

## ELDER PULSE ON COOL WEATHER PULSES GROWN IN THE OREGON MARITIME CLIMATE

by Harry MacCormack – March 2019

The March 10<sup>th</sup> meeting of Growing Organic, a Chapter of Ten Rivers Food Web, focused on a discussion of Fava Bean, Chick Pea, and other cool weather legume/pulses food production. Mostly Elder growers shared our collective experiences with these crops in our mini microclimates over the last 30 or more years.

The popular terms Fava Bean and Garbanzo Bean do not reflect the fact that these two major high protein plant foods are actually not beans. Fava Beans are of the same plant family as Vetch, a broad stemmed, determinate variety; and Garbanzo Beans are actually Peas, specifically Chick Peas. Favas come in two sizes: Windsor, which is a large bean, larger than most large Lima Beans; Bell Bean, also known as Sweet Lorane in our area, which is much smaller. Garbanzo is usually in the USA associated with a 1/4<sup>th</sup> to 1/2 inch variety of tan Chick Pea. Chick Peas also have varieties that range from orange- golden to black in color, most sizes 1/4<sup>th</sup> inch or even smaller. We also briefly touched on local growing of Whistler or golden and green hard peas, what split peas come from, and Lentils.

Recipes featuring locally produced cool weather pulses were shared, and some can be found on the [tenriversfoodweb.org/Nutrition](http://tenriversfoodweb.org/Nutrition) website.

### LOCAL FAVA BEAN PRODUCTION

Most of us in the room remembered the Aprovecho Fava Bean Booklet. It was written around the period when we were introduced to cool weather plant proteins that could provide food security storage foods as staples growing in our region. Favas became one of our survival crops should times get really tough. Part of Food Security is reliability. Favas have been reliable in production no matter what an agricultural year's peculiar characteristics. The dry form stores for really long periods of time with no deterioration nutritionally. That is not the case with many other beans.

Aprovecho was actually started in Philomath before it moved to the Cottage Grove area. Inanto introduced Fava Beans at that time. The booklet dealt with varieties, directions for growing, harvesting, storage, and processing either as human recipes or animal feeds. Now you can goggle Fava or Broad Beans and find all kinds of information and pictures at your fingertips on the Internet. So that booklet, which is sited there, is kind of an antique. Sweet Home based Adaptive Seeds still handles Inanto's version of Fava.

Fava Beans appear to have the unique capability of being able to overwinter here. They will freeze out if temperatures get below 10F, but most winters are not that cold, especially since global warming became apparent in the 1990's in our area. Favas can be sown in soil that is 40F or more in temperature (they germinate best when soils are 50F to 55F), which means they can be planted in late October or November, or again in late January – March. Overwintered beans seem to flower and produce pods at about the same time as late winter, early spring plantings. Flowering is usually in the cool (under 70's) temperatures of April-May. Fruiting begins in May. Dry down for storage-beans is usually in July. Some at our meeting expressed that in gardens somewhat higher in elevation than the valley later planting and harvest dates work.

A new concern for Fava production is that Climate Change has resulted in May and June temperature swings that are often about 10 degrees hotter than older norms, which can negatively effect blossoming and fruit set. That situation seems especially the case on the floor of the Willamette Valley. This temperature factor can also weaken cool weather plants, resulting in more insect damage from both aphids and weevils. (Note :that weevils are actually edible by humans, but are a cosmetic and storage concern, requiring flash freezing of the crop after harvest. Also research shows that they 'hang out' in organic matter.)

Bigger plants containing more numbers of Fava beans appear to be a result of both planting time and spacing. Broadcast beans drown out weeds in organic production, but per plant production is lowered in actual numbers of beans: which, might be offset by having more plants closer together. Fava plants are usually 3-5 feet tall, and a thick planting providing a shade factor might help offset high temperatures at blossom and fruiting time.

Fava beans are very productive. From 10, 80ft. rows on 2 ft. centers, it is not unusual to harvest more than 200 lbs. of Windsor type Favas. That scale of planting can be done on rather small homestead or even city garden plots. The harvest period covers about a month and a half, and includes green beans eaten before seed set, green half to full size seed beans removed from the shell, roasted shell and bean eaten edamame style, and dried down storage bean seeds. Hotter temperatures appear to shorten the length of the three- stage harvest period, forcing dry down quicker.

Fava Beans are used in crop rotations both for their excellent ability to fix Nitrogen from the air into living soils, and to provide a range of soil nutrients if they are tilled into soils ahead of crops that are heavy feeders, like Corn or Broccoli. Observation indicates that nodulation by specific soil Bacteria is seemingly regulated by Active Soil Nitrogen Reserves. If those reserves are high, Fava plants don't have to nodulate; as much or at all.

Human and sometimes Animal nutritional need characteristics are why gardeners and small farmers grow Fava beans. The green versions of Favas can be used wherever green beans are desired in recipes from around the world. Dry Fava recipes usually involve soaking the dry beans for at least 12 -18 hours, then pressure-cooking them for up to 45 minutes, or 10 minutes in an Instant Pot.

See the [tenriversfoodweb.org/Nutrition/ Recipes](http://tenriversfoodweb.org/Nutrition/Recipes) site for specifics. A basic finding is that any recipe developed using tofu can use Favas instead. Simply place 1 ½ to 2 cups of cooked Favas into a food processor, pulse enough to crack the beans but not turn them to humus, then use those pulsed beans to replace 1 lb. of tofu. That process gets people past the negative estrogen effects some equate with Soy, and uses a bean that can be grown and stored in our immediate locality.

Goggle Fava Bean Nutrition and you will find several sites that give you readouts of the really great nutritional qualities of Fava or Broad beans. They are usually in the 25%-30% range Protein wise, less than Soy, but far higher than most other beans. The Protein is made up of 7 Amino Acids. Favas are particularly high in Calcium, Magnesium, Phosphorus and Potassium minerals, and contain a good range of trace minerals. A range of vitamins are present in Favas, of particular note Vitamin K, Thiamin, Riboflavin, Niacin, Vitamin B6, and Folate. They are a rich fiber food. And per serving they provide 187 Calories of Carbohydrate, 5.7 Calories of Fat, and 44.8 Calories of Protein.

#### LOCAL CHICK PEA PRODUCTION

Chick Peas (Garbanzo Beans) are slightly more delicate regarding germination and production. Data is available that shows that March planted Chick Peas had poorer germination, but resulted in much larger plants with two times or more beans per plant than the same beans on the same ground planted in May. Late April or early May is usually when commercial plantings go in because of reliance on heavy equipment on wet soils. At that time soils are usually in the 50F -60F range, which gives optimum germination rates.

Chick Peas also prefer blossom and fruit set in weather that averages below 70F to 80F, with nighttime temperatures in the 64F – 70F range. It is nighttime average temperatures of the high 40F to 50's F that make growing some varieties of Chick Peas tricky in our Maritime climate. Chick Peas can withstand frosts, but prolonged lowered soil temperatures can affect numbers of beans per plant.

Chick Peas have a deep tap root, so do well in dry farmed situations, unless soil dries out too fast. It is recommended that on garden and homestead sowings mulching be used to conserve soil moisture and more even soil temperatures.

Also, spacing is a factor in numbers of beans per plant. Wider spacing allows larger plants with up to twice as many beans per plant.

Harvest of Chick Peas can be two stage. Homestead scale gardeners can begin eating the peas inside the pods in the green stage. Chick Peas can also be eaten raw in sprouted form. That is not the case with many other beans. There are now on line recipes for green Chick Peas. However, most Chick Peas or Garbanzo beans are dried down in the field to be used as storage beans. Their dried nutritional profile seems stable for years. Older beans just require longer soak times of 12-15 hours before cooking.

The nutritional profile for Garbanzo/Chick Peas is available in detail on the Internet. Briefly, 25% -29% Protein is attractive, especially because that figure is made up of 19 Amino Acids. Dietary Fiber of 45% of Daily Requirement is also an impressive figure. As are the vitamins B1 = 16% of Daily Requirement; B6 = 14%; Choline = 17%; Folate = 71%; Vitamin E = 4%; Vitamin K = 7%. Trace mineral and mineral counts are highest for Copper= 64% of Daily Requirement; Iron 26%; Magnesium = 19%; Manganese= 73%; Molybdenum=273 %; Phosphorous 39%; Selenium=11%; Zinc= 23%. Chick Peas also offer 3% of Omega-3 Daily Requirements.

We have grown Golden Dragon Chickpeas at Sunbow Farm for many seasons. That bean originated in India and is a favorite in Indian cuisine. Those smallish peas are said to give those who eat them 'the power of the dragon'.

There are all kinds of Chick Pea recipes available at your fingertips doing an quick Internet search. The most popular use of Chick Peas in the USA is Humus. Humus has been a dietary staple of many Middle Eastern cultures for centuries. But don't limit your use of these beans. They are very versatile for us in everything from salads to burgers and more.

#### DRY (GOLDEN OR GREEN) OVERWINTERING PEA – Pisum Sativuna L

In 2011-2012 both Sunbow Farm and A 2 R arm experimented with overwintering Dry Peas. We grew both green and yellow varieties on the floor of the Willamette Valley under Organic Certification practices. Sunbow also did Spring plantings.

Fall planting worked, as Dry Peas need a minimum of 50F to germinate well. They appear to be frost resistant in our typical Maritime winters. Spring soils might get into the 50's by May, but sometimes do not. Dry Peas need 110 days to mature, and are generally ready to harvest in late July or early August. They are generally grown as a "field" crop. They produce deep roots, and are known to cycle good quantities of atmospheric Nitrogen, which is fixed by soil Bacteria for subsequent crop use.

The down side of fall planting was weed pressure during overwintering. Peas do not compete well, even though originally a wild plant, seeds of which have been found and Carbon Dated to 9750 B.C.E in Asia. Wild Geese also ate part of the crops. Spring planting in May is more usual, and works fine with less weed pressure in a dry land situation, as long as Fall weather doesn't turn wet early. In our experience some years May plantings might require some irrigation. The dried down crop needs to be off the field, cleaned and stored by September 1<sup>st</sup>. Morning dew in this valley can be a harvest and dry seed-cleaning factor after that date.

The nutritional profile of Dried Peas has made them attractive for many cultures worldwide. Recipes for dried or split peas are available these days on the Internet. In a single serving Cornell University found 231 Calories; 16.4 grams of Protein; .08 grams of Fat; 40 grams Carbohydrates; 16.3 grams of Dietary Fibers; and 5.7 grams of sugar. 11 Amino Acids made up the Protein profile. In one cup, the percent of Recommended Daily Intake (RDI) values were: Molybdenum=196%; Tryptophan 56.3%;Manganese=39%; Folate=31.8%;Thiamine= 24.7%; Potassium=20.3%; Phosphorous= 19%; and 10-20% values for Magnesium, Iron, Zinc and Copper.

After harvest Dry Peas usually go through a husking or de-hulling process. This allows easy division of the pea into its two cotyledons, called splitting. Split peas are sweeter, less starchy, softer, and have an "earthier" flavor. They are the basis of Dal or Pease pudding, which is eaten by millions of people daily across the world.

## LENTILS

As part of the Southern Willamette Valley Bean and Grain Project we reintroduced both small plots and very large fields of Lentils. Lentils are usually found as major crops in NE Washington and NE Oregon. They historically were staple food for the Seventh Day Adventist community, with years of research and variety development centered around Milton-Freewater in Oregon. Our large and small experiments showed that they grow and mature well in this western Oregon valley area.

Like other cool weather pulses, Lentils can germinate when soils are 41 F. Some varieties can overwinter here, meaning they can be fall planted. Or they can be planted in late winter or early spring. Lentils grow best when temperatures average 68 F. Which translates to planting from March on in our area. Lentils are known to be the most frost tolerant of the pulses, but they are not immune to frost damage.

We found that if there is a late May frost cycle accompanied by late soil saturation with moisture, that combination can lead to damage or retardation of production.

There is a lot of research available on the Internet regarding Lentil and other pulse crop reactions to ever-higher average temperatures resulting from global warming. Damage can be mild to severe and appears tied to plant growth stages when

excessive heat scenarios hit a region. Number of seeds per plant and nutritional quality of seeds are victims when average temperatures soar for days or weeks.

The nutritional profile of Lentils makes them attractive staple foods for many cultures across the world. A cup/or serving typically contains 17.9 grams of Protein;39.9 grams of Carbohydrate; 230 Calories; 0.8 grams of Fat; and 15.6 grams of Fiber. RDI or Reference Daily Intake of vitamins and minerals are typically: Thiamine 22%;Niacin 10%; Vitamin B6 18%; Folate 90%;Pantothenic Acid 13%; Iron 37%;Magnesium18%; Phosphorous 36%; Potassium 21%; Zinc 17%; Copper 25%; Manganese 49%. Lentils are also loaded with Phytochemicals that are known to help reduce symptoms of both heart disease and diabetes. These nutritional numbers generally hold across the many varieties: Brown, Puy, Green, Yellow, Red, and Beluga Lentils.

Lentil recipes from many cultures are available with an Internet search. One of the attractions of Lentils, compared to the other pulses, is their quick cooking time. They require no soaking, and are ready to eat in 15-20 minutes of simmering.

#### WATER REQUIREMENTS

A point of our Elder discussion advantages for Favas, Chick Peas, and Yellow or Gold Field Peas and Lentils was that if overwintered, or even early spring planted, these legumes should need no, or very little, irrigation. Again, early heat may put stresses on cool weather pulse plants, particularly during blossoming and fruit set and would require supplemental watering. Weeks of 90 F as we've seen the last two seasons, or even a week of temperatures in excess of 100 F can damage or kill plants if they are still in growth stages.

Generally cool weather pulse roots are strong enough to follow the water table down as it recedes in late spring and early summer. A winter of severe drought can alter that tendency. So can a sudden severe rain event. This might be the case if a bed or field with generally good drainage is suddenly having to handle days of flood type rains; such as happens periodically when atmospheric rivers push in from the Pacific Ocean, bringing multiple inches of rain in just a few hours.

#### HARVEST AND STORAGE

At commercial scale levels, all the above pulses are combined. Some farmers elect to windrow pulses as they begin to ripen, the ripening then finishing while in the windrow.

That practice of cutting the plants before finished ripening might be a tactic for reducing damage from weevils, which seems to come most often as pods are ripening in a stand. For homestead scale production that pre-ripened cutting could

be placed on tarps and dragged away from the growing area. Weevils are known to hangout in organic matter, which is often high in Organic homestead situations.

Our group of Elders discussed various ways of either pulling ripe pulse plants or cutting them for harvest. On very small plots some hand pick each pod. Most either use a sickle or pruners to cut the plants. Nate Johnson of Sunbow Produce introduced a homestead scale tool for both pulse and grain harvest during the 2017 season. It is a Black & Decker Hedge Trimmer that is battery powered and adjusts to a 90 degree angle. With it you can walk beside a row of crop, the sickle bar just above the soil, and easily cut standing pulse, grain, or edible seed crops. Then pick up the dropped plants and put them on a tarp for drying and processing.

On a homestead scale getting the seed out of the pods is most easily accomplished by doing what we call the bean dance. A layer of crop is spread on a tarp on a hard surface. Feet stomping in a kind of twisting motion separates the pods from the stems, and releases dried seeds from dried pods. Stems are pulled from the tarp, the dance continues, until all or most of the seeds are free from pods. Then we use a broom and dustpan to sweep up the seeds and put them into a bucket. Various forms of screens are then used to get rid of chaff and shattered pod pieces. Various sizes of seed cleaners with ranges of screens are available, both for home and commercial use.

Dried pulses can be stored in sealed glass or plastic containers for home or homestead scale food security. Commercial packing sheds use various scales of bags for storage. The important part of storage is to keep product away from rodents and bugs. Any moisture getting into storage can ruin what is being saved. Properly stored, pulses can be food security for years.