

4. Planting Trials Results

Results of System Test Plantings from December 2007 - April 2012:

- ❖ **WARNING!Remember, if you have a pest attack, YOU CANNOT USE POISON; you can't spray bug sprays! If any of this stuff gets into your water, it will kill your fish. Even things as mild and organic as Neem oil spray have killed all the fish in one of our student's systems. See section 5-C-6 Controlling Vegetable Pests for more information on this.**
- ❖ Many things grow VERY well in aquaponic systems. They are: any leafy plant where the whole plant is harvested and used, such as lettuces, cabbages, oriental stir fry varieties, kale, chard, silver beets, kohlrabi, culinary herbs, green onions, chives, leeks, and the like; fruiting plants such as melons, cucumbers, squashes, tomatoes, strawberries, peppers, okra; and many different kinds of legumes including peas, sugar snap peas, purple beans, green beans, and French green beans. Some of these need green-or-screen houses for best growth and yield; you can't spray bug sprays on them. You will have to determine what grows well in the system where you live, as that is highly dependent upon your elevation, the amount of sun and wind your system receives, etc. In other words, you need to think about all the same considerations you would give to that location if you were planning a garden in the ground.

Some things didn't grow well in our initial tests. These need further research to figure out what happened. Did we plant at the wrong time of year, use the wrong variety of seed, did our plants not get pollinated adequately, did it need some kind of special nutrient supplement that wasn't present, does that variety just not respond well in an aquaponics system or what? (The trial to which we refer was planted in December, 2007, at the beginning to a six-week long cold, rainy period.)

For instance, we got monster lima bean and fava bean bushes where the bushes must have weighed 10 lbs. each, but NO beans. This was in the same system right next to a sugar snap pea plant that had incredible pea yields. We had eggplant that took forever to grow and finally gave us a single 3-oz fruit, next to a tomato plant that yielded 200 lbs. in a 3-month period. However, these experiences were a small minority. Almost everything we planted in the system grew like gangbusters in about half the time as in the dirt.

Although we don't have specific production volume information on the vegetables here, we conducted a planting trial when we first began aquaponic operation with these 135 varieties of vegetables. The vegetables you want to use as "target" vegetables for your trials are the ones that grew the best, had the least bug problems, had the best weight, had the highest market price, or a combination of all these qualities. You should talk also to produce buyers and brokers, markets, and other outlets in your area to get an idea of current market price and amounts of produce needed per week to find additional "possibles" as well as trying things on this list.

It is a REALLY GOOD IDEA to plant AT LEAST three or four varieties of each vegetable type you're considering. Here's why: we've found that one or two varieties of a vegetable will do quite well in our specific location, one or two will do poorly, and the others in between somewhere. If we accidentally select the one that grows poorly when we're ordering seeds, and don't ever try the others, we're running the chance that we will conclude that "so-and-so doesn't grow well", and miss a bet, when what really happened is that we just picked the wrong one.

(PLEASE NOTE: Bold text indicates that this plant grew well, plain text indicates that plant either did not flourish, or did not fruit. Initially, all these seeds were obtained from Baker Creek Seed Company, www.rareseeds.com, and were all heirloom varieties, but not all organic.



Flowers

Aster - Giant Perfection Mix - Beautiful, long-lasting cut flowers, an old-fashioned favorite. Asters originated in China. Peony type, extra-large flowers that are great for cutting. This variety is popular with home and market growers.

Bachelor's Buttons - Tall Mixed Colors - An old-fashioned mix of tall types. Many beautiful colors: purple, violet, light and dark blue, rose, white, lavender, pink and more! Very easy to grow.

Nasturtium - Dwarf Jewel Mix - Bright sunny colors: yellow, pink, red and orange. The edible flowers are popular for salads and as a garnish; the peppery leaves are also very flavorful. These plants are a colorful garden favorite that grew phenomenally well in our system. The plants got HUGE, leaves are edible as well. Make sure to plant on an end of a grow bed, so it can grow out over the ground.

Here is squinting Jack, with our very first zinnias in 2008. Cut flowers and edible flowers grew wonderfully!

Marigolds – yummy in salads! Marigolds are a great detrimental insect repellent and are reputed to be good for companion planting, so interplant wherever you have an empty hole. If nothing else, they're pretty, and the flowers are great in salads!

Harlequin - This antique variety dates back to 1870 and has recently become popular again. It is quite unique with its yellow and red striped flowers that are both charming and flashy. It made a good cut flower, too!

Orange Hawaii - Large, deep-orange flowers seed packet said would grow to 4" across, ours were 5.5" across – HUGE and very striking and beautiful. Seed packet said plants grow to three feet tall, ours grew to five and a half feet tall. Orange Hawaii is used as a natural feed additive to brighten the yolks of eggs, and for fabric dyes.

Crackerjack Mix - The giant African type that is popular with gardeners coast to coast, the big double blooms come in shades of lemon yellow to deep orange, and the 30" plants are profuse.

Statice - Blue Seas (*L. perezii*) This variety produces large clusters of deep blue flowers over a long season, perfect for using in both dried and fresh flower arrangements. Grew beautifully and had flowers for eight months.

Baby's Breath - Covent Garden - A lovely annual, single-flowered type that produces clouds of small pure white flowers on each stem. A cottage garden favorite that is perfect for fresh or dried floral arrangements. Grew very well.

Also grew well: zinnias, dahlias.

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Subsequent tests have included seeds procured from Johnny's (NOT owned by Monsanto, and an excellent company, in all ways), Territorial, Seeds of Change, and Seed Saver's Exchange.

Veggies

Asian Beans

Thai Winged Beans (*Psophocarpus tetragonolobus*) This is one of the most unique beans, it produces delicious pods with four winged edges, the leaves are cooked like spinach and the roots have a delicious, nutty flavor. This high-protein bean is an excellent crop in Aquaponics. The plants are tropical and do best in warm areas. Soak seeds 24 hours before planting. Very popular in Thailand. Needs to be strung up, so I used my tomato trellises. **Plant along the back row of a grow bed, so as to not shade plants, four to six per row.**

Limas – plants were beautiful! But we got no beans!

King of the Garden Lima - 90 days. Large 8'-10' vines yield very LARGE white lima beans and give huge yields over a long season. An heirloom from 1883. An old-fashioned favorite excellent for home gardeners.

Henderson's Bush Lima - 71 days. Introduced in 1888 by Peter Henderson & Co. and one of their most famous varieties; still popular to this day. Henderson offered in 1888 \$100.00 in cash for plants bearing the most pods and said, "A VEGETABLE WONDER!!!" & "Can and should be grown in every garden..." & "Of all the Novelties ... ever sent out, there is nothing so entirely distinct and valuable as this New Vegetable." Dwarf bush plants can be grown like regular bush beans. Seed packet says tasty, tender lima beans, and very early too! (So, good for colder climates/higher elevations).



This Golden Wax bean plant was 6" high and already had 2" long beans. The beans were sweet and delicious, and there were a lot of them! This is a wonderful variety in aquaponics!

Long Beans

Chinese Red Noodle Bean - This is the most stunning and unique bean I have ever seen. Fantastic deep red 18" pods are so delicious, full of nutrition, and they even keep most their color when sautéed! Long vines produced all spring and summer. Must be trellised. **Plant along the back row of a grow bed, so as to not shade plants, four to six per row.**

Chinese Green Noodle - 20" pods are straight and smooth, bright-green, and of excellent quality. This hardy long bean grew very well in the system. Very tasty stir-fried. **Plant along the back row of a grow bed, so as to not shade other plants.**

Beans

Royalty Purple Pod - Seed packet said 56

days, I had beans on a 4" tall plant that was 33 days from germination! Tender, bright purple pods turn green when cooked. Very ornamental, beautiful and tasty. Bush plant.

Golden Wax - Delicious, golden-yellow pods are stingless and are of good quality with extra- fine rich flavor. This old-time favorite has bush plants.



This Royalty Purple Pod bean plant was also tiny – just 6" high with 2" long beans. In this photo, you see almost the entire plant. We picked pounds of beans off these plants, and they were very tasty!

Rattlesnake Pole - This pole bean is easy to grow and produces lots of green pods that have purple streaks. Good flavor and very tender, the speckled seeds are great in soup. This variety is great for hot, humid areas. **Plant along the back row of a grow bed, so as to not shade plants, four to six per row.**

Lettuce Mixes (sold by Baker Seeds)

European Mesclun Salad - Grow this mix of greens for one of the tastiest salads ever! Flavors range from sweet-mild to sour-hot-tangy, and colors come in red, purple, yellow, and green. Colorful lettuce, radicchio, arugula, endive, orach, mizuna, kale, mustard, corn salad and more.

Rocky Top Lettuce Salad Mix - Brightly colored and unique lettuces, it made a flavorful and brilliant salad

Red Wing Lettuce Mix - "The All Red Formula Mix". At last a lettuce mix that contains a wide range of the best brilliant red (and red splashed) specialty types. Beautiful mix.

Siamese Dragon Stir-Fry Mix - All the best Asian greens for stir-frying and steaming. The rich flavor of these greens is incredible when lightly cooked and seasoned with garlic and Thai peppers. This formula mix is perfect for market growers. Also pick the greens in the "baby stage" for a tangy salad mix.

Cucumbers

Chinese Yellow - Beautiful, yellow-orange cucumber from Mainland China, the young fruit is green. 10" fruit are as crisp as an apple. Very mild and delicious, great for slicing or for pickles. This was our largest yielding variety ever - just a few plants produced hundreds of cucumbers! A very rare Chinese heirloom. **Plant in the edge row of a grow bed, to allow it to crawl over the ground.**



We call this photo "Kids and the \$65,000 salad, because this was the evening we picked our very first salad – and we'd spent \$65,000!"

Suyo Long - Long, ribbed, dark green fruit can grow to 18". They are very mild, sweet and burpless. Excellent for fresh eating. This productive heirloom comes from northern China and is very attractive. **Plant in the edge row of a grow bed, to allow it to crawl over the ground.**

Japanese Long - Long, slim fruit that are very crisp and mild. Easy to digest, firm flesh with few seeds, a great Japanese variety for home use or farmers' markets. Plants did not flourish.



A Chinese Yellow cucumber blossom and baby cucumber just to the right of the blossom.

Eggplant

Ping Tung - 65 days. From Ping Tung, Taiwan. Fruits are purple and up to 18" long and 2" in diameter. This variety is so sweet and tender, superbly delicious! One of the best Chinese eggplants on the market. Did not thrive in 2008, doing much better in current trials.

Listada de Gandia - One of the most popular heirloom types, this variety has 7" long fruit that are white with lovely bright-purple stripes. Very beautiful & with fabulous flavor in the sweet, tender flesh. This great variety hails from Italy, a country that is renowned for fine food. However, it took three months to get to get one 3" fruit, right next to a tomato plant that gave us 200 lbs of tomatoes in the same period. Did not thrive in 2008, doing much better in current trials.

Fennel

Di Firenze (*Foeniculum vulgare*) This is the anise flavored vegetable that Italians love. Large 1 to 2 lb bulbs are delicious in soups, sautéed, baked and raw in salads. This Italian cultivar is fairly early. The authentic "Finocchio" for growers of quality. Grew huge and gorgeous, bulb formed on top of raft.

Garden Berries

Red Wonder Wild Strawberry - This variety was selected to produce large, elongated red fruits that are sweet and aromatic. Perfect for growing in flower gardens and containers as the plants, flowers and berries are ornamental. So delicious, the fruit won't last long! Plant did well, small fruit that the kids loved.

Wonderberry - (*Solanum burbankii*). Developed by Luther Burbank, tasty small blue-purple fruit, and good fresh or cooked. Small plants produce good yields in about 75 days. A historic heirloom that is easy to grow and fun for kids. Bush grew HUGE (probably should grow this in the ground and water it with system water).

Strawberry Spinach - (*Chenopodium capitatum*). An old-fashioned plant that dates to 1600 in Europe. This curious plant produces greens that are picked and cooked like spinach, but it also produces sweet, red berries that are bland in flavor. These add a nice touch to fruit salads. Easy-to-grow plants are similar to "Lamb's Quarters", a wild relative. Found in a European Monastery garden.

Garden Huckleberry - (*Solanum melanocerasum*) 75 days, large purple berries, that are that cooked and sweetened, (do not eat raw). Great in pies, huge yields of fruit all summer long. Plant

14" apart. Strong tall plants do not have to be staked. Grow plants like peppers. Great for anyone wanting quick easy berries, and a huge yield. Originated in Africa.

Chichiquelite Huckleberry - (*Solanum nigrum*) Sweet purple berries are great fresh or cooked. They are much like Wonderberry but are larger in size and give heavier yields. Very easy cultivation; start seeds and grow like pepper plants, just 75 days to harvest, says seed packet; more like 35 for small berries to form, large ones after 45 days.

Herbs

Basil – grows wonderfully! Bushes must be harvested from regularly, or plant will go to seed. Excellent for cut and regrow, up to three times.

Genovese Basil - The famous Italian heirloom is very popular with many cooks. Bushes must be harvested from regularly, or plant will go to seed. Excellent for cut and regrow.

Siam Queen Thai Basil - Very strong, clove-scented basil. This heirloom is very popular in Thailand and is a very flavorful specialty variety.

Lime Basil - A unique lime-flavored basil from Thailand.

Cinnamon Basil - Spicy flavor, tasty Mexican variety.

Licorice Basil - Has a strong licorice scent and flavor. Unique.

Dark Purple Opal Basil - A beautiful and ornamental variety, deep purple.

Lemon Basil - Wonderful lemon fragrance & taste, a real culinary delight.

Lettuce Leaf Basil - Huge 3-5" leaves; Japanese basil with a great flavor.



Photo to the left is of Lettuce Leaf Basil, which grew brilliantly in our system.

Fine Verde Basil - Very small, fine leaves on compact bushes. Perfect rich, spicy basil flavor that Italians love. My absolute favorite basil ever – no chopping required when using it to cook!

Chinese Chives Mix - (*Allium tuberosum*) Winter-tolerant and great for greenhouse production, this chive mix has a wonderful garlic flavor and is popular with Asian chefs. Cut and regrow, for months!

Thyme - French Summer (*T. Vulgaris*) a very aromatic French variety; not winter hardy. Slow-growing, small plant. Roots did not seem to do well in the water.

Yarrow - (*Achillea millefolium*) Beautiful when used as a dried flower. Also popular as an herb, used for colds, fevers, and for healing wounds.

German Chamomile - (*Matricaria recutita*) Beautiful small flowers, makes a relaxing tea with a sweet fruity fragrance, medicinal. Attractive plants; got very large in the system.

Shungiku Edible Chrysanthemum - Delicious green leaves are great in salads and stir-fries. The brilliant yellow flowers are also tasty! A beautiful Oriental heirloom, very colorful. Did exceptionally well!

Russian Tarragon - A flavorful herb that is used to season salads, meats and other dishes, hardy plants grow to 40". Used fresh or dried. Did not thrive.

Broad Leaf Sage - (*Salvia officinalis*) Used in Europe and America to flavor many meats, stuffings, vinegars and more! Fragrant leaves are also used in potpourri, 20" tall gray-green plants are quite attractive.

Shisho or Perilla Purple Zi Su - A beautiful and delicious plant that is very popular in Asia. The purple-red leaves are used to color and flavor vinegar and to make beautiful, pink rice. Great in salads; flavor is a mix of basil and mint.

Kales - Cabbage moths loved them! Get floating row covers! Consider planting them as a "sacrifice" planting, because in our experience, when there's kale around, the bugs don't bother anything else!

Dwarf Siberian - This tasty Russian variety produces leaves that are only slightly frilled and of top quality. 16" plants are very hardy and productive.

Russian Red or Ragged Jack - Very tender and mild, a pre-1885 heirloom variety. Oak type leaves have a red tinge, and stems are a purplish-red. One of our favorite kales. Great flavor.

Blue Curled Scotch - Compact plants yield tender, blue-green, crinkled leaves that are quite delicious, very cold hardy, and rich in vitamin A.

Leeks

Giant Musselburgh - An heirloom that was introduced in 1834, near Edinburgh, Scotland. Large, very thick stems, tasty mild flavor. Grows well in most locations, perfect for home or market, this old favorite has huge size, and is very winter hardy. 90 days instead of 180. **Use two or three-inch pots, cut and re-grow many times. I have not found an upper limit on the number of cuts/re-grows.**

Bulgarian Giant - A long thin leek of the best quality, light green leaves. Fine autumn variety that is popular in Europe. 90 days instead of 180. **Use standard two-inch pots, or try three-inch pots, cut and re-grow many times. I have not found an upper limit on the number of cuts/re-grows.**



Here is a raft full of leeks that we ate from for over six months! Leeks are perfect for "cut and re-grow", which is what we did with this raft.

Melons

We tried cantaloupe, honeydew, watermelon, and many other special melons. We got only a few small melons before the blossom end rot got them. The vines produced many flowers from a very young age, and began to form fruit, which we believe was mostly destroyed when the vines got blossom end rot. We need to find a suitable, safe, and organic application to remedy this, because the all the varieties of melon vines themselves looked GREAT!

Snow Peas

Sugar Snap - This is the wonderfully sweet, edible-pod pea so popular with consumers and gardeners. The delicious, tender pods are great raw (eaten before you ever leave the garden), stir-fried, or in salads. They also freeze very well. Plants did very well, with pounds and pounds of peas per plant.

Oregon Sugar Pod II - Large, thick, 4"-5" pods are superbly tender and delicious. This is my favorite snow pea. Bush plants are high yielding and stay compact. Developed by Dr. James Baggett, of Oregon State University. Plants did very well, with pounds and pounds of peas per plant.

Spinach

Bloomsdale Long Standing - The old standard since 1925, does better in hot weather than most, but did not thrive.

New Zealand Spinach - (*Tetragonia tetragonioides*) Not the same species as common spinach, this variety takes the heat and keeps producing all summer. Not frost hardy. Did not thrive.

Red Malabar Spinach - This beautiful plant is not a true spinach but a different species (*Basella rubra*). This heat-loving Asian vine has lovely red stems and delicious, succulent leaves that are great in salads and stir-fries. A delicious green that can be grown as an annual in many areas or as a perennial in sub-tropical areas.

Summer Squash

White Scallop - 50 days. A very ancient native American heirloom squash, grown by the Northern Indians for hundreds of years, this type was depicted by Europeans back to 1591, and

one of the best tasting and yielding varieties still around today! Great fried and baked. Flat fruit with scalloped edges, beautiful! **Plant at edge of raft, grow over edge.**

Zucchini - Golden - Slender fruit are bright golden-yellow, they are as delicious as they are attractive, bush plants.

Winter Squash

Red Kuri (Hokkaido) - 92 days. (C. maxima) A red-orange Japanese winter squash, fruit are 5-10 lbs. each and teardrop-shaped. The golden flesh is smooth, dry, sweet and rich, a great yielding and keeping variety. Grew very well in system, vines got huge; many fruit. **Plant at edge of raft, grow over edge.**



Shishigatani or Toonas Makino - (C. moschata) The unique Japanese pumpkin that was developed in the Bunka era of the Edo period (1804-1818). Very rare and historic variety! The fruit are uniquely shaped, like a bottle gourd and are ribbed and very warty. They are dark green, turning to tan at full maturity. The fine-grained flesh has a delicious nutty flavor. Traditionally believed to keep people from getting paralysis if eaten in the hottest part of summer. Shishigatani pumpkin is a famous vegetable in Kyoto cuisine. Very rare.

Buttercup - 95 days. (C. maxima) Very sweet dry flesh of excellent quality. Deep orange flesh with green skin. Fruit are around 3 lbs. each. **Plant at edge of raft, grow over edge.**

Oriental Stir Fry Greens

There were a number of different kinds of heartier greens that grew amazingly well in the system. All these can be eaten either raw or cooked, and the entire plant is edible, up to and including when the plant is bolting! (Usually the plant becomes too bitter to enjoy once the process of going to seed has begun.) Probably the very best overall category of food to grow in Aquaponics; everything I have tried thrived!

Lucky with an extra-dwarf pak choy, excellent in stir-fries!

From Baker Creek Heirloom Seeds:

Shiso (*Perilla frutescens*) **Spicy Oriental favorite.** Distinct cinnamon/clove flavor and aroma, with the spiciness of cumin. Used in oriental cooking, sushi and salad mix. Red Shiso colors radish pickles and "umeboshi" plums. Choose from red- or green-leaved varieties.

Chinese Pak Choy and Extra Dwarf Pak Choy:

(*Brassica rapa* (*Chinensis* group))

Pac Choi. Flat, pale, misty green stems form a thick, heavy base with broad, oval, rich green leaves. The compact, vase-shaped plant at full growth is about 8-10" tall, but perfectly formed at "baby" size when young. One of the most bolt-resistant and uniform varieties of this type. (Also spelled "Bok Choy".)

Shungiku (Edible Chrysanthemum)

(*Chrysanthemum coronarium*) **Special aromatic greens.** Cut greens when about 4-8" tall for a flavorful addition to salads, vegetables, pickles, and sushi. Plant more thickly than other greens. Small orange and yellow chrysanthemum flowers appear later on unharvested plants. This is the preferred "fine" or "small" leaf strain.



To the left is photo showing an entire 8'x4' raft that I planted with pak choy, which grew so big and so fast that even though we ate at least one of them daily, by the time I harvested the last one, it weighed 6.96 pounds, looked stringy and tough, but tasted sweet and was very tender! That was almost 7 pounds of food from one single raft hole! From what we weighed off this raft, we ate 43.24 pounds of pak choy from this single 32 sqft area, over a six-week time period. **I consider this plant to be one of the very best you can grow – you can eat all of it, it is tasty and easy to prepare, and it grows like wildfire in an Aquaponics system!**

From Johnny's Selected Seeds:

NOTE: Johnny's is NOT owned by Monsanto, as has been rumored. Johnny's Selected Seeds provides quality vegetable, herb and flower seeds and flower bulbs--as well as a full line of gardening/small-grower accessories--to home garden and commercial growers.

An independent company since 1973, and over the past few years it has become employee-owned, Johnny's provides superior products, technical information, and customer service. All of Johnny's seeds and accessories are thoroughly tested at their 40-acre certified organic farm in Albion, Maine, and are backed by a 100% satisfaction guarantee.

Their customer service is impeccable. Shipment is rapid, staff is knowledgeable. Your call is initially answered by an automated attendant, however, it's very easy to reach a real person.

Johnny's a member of the Safe Seed Initiative (who we all need to join forces with, to protect our seeds). I am inspired by Johnny's Mission Statement (emphasis is mine): "To provide superior product, research, technical information, and service to **critical home gardeners**, and specialty and small commercial growers." I like that they get it...."critical home gardeners". **This is you.**

Chinese Leeks/Garlic Chives (OG)

(*Allium tuberosum*) **Thin, flat leaves with delicate garlic flavor.** Attractive white flowers in midsummer. Flowers are edible and make a great addition to bouquets. The budded flower stalks are sold as "Gow Choy" in Chinese grocery stores. 90 days to harvest. Organically grown. **Cut and regrow, for months and months!**

Staro (OG) Chinese Chives

(*Allium schoenoprasum*) **Heaviest leaf for processing and freezing.**

Best for markets demanding a thicker leaf for freezing, drying, or fresh use. Organic seeds. **Cut and regrow, for months and months!**

Tatsoi (OG)

(*Brassica rapa* (*Narinosa* group)) **Standard salad mix ingredient.**

Leaves form a compact, thick rosette. Long harvest period. Mild taste for salads, stir-fries, etc. Thin to 6-8" apart for full-sized rosettes. Unique and easy to grow. NOTE: Suitable for late spring through autumn sowing. Spring sowings should be made after last frost date to eliminate risk of premature bolting. Organically grown.

Hon Tsai Tai

(*Brassica rapa*) **Purple flower stems and buds.** A Chinese specialty. The young plants soon branch and produce quantities of long, pencil-thin, red-purple, budded flower stems. Pleasing, mild mustard taste for use raw in salads or lightly cooked in stir-fries or soups. For multiple harvesting of tender stems and leaves. Can be spring sown, but yields best when sown June through October for harvest from midsummer through winter (in mild areas).

Purple Mizuna

(*Brassica rapa* (*Japonica* group)) **Distinctive purple-tinged, sharply serrated leaves.** Leaves are mostly green with purple margins at baby stage, while mature plants are purple tinged all over. More delicate appearance than Kyona Mizuna. Plants are very slow to bolt.

Kyona Mizuna

(*Brassica rapa* (*Japonica* group)) **Essential salad mix ingredient.**

Unique mustard green of Japanese origin, producing rosettes of dozens of pencil-thin, white stalks and deeply cut, fringed leaves. Mild flavor. Continues to produce several weeks from one planting, regrowing after cutting.

Early Mizuna (OG)

(*Brassica rapa* (*Japonica* group)) **Similar to Kyona with narrower leaves.**

Vitamin Green

(*Brassica rapa* (*Narinosa* group)) **For salad mix and bunching.** An entirely different and delicious leafy green brassica crop. Band-sow thickly for baby leaf mix. For bunching, mature leaves, avg. 12" x 4", are smooth and brilliantly deep green. The plants are slow-bolting and will grow for a second harvest. The tender leaves are flavorful, but not at all mustardy. Tolerant to both cold and heat.

Da Cheong Chae

(Brassica rapa) **Unique combination of Pac Choi and Tatsoi qualities.**

Shiny, rounded, dark green leaves with a Pac Choi shape. Light green stems. **Please note: this item is now treated with a non-organically-approved substance, and is NOT recommended.**

Hong Vit

(Raphanus sativus) **Pink-stemmed leaf radish.** Fast growing, erect plants produce attractively lobed, essentially hairless leaves with pink stems. Mild radish flavor. Harvest from micro to mini to full-size bunched for a nice addition to soups, salads, or stir-fries.

Note: the following seeds I tried are F1 Hybrids. These are NOT the seeds we recommend using over the long term, as the seeds do not breed true after the first generation. They are excellent for commercial production, but are not useful for seed saving, which we highly recommend. All these varieties are from Johnny's.

Summer Jean (F1)

(Brassica rapa) **Tender, budded stems.** Dark green leaves with small, edible buds. Similar to Hon Tsai Tai, but with thicker stems. Stems regrow for 'cut and come again' harvest. Best suited to summer and fall planting; spring plantings may bolt.

Joi Choi (F1)

(Brassica rapa (Chinensis group)) **Heavy, vigorous white-stem Pac Choi.**

It forms a 12-15" tall, broad, heavy bunch with dark green leaves and thick, flattened white petioles. Compared to Prize Choy, Joi Choi is heavier and even slower to bolt. Tolerant to heat and cold. Space 10-12" apart. NOTE: To prevent breakage at harvest, allow to wilt slightly in field after cutting, pack in boxes, then hydrocool or liquid ice to restore.

Red Choi (F1)

(Brassica rapa) **Versatile Pac Choi adds a touch of red.** Excellent at micro mix, baby leaf, and full size. Red Choi changes from dark green leaves with maroon veins at micro size to dark maroon leaves with green undersides and thin green petioles at full size (8-10").

Black Summer (F1)

(Brassica rapa) **Beautiful, dark green Pac Choi.** Broad, flat, light green petioles are topped with oval dark green leaves. Forms a perfect thick vase shape even when small. Slightly smaller in size (10-12") and a complement to the white-stemmed Joi Choi. Very slow bolting.

Happy Rich (F1)

(Brassica oleracea) **A later, larger version of Green Lance.** Uniform, vigorous, dark green plants are topped with jumbo-size florets that resemble mini heads of broccoli.

Green Lance (F1)

(Brassica oleracea) **Glossy leaves and crisp, thick stems.** This uniform, budding-type Chinese kale (also called gai lohn and pak kah nah) is great in stir-fries or cooked like broccoli. Harvest the stalks when 8" tall and 2-3 flower buds are open. After the main stem is cut, the plant will send up many branches for subsequent harvests. More vigorous and adaptable than nonhybrid varieties.

Komatsuna "Summer Fest" (F1)

(Brassica rapa (Perviridis group)) **Mild, tender greens.** Japanese greens for salad and braising mixes. Uniform, upright plants with slender, fleshy, rounded green stems and dark green, rounded leaves. Good heat tolerance and disease resistance.

Red Komatsuna (F1)

(*Brassica rapa*) **Dark maroon leaves with bright green undersides.**

Beautiful addition to salads or micro mix. Upright plants with rounded leaves and green stems. Color will be darker when sown in summer and harvested in fall.

Kohlrabi (Purple and White)

(*Brassica oleracea (gongylodes group)*) **Extra-early white.**

Tender and fast maturing, even our kids loved this root vegetable that grew on top of the rafts! Easily grown for its crisp apple-like white flesh. For salads, "kohlrabi slaw," snacking, and light cooking. Sweeter than turnips.

Turnips

Purple Top White Globe (OG)

(*Brassica rapa*)

The traditional American turnip. Selected strain of this traditional, Southern U.S. variety. Smooth, round roots, avg. 3-4" in diameter, are white below the soil line and bright purple above. Large, lobed greens. Organically grown. (See photo at right).

Beets

Touchstone Gold (OG)

(*Beta vulgaris*) **Smooth, round roots with good internal color.** Touchstone Gold has green petioles and leaves, and retains its golden color when cooked. Very good germination and excellent, sweet flavor.

Compared to Golden Beet, Touchstone Gold has better germination, more uniformly round roots, much smoother shoulders, and less zoning. Organic seeds.

Merlin (F1) (OG)

(*Beta vulgaris*)

New last year! Uniform roots with exceptional flavor.

Smooth, round roots with high sugar content. Tops are somewhat smaller than Red Ace and can be used for bunching.

Some resistance to cercospora and downy mildew. Choose organic or nonorganic seeds.

Onions

Depending upon your latitude, you will either need to get onions that are listed as **short-day onions** or **long-day onions**. Which ones to grow depend upon where you live. Here in Hawaii, I have tried several short-day onions (because all year, our day length is about 12 hours) that have grown beautifully. Bulbs form on top of the rafts, and are perfectly clean!

Northern gardeners should plant long-day onions. In the North, daylight length varies greatly as you get farther and father away from the equator. Winter days are very short, but summer days are long. Long-day onions will have a chance to produce lots of top growth (hence produce bigger bulbs) before the day length triggers bulbing. If short-day onions were grown in the North, the onions would bulb up too early and they would be small by comparison.

Southern gardeners should plant short-day onions. In the South, there is much less variation in day length between seasons than up North. If long-day onions were planted in the South, they may not experience enough day length to trigger the bulbing process.



Jack and the 2.87 pound turnip that grew in seven weeks from seed! The black 2" net pot is just visible to the right of his fingers, with the roots extending down parallel to his arm. This turnip was sweet and tasty, and the kids loved it!



Five Color Silverbeet from Baker Creek Seed Company (which sells only heirloom seeds), also called Orange Fantasia. These plants grew HUGE. The largest I weighed (not this one, it is still young) was 6.83 pounds / 3 kg with the stalks looking tough and stringy. Yet, when they were cooked, the stalks were tasty, sweet, and tender.

Chard

Five Color Silverbeet (Rainbow Chard) - A beautiful chard, its colors are brilliant (pink, yellow, orange, red and white). This chard originated in Australia. Very mild, ornamental, and tasty. Great for market growers and specialty markets. Pretty enough to plant in the flower garden, so delicious, one of our favorite greens! Grew brilliantly in the system. (Sold in stores as "Bright Lights")

Orange Fantasia - beautiful, brilliant orange. Very tasty. Grew beautifully in system.

Peppers

Peppers all grew very well, but in our first planting (2008) suddenly the entire plant wilted and shortly thereafter fell over with stem rotted in the center; need to experiment with an air gap to see if this problem can be solved. Plants produced dozens (and in some cases hundreds) of peppers until this happened. In our subsequent trials, the plants thrive in the warmer greenhouse environment. Peppers want hot days AND hot nights to do well.

Golden Cal Wonder - 78 days. Colorful golden bells that are very sweet and tasty. Gold peppers are superb for fresh eating, great for kitchen or market gardens.

Corno di Toro Giallo - The traditional favorite in Italy. Long 8" tapered, bull-horn shaped golden-yellow peppers are sweet and spicy. They are great fresh or roasted. Large plants yield well. Among the best peppers you can grow and so delicious. Pure Italian seed.

Thai Long Sweet - Light-green fruit are about 6" long, with a tapered and pointed frying pepper shape. Great for grilling or frying, this pepper is very popular in Thailand. We are happy to offer this rare and delicious variety.

Red Cheese Pepper - 80 days. Candy-sweet, round, flat, 3", pimento-type peppers that have thick, red flesh, great for stuffing or fresh eating. So good, they are almost addictive. Very productive plants. Once used to color cheese.

Mini Red Bell - 60 days. Oh, so cute! Tiny, red, bell peppers are only about 1-1/2" tall and wide. They have thick, red flesh that is very sweet and great for stuffing. 2' tall plants produce loads of these little winners and early, too.

Purple Beauty - 75 days. Purple peppers are always a favorite, as they are so colorful. This variety produces loads of beautiful bells on compact, bushy plants. Crisp texture and mild, sweet flavor makes this one popular with everyone. I even believe Peter Piper picked a peck of these purple peppers and I don't blame him.

Sweet Chocolate - 75 days. Great flavor, rich, chocolate-brown pepper. The flesh is cola-red color; very sweet and delicious. The medium-sized, semi-bell shaped fruit ripen very early. Great in salads.



(Note from Susanne: In 2008, nine varieties of hot peppers and thirteen kinds of tomatoes were planted, but records have not been located. Please keep better records that I do! I am still mad at myself for losing these records!)

Our remembered impression is that the tomatoes grew fast and plentifully. Subsequent trials have shown tomatoes did very well in summer, and gave a burst of fruit, but then began to die off. We only found three tomato varieties that did not

have any pest problems. Tomatoes need a greenhouse, period, or you need to find pest-repelling varieties as our three seemed to be. They were a yellow cherry tomato (called "Egg Yolk", from Baker Creek – this cultivar still shows up all over our seven acres as a volunteer!), a small Roma, and the volunteer Beefsteak. Plant where they can grow up a trellis if using indeterminate vining plants, two to three mature plants per square meter. What this means is that you will have this many mature plants per SM, PLUS this many about half mature, PLUS this many about 18" tall, PLUS this many about 3" tall that you just planted. The raft area will thus have a staggered planting such that as the oldest plants go out of production and are removed, you are constantly introducing new seedlings onto the raft.

Subsequent plantings of tomatoes have been very successful, but the plants do not seem to last for a long time. It's like they "burn out", after putting out a tremendous amount of fruit in a short time. I have taken to planning for this, and plant seeds every couple of weeks, in order to have new tomato plants coming up all the time. See our FaceBook page for photos!

In addition, I recommend planting your tomatoes using a "Dutch bucket" system, using a bucket or half-barrel filled with good compost material and soil, then watered with your aquaponics water. This will allow you to combat pests using organic pest control solutions, such as neem, insecticidal soaps, stylet oil, and/or hot pepper wax, which could not be used if your tomatoes were planted in your aquaponics system. See page 111 for more information on the differences between "Organic Pest Control Solutions" and "Aquaponics Pest Control Solutions".