

For those gardeners among you who missed the Waverly potluck\* with speaker Tony Koski, here are my notes from his wonderful presentation. Helen Boggs, 02-23-14

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Tony Koski is both a presenter to the Colorado Master Gardener Program and a graduate. He has lived out here for more than 25 years on NCR 17 in the Buckeye area. He is also a nationally recognized turf specialist, Horticulture professor at CSU, and entertaining lecturer.

The following handouts were distributed as well as the Powerpoint slides from his presentation:

CMG GardenNotes #746, Climate Summary: Fort Collins, Greeley, and Estes Park CO

CMG GardenNotes #719, Vegetable Garden Hints

CMG GardenNotes #724, Vegetable Gardening in Containers

CSU Extension Fact Sheet #5.536, Grasshopper Control in Gardens and Small Acreages

These and other Extension and CMG publications can be found and downloaded from

[www.cmg.colostate.edu](http://www.cmg.colostate.edu). Additional CSU Extension publications are also available at

[www.ext.colostate.edu](http://www.ext.colostate.edu).

## Vegetable Gardening Up North

Vegetable gardening poses many challenges to us such as short growing season (See CMG#746), hot days and cool nights, dryness, often poor soils, wind, salty water, hail, grasshoppers (See Extension Fact Sheet 5.536).

**Garden soil improvements** can include the use of organic amendments of compost or AGED manure. Cover crops (aka “green manure” such as oats, peas & vetches which are later tilled in) will also add nutrients to your soil. Mulch is an important component as well as not overtiling. After proper soil consistency is obtained, loosening the soil with a broad fork helps to maintain the existing soil structure and organisms. Overall, time and patience is needed for gardening in our area.

**Grasshopper “Control”** can be utilized in a number of ways.

- 1) Tony has found that if you leave strips of green unmowed (and irrigated) grass near your garden, this will provide shelter for grasshoppers and they will seek out this area over your crop area.
- 2) Chickens and turkeys are good at removing grasshoppers once your crops are established beyond the seedling stage.
- 3) Synthetic insecticides can be used.
- 4) Baits containing the protozoan *Noxema locustae* can be good biological options. These include *Nolo Bait* and *Semaspoore Bait*. Both these products have a short shelf life, so check the packaging and refrigeration is also suggested to extend the time the product is viable. Also, this bait is only effective if used when the grasshoppers are no larger than ¼” so be vigilant. The bait does not need to be reinstalled after it rains, but will not be effective on adult insects. This bait is not harmful to birds or bees.

**Extension of the Short Growing Season.** The follow methods can be use singly or in tandem:

- 1) Raised beds warm the soil more quickly, can provide better drainage, and can make harvesting weeding, irrigation, and fertilization easier. Tony uses 4-5’ x 20’ beds made of 2 layers of 6x6” timbers (pinned together) with wood chip paths between.
- 2) Mulching. Clear plastic has been found to warm the soil best in the spring. Organic mulch can then be applied after the soil warms and will help moderate the soil temperature. Mulch will also act to suppress weeds and maintain more consistent soil moisture. Specifically
  - a. Grass clippings make good mulch when applied as thin layers and allowed to dry between applications. Add another thin layer whenever the lawn is mowed, and weed seed germination

should be inhibited after several layers. Grass clippings decompose rapidly and will require additional applications throughout the summer. A grass clipping mulch will recycle its nutrients into the garden. Grass mulch will keep spinach and broccoli cooler longer. Grass clippings are just about the best mulch you can use to build your soil. **DO NOT USE** clippings from lawns treated with herbicides or insecticides for at least 4 weeks after application.

b. Straw can be a good mulch if clean of viable seed. If not, it is often a weed source. It can also result in nitrogen deficiency as the straw breaks down and can be messy to apply or as the wind catches it.

c. Woodchips also will take nitrogen from the soil as they break down. If you can no longer see the actual chip then they are broken down enough and do not need additional nitrogen.

d. Newspaper under mulch. Newspapers can be a good barrier to weed seeds. Apply only 1-2 sheets thick and then add grass/ wood chip mulch to hold in place. Any remaining papers may be cultivated into the soil in the fall. Newspapers are now printed with soy based ink and are safe to use in the garden. Shredded paper makes especially good mulch and will knot together in a continuous when wetted down, but it will also need additional nitrogen.

e. Plastic mulch. Colored plastic will kill weeds more effectively than clear and may enhance plant growth. Black plastic is good later for peppers, and red plastic actually does increase tomato yield. Plastic mulch will warm the soil and can conserve water, however it can also cause excessive wetness and may encourage slugs and other insect pests and may provide cover for rodents.

3) **Water tubes (wall-o-waters)**. These can allow you to set out tender plants a month before the frost free date. If they are only filled 2/3 and are closed at the top they can provide protection down to 20°F. If your older wall-o-waters develop pinhole leaks the water will drain from that cell and they will be ineffective against the cold unless repaired. They should be removed after the temperatures warm and before the plant grows out the top too far.

4) **Low Tunnels**. Hoop tunnels or floating row covers of 1-1½ mil clear plastic require ventilation and can be used for either ground or raised beds. The hoops can be made of PVC, conduit, or wire and must be weighted to keep the wind from relocating them.

5) A late planting of **Cool season vegetables** can extend your garden season. These include peas (65 days from seedling), cabbage (85 days), collards (55 days), broccoli (65 days), kale (60 days), spinach (40 days), and lettuce (60 days).

**Irrigation/ Watering.** Drip irrigation is recommended over overhead irrigation. It increases watering efficiency, is easy to automate, and is fairly easy to install and repair. It reduces plant disease and can be used for traditional garden plots, beds and containers. Using inline emitters spaced every 12” is a good compromise because the water will leach out of the emitter toward the dryer location (emitters are usually spaced per 6, 12, and 18”). Layout your soaker line and plant along it. Drip irrigation is not without cost. The black soaker hoses can be used but they breakdown with UV exposure and eventually will clog and not water evenly.

You need to drought stress hot peppers if you really want to get some heat out of them.

**Weed Management Options.** Weeds need to be removed because they compete with your crops for soil nutrients and water. Control of soil pests is usually best in the surface 6” of soil.

1) The “square foot” gardening method takes advantage of companion plant locations so that less free ground is available for weeds to take hold.

2) Mulches can also make weed germination less hospitable.

3) Mechanical methods of weed removal include pulling and hoeing and may mess up the soil structure some. (Peppers do not like anything tampering with their roots.)

4) Herbicidal weeding methods

a. Traditional

b. Organic –The brand Preem has a both a Garden Weed Preventer and an Organic Weed Preventer product. Neither works well because it has to be applied every 4 weeks AND, if you follow

label directions you will be applying 5x the nitrogen usually needed for vegetable gardens. It also smells like dead animals so you may want to avoid these Preem products.

There are other organic weed control products and the best ones contain essential oils which attack the waxy cuticle of the plant leaf and are not selective, so use caution.

*Burnout I* weed and grass killer uses clove oil and sodium laurel sulphate, as active ingredients.

Vinegar, lecithin, water, citric acid, and mineral oil make up the 80% inert ingredients. This is advertised to be “Made of special blend of vinegar and lemon juices,” however if you get the *Burnout II* product in your eyes, it can permanently blind you. These Burnout products are not selective and will cause wilting in 20 minutes and apparent death by morning. However, perennial roots may not be killed.

5) Biological controls are the use of insects, fungi or other organisms that selectively feed upon specific weed species. Full eradication is rarely achieved. Bio-control is self-regulating because, as the weed population increases, so does the insect population. As the weed population decreases, due to the insect, the insect population also decreases. A balance is hopefully attained where the weed and insect population are held at a low level. The advantage is that there is little labor involved and that it is environmentally friendly. Disadvantages are that it is not always effective, does not totally eradicate some weeds, and may be slow. Please see the website

[www.colorado.gov/cs/Satellite/ag/CBON/1251618660697](http://www.colorado.gov/cs/Satellite/ag/CBON/1251618660697) for more information about this Colorado program. Use of biological controls for the home garden is not that effective.

**Bindweed** is a perennial which spreads mainly by underground stems but seeds will also readily germinate after a rain. REPEATED applications of glyphosate (Roundup-like products) are effective as well as mulch. When this does not work, REPEATED pullings (removal of the above ground leaf-vine surface which feeds the plant) can be EVENTUALLY effective if kept up so that the plant eventually starves. Bindweed mites work on bindweed in unirrigated areas, and with our winds, the areas you treat with infected plants are not always the areas in which the disease will take residence. This method will REDUCE the bindweed population not completely kill it.

#### 6) Container Gardening

7) Solarization is the use of solar energy to sterilize the soil. This is an alternative to using herbicides and will kill living grass for the initial conversion of lawn space, some weed seeds, insects, and some fungi. The soil temperature, if done in summer, may reach 108-131°F at a depth of 2” and 90-99°F at 18”. This is effective for traditional and raised planting beds.

Use clear 1-4mil plastic. Black plastic is less effective (unless the weather is cool). Water the soil/ turf well before laying the plastic. Seal or weigh down the edges with sold or rocks or other material. Leave in place for 4-6 weeks when hot or 8-10 weeks in cooler weather.

Solarization of raised beds works best if the plastic is close to the soil surface. A double layer of plastic, one layer directly on the soil and one layer stretched atop the bed, can raise the temperature in the soil another 5-10°F.

**Container Gardening.** Most require full sun, although some lettuce, radish and spinach can be grown in partial shade. See also CMG GardenNotes #724, Vegetable Gardening in Containers)

Advantages of container gardening:

- Allows gardening in small spaces
- Can be easier than conventional gardening for those with physical limitations
- Less daunting for the beginner
- Easy and fun way to introduce gardening to children
- No digging or tilling
- Fewer (and smaller) gardening tools are needed
- Potting media (not potting soil) is easier to work with than the clay-rock soils of your yard
- Pretty much weed free
- Easy to locate plants where they grow best (sun/ shade, out of the wind, etc) or where care or harvesting is more convenient

- Possible extension of the growing season with starting indoors
- Can be easier to control conditions and garden organically
- Can be easier to protect plants from wildlife consumption
- Your plants can grow faster in containers

1. Growing media. Soilless mixes are best for containers. These include peat moss, composted tree bark, perlite & vermiculite, and some have added fertilizer. You get what you pay for, and cheap media may not drain well or may be excessively salty. Use of hydrogels to reduce watering requirements is questionable, but adding vermicompost (worm castings) is beneficial.

2. Pots. Just about anything that will hold planting media will work, although drainage is essential. Taller containers will drain better and larger ones will require more media. Unglazed clay pots dry out quickly and will eventually break in the winter (over years of consecutive use). Larger tomatoes will need larger pots. Root crops like carrots will need deeper containers than lettuce, radishes, beans, and peas. Salad greens can be grown in gutters with drainage holes. Some nurseries offer free recycled pots. You can reduce the depth of media required by filling the pot bottom with rocks, upside down smaller pots, empty liter pop bottles, etc.

a **1-gallon** pot will grow 1 cabbage; or 2 cucumbers with a cage; or 2-3 green bean plants; or 4-6 leaf lettuce plants; or 1 parsley plant; or spinach, thinned to 3" apart; or a single Swiss chard plant; or 1 cherry tomato using a cage,

a **2-gallon** pot can support beets, thinned to 2-3" apart; or carrots, thinned to 2-3" apart; or 1 eggplant; or 2 pepper plants; or radishes, thinned to 1-2" apart.

Standard tomatoes take at least a **3-gallon** pot.

**Some plant varieties** have been bred to be grown in the following containers:

- hanging baskets can support cucumber, peas, or cherry tomatoes.
- small containers (4-6" dia pot) can support leaf lettuce, onions (sets), peas, radish, or spinach
- large containers (8-12" dia pot) can support beans, beets, carrots, eggplant, leaf lettuce, onion & sets, peas, peppers, radish, spinach, or cherry tomatoes.
- tubs, or 2-4 gallon containers, can support beans, broccoli, Brussels sprouts, cabbage, cauliflower, cucumber, eggplant, pepper, squash, tomato or cherry tomatoes.

**Best Container Varieties.** Seed companies have many varieties especially designed for container gardening.

Peas – Sugar Snap; English peas: Little Marvel, Tom Thumb, Early Frosty; Snow peas: Oregon Sugar Pod.

Cabbage – Parel, Gonzales, Savoy Express, Caraflex

Collard – any

Broccoli – Little Giant

Kale – any

Spinach – Regiment, Tyee, Teton, Red Cardinal, Space

Lettuce – Buttercrunch, Salad Bowl, Dark Green Boston, Ruby, Little Gem, Mesclun

Root Vegetables such as Beets (60 days), Carrots (70 days), Turnips (50 days), and Radishes (30 days) can also be container grown. The following are the best container varieties for those root crops:

Beet – any

Carrot – Scarlet Nantes, Gold Nugget, Little Finger, Baby Spike, Thumbelina

Turnip – any

Radish – Cherry Belle, Scarlet Globe, Icicle

Other vegetables require the lack of frost and must be planted after the first frost free day or with one of the frost protection covers noted for garden extensions. The following are suitable for container plantings:

Bush bean (60 days) – Kentucky Wonder, Contender

Cucumbers (55 days) – Spacemaster, Salad Bush, Bush Champion, Lemon, Picklebush, Midget Bush Pickler

Cherry Tomato – Sungold, Gardner's delight, Green Doctors, Sprite

Compact Bush Tomato – Beefsteak, Patio Princess, Stupice, Marglobe  
Standard tomatoes can grow in a large enough container with good staking/ a cage  
Peppers grow well in containers, and heat will speed them up. It is also easier to control moisture required to increase the heat for hot peppers.

Sweet Peppers – bell and pimento

Hot Peppers – chile, anaheim, jalapenos, habaneros.

Container Herbs. Most do well and they can be moved indoors at the end of the season. Parsley, sage, basil, thyme, rosemary, mints, chives, and dill do especially well.

**Fertilizing Container Vegetables.** You can use potting media with fertilizer added, but it will not last. Add a slow release fertilizer on the surface of the soil (per instructions), and avoid excessive fertilization at any one time. It is better to fertilize weekly and lightly; excess fertilizer will cause salt injury. Organic sources can be safer to use but may be smelly. Fish emulsion can be applied every 10 days using a hose sprayer. Follow Label Instructions!!!

**Tomatoes, Performers and Problems.** There are 2 main types of tomatoes – Determinates and Indeterminates. Determinates were developed for the commercial canning industry to have all their fruits ripen at once. They grow on smaller plants and mature early. They do most of their growing before fruit sets, then they stop. Indeterminate plants are larger and continue growing and fruiting until the frost with yields over the entire season. The following are good performers in our area:

Paste tomatoes – Speckled Roman, Polish Linguisa, Big Red Pear, Roma (Paste tomatoes are more fleshy, not nearly as juicy or tasty as regular tomatoes, and are meant for those wanting to use them in sauces.)

Cherry – Sungold, Indigo Rose, Virginia Sweet, Green Doctors (you only need 1 of these), Sweet 100, Ananas Noir

Heirlooms are older varieties. Often they have less resistance needed to repel the tomato disease and viruses that can hit tomatoes today. They can be very tasty but some do better than others. Prudens Purple, Black Krim, Cherokee Purple, Black from Tula, Kellogg's Breakfast.

Standard – Early Girl, 4<sup>th</sup> of July, Sweet Tangerine, Better Boy.

### **Most common Tomato Problems**

1) **Blossom End Rot.** Caused by fluctuating soil moisture during pollination and early fruit set. Can also be caused by calcium deficiency. FIX: Irrigate regularly, preferably by drip. Use mulch. Use calcium fertilizer sparingly.

2) **Early Blight.** *Alternaria solani* is a very infectious fungal disease promoted by warm (80s) moist conditions and wet leaves. It is most severe on under nourished plants, and crowded plants with poor circulation. This disease can overwinter in plant debris (so remove and do not compost it). FIX: Avoid overhead irrigation (use drip), use mulch, removal of affected plants, practice crop rotation.

3) **Late Blight.** Can overwinter in previous season's potato tubers (same family), but not dead plant debris. Introduced by infected seed or plants. FIX: Buy plants from reliable sources or start your own. Destroy volunteer tomatoes and potatoes, and destroy any plants showing symptoms. Avoid overhead irrigation (use drip), use mulch.

4) **Blossom drop or no pollination.** This is caused by temperature fluctuations when daytime highs are > 90°F and nighttime lows are < 55°F. Sound familiar? High nitrogen can cause a great rush of foliage with few flowers and too little nitrogen provides the plant too little energy to produce flowers. It is recommended that one fertilize with a balanced fertilizer every 3-4 weeks.

Lack of fruiting on Squash. Squash has both male and female flowers. Both must be present for pollination to take place. It is common for plants to produce mostly male flowers (especially zucchini) early in the growing season. If you are cooking with squash blossoms, eat the males.

Also, squash are pollinated by bees and if you have your yard sprayed for mosquitoes by one of the local companies check out the chemical they use on-line for compatibility with bees. They will probably say it is safe, and hand pollinating of your cucurbits isn't really that hard. Plus it is a good way to introduce plant sex to your family. (This aside from Helen)

There is a **new fruit fly-like pest** attacking raspberries and strawberries. The Spottedwing Drosophilid lays eggs on the fruit a couple of days before final ripening (when the fruit first shows pink), so that when you bite into it you see these tiny white larva milling around. Any infected fruit should be carefully disposed of because there is a fear these insects will spread to peaches and the western slope fruit supply. These larva are not harmful to us, but not really appetizing. One solution is to pick your fruit a couple of days before they are fully mature and let them mature in the fridge. Another is to switch to June or early bearing cultivars.

The Larimer County Farmers' Market operates on Saturday mornings in old town in the parking lot of the Oak Street County Building. (It is one of several markets in operation throughout the week in the summer.) The Larimer County Market will open this year on May 17<sup>th</sup>, 2014. More information can be found at [www.larimercountyfarmersmarket.colostate.edu](http://www.larimercountyfarmersmarket.colostate.edu).

Recommended Seed Catalogues: Johnny's (carries the broad fork & specializes in short season seed), Territorial Company, Baker Creek Heirlooms (vege porn), Burpee.

The City of Fort Collins and the Larimer County Extension Office offer the Colorado **Master Gardener Program** annually. This is a free multi-week informational program offered to the public. Applications are required as well as an annual service requirement. The 2014 class started in January. For more information on the Master Gardener Program go to [www.cmg.colostate.edu](http://www.cmg.colostate.edu).

\* At this time, potlucks are promoted through our email tree only (email [hwboggs@aol.com](mailto:hwboggs@aol.com) if you would like notices) as they are RSVP events and not typically published on the Waverly Community website as walk-ins can't very well be accomodated.