant strain of Dark Skin Perfection type. Season, vine type, and sieve size are very similar to Hyalite. Being resistant to near-wilt, this variety enables the production of higher quality frozen packs in areas where the disease is a problem.

Resistant to: Pea wilt, near-wilt, pea mosaic.

Approximate sieve size distribution at 95-100 Tenderometer.

SIeve	1	2	3	4	5	6	7	Avg.
%	3	5	10	17	40	24	1	4.62

### MATURITY

70 Days.

### HEAT UNITS

1550

### PLANT HEIGHT

32-36 in.

### PODS

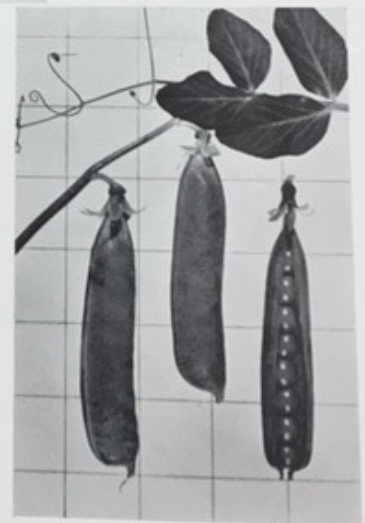
3.25-3.50 in.; blunt, nearly straight, double; medium dark green; 6-8 peas.

### SEEDS

1950 per lb.

Date and terms explained in  
"Foreword—Peas."

JAN. 1964



The pea variety 'Hyalite' was one of many varieties grown and sold by Gallatin Valley Seeds. It was selected and named while the company was in Bozeman but became a popular freezer type after the company moved to Twin Falls.

resistance to Fusarium wilt race 1 (conferred by a single dominant gene, *Fw*) were just beginning to become available, and it is probable that switching to these resistant varieties could have alleviated the primary pathogen pressure in the valley. However, the industry was in transition, with freezing of peas producing a much more acceptable product than canning. As the new facilities had been built in other states (Washington, Oregon, Minnesota) pea production shifted to these regions with only 1,600 acres of peas being planted in the Gallatin Valley in 1956 and the cannery closing in 1958.



The increase in pea acreage in Montana that has occurred since 2000 is due to an increased demand for dry peas as well as increased costs for nitrogen fertilizer. Growers can now make a profit on a pea crop (although at current prices they can make more on lentils and perhaps chickpeas), and the nitrogen residue left in the soil for the following crop significantly reduces the amount of fertilizer that needs to be applied. Montana (although not the Gallatin Valley) can again claim the title as the center of pea production in the United States, producing more dry peas than the next three states combined. New markets for dry peas, particularly for use as a flour, are developing rapidly with the recent demand for gluten-free products and products with a low glycemic index. With the low disease pressure in Montana and the importance of a legume as a rotational crop the future of peas looks bright in the state, even if land prices in the Gallatin Valley prevent growing dry peas from becoming a viable commercial enterprise here. (Note that fresh peas still make an excellent crop for the home gardener, but be sure you plant varieties resistant to Fusarium wilt.)

**Towne's Harvest Lunch 8th Annual  
President's Luncheon  
By Mac Burgess**

Towne's Harvest Garden staff hosted the 10th Annual 'President's Luncheon' at the Horticulture farm on Wednesday, July 20, for 60 plus attendees. Opening comments



were made by David Baumbauer, Bruce Maxwell, Bill Dyer, Pat Hatfield, Allison Milodragovich, and Mac Burgess. Guests, faculty, and students from the Colleges of Agriculture and HHD dined on a delicious lunch prepared by students of Lindsay Ganong's SFBS 445R/541 Culinary Marketing: Farm to Table class. They also used foods from Towne's Harvest Garden and other local sources to prepare the lunch. After lunch, a tour of the farm was given by Mac Burgess and David A. Lobry.

**International Barley Symposium  
By Traci Hoogland**

From June 24 to June 30, the 12th International Barley Genetics Symposium (IBGS) was held on the University of Minnesota campus in Minneapolis, Minnesota. In attendance from Montana State University were Dr. Jamie Sherman, Dr. Andreas Fischer (both Keynote speakers), Dr. Hikmet Budak, Andy Burkhardt, Megan Getz and Traci Hoogland.

With over three hundred individuals from across the globe in attendance, the 12<sup>th</sup> IBGS was the largest to date and gave researchers an un-paralleled opportunity for learning, open communication and possible collaboration. Poster presentations, keynote speeches and breakout sessions and workshops covered topics, resources and challenges on the cutting edge of barley genetics research.

As an attendant, it was incredible to hear about all of the work being done on this crop – from continued work on the barley genome project to an update on the progress of barley in the human food market, from genome editing and utilizing barley as a model organism to controlling chill haze stability of beer. Barley is unique in the diversity of its end uses – one of the reasons I personally enjoy working with it so much – and it was remarkable to be able to see all of the diverse research currently underway. But the IBGS also gives researchers the opportunity to connect with others in their particular area of barley research: graduate students were able



Attendees enjoy the view on an evening dinner cruise on the Mississippi. Left to right: Andy Burkhardt, Megan Getz, Jamie Sherman and Pam Hole (Utah State University).

to connect with keynote speakers over lunch and everyone was invited to participate in smaller group breakout sessions.

Of course, the symposium was not just all work and no play. Local breweries sponsored the event and beer tastings gave individuals another opportunity to meet and mingle, and the final evening of the conference included dinner on the Mississippi. Overall, this conference was an invaluable – and highly enjoyable – experience.

### Scholarships By Jill Scarson



Andy Burkhardt, a doctoral student in plant genetics, has been awarded the Robert F. Eslick Memorial Scholarship for the 2016-2017 academic year, sponsored by the College of Agriculture. He is a 2<sup>nd</sup> year graduate student working with barley

breeder, Dr. Jamie Sherman, with a research focus on nematode ecology under barley cropping systems, with an emphasis on malt barley-pea rotations.

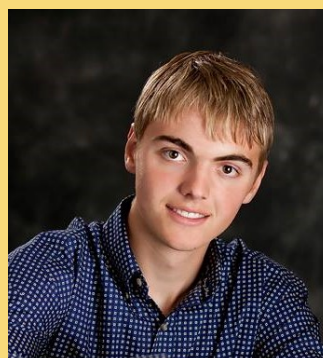
Burkhardt strives for involvement outside of the field and lab. He routinely leads sessions of the Plant Sciences Graduate Student

articles are reviewed, including one of his own publications. This summer, he presented a talk on soil biology to elementary school children at a summer camp in Missoula.

“I’ve presented many times in the past to groups of academics and stakeholders, but talking to children presents my most challenging presentation yet,” Burkhardt said. “I feel that being able to communicate our research and knowledge to children poses an immense but highly rewarding challenge. I am truly excited for this opportunity and hope to continue it in the future.”

The Robert F. Eslick Memorial Scholarship is awarded each academic year by the College of Agriculture to one deserving graduate student in the Plant Sciences and Plant Pathology Department.

“Without this support, many students like me would not be able to continue their education,” Burkhardt said. “The Department of Plant Sciences and Plant Pathology has offered me many new opportunities to expand my knowledge and gain experience as a scientist and educator. I look forward to the coming years with the department. I truly appreciate your generosity.”



The College of Agriculture has awarded the Clyde & Helen Erskine Excellence in Agriculture Scholarship to Tyler Zinne (PSPP) and Noelani Boise (LRES) for the 2016-2017

academic year. Tyler Zinne is a sophomore crop science student in the Department of Plant Sciences and Plant Pathology. The Clyde & Helen Erskine Fund for Excellence in Agriculture provides scholarship assistance to students enrolled in a curriculum in the Departments of Plant Sciences and Plant Pathology or Land Resources and Environmental Sciences.



Raised on a dryland farm, Zinne is interested in how to produce the highest yielding crops using new agricultural techniques. He is actively involved with the Alpha Gamma Rho fraternity, including their annual philanthropy event, the "Testicle Festival," where all proceeds are donated to nonprofit organizations such as Montana FFA and Montana Special Olympics. Following graduation, he hopes to be employed as an agronomist or a chemical sales representative.

Over the past academic year, the College of Agriculture has been able to award over \$390,000 in scholarships due to generous support from donors, including the Department of Plant Sciences and Plant Pathology.

"I extend my sincerest thanks to you for financially supporting students like myself pursuing a degree in crop science," Zinne said. "I truly appreciate your kindness."

### Course Focus

#### **AGSC 356 - Plant Nutrition and Soil Fertility Management - Mac Burgess**



AGSC 356, Plant Nutrition and Soil Fertility Management is a new course in the catalog now after being taught for two years as AGSC 491. This

course offers practical and applied plant nutrition and soil fertility management for MSU undergraduate students in Horticulture, Crop Science, and Sustainable Food and Bioenergy Systems. Students who complete this course will understand the metabolic roles, relative amounts taken up, natural cycling, fertilizer sources, and soil and tissue testing interpretation for all of the essential plant nutrients. One fun project



*2014 AGSC 491 students collecting soil samples on a farm near Wilsal, Montana.*

in AGSC 356 is collecting soil samples and interpreting the results of lab tests to make recommendations to a farmer.

### New Employees

#### **Dongjin Kim (Hikmet Budak)**



Hello, I am Dongjin Kim. I'll begin working with Hikmet Budak as a research scientist this August. I received my PhD degree in plant biotechnology at Sant'Anna School of Advanced Studies of

Pisa, Italy. After the PhD degree, I moved to King Abdullah University of Science and Technology (KAUST, Saudi Arabia) where I worked as a Post-Doctoral fellow. My research focus at KAUST was to determine salinity stress resistance mechanism in crop plants as well as to identify novel plant growth promoting signaling molecules in the carotenoid biosynthetic pathway. I'll continue working with abiotic stress resistance/tolerance in wheat in Dr. Budak's lab. My long-term research goal is to integrate molecular, genomic and biotechnology tools with plant biology to develop crop plants showing enhanced resistance to abiotic and biotic stresses.

**Hannah Estabrooks (Jamie Sherman)**



I am very excited to be joining Jamie Sherman and the Barley Breeding Program as the Lab Manager. I grew up in Northern New Hampshire with a love for the

outdoors and plants. After high school I went on a two-month road trip across the country and although Bozeman was planned as a quick stop, it turned into my long term home. I have now been here for nearly ten years. In those years I completed my undergrad degree in Environmental Horticulture-Science here at MSU as well as recently completing an M.S. degree in Plant Science under Mike Giroux in the Small Grain Quality Lab.

In my free time my favorite hobbies are camping, hiking, gardening, and cooking. I am very excited to continue calling Montana my home and really look forward to getting to know the growers and brewers around the state with my new position.

**Julie Zickovich (Hikmet Budak)**



I was recently hired by Dr. Hikmet Budak as a research associate. I have a Master's in Evolutionary Biology from

San Diego State University where I looked at the population genetic diversity and gene flow patterns of aquatic invertebrates in freshwater streams around San Diego County. A Bozeman native, I missed the mountains and the seasons and returned after graduate school. I have been at MSU for quite a few years now working in various labs and departments. From Microbiology and

Immunology studying CD T cells and influenza to Chemistry and Biochemistry studying soil microbial ecology. I am looking forward to being in Plant Sciences and Plant Pathology and a new laboratory.

In my free time, I like to push my six month old son around in a stroller but in the future hope to again find time to swim, bike, run, and hopefully toe the line at some big triathlon events.

**Grants**

Ryan Thum, Jefferson County, Montana, "Growth and efficacy of herbicide treatment on pure and hybrid Eurasian watermilfoil in Jefferson Slough, Montana.

**Invited Talks**

Laurie Kerzicnik, "The Allure of Spiders", Pecha Kucha, July 20, Ellen Theatre, Bozeman, Montana.

**Mathre Courtyard**

A huge thank you to Deanna Nash, Toby Day, Dara Palmer, and several Master Gardener and PSPP volunteers for once again making The Mathre Courtyard look absolutely amazing this year! Deanna planted and waters the six large pots all summer and Toby Day along with several volunteers planted dozens of annuals. Thank you!



*Toni Koontz and Toby Day planting annuals in the Mathre Courtyard and one of Deanna's pots in the next photo.*





## **Elderberries!** **By Toby Day**

What a year for berry picking! I had a bumper crop of strawberries, picking of raspberries are plentiful and consistent, and when talking with the locals in the Flathead, it sounds like there will be a lot of huckleberries this year. There are some lesser known berries such as service berries (also called June berries or Saskatoons) and choke cherries that, in my opinion, make the best syrups. Then there are gooseberries (that make the best pie) and currants. And yes, there are blueberries, but you will have to travel to the far northwest part of the state to find those.

One of the lesser known berries, and one of my favorites, is the elderberry (*Sambucus spp*). They have an unusual taste that lends them to syrups, jellies, and even jams. The fruit can be made into wine and even the flowers are often infused to make cordials, cocktails, and desserts. They also have incredible health benefits. According to [www.herbwisdom.com](http://www.herbwisdom.com), elderberries are an antioxidant and have been known to "lower cholesterol, improve vision, boost immune systems, improve heart health and are a remedy for colds, the flu, infections and even tonsillitis." There are many more benefits you can find at <http://www.herbwisdom.com/herb-elderberry.html>

I am finding that they are very easy to grow (the one in my back yard is huge!) and produce a lot of fruit. They are hardy (USDA hardiness zone 3 or 4), will grow in most locations with moist, fertile soil, and the flowers rarely succumb to freezing as they flower late (often later in June). They also have very little disease or insect pressure. Cornell University has a great website and factsheet on elderberries at <http://www.fruit.cornell.edu/mfruit/elderberries.html>

There is much information on the toxicity of elderberries, which I believe keep most people from growing or harvesting elderberries. In fact, we even have it listed on the MontGuide "Poisonous Plants in the Home Landscape." However, they really aren't. Most poisonings only cause a stomach ache and is caused by eating the raw fruit. Once you cook



*Elderberry blossom Elderberry Fruit*  
([en.wikipedia.org](http://en.wikipedia.org))



*Elderberry fruit* ([en.wikipedia.org](http://en.wikipedia.org))

the berries (which is most likely while making jellies or syrups) the toxins are off-gassed and the fruit is safe to eat.

If you would like to see an elderberry shrub, there is one in front of Linfield Hall (I passed it on the way to work today). Think about this plant if you are adding a shrub to your property next year!

(<http://www.fruit.cornell.edu/mfruit/elderberries.html>)

### Recipe of the Month

#### Bay Shrimp and Avocado Salad

1/4 c white wine vinegar

1/4 c olive oil

1 green onion, thinly sliced

Pinch of salt

3/4 lb cooked bay shrimp or extra small shrimp that are cooked, peeled, and de-veined and roughly chopped

3 ripe avocados

Lettuce - preferably butter lettuce or red leaf lettuce

#### Optional:

2 T chopped roasted hazelnuts, almonds, or pistachios

1 T chopped cilantro

Lemon slices as garnish



### August Birthdays

Barry Jacobsen	6
Deji Owati	7
Nar Ranabhat	12
Nancy Cooke	12
Mike Ivie	16
Karen Maroney	23
Bright Agindotan	25
Ruth O'Neill	26
David Sands	41

