

**LSU**  
**AgCenter**  
Research & Extension



## **Family Nutrition Program Gardening Manual**

## FNP Gardening Project

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Adapted from Families First – Nutrition, Education and Wellness System manual, Cooperative Extension Program, University of Arkansas at Pine Bluff

Additional reference source: 4-H Project Book, Horticulture, 7<sup>th</sup> – 9<sup>th</sup> Grade Level, Pub. 2514

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### Objective:

- To reinforce the beneficial nutritional aspects of gardening through education and to increase consumption of fresh fruits and vegetables among low-income populations.
- The goal of this program will be consistent with recommended efforts to promote healthy environments in community settings serving low-income populations, to promote changes that will increase access to healthy foods and to help the food stamp population make healthy food choices.
- As a result of this program, participants will increase their knowledge about the nutritional value of fruits and vegetables and become aware of the following benefits of gardening:
  - Gardening gives you easy access to healthy foods.
  - Growing your own foods saves money.
  - Gardening is a very enjoyable form of physical activity.

### Method(s) to be used:

Formal and informal classes taught by LSU AgCenter specialized horticulture agents, FNP nutrition educators and LSU Master Gardeners.

On-site training (visits to LSU AgCenter experiment stations) on gardening practices (planning a garden, vegetable variety selection, soil preparation and tools). As time permits, garden education will be provided on irrigation/watering, disease, insect and weed control, harvesting and handling, container gardening, etc., by the LSU AgCenter specialized horticulture agent. FNP nutrition educators will do follow-up sessions (at various locations) on nutritional and food safety aspects of gardening.

Collaboration will be established with the LSU AgCenter's ongoing 4-H gardening program to reach and educate eligible low-income youth.

Online Internet support with the LSU AgCenter horticulture "Junior Master Gardening" Web site and School Gardens Web site :

[http://www.lsuagcenter.com/en/lawn\\_garden/master\\_gardener/Junior+Master+Gardener+Program.htm](http://www.lsuagcenter.com/en/lawn_garden/master_gardener/Junior+Master+Gardener+Program.htm)

[http://www.lsuagcenter.com/en/lawn\\_garden/master\\_gardener/school\\_gardens/](http://www.lsuagcenter.com/en/lawn_garden/master_gardener/school_gardens/)

Mail information related to nutritional aspects of gardening to FNP program participants and one-on-one contacts.

Online Internet support with the LSU AgCenter Web site:

[http://lsuagcenter.com/en/lawn\\_garden/home\\_gardening/vegetables/](http://lsuagcenter.com/en/lawn_garden/home_gardening/vegetables/)

**Educational resources and/or materials:**

- LSU AgCenter gardening resources (existing and in development)
- 4-H Six Easy Bites curriculum
- Other existing nutrition education materials related to gardening education
- FNP Home Gardening Lessons (1-4)

**Performance measure:** number of people reached through direct or indirect contact, evaluation forms.

**Volunteer use:**

FNP volunteer agencies (local Food Stamp Office, Council on Aging, Community Action Center, etc.) may provide transportation for the participants to the training sites.

Volunteer agencies may provide seeds and other teaching supplies to assist the nutrition educators.

Volunteer agencies may help (provide space, volunteers, supplies, prizes for the contest winners, etc.) with contests for program participants. Clients who choose to participate in the contest will have a garden at home. A show-and-tell program will accompany the contest.

**Use of nutrition education reinforcement items:**

- Seeds
- Gardening utensils (shovels, hoes, rakes, gloves, etc.) donated by the volunteer agencies

**Recommended Curriculum Topics (four lessons):**

- Planning a garden/vegetable variety selection
- Soil preparation, tools and watering and growing
- Disease, insect, watering and weed control
- Harvesting and handling produce

# FNP Home Gardening - Lesson 1

## Planning a Garden - Vegetable Variety Selection

### Objectives:

- Discuss the relationship between extending the food budget and home gardening.
- Develop a home garden plan.
- List and discuss the things to consider when planning a garden site.
- Understand the concept of vegetable varieties.
- Analyze and choose vegetable varieties suitable for soil, climatic, space conditions and as seasons permit.

### Method(s) to be used:

Train-the-Trainers/Direct training by AgCenter agents as needed

### Educational resources and/or Material (identify non-English):

LSU AgCenter gardening resources  
Transparencies (Garden Arrangements, Garden Plot Plan, Veggie Planning)  
La. Vegetable Planting Guide #1980  
4-H Six Easy Bites curriculum  
4-H Project Book, Publication #2514  
Other existing nutrition education materials related to gardening education (vitamin content)

Other items needed:

- Binders (three-ring)
- Chalkboard
- Chalk
- Flip chart (stand/holder)
- Garden plans (by participant)
- Markers
- Overhead projector (stand/screen)
- Paper (flip chart pad)
- Paper (grid)
- Pencils (sharpened, with erasers)
- Seed catalogs (assortment)
- Sheet protectors (plastic)
- Vegetable plantings (assortment)
- Vegetable seed packets (assortment)
- Magazines (home and garden)

### Time Frame:

Northern Louisiana: January, February, March

Southern Louisiana: January, February

**Performance Measure:**

- Participants will discuss the relationship between extending the food budget and home gardening.
- Participants will discuss issues to consider when planning a garden site.
- Participants will develop home garden plans.
- Participants will learn and understand the concepts of vegetable varieties.
- Participants will analyze and choose vegetable varieties suitable for soil, climatic (as seasons permit) and space conditions.

**Coordination Effort:**

Collaborate with Ag agent, specialized horticulture agent and Master Gardener volunteers where applicable

**Key Teaching Points:**

A home garden is planned far in advance of planting time. A home garden plan should show the crops to be grown, the space to be occupied by each, the direction of the rows and the distance between rows.

A home garden can produce fresh vegetables for a large part of the growing season. Home gardening can result in many benefits for the home gardener and the family.

Vegetables come in many varieties, often with different shapes, sizes, colors and flavors. A well-planned home garden involves determining the variety of vegetables to be planted. Choose vegetable varieties suitable for your garden conditions. New plant varieties are regularly introduced as research produces those that are more resistant to pests and weather conditions.

**Preparation:**

Collect gardening (or home and garden) magazines that contain a wide variety of pictures of garden types and sizes; backyard, window, deck, barrels, rooftop, terraced, etc. Set up a tabletop display of the pictures. (Laminate pictures to extend their instructional life.)

Immediately prior to the session, print the words BEST and WORST in large letters on the chalkboard forming two columns.

Collect a wide variety of commercial seed packets (different varieties of same vegetable, different seed companies).

Collect a variety of commercial seed catalogs.

Collect color catalogs or vegetable picture books of a wide range of vegetable varieties. [Alternative: Collect photographs. Place these in three-hole punched, clear plastic sheet protectors. Sort the photographs by type of vegetable (tomatoes, carrots, lettuce). Place in several large three-ring binders in alphabetical order or by category (e.g. green leafy, root)].

Set up a display of the vegetable plantings. Try to match them with the seed packets.

**Teaching-learning Sequence:**

1. Introduce the home gardening lesson series. Ask the participants to play the Best and Worst game, and focus only on home vegetable planting. Ask the participants to quickly “yell out” the best and worst examples they know about the topic, including personal experiences. Capture these by writing (some of) the responses on the chalkboard under the appropriate heading. (Try not to offer any comments on the bests and worsts given by the participants.)

2. Follow up with mini-lecture/summary about home gardening using the following language:

A home garden is a valuable asset to any home, whether in the country, on a hillside, in the city or in the suburbs! Whether a small plot in a community garden, a rooftop garden made of barrels, window boxes filled with herbs, boxes and barrels on decks, raised beds or a large backyard garden in the country, a home garden offers good, wholesome exercise in the fresh air and sunshine and at the same time can yield a valuable return for time well spent. Ask any avid gardener, and he or she will likely sing the praises of gardening! Gardening helps uplift the human spirit and teaches vital lessons about sharing, taking care of yourself and living in harmony with the earth.

In some areas of the United States and the world, fresh vegetables frequently are not easily available unless they are grown at home. And, many vegetables are tastier and provide more food value when fresh and home-grown. You've probably seen supermarkets often promote some of their vegetables as home-grown. Often the cost of home-grown vegetables is higher than those that are not.

[Incorporate here information from the participant's BEST and WORST list. Ask participants to share their reasons for placing particular items on the list.]

You will be acquainted with home gardening during the next several lessons. We'll discuss planning and arranging the garden, selecting foods and varieties to be planted, how to prepare the soil for planting, the tools needed, planting, watering, controlling weeds, insects, diseases and – the best part – harvesting and storing.

Most vegetables come in many varieties. Through cross-cultural communication and continued agricultural research, we learn more and more about vegetable varieties every day. For example, did you know there are thousands of different varieties of potatoes? Or that they come in colors ranging from rainbow pastels to bright reds and deep purples? Not all these varieties are grown in Louisiana, but you can find many of them in the market, and sometimes you can find the seeds or transplants for some of them.

3. Ask participants to think about ways a home garden can extend the family's food budget. Bring into the discussion the following points: availability of fresh vegetables by freezing, canning and drying; exchanging produce with friends and neighbors who garden; etc. Also discuss the cost associated with planting and harvesting versus the cost of purchasing fresh vegetables from local markets.
4. Refer participants to the tabletop picture display (and/or show slides of a variety of garden types, including those well-tended and those not well-tended). Encourage

participants to ask questions about the kinds of vegetable gardens depicted. Remind participants to bring out concepts not fully understood.

5. Project the transparency and distribute the handouts. Review and discuss each point with participants. Solicit interaction with such questions as:

How big should a garden be?

How can you tell whether you are planting north or south?

Which plants need more space than others?

How do you know what plants to plant next to each other?

6. Discuss garden size using the following language:

A garden of one-eighth of an acre (100 feet by 55 feet) that is well-planned, well-planted and well-cared-for can supply fresh vegetables for a family of four for nearly all of the growing season and will likely yield enough produce for preserving and sharing with friends and neighbors. Even a garden half of that size will produce plenty to eat.

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Home gardening has a lot of common sense rules. One important rule is never plant a garden larger than you will be able to maintain successfully. You may not be able to grow everything you want in a garden patch or very small garden, but a small garden that is well-planned and cared-for can be very productive. Help participants determine the size of the garden they would select for their families.

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7. Distribute the grid paper and the pencils. Direct the participants in drawing a garden plan showing crops to be grown, spacing, and direction of rows.

8. Collect the plans. Tell them that the plans will be reviewed and returned at the next session.

9. Have participants discuss vegetable varieties. Get started by asking such questions as:

How many colors have you seen a tomato?

How many shapes?

Do you think color and shape affect the flavor?

10. Ask participants to indicate their preferences about vegetable varieties, especially with regard to color, shape, size and taste.

Expect such responses as:

I like my tomatoes red and not yellow!

I don't mind the small watermelons, but I like large watermelons, the kind with black seed. But I wouldn't eat a giant cabbage – oh no!

I think bell peppers that are red, yellow and green are pretty, and they taste about the same!

Where I come from, the carrots are little-bitty, not like the big ones I see here.

The ones I grew up with in my home country cost more here!

Listen for misconceptions. Follow up with a brief discussion of cultural diversity and vegetable variety: availability, individual and family preferences, cost, etc.

Distribute the handout and the Louisiana Planting Guide. Explain that it represents the varieties that have been shown to produce well in this state and region. Explain how to use the guide.

11. Give a mini-lecture on the points to consider in selecting vegetable varieties to plant in a home garden.

In deciding what crops to grow, consider the following:

Size of the area available for planting (watermelon takes a lot of space)

Yield (return) for the space to be occupied by the vegetables

Food value of the crop (especially vitamins and minerals)

Condition of the soil (acid, heavy clay)

Climatic conditions

Number of hours of full sun the crop will receive each day

Preferences of the individuals who will consume the vegetables

length of growing season (days until frost)

Time you have to devote to tending the garden

(Explain each point, giving examples as appropriate.) Continue the mini-lecture.

A successful garden begins with the selection of varieties that are adapted to the area. In other words, the key to choosing the right variety is to make sure the variety is adapted to your climate and soil. The wrong variety may not produce satisfactorily, even when other conditions are favorable. It is good practice to plant more than one variety of a vegetable. You can learn what works for you and your garden.

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12. Continue the mini-lecture, indicating things to look for in selecting plant varieties. Discuss hardiness, resistance to disease and insect pests, drought or heat tolerance and nutritional quality.
13. Have participants compare the information on the seed packets, seed catalogs and the photographs. Call attention to differences in the information provided by seed companies and the claims made about yield, etc. Examine differences in shape, color and texture for several varieties of tomatoes, squash, beans, etc. Discuss differences in the prices shown for individual seed packets and reasons for these (reputation of seed company, newness of variety, demand and supply).
14. Have participants begin to select the varieties they would like to plant. Ask them to examine the display of vegetable plantings and look again at their seed catalogs and seed packets.

15. Instruct participants to write these on their grid paper and include with their garden plan. Collect the plans and planting guide to hold for next class or have participants bring these back for lesson 2.
16. Summarize the lesson's key teaching plan.

## **Garden Arrangements (*Transparency*)**

### **Perennial Crops**

Should be planted at one end or on one side of the garden (Examples: asparagus, blueberries, mint, blackberries and other fruit).

### **Tall Crops**

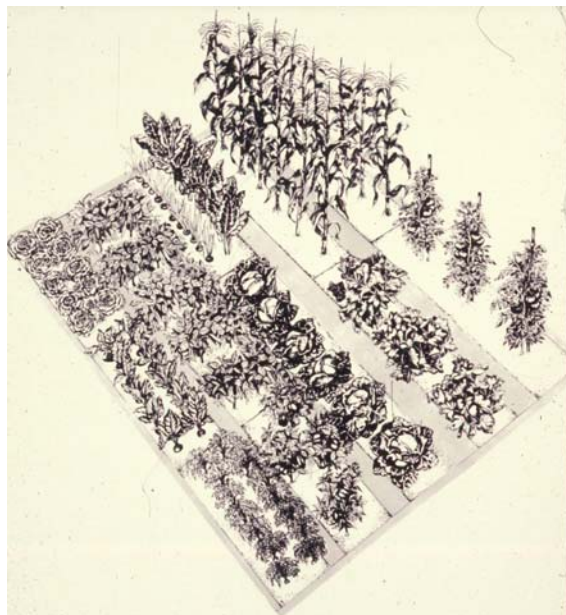
Should be planted on the north side if rows are running east and west (this reduces shading of smaller plants).

Interplant by height to get optimum use of space and light. (Example: for tomatoes and cucumbers planted in close proximity – the tomatoes grow tall, the cucumbers spread close to the ground.)

### **Smaller Plants**

Smaller plants that occupy the land for about the same length of time should be grouped together.

- \* Crops that occupy the land most of the growing season should be grouped together. (Examples: collards, peppers, okra, garlic, chard, onions grown from seed, basil and sweet potatoes)
- \* In planning a garden, consider planting more than one variety of a vegetable. (Examples, two kinds of lettuce, large and cherry tomatoes, two kinds of greens)



## Veggie Planning – (*Transparency /Handout*)

Considering planting a vegetable garden? Consider this . . .

### Direction of the rows

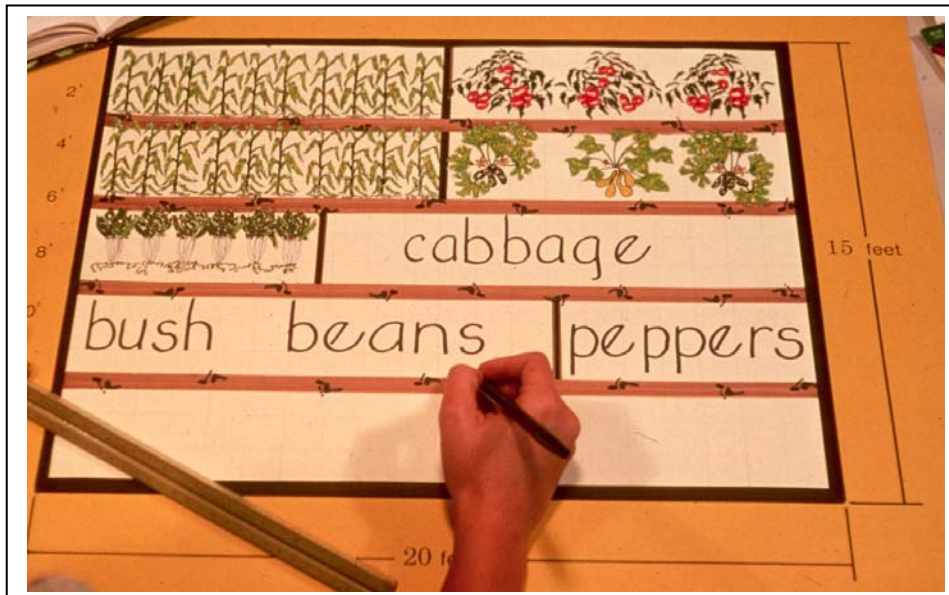
- Examine the slope of the land. If the ground slopes a lot, the rows should run at right angles to the slope. If the land is uneven, contour the rows.
- Rows running north and south give equal sunlight to plants.
- If rows run east and west, plant tall crops – such as corn and pole beans – on the north side.

### Distance between rows

- Adequately space vegetables that are truly wanted and likely to be eaten by family members.
- Avoid overplanting.
- Remember that some vegetables require a lot of space because they spread as they grow.
- Plant the varieties that are recommended for your region before you experiment with others.

### Space to be used for the garden

- Select the best space available for your home garden plans.
- Match plantings to the conditions that exist in your chosen garden space.



# FNP Gardening – Lesson 2

## Soil Preparation, Tools and Growing

### Objectives:

- Know the factors to consider in selecting a garden site.
- Know how to select a site for a garden.
- Recognize differences in soil texture and structure.
- Identify basic tools needed for preparing and caring for a home garden.
- Understand the function/purpose of basic gardening tools.
- Recognize quality construction in small hand garden tools.
- Understand fertilizer.
- Know how much fertilizer to apply.
- Know how to apply fertilizers.
- Understand how to develop a garden bed.
- Understand how to plant a garden bed.

### Method(s) to be used:

Train-the-Trainers/ Direct training by paraprofessional and Ag agents as needed.

### Educational Resources and/or Material (Identify non-English):

LSU AgCenter gardening resources (Existing and in development)

La. Vegetable Planting Guide #1980

4-H Six Easy Bites curriculum

4-H Project Book, Publication #2514

Other nutrition education materials related to gardening education

[http://lsuagcenter.com/en/lawn\\_garden/home\\_gardening/](http://lsuagcenter.com/en/lawn_garden/home_gardening/)

Garden plans (by participant)

Soil samples (clay, sandy, etc.) [www.agctr.lsu.edu/subjects/stpal](http://www.agctr.lsu.edu/subjects/stpal) - LSU soil test

Web site

Other Items Needed:

- Chalkboard and chalk
- Flip chart (stand/holder)
- Gardening tools and/or pictures of tools
- Labels (pressure sensitive)
- Markers and pencils
- Paper (flip chart pad)
- Dish pan with soil (for planting demo)
- Seeds and transplants
- Watering can & hose
- Sprinkler and water source
- Bag of fertilizer and dry compost (about 1 gallon)
- Overhead projector (stand/screen)
- Soil test form and a result sheet

**Time Frame:**

Northern Louisiana: January, February, March

Southern Louisiana: January, February

**Performance Measure:**

- Participants will learn the factors to consider in selecting a garden site.
- Participants will recognize differences in soil texture and structure.
- Participants will be able to fertilize vegetables properly.
- Participants will construct a bed/row proper for their location.
- Participants will plant seeds and transplants properly.

**Coordination Effort:**

Collaborate with Ag agent, specialized horticulture agents and Master Gardener volunteers where applicable.

**Key Teaching Points:**

Home gardens, no matter how well planned, need good soil to yield good crops.

Soil, water and sunlight are three of the keys to successful home gardening.

Soil differs among regions, states and communities, even from one section on a plot of land to another.

Not many tools are needed to prepare and care for a small vegetable garden.

The materials and construction method used affect the cost and durability of hand tools.

Garden tools can be purchased at a variety of businesses and a wide range of prices.

Protective clothing, such as gloves and sun hat, are among the tools needed for gardening.

Soil testing can determine the presence or lack of essential nutrients in the soil as well as its alkalinity or acidity.

Plants differ in the type of soil they prefer. Soil can be improved by adding such products as fertilizer, organic matter (compost, manure), lime and sulfur.

Soil testing can show the amount of essential nutrients in the soil as well as its alkalinity or acidity. Planting times are regional and depend on weather conditions in the region where you live and the vegetables to be planted. Vegetable seeds and transplants must be planted at correct depths in well-prepared soil for good growth to occur.

Healthy plants depend on the best combination of soil nutrients in properly prepared and improved soil, adequate watering and 6 to 8 hours of direct sunlight a day.

**Preparation:**

Collect an assortment of garden tools, including minimum equipment. Prepare a label for each tool.

Obtain pictures of a variety of styles of basic gardening tools (gardening catalogs, magazines, advertisements/fliers, etc.). Prepare a brief description of the tool, label its parts and make transparencies from the pictures (see sample).

Prepare a display of selected garden hand tools.

Prepare the series of transparencies and photocopy handout and work sheet.

Place a variety of local soil samples in easy-to-use containers (plastic bags, buckets, aluminum foil trays, etc.).

Obtain an LSU AgCenter soil testing result (any).

Obtain bags of fertilizer.

Using the colored markers, print in large letters the definition for organic matter and list examples of organic matter commonly used in Louisiana and local area on separate pages of the flip chart.

Fill a dish pan or clean cat litter box with soil for planting demonstration.

Obtain a bucket of dry compost.

**Teaching-Learning Sequence:**

1. Give an overview of factors involved in site selection and placement of a home garden.

**Avoid . . .**

- areas known to have serious weed problems.
- low, wet places.
- steep slopes, unless the space can be terraced.
- places that do not receive full sun each day (i.e. six to eight hours).

**Choose places . . .**

- with loose, fertile, well-drained soil or places where the soil can be improved.
- that have a convenient water supply.
- with a gentle slope (will help drain surface water).
- close to home, but not shaded by tall buildings or trees.
- that are fenced areas, if possible.

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2. Discuss texture and structure of soil, pointing out:

Soil structure influences heat and water absorption.

Soil can be destroyed by too much cultivation and traffic over the field, working the soil while wet and by flooding.

The way soil feels (texture) depends on the mixture of sand, silt and clay.

The way sand, silt and clay group to form granules determines structures.

Allow participants to examine the soil samples and have them rub mixtures between their fingers.

3. The ideal soil is loose, fertile, well-drained and has plenty of organic matter (compost, aged manure). [Basically, two kinds of soil predominate this region: clay and sandy.] Clay or sandy soil will grow a good garden when prepared adequately.

Even the poorest soil can be improved by adding organic matter, which helps the soil retain water, lime (as needed) and nutrients.

Soil for the garden should be prepared thoroughly before attempting to plant seeds or set out transplants. The soil should be prepared to a depth of 6 to 8 inches.

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“The secret is in the soil. The soil has got to be right. You’ve got to doctor the soil.” These are the kinds of comments you are likely to hear from successful home gardeners and farmers, long-time salespeople at local garden supply stores and even from home garden specialists with the Cooperative Extension Service. It is a way of saying that poor quality soil does not produce good crops. Soil must be able to retain nutrients and water adequately and to drain properly. Soil must also contain the correct amount of acid or alkaline needed for the kinds of plants and vegetables you want to grow.

Many areas lack one or more plant nutrient fertilizing elements, and many lack adequate levels of all the three important ones: nitrogen, phosphorus and potassium. Soils can be made more suitable for plant growth by adding humus-forming material or organic matter. Stable manure supplies both humus and commonly needed nutrient elements, common fertilizing elements.

Fortunately, soil can be tested to determine its condition. But even the most inexperienced gardener will soon know that the plants themselves will tell if the soil condition is not correct.

Let’s examine some soil samples and decide whether we’ll need to “doctor” them. Then we’ll talk about the methods and techniques to improve the soil.

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4. Your soil test results are only as good as your soil sample.

In general, soils that differ in appearance, crop growth or past treatment should be sampled separately, provided the area is of such size and nature that it can be fertilized separately. For each sample, collect soil from about 10 places in each area in a zigzag fashion so as to make a representative sample. Mix thoroughly before filling a sampling carton or container to be mailed to the Lab. The one soil sample should represent that part of the garden. Avoid sampling directly in the fertilized band. Proper sampling depth depends on the kind of crop you plan to grow. We recommend that for gardens, you collect from the upper 5 to 6 inches of soil.

Distribute the handout, "Taking a Soil Sample." Instruct participants to place the sample in doubled lunch bag or clean pint-size milk carton or similar container and put their names on the container or bag. Then show transparency of sampling.

5. Show an LSU AgCenter soil test form and a soil test report. Discuss what is reported and how to use the information. Link to the ag agent in the parish office.
6. Display the fertilizer container or bags. Have the participants inspect each, looking at contents, information presented, brand name, manufacturer, etc. Initiate discussion using the following question: What do the numbers mean?

Explain why nitrogen, phosphorus and potassium are important to the soil.

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Tell participants to apply the fertilizer a week or two before planting. This allows the fertilizer to spread in the soil. The result is less salt burn to plant roots. You should conserve fertilizer and reduce pollution by placing it down the middle of the row before planting. Mix it in with a hoe several inches deep. You may also apply it first where the row will be and rake soil over it to form the row.

Most crops except maybe legumes and sweet potatoes will need extra food. We sometimes apply extra fertilizer every four or five weeks. Apply this sidedressing of fertilizer along the row. Be sure to keep the fertilizer 5 or 6 inches away from the plant stem to avoid salt burn. Sidedressing replaces fertilizer taken up by the crop or that has been washed away with the rain.

Leafy crops, such as spinach, cabbage, kale and lettuce, tend to require more nitrogen than other types of crops. Tuber or root crops, including potatoes, sweet potatoes, beets, carrots, turnips, and parsnips, need a higher percentage of potassium. (See fertilizer handout and planting guide.)

Frequently, fertilizers are advertised by name and number; for example: "Vaughn's 8-24-24 will solve your soil problems!" What do you think these numbers mean? [Wait for responses from participants.]

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7. Discuss the role of lime in improving soil. It reduces soil acidity (makes acid soil less acid) and supplies calcium and other plant nutrients. It allows other soil nutrients to be in a useful form. Give examples of vegetables that benefit from an application of lime to the soil (beets, spinach, and tomatoes). Indicate that if lime is needed, it is best applied in the winter. Also indicate that most vegetables grow best in slightly acid soil that has a pH of 6.0 to 7.0
8. Explain soil alkalinity, acidity and neutrality. Discuss the relationship of minerals available in the soil to pH of the soil.

**(Handout)**

Most garden soils need a complete fertilizer. A complete fertilizer contains nitrogen, phosphate and potash. Examples are 8-24-24, 6-24-24, 8-8-8, 13-13-13. How much fertilizer you use depends on the type of crops you grow and your soil. You may use the chart below or the Louisiana Planting Guide without a soil test recommendation.

**Fertilizer for Garden Crops**

Amount to spread down 10 feet of row

**1/4 lb or 1/2 cup**

Legumes  
Okra  
Sweet Potatoes

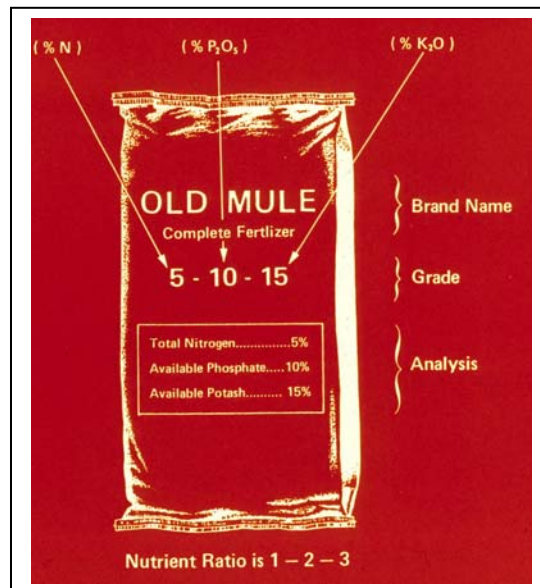
**1/2 lb or 1 cup**

Fruit Crops  
Root Crops  
Vine Crops  
Leafy Crops

**3/4 lb or 1 1/2 cup**

Irish potatoes

NOTE: A pint jar is 2 cups. It holds about 1 pound of fertilizer.



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Ask participants to recall old wives' tales or true family stories about techniques used to change the pH of soil or improve the nutrient quality of soil (placing nails deep into soil, adding chicken or cow manure, putting pine straw on top of soil after planting season, etc.). Correct the misconceptions and, as possible, relate older practices to current gardening techniques.

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9. Continue the discussion on soil improvement. Refer participants to the display of organic matter samples, the flip chart definition of organic matter and the listing of examples of organic matter used in the local area and state. Explain the definition and show the examples using the following language:

Organic matter is naturally occurring material derived from once-living organisms. It adds important plant nutrients to poor soils. It helps the soil hold nutrients and water, thus keeping the soil from crusting and compacting. By releasing nitrogen, minerals and other nutrients, it helps make the soil healthy over time. Organic matter also helps retard the growth of weeds when used as mulch. (Examples of organic matter are rotted pine straw, leaves, aged and dried cow and chicken manure, compost and non-decomposed crop residue.)

Organic matter can be placed on the surface of the soil as mulch or mixed into the soil as a soil enhancer. (Note: Good organic matter amendments, such as manure, compost and peat moss, do not necessarily make good mulches. And, excellent mulches, such as pine straw, do not necessarily make good soil amendments.)

10. Pass out "Let's Make Compost" handout and discuss.
11. Distribute the handout, "Home Gardening: Tools of the Trade." Review the information.

Discuss the need for protective outer clothing when gardening (gloves, sun hat, long pants and long-sleeved shirts/blouses).

Encourage participants to visit garden stores or the garden section of supermarkets and discount stores to examine the garden tools available for sale.

Encourage participants to ask questions about the tools, including cost. Discuss the merits of (1) buying less expensive tools that may require replacement in two to three years and may also require more energy to use versus (2) buying tools that are more expensive but which may last 10 years or longer.

Project the series of transparencies, "Home Gardening Tools." For each tool projected, offer a definition, describe its function or purpose and point out the parts of the tool; show the participants the corresponding tool from the garden tools display. Demonstrate the correct way to use the tool, and describe the tool's construction ("steel head and shank forged into one piece; rubber-covered handles with finger impressions for better gripping"). When all transparencies have been shown, pass the tools among the participants so that they can handle the tools, getting a feel for weight, function and correct handling procedure.

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Most gardens grow better when you rake rows up to 6 inches high. These high rows warm sooner in the spring. They also won't drown the plants when we get lots of rain. Space rows 36-42 inches apart. When your rows are built and fertilized, you're ready to plant.

Drag the tip of the hoe or rake down the row lightly. This makes a shallow seed row called a furrow. We usually plant 20 percent more seed than we need. This ensures that we have a full row of plants. Most seeds need shallow planting. Crops with small seeds should barely be covered with soil. Cover small seeds no more than one-fourth inch deep. Plant crops with larger seeds, such as beans and corn, about one-half inch deep. This is called direct seeding.

Water the seeded area lightly every day until the seedlings pop through.

More plants may grow than we wish to have in the row. We must pull out the extra plants. This is called thinning. It allows enough space for each plant to grow without crowding.

Some vegetables are typically planted into the garden as young plants. We call these young plants transplants. Many stores and garden centers sell transplants. Sweet potato transplants have a special name. They are called slips. Transplants save gardening time and allow you to start gardening right after the late frost. Leafy crops can be transplanted as well. Root crops, such as radishes and carrots, are always direct-seeded, never transplanted. Plant transplants into well-prepared and fertilized beds. In the row, dig holes for transplants. Space holes at the proper distance. Set the plants at about the same depth they were in the pots. Firm the soil slightly around the roots. Water each transplant.

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12. Discuss how several popular vegetables are planted.
13. Conduct a brief review of the information from lessons on garden tools, planting and soil. Have each participant "stand and deliver" one point about the importance of preparing the soil before planting and how correct garden tools help with that process. Monitor their responses; correct misunderstandings and incorrect information. Discuss the differences and connections between soil preparation and soil improvement.

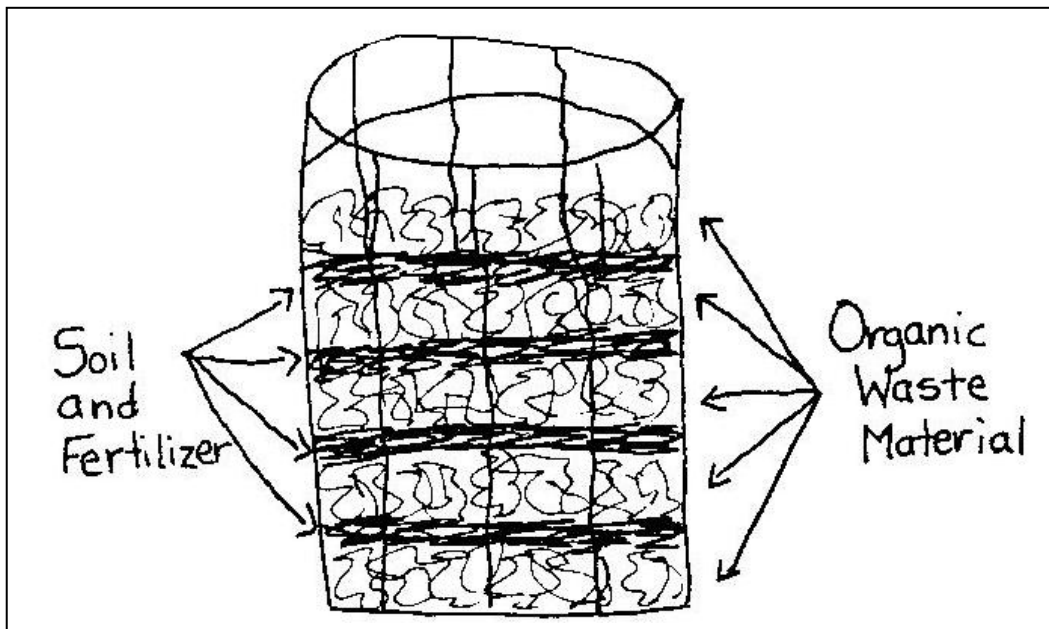
## Let's Make Compost - (Handout)

Organic matter, like leaves and grass clippings, rots naturally and forms a product called compost. Soil microbes naturally change organic matter into compost and humus. To do this, they need good moisture, air and sometimes fertilizer. We can bring all of these conditions together in a compost pile.

Choose a site for the compost pile that is out of the way and shady. Make an 8-inch layer of leaves and clippings. Sprinkle about one-half to 1 inch of garden soil on top of the layer. This will quickly bring in the natural microbes that rot the leaves. Repeat with another 8 inches of leaves, and top with a thin layer of soil. Do this layering again. Now you have your compost pile.

The leaves will compost faster if you turn, or mix, the pile every week or two. Add water to the pile whenever the pile looks a little dry. After two or three months, you will have good compost. Mix this compost into the garden as you plant more crops or mulch with the compost.

Illustration of a sample compost bin



# FNP Gardening – Lesson 3

## Disease, Insect and Weed Control

### Objectives:

- Recognize and control certain common plant diseases.
- Recognize and control certain common insects that infect plants.
- Recognize and control certain common weeds.
- Understand the role of watering/irrigation in plant growth, production and disease prevention.
- Know the correct times to apply water to plants.
- Differentiate between furrow irrigation and overhead sprinkling.

### Method(s) to be used:

Train-the-Trainers/Direct training by paraprofessional as needed.

### Educational Resources and/or Material (Identify non-English):

LSU AgCenter gardening resources (existing and in development)  
4-H Six Easy Bites curriculum  
4-H Project Book, Publication #2514  
Other existing nutrition education materials related to gardening education  
Diseased vegetables (assortment)  
Transparency (watering and irrigation)  
Overhead projector (stand/screen)  
Watering devices (sprinkler, can, drip)  
Other Items Needed: Flip Chart (stand/holder)  
Insects (assortment)  
Magnifying glass  
Markers and pencils  
Paper (flip chart pad)  
Towels (paper)  
Weeds (assortments)  
Black plastic trash bag (large)  
Plant labels

### Time Frame:

Northern Louisiana: January, February, March

Southern Louisiana: January, February

### Performance Measure:

- Participants will recognize and control certain common plant diseases.
- Participants recognize and control certain common insects that infest plants.
- Participants will learn how to recognize and control certain common weed groups.
- Participants will understand the role of watering/irrigation in vegetable production and disease prevention.
- Participants will learn the correct times and methods to water plants.

**Coordination Effort:**

Collaborate with ag agent, specialized horticulture agent and Master Gardener volunteers where applicable.

**Key Teaching Points:**

Your watering should provide good soil moisture at three critical periods: (1) seed germination and early growth; (2) flowering through fruit set; and (3) during fruit development.

Garden crops are subject to attack by a variety of diseases and insects. Prevention strategies appropriately applied can reduce the incidence of disease and insect infestation.

Hoeing and mulching are the best methods to control undesirable plants (WEEDS) in a home garden.

**Preparation:**

Collect slides/pictures of gardens that were either not watered or watered improperly.

Collect watering devices (sprinkler, watering can, drip hose) or pictures of them.

Collect a variety of diseased plants, weeds and insects. Identify each with labels.

Invite a special agent from the parish extension office to present the lesson.

**Teaching-Learning Sequence:**

1. Introduce the role of watering and irrigation by using the following language:

During dry periods, you'll need to water the garden. If the soil is dry, plants will droop with the noontime sun. Sprinkle or soak the dry garden until the soil is wet 6 inches deep. In setting plants in the garden, it is common practice to apply water around the plant unless the soil is well supplied with water. The most common methods of applying water to the garden are by spraying or sprinkling from above and by trench or furrow irrigation flooding between the rows. Most gardens require a moisture supply of moist to slightly moist during the growing season. Avoid overwatering and keeping the soil wet instead of just moist.

2. Continue the introduction, projecting the transparency, "Watering and Irrigation." Walk the participants through each of the pointers about watering, explaining the rationale for each and providing appropriate examples.
3. Have participants examine plant sample and try to determine whether the plant's problem is related to disease or to insect damage.
4. Conduct a discussion on methods to control weeds, diseases and insects. Stress early control while the problem is small and insects are young. Gather opinions on

how the group feels about using pesticides versus organic control of these problems. Have extension agent discuss the pros and cons of both.

5. Identify and show participants how to recognize the problems associated with the plants they examined earlier. Distribute the handout, "Identifying Plant Problems."
6. Discuss watering/irrigation of plants including when to water and how much to apply in relation to disease prevention.
7. Distribute the handout "Pest Control."
8. Weeds rob food and water from your crop. They also may be a nursery for insect pests and diseases. Cultivation is the control of weeds by chopping with a hoe or tiller. Cultivating also loosens the soil for better aeration and water absorption. Chop weeds while they are young and easy to control. Pull out weeds growing close to the crop by hand (avoid crop damage), but avoid pulling the young vegetables out with the weeds.
9. Heavy mulching is an excellent way to keep weeds out of a clean garden row. A mulch is a cover over the garden. This cover holds in moisture and smothers weeds. Mulches can be organic or plastic. Organic mulches are natural plant materials or products from plants. They can be turned into the garden after the garden season. Plastic mulch is a thin black plastic like that of a garbage bag. We spread this over the row before planting. Plastic mulch is held in place by burying the edges into the soil. Apply organic mulches after the soil warms and plants begin to grow. Plastic mulches are applied before planting or transplanting the row. Plastic mulches hold heat and warm the soil.
10. Demonstrate cutting the black plastic trash bag open and its use in mulching.

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Keep up good moisture under the plastic mulch. Don't let the soil under the mulch get real dry before you start to water.

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Review pest control:

- Practice proper watering (time and amount).
- Identify problems accurately.
- Treat problems early, while young.
- Use proper central measures.
- Handle pesticides safely (child exposure)

## **Pest Control – (Handout)**

1) First, identify the problem. See [http://lsuagcenter.com/en/lawn\\_garden/home\\_gardening/vegetables/disease\\_pest\\_management/Insect+Management+in+Home+Vegetable+Gardens.htm](http://lsuagcenter.com/en/lawn_garden/home_gardening/vegetables/disease_pest_management/Insect+Management+in+Home+Vegetable+Gardens.htm)

2) Most insect pests can be killed with a mild insecticide called Malathion. It is usually diluted and then sprayed on. Fresh (this year) Malathion should give good results.

Worm pests often can be killed with BT (bacillus) pesticide. It works only on worms. Allow enough space between plants.

3) Most leaf diseases can be controlled with a fungicide containing maneb or chlorothalonil. Bordeaux fungicides or fixed copper fungicides also control many leaf diseases. Do not wet leaves/foliage more than you have to. See [http://lsuagcenter.com/en/lawn\\_garden/home\\_gardening/vegetables/disease\\_pest\\_management/Disease+Management+in+Home+Vegetable+Gardens.htm](http://lsuagcenter.com/en/lawn_garden/home_gardening/vegetables/disease_pest_management/Disease+Management+in+Home+Vegetable+Gardens.htm)

4) A key control strategy is to apply pesticides before the problem gets bad. This is especially true of fungicides, because they work to prevent the infection of plants.

# FNP Gardening – Lesson 4

## Harvesting and Handling

### Objectives:

- Know how to harvest a variety of vegetables.
- Use the correct harvesting tools and hand-harvesting techniques.
- Understand how poor harvesting techniques contribute to loss of high-quality produce.
- Adopt recommended food safety practices for handling fresh fruits and vegetables.

### Method(s) to be used:

Train-the-Trainers/Direct training by paraprofessional as needed.

Garden tour field trip.

### Educational Resources and/or Material (Identify non-English):

LSU AgCenter gardening resources.  
4-H Six Easy Bites curriculum.  
4-H Project Book, Publication #2514.  
Other existing nutrition education materials related to gardening education.  
Freezing Vegetables, Publication #1987  
Freezing Fruits, Publication #2110  
USDA Dietary Guidelines for Americans, 5<sup>th</sup> Edition-2000  
Home and garden bulletin #232, page 23  
<http://www.fsis.usda.gov>  
<http://www.fsis.usda.gov/oa/pubs/washing.htm>

Other Items Needed:      Awards  
   Certificates  
   Flip chart (stand/holder)  
   Markers  
   Paper (flip chart pad)  
   Pencils (sharpened)

### Time Frame:

Northern Louisiana: April, May

Southern Louisiana: March, April

### Performance Measure:

- Participants will learn how to harvest a variety of vegetables.
- Participants will understand how poor harvesting techniques contribute to loss of high quality produce.
- Participants will adopt recommended food safety practices for handling fresh fruits and vegetables.

**Coordination Effort:**

Collaborate with ag agents, specialized horticulture agents and Master Gardener volunteers were applicable.

**Key Teaching Points:**

Correct harvesting procedures help to reduce food waste and improve food quality.

Home gardening is time well spent. The exercise and resulting produce help a family “eat right and stay well.”

Some vegetables should be harvested before they reach full maturity; others must be allowed to ripen on the plant.

Some vegetables remain edible for several days after harvesting; others are edible after several weeks.

**Preparation:**

Review USDA’s 1996 publication, “A Citizen’s Guide to Food Recovery.” Use the information to help make the participants aware of roles they can assume in helping to reduce post harvest losses and hunger.

Select a means to recognize the participants for successfully completing the lesson series on home gardening. Plan a garden tour of several sites when the client gardens begin to yield produce. Prepare special certificates.

Arrange for transportation and child care for tour participants.

Prepare transparency; photocopy handouts.

**Teaching-Learning Sequence:**

1. Discuss issues of local and regional hunger and food recovery activities (“gleaning”). Use the following language:

“In the United States, an abundance of edible food is wasted each year, food that could be collected and distributed to those in need. Our harvesting practices are a major cause of this food loss. Faulty handling practices after harvest can cause large losses of produce that required large inputs of labor, materials and money to grow.”

2. Have participants brainstorm about ways to use excess produce. Use the flip chart to record their suggestions. Encourage participants to support local food bank initiatives that recover food in various ways.

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All vegetables, whether we are talking about a tomato (which is a fruit) or collard greens (leaves), are living things. And like all living things, they are constantly undergoing internal changes of a chemical nature. These changes affect their flavor, appearance and quality factors, such as stringiness (with snap beans) or toughness (as with summer squash) if they are not picked at the proper stage of maturity. The home gardener has the ability to harvest at the best times. Cucumbers are often picked too late, when the seeds have begun to become hard; much of their crisp texture is gone, and their flavor is too strong. With some vegetables, especially the sweet ones like sweet corn and sweet peas, it is important not only to pick them at the right stage, but to cook them soon after picking, because the sugars in them very quickly begin to change to starch; thus, they lose their sweetness. An old country saying teaches that you should put the pot of water on to boil before you go to the garden to pick the corn. Quick cooling can help hold the quality of most produce.

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3. Ask participants to describe their experiences of purchasing or selecting fruits and vegetables that were not fully ripe or about buying very green foods, expecting they would ripen in a few days, etc. Follow up on the discussion by presenting information on when to harvest. Project the transparency, "When to Harvest." Walk through the points, encouraging and answering questions. Distribute the handout "Best Harvest Time."
  4. Demonstrate/discuss correct techniques for harvesting a variety of vegetables. Discuss handout "Gleaning Older Produce."
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With most vegetables, storage in the refrigerator will slow down the chemical changes that cause them to lose quality. This is one reason you should pick your vegetables early in the morning before the sun has warmed them up and refrigerate them as soon as possible after picking. (Note: if tomatoes are not completely ripe when picked, always allow them to ripen completely at room temperature before considering refrigerating.) Sweet potatoes and Irish potatoes, on the other hand, keep their quality better if they are not put in the refrigerator. Avoid refrigerating ripe tomatoes if you can.

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5. See "Vegetable Storage" handout.
6. Award each participant a special certificate or other small reward for successfully completing the four-lesson series on home gardening.
7. Schedule a garden tour to see how good produce is grown. Inform participants about a forthcoming field trip to a garden site, briefly explaining the purpose and indicating the location. Determine the number that will need transportation and those for whom child care may need to be provided. As appropriate, establish new meeting time and place for field trip, and give written directions. Inform participants that session will require additional time because of the field trip.

## Best Harvest Time (*Transparency/Handout*)

<b><u>CROP</u></b>	<b><u>WHEN TO HARVEST</u></b>
Beans, snap	Before seeds swell much. Limas and butterbeans go until seeds swell.
Beets, radish, turnip and carrot	Young roots; before full size; before split.
Broccoli, cauliflower	While buds and heads are tight.
Cabbage	Full head, but before splitting.
Cucumber and summer squash	Small to almost mature; skin is bright and tender.
Eggplant	Young; 3/4 of full size and glossy.
Lettuce and greens	Anytime large enough; as outer leaves first become mature.
Melons	At maturity with a change in early base color.
Garlic and onion	When most (75%) of tops flop over.
English peas	Just before seeds reach full size; plump pods that are still bright green.
Snow peas	Before seeds bulge.
Southern peas	Seeds still green or fully ripe (colored up).
Peppers	Green or fully ripe (colored up).
Potatoes (sweet and Irish)	Roots reach adequate size.
Pumpkin and winter squash	Mature-colored fruit; hard skin.
Okra	While young pod tips still can snap off.
Tomato	After first color shows and until full color.

## **Gleaning (Saving) Older Produce (*Handout*)**

There is a best time to harvest a vegetable, but you can also enjoy some vegetables that are a little far gone. Use these general tips to decide what can be saved.

### **I. Several days past early maturity:**

Snap beans, green peas, summer squash, okra and regular sweet corn must be harvested soon after they reach early maturity or they lose quality quickly. Most vegetables should be harvested before this stage.

You may peel a larger squash and scoop out the seeds. Maybe the lower half of the “day late” okra pod is still edible. Older sweet corn could be ground into corn meal.

Lima beans, broccoli, cucumber, southern peas, melons, lettuce, radish, eggplant, super sweet corn and tomatoes remain edible for several days after reaching maturity.

### **II. One week or less after reaching maturity:**

Beets, carrots, cabbage, pumpkin, greens, turnips, shallots, onions, garlic, hard shell squash, spinach, mirliton, potatoes and peppers remain edible for a week or so without much loss in quality.

- \* Most varieties of vegetables are best – full-bodied, colorful and flavorful – when they are allowed to ripen on the plant (tomatoes, watermelons and muskmelons). Beware of harvesting most too early: some vegetables DO NOT ripen further after they have been harvested.
- \* Remember, ripening will occur faster in very warm weather, so watch your plants and the weather as they begin to mature.
- \* When collecting several varieties of vegetables and placing them into a common basket or bucket, place the heavier, sturdier vegetables on the bottom (melons, cucumbers, corn). Put the lighter, smaller vegetables and those that crush or bruise more easily on top (tomatoes, greens, lettuce).

## **Vegetable Storage (*Handout*)**

### **Group I - Keep cold in a humid refrigerator**

Beets  
Carrots  
Cabbage  
Broccoli  
Cauliflower  
Cucumber  
Eggplant  
Greens  
Turnips  
Radish  
Beans  
Peppers  
Corn  
Ripe melons  
Ripe tomato  
Okra  
Summer squash  
Sweet peas  
Southern peas  
Green onions

### **Group II - Keep cool and dry**

Less ripe tomatoes and melons  
Potatoes (Irish and sweet)  
Pumpkins and hard skin squash  
Onions and garlic

This material was partially funded by USDA's Food Stamp program. The Food Stamp program provides nutrition assistance to people with low income. It can help you buy nutritious foods for a better diet. Contact the Office of Family Support at 1-888-LAHELPU (1-888-524-3578) for more information on all programs and how to apply.