Introduction

The goal of the Sand Creek Community Gardens is to foster the development of wise practices of gardening that take into account the following three principles:

A. The larger ecosystem: the rich diversity of biotic life, the soil as a living organism, the air we breathe, water, our streams and rivers. Wise gardeners consider not only the intended eradication of a pest or disease, but also the unintended impact on beneficial insects and of commercial fertilizers in polluting ground water and streams.

B. The impact on human health of our gardening practices: the potential hazards of poisons to ourselves in applying pesticides to our gardens; and the potential long term unintended impacts of accumulated residues in the food we eat.

C. We are a community of gardeners who learn from each other. What one gardener does affects other gardeners. Wise practices of gardening are arrived at through a process of ongoing conversation that draws on the accumulated wisdom of science, the gardening experience of all of us, and respect for our diverse value systems.

Our Goal: Toward Becoming an Organic Garden.

“Organic” is not easy to define. For some it means no use of pesticides, herbicides, and chemical fertilizers of any kind; supporting only the use of cultivation practices, animal manures, composting, and physical barriers to address threats from pests and disease. A second approach defines “organic” as the products and practices approved by the National Organic Products Organization (U. S. Department of Agriculture). Michael Pollan in The Omnivore’s Dilemma, discusses the complexity, ambiguity, and problems with this definition.

A third understanding of “organic” is the goal we believe Sand Creek Community Gardens should aim for, an approach built in three successive stages.

A. The first stage is prevention: the wise practices of cultivation, irrigation, plant selection, animal manures, composting, and physical barriers to prevent pest problems and disease.

1. Building healthy soil with cultivation practices that loosen the soil in fall without destroying soil structure (chisel rather than tilling), compost to add organic matter, and animal manure and organic fertilizer to add nutrients (when needed).
2. Starting with quality seeds, healthy plants, selecting crop varieties that have fewer pest problems, timely planting to avoid pests.
3. Eliminating weeds and grass with hand cultivation that compete for nutrients and water.
4. Watering wisely.
   a) In morning rather than evening, so plants do not remain wet overnight.
   b) Plants kept too wet, or that get too dry, are susceptible to disease and insects.
   c) A forceful spray of water can wash off eggs from leaves to control pests (e.g. squash)
5. Mulching to preserve water, keeping the soil from baking from the hot sun and wind, and to prevent weeds from growing.
6. Using physical barriers. Barriers are non-toxic, leave no residues, and do not kill beneficial insects. (See the appendix for barriers that are effective for our most problematic pests in Kansas: the Cucumber Beetle, and the Mexican Bean Beetle.)

B. Stage two is a second line of defense in an “organic” garden against pests and disease: biological, degradable controls. Pesticidal products are available as an alternative to
synthetic chemical formulations that more readily break down in soil, are not stored in plant or animal tissue, and whose effects are not as long-lasting as those of synthetic pesticides. Three guidelines apply in using these controls:

1. Be sure you know what the problem is (identify the critter or disease first).
2. Though their toxicity is low to warm blooded animals, safety precautions should be used when applying these pesticides.
3. Never spray or apply any pesticide when beneficial pollinators are active.

Biological controls considered “organic:” (See appendix for availability of these products)

1. *Bacillus thuringiensis* (BT, Dipel Thuricide): Contains a dormant bacteria that becomes active in worms and stops the gut activity. It comes in either liquid or dust form. It is invaluable for controlling the cabbage looper and can be used for other leaf eating worms.

2. *Spinosad*: A relatively new control produced from a bacteria, now produced in products rated to control such things as bean beetles and asparagus bugs.

3. *Flowable Liquid Copper Fungicide*: Helps control mildew and blight on tomatoes.

4. *Pyrethrins*: A biological product made from chrysanthemum plants that contains a toxin that is effective on a wide variety of bugs. It used to be available as a spray but is now rare because of the availability of synthetic pyrethrins such as permethrin. The most available source of pyrethrins is Pyola which is canola oil containing pyrethrins.

5. *Neem Oil*: This product is made from the Indian Neem tree and is fairly effective against pests such as mites, aphids, white flies, mealy bugs, etc.

6. *Beneficial Nematodes*: These microscopic creatures live in the soil and eat harmful soil pests such as the carrot maggot. These are effective but pricey.

7. *Nolo Bait*: Tidbits of wheat bran are impregnated with a protozoan that kills grasshoppers and crickets. Natural cannibalism continues to spread the disease. It does not eliminate grasshoppers but controls the population.

C. The third stage of “organic” gardening is the prohibition of artificial or synthetically produced hydrocarbon products. Two examples of the more popular, widely used synthetic insecticides prohibited are:

1. *Permethrin* (not to be confused with Pyrethrins) is a synthetic insecticide modeled after pyrethrins. One of the safest for humans, it is used in public health mosquito control programs, on food and feed crops, on ornamental lawns, on livestock and pets, in structures and buildings, and on clothing. It is not toxic to most animals but it is a problem for cats and fish. It is highly toxic to honeybees, as well as other beneficial insects. The synthetic *Permethrin* does not degrade as rapidly when exposed to air and sunlight as the organic pyrethrins. If applied to plants, it may stay on the leaves for between 1 and 3 weeks.

2. *Carbaryl* (known by the trade name, *Sevin*) is a wide-spectrum carbamate insecticide which controls over 100 species of insects. Moderately to very toxic,
it is labeled with a WARNING signal word. It can produce adverse effects in humans by skin contact, inhalation or ingestion. **Carbaryl** is lethal to many non target insects. Because **Carbaryl** has a half-life in the air of one to four months, crops, shade trees, shrubs and other vegetation in bloom should not be sprayed with **Carbaryl** as bee kills are possible. Carbaryl is moderately toxic to aquatic organisms and wild bird species.

3. The herbicide **Roundup** is approved only for selective use in the gardens. **Roundup** kills plants by being absorbed through the leaves into the roots. Because the active chemical, glyphosate, binds with soil and becomes inactive, it will not damage adjacent plants, will not make them toxic to humans, or run off into water systems. We use it selectively:
   a) to control weeds in the parking area and along the road where we cannot mow
   b) on Bemuda grass in the walking paths and on bind weed to keep it from spreading into the gardens.
   c) Gardeners may use **Roundup** at their discretion, though it must not be applied when winds are above 5 miles per hour because it will kill any plant it contacts. Bermuda and bind weed are best controlled within a vegetable garden by persistent methods of conventional weeding.

**Conclusion: A Work in Process**

These guidelines are a work in process. We have only begun to address the complex issues that arise when we work toward the goal of becoming an “organic” community garden. Gardeners are invited and encouraged to participate in the ongoing conversation as we together further refine and develop these guidelines.

**Appendix**

A. Physical Barriers.
   1. For cucumbers (works for squash and pumpkins as well) construct simple 4-6 inch high small boxes covered by a fine screen that lets in sunlight, air, and rain. Place over the seed beds immediately after planting. Remove the barrier when the plants are ready to bloom (for pollination) or are several inches high and growing vigorously.
   2. For beans use a row cover just after planting that allows air, water and sunlight through. When the bean plants are growing vigorously, remove the cover. Though the bean beetle may still munch on the leaves, the plants have a head start to survive and produce fruit.

B. Where do I find biological organic controls if I cannot find them locally? A good source is the website (and catalogue) “Garden Alive.” Names of some of these products:
   - Bacillus thuringiensis: Bt, Dipel, Thuricide
   - Spinosad: In “Garden Alive” called Bull’s Eye
   - Flowable Liquid Copper Fungicide: In Garden Alive called Soap Shield
   - Pyrethrins: In Garden Alive called Pyola
   - Neem Oil (last summer was available at Harvest Greenhouse)

C. Additional Resources:
   - See p. 35 of the [Kansas Garden Guide](#), 2 copies in Mantz Library, and 1 in our shed.
   - Rodale’s All-New Encyclopedia of Organic Gardening (borrow from Duane Friesen)