Workshop 3

Tending & Harvesting

Instructor's Guide

Lesson Overview

1. Introduce the concepts of:
    a. Tending your garden: watering, thinning, weeding, revitalizing, bug & disease controls.
    b. Harvesting at the proper time.
    c. Planning your harvest schedule based on days till harvest for common crops.
    d. Record keeping and monitoring your garden for successful yield.
    e. Crops with one time harvest vs. crops with continual harvest.
2. Equip the participants with materials and knowledge necessary to care for their vegetables to obtain maximum yield, to plan and monitor their crops, and harvest at the proper time.

Learning Objectives

At the end of "Workshop 3: Tending & Harvesting," participants will be able to:

- Identify proper care of vegetables to ensure a yield by watering, thinning, weeding, and revitalizing soil.
- Demonstrate knowledge of the "finger test" method for determining if it's time to water your plants.
- Navigate IPM (Integrated Pest Management) website so they can troubleshoot their own insect challenges and solutions.
- Select vegetables ready for harvest based on proper harvesting timelines for different vegetable varieties.
- Identify which vegetables can be continually harvested and which are one-time harvest.
- Demonstrate understanding of record keeping by charting days to harvest.

Learner Outcomes for Activities:

- At the end of the harvesting activity, participants will be able to identify which leaves to harvest on a Swiss Chard plant in order to preserve the continual production of the plant.

Setting for Workshop

It would be ideal to teach this workshop at a site that has at least one established garden bed with well-tended produce. This will give students a concrete picture of what they are attempting to create and provide the hands-on educational tools for teaching ***Tending &***

Harvesting. Outdoor seating for the discussion portion of this class would also be helpful. If such an outdoor garden site is unavailable, this workshop can be taught indoors using potted plants such as Swiss chard, herbs, etc.

Before Workshop Begins

- Read through entire workshop to understand activities and learning objectives before participants arrive.
- Assemble folder for participants that includes:
    - Handout with additional web links and resources and contact information (for post-workshop questions)
    - Home Vegetable Guide
    - "Pick For Peak Flavor" article
    - "Gardening Records Made Simple" handout
- Locate Swiss chard plant (or other available plant) to demonstrate harvesting. If you are instructing at a garden, use a plant in the garden to do the harvesting activity. If not, provide container plants.
    - Swiss chard plant to demonstrate harvesting.

Workshop Outline

Time (mins)	Lesson Component	Key Messages & Discussion	Instructor
10	Introductions	Introduce instructors. Discuss the importance and benefits of this Tending & Harvesting lesson.	
50	Lesson Content	Discuss how to tend your garden to obtain maximum yield (watering, thinning, weeding, revitalizing). Guide students on how to navigate IPM (Integrated Pest Management) website to troubleshoot their personal bug-related problems. Discuss planning for harvest. Discuss proper harvest times and methods. Discuss record keeping for a garden. Discuss plants that are one-time harvest and those that are ongoing.	

20	Activity	Instructor will review handouts and discuss proper harvesting of plants. Students will observe and practice how to harvest Swiss chard (or whatever similar plant is available to harvest onsite or in containers). If desired, students could also practice watering, weeding and/or thinning.	
10	Evaluation of achieving learning objectives	Instructor will ask participants pertinent questions about the basic concepts and techniques that were taught.	
10	Q&A and Conclusion	Summarize key points. Answer any remaining questions from students.	

Introductions (10 minutes)

- Welcome participants. Provide an overview of the class, including its length, content, and requirements.
- Introduce the instructors and the students to each other.
    - Introduce yourself briefly. Turn attention to learning about class participants and have them introduce themselves.
    - Encourage discussion and sharing.
    - **ASK: Have all participants share what they are most interested in learning about how to tend their garden.**

Teaching Tip: If participants seem reluctant to share, ask them what vegetables they might enjoy eating fresh from a garden.

Welcome & Purpose

Welcome, everyone, to Workshop 3: Tending & Harvesting. Today we are going to discover what helps make a garden even more successful. Specifically, we will discuss two things. First, we will talk about how to care for your garden to achieve the highest potential yield of produce at your site for the least amount of work. You all want to have more produce with less work, right? Then, second, we will discuss when and how to harvest common crops at their peak of freshness. You want your food to taste good, right? Let's get started!

Section 1: Tending (30 minutes)

So you've planted your plants…now what?

1. **Watering:**
    a. Have a student read the "Watering" section of RSG handout.
    b. **Ask**: Does anyone know an easy way to test if your garden needs watering? (***Answer****: If you stick your finger in the soil and it's dry to your second knuckle*.)

c. Watering to establish seeds:

I. Seeds need to be kept moist but not waterlogged for the first week after planting in order to germinate (sprout). Check the back of your seed packet to see estimated days until germination. This indicates when you should expect to see those green little shoots poke their heads out of the ground.

II. Most seeds are sown within the top inch of the soil surface, which is usually the first to dry out. You need to keep a daily eye on your newly planted seeds to make sure the soil stays moist.

III. At this young stage, it's important to water with low pressure. A favorite way of doing this is with a watering can. You could also use a nozzle hose attachment that has a gentle spray setting, or a swiveling sprinkler head that distributes water relatively evenly to your entire garden.

IV. You will most likely need to water daily at this stage. If you water in the evening, it gives the seedlings all night to soak water in before the heat of the day. Water this way even after the young shoots pop up, most likely for a few weeks, until they are well established.

d. Watering well established plants:

I. "Well established" means the plants have begun to mature and have increased their hardiness by developing a large enough root system to search out water without daily doses.

II. After several weeks, begin to reduce the frequency of your watering to 3 times a week, watering deeply. This will begin to strengthen your plants, increasing hardiness. This is an important step to help the plants build a deep, strong root system that will in turn help them weather inconsistent temperatures and precipitation.

III. Consistent watering is crucial for obtaining a maximum yield of vegetables, as is providing enough water, but not too much. How much water your plants need will also vary depending on the season, the condition of your soil, how well mulched they are, how much sunlight they receive, and other factors. Check your garden every day to make sure you are getting the moisture balance right.

IV. Drip irrigation is a fantastic way to ensure consistent watering, maximize absorption, and minimize runoff and volume of water needed.

e. **Note:** Drip irrigation is **not** an effective way of watering young seeds because it's designed to penetrate one specific area deeply. This makes it perfect for watering established plants, but insufficient to soak the whole bed's surface area, which is essential for seed germination.

2. Thinning:

a. Have a student read the "Thinning" section of RSG handout.

b. **Ask:** How many of you have thinned before? Does it break your heart to pull up those tiny plants?

c. **Note:** One benefit of the square foot gardening method we learned in Workshop

2 is it drastically reduces the amount of thinning required because you intentionally space seeds according to the recommended distance required for mature plants.

d. **For Example:** Instead of sowing a whole row of carrots and coming back to thin to 3 inches two weeks later, you just sow seeds every 3 inches. You may need to do some thinning work, but not nearly as much! You will also save seeds because you use less in the first place.
e. It's easy to minimize the importance of thinning. It can also be painful to pull out all those cute, healthy green shoots! However, without proper space to fully mature, your vegetable yield will be significantly lower. For example, if you have a bed thickly planted with beets and don't thin them to the proper spacing, you may have nice, thick, big foliage, but very thin, stringy roots underneath…and it's the root you want to eat!
f. Thinning Tips:
    - Use scissors to cut out the plants you want to thin, leaving the roots in the ground. It's easy to accidentally pull out the plants you want to keep while thinning or to damage their root systems. The roots left in the ground supply organic matter and channels for air in the soil as additional benefits.
    - You don't have to throw out your thinnings! Here are some other options:
        1. Add them to a salad or soup.
        2. Compost them.
        3. Lay them down on the soil next to your plants as a green mulch.

3. Weeding:

a. Have a student read the "Weeding" section of RSG handout.
b. That last phrase, "1 weed equals 100 seeds," is pretty alarming, right? Here's another one: "1 year of seeds equals 7 years of weeds!" This illustrates the crucial importance of keeping your garden weeded. If you do a bit each week while they are small and young, you will keep them under control and work far less in the long run. If you let them get larger, you will break your back clearing your space. If you let them go to seed, you've just multiplied your weeds by 100 times for next year! This is one thing that's worth staying on top of.
c. The first 40 days after planting plants or seeds is the most critical window for keeping your garden absolutely weed free:
    I. Having a weed next to your plant decreases your yield by at least 10% in the first 40 days.
    II. After 40 days, weeds have no significant impact on yield.
    III. BUT it's wise to keep them under control so you don't have more next year and your garden looks clean and neat. Weeds can also be great hiding spots for insect pests to sneak off to while you're trying to prevent them from accessing your crops. They will just sneak right back to your veggies in a few days if you give them nice weeds to hide in!

4. **Revitalizing:**
    a. Have a student read the "Revitalizing" section of RSG handout.
    b. Fertilizing:
        I. Also note, particularly if you have poor soil, adding compost tea and/or a natural fertilizer like fish emulsion, seaweed, or Lady Bug mix as a liquid foliar feed every two to four weeks can help maintain soil and plant nutrition, minimize pests, and increase yields. After the plants are established you might also try top dressing with compost (adding solid compost on top of the soil and working it into the soil a bit).
        II. It is also important to consider when is the best time to fertilize for the specific crops you are growing. For example, for fruiting crops like tomatoes, peppers, and eggplants, you should start fertilizing mainly after the plants have flowered and set fruit; otherwise the plants will put their energy into growing leaves rather than making bigger fruits. It's a good idea to look up the specific fertilization needs for each of the crops you have planted in the garden. One good source is *Texas Organic Vegetable Gardening* by J. Howard Garrett and C. Malcolm Beck.
        III. A favorite (and usually FREE) resource to replenish nutrition and boost yields is composted manure. You can use cow, horse, rabbit, chicken, alpaca, etc. (BUT see below on horse manure.) Make sure it doesn't have a strong odor. DO NOT use house pet (cat, dog) manure. These manures contain a multitude of parasites that are not killed by composting.
        IV. You can add manure:
            1. Directly to garden beds if it's well composted and has no strong odor.
            2. "Hot" or fresh to fallow garden that you don't plan to plant into for at least one season.
            3. To your compost pile. Make sure you cover with plenty of "brown" carbon material to keep smell down and enhance breakdown.

    *CAUTION: If you pick up composted manure from a local farmer or rancher, do your homework.

            4. It is ideal to use manure from animals that are not vaccinated or given wormers, and that have not eaten hay/feed to which herbicides have been applied. Some herbicides, wormers, or vaccines may harm your compost and/or soil organisms. For example, ask if the farmers use or their hay/feed supplier uses an herbicide called "Graze On" or 24D. Graze On in particular does not break down in animal digestive tracts or over time. It WILL kill your garden if the animals ate this and it's in your manure.
            5. It's worth asking a few questions and searching to find a safe source.

c. Mulching:

I. After your plants emerge, you can mulch them. It's important to keep your garden mulched deeply, at least 4 inches. This not only prevents evaporation and keeps soil in the ground longer, but it provides rich nutrients and organic matter that can be turned into the soil to enhance the soil building process.

II. Leaves are the FREE and recommended choice here. They are abundant and they carry about 75% of all the nutrition the tree soaks up during the year. That's a lot of free nutrients! They also require less nitrogen to break down than wood chips, which means more nitrogen will be available to your plants.

III. The best time to stockpile leaves is November to December. Pick them up around your neighborhood! Ask your neighbors if you can take their bagged leaves for your garden project. This is a fantastic opportunity to build community and spread resource conservation knowledge.

IV. The city also provides free woodchip mulch. (See attached for a list of City Drop Off Sites.)

V. You can also contact a local tree trimming company to drop off at your house or community garden. Just be aware that it's usually 12 yards minimum (each yard is 27 cubic feet), so you'll want to be able to use it all and move it quickly to avoid a city code compliance violation.

5. Bugs and Diseases

- This topic could be a whole class or two in and of itself! The keys to pest and disease management are your presence as a gardener and your observing eyes: as the old saying goes, "make sure your shadow falls on your garden every day." Bugs can easily get out of control.
- Be aware that much of the gardening literature discusses bugs and diseases as if they are organisms to be eliminated altogether. However, if a garden is to mimic surrounding healthy ecosystems, these organisms play a natural part. That doesn't mean that you should never be concerned about the presence of diseases or bugs -- it just means that they shouldn't automatically send off alarm bells! Observation, as the most important tool for the gardener, will help you figure out whether or not particular bugs or diseases will be a problem and may also help you understand how to naturally reduce their effects.
- Here is a link to an Integrated Pest Management website that provides both organic and inorganic ways of controlling pests. Be sure to find out whether controls target just the pest you're observing, or if they will wipe out good bugs, too! If your garden is small and you have the time, you may be able to control small numbers of pests simply by hand-picking them off your plants every day.
    - vegipm.tamu.edu
- Here is a link to help you identify common plant diseases and interventions:
    - plantdiseasehandbook.tamu.edu

- **Note:** As your soil health improves over time you will see a reduction in disease and pests, since they prey on weak or unhealthy plants. Nutrient and microbe-rich soil along with plant diversity, crop rotation, and consistent mulching significantly improve the health of your garden, so don't skimp on these preparations.

Section 2: Harvesting (20 minutes)

Ask: How many of you feel comfortable deciding when garden vegetables are ready to harvest? Did any of you help your grandparents or parents harvest garden produce as a child? (Give time for one or two students to share a story.)

1. It's important to harvest at the right time. Each plant is a little different, so it's worth the time and effort to research the ideal harvest size of each plant you're growing in your garden. For example, if you harvest a melon too young, it will be underdeveloped and never be the sweet, juicy fruit you intended to grow. But if you wait too long to harvest cucumbers, squash, or okra, they will be bitter and woody, not tender and enjoyable.

2. Days until harvest notes are a good place to start when trying to determine when a veggie is ready for harvest. Look at the back of your seed packet or at the Days to Harvest guide we've given you to find the approximate time you should look for your first harvest. Note that this is APPROXIMATE! Planting temperature, weather through the season, soil or fertilizer nutrition received, and watering patterns all affect harvest, so there's no substitute for getting out in your garden and seeing for yourself.

3. Go over "Days Till Harvest," "Pick for Peak Flavor," and "Garden Records Made Simple" handouts as a group. Discuss methods for success.
    a. Along with many other helpful management tips, this guide includes estimated days till harvest for many common crops in North Central Texas: http://aggie-horticulture.tamu.edu/vegetable/files/2010/10/E-502_home_vegetable_guide.pdf
    b. Let's go over the "Pick for Peak Flavor" article: http://www.motherearthnews.com/organic-gardening/pick-for-peak-flavor.aspx#axzz2cWvcLyKT
    c. Here is a fantastic guide and template for your garden record keeping called "Garden Records Made Simple" developed by the University of Nevada Cooperative Extension. Use any or all of these tools to plan and monitor your garden for success! http://www.unce.unr.edu/publications/files/ho/2005/sp0503.pdf

Example of Harvesting Records:

Let's use a summer squash as an example for harvesting. Turn to page one in your planting packet. You will see a space for the plant type as well as the planting date. Let's say we are planting summer squash, so I would write "summer squash" under plant type and the date on

which it was planted. Next we will use our planting guide to determine when the plant will need to be harvested. For summer squash, it is estimated to be between 55-70 days from planting to harvesting.

You can see on page 2 under "Growth Chart and Harvest Yield" that over the next 55 to 70 days you can observe and record how much your summer squash has grown, but be sure to record the date, too. Once the plant has reached the harvesting period, you will be the judge as to whether you believe it is time to harvest your plant. It's a good idea to start by picking just one plant to make sure the crop is ready. If it isn't, you can then let the other plants grow more before testing another to see if they're ready for harvest. Once you do decide to harvest, be sure to record the date of this event, too, just in case you would like to reference it in the future.

How Often Can I Harvest?

Some crops can be harvested on an ongoing basis while others only provide one-time harvests.

Ongoing Harvest:
Cucumbers
Tomatoes
Squash (Summer & Winter)
Sugar Snap Peas
Beans
Peas
Leaf Lettuce
Swiss chard
Kale
Peppers
Mustard Greens
Herbs

One-Time Harvest:
Potatoes
Sweet Potatoes
Onion
Garlic
Cabbage
Cauliflower
Broccoli
Head Lettuce
Radishes
Carrots
Beets
Turnips

Activity (20 minutes)

Demonstrate harvesting Swiss chard, tearing leaves from the base of the plant while allowing the young leaves in the center to grow and mature for future harvest.

Teaching Tip: the best way to teach someone a skill is to use this process:
1) Tell - tell them what you want them to do
2) Show - show them how to do it
3) Invite - ask them to do it themselves
4) Encourage and correct - provide positive and corrective feedback

If a garden is available for teaching harvest on-site, give a guided instruction and practice of proper harvesting methods for several of the plants available in the garden.

Evaluation (10 minutes)

Before the workshop ends, it is important to check and make sure the students understand some of the key concepts from the lesson. If they have missed or not fully grasped a concept, the instructor can then reinforce it. Here are some sample questions that instructors can use to assess whether the students have mastered this workshop's Learning Objectives:

- How do you know when your plants need to be watered?
- What is "thinning" of plants? Why is it important?
- When is the right time to weed?
- When should you add fertilizer and/or top dress with compost?
- How much mulch should you add to your plants? What materials are best to use as mulch and why?
- How do you know when plants are ready to harvest?
- Why is it important to record planting and harvest dates?
- What is the best way to harvest plants that can be harvested on an ongoing basis, such as Swiss chard?

Q&A and Conclusion (10 minutes)

- Summarize key points
- Answer any questions
- Mention dates of advanced training classes and/or where students can go to have future questions answered (e.g., Tarrant County Master Gardener Association Help Desk, tel. 817-884-1944 or email tarrantmg@ag.tamu.edu)

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(www.baylor.edu/texashunger), and University of Nevada Cooperative Extension (www.unce.unr.edu).

Disclaimer of Liability

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SUMMARY OF LESSON THREE—TENDING AND HARVESTING

Talked about different watering methods and tools to use (drip, can, sprayer)

Mentioned thinning plants to promote healthy growth

Discussed the relationship between mulching, weeding, and watering

Briefly discussed fertilizers (natural manures and compost vs. synthetic)

Bugs: good or bad ?

Harvesting: when to, days to maturity from seed packets and planting guides. Showed two butternut squashes and cut open to display the different stages of maturity. Provided prepared butternut squash as taste samples. Discussed difference between continual harvest and one time pick and gave examples of each.

RESUMEN DE LA LECCIÓN TRES --- Atendiendo y Cosechando

. Vocabulario para el jardín en español e Inglés

. Repaso de las primeras dos lecciones: Tierra y Abono y Planeando y Plantando

. Diferentes métodos para regar y herramientas para regar como manguera de goteo, y aparato para rociar

. Podar las plantas para promover el crecimiento saludable

. Discutir la relación entre aditivos como el mantillo (mulch), quitar las yerbas y regar las plantas

. Hablar sobre los fertilizantes el estiércol, abono natural y sintético

. Insectos-buenos y malos

. Cosecha-cuándo, días a madurez de los paquetes de semillas y las guías de siembra. Se Mostraron dos calabazas "butternut" y se cortaron para mostrar las diferentes etapas de madurez. Se demostró calabazas preparadas. Se demostraron las diferencias entre la cosecha continua y la cosecha de una vez.

REAL
school gardens

Garden Maintenance

In the "Web of Life" there are interactions and interconnected relationships among the members of an ecological community which involve the exchange of matter, energy and resources in continual cycles. Everything exchanges matter, energy and information to maintain a dynamic balance of the Earth's systems and its resources.

Responsible stewardship of the Earth involves maintenance of the garden/outdoor laboratory. This embodies cooperative planning and management in the interest of long-term sustainability. In the simplest of terms this involves watering, thinning, weeding and revitalizing the garden areas. This process is seasonal and cyclic throughout the year as the needs arise. Weekly maintenance keeps a garden well sustained.

Watering:
Water deeply, as deep watering encourages deep rooting. Soak the soil thoroughly when watering. The root systems grow downward searching for moist soil and are strengthened as they move deeper to find water. Deep watering helps plants withstand periods of dry weather. As a general rule, it is best to apply 1 inch of water per week on garden areas.

Water immediately after planting seeds and then water at least twice a week until the seeds sprout. Water once a week as the plants mature. When transplanting a plant, be sure to water after planting. Note: the frequency of watering need will vary season to season. For example, you will have to water more frequently in summer months and less frequently in winter months.

Thinning:
Thinning means removing some plants to make room for the efficient growth of others; thinning reduces the competition for light, nutrients, water and air among the plants.

Follow instructions on the seed packages for the thinning distances of sprouted plants. Thin after the plants are 1/2 -1 inch tall. Thinning may be done one or two times during the early part of the growing season.

Weeding:
As with thinning, weeding also reduces competition for light, nutrients, water and air among the growing plants and it helps the garden look managed. Weeding can be done by hand or with a tool such as a hoe or hand cultivator.

Weeds fall into two basic categories—annual and perennial. When removing annual weeds, simply pulling the plant out is usually sufficient. Perennial weeds, on the other hand, have more tenacious and permanent roots. Nut Sedge and Bermuda grass, for example, can be dug out by hand, but attention must be paid to the deep roots. If you just pull on the top, it will break off from the roots and the plant will re-sprout. So, be sure to remove the entire root system. Sometimes this means digging in the soil to follow the roots as they grow.

Remember the adage that "one weed is one hundred seeds" to understand the importance of weeding. Weed when plants are small--before they mature and go to seed.

Revitalizing:
Soil is one of the building blocks of all life and is one of the greatest resources along with air and water that we have. Soil consists of air, water, minerals, decayed plants, animals and insects. Natural processes of Earth's systems create soil by weathering, erosion and decomposition. It has been estimated that it takes up to 100 years to create one inch of soil. As stewards of gardens/outdoor labs we can speed up the creation of soil building and replenish and protect the nutrients in soil by composting and mulching bare ground and planted areas, thus recycling soil nutrients, creating fertility and protecting the structure of the soil. Keep your garden mulched with leaves, straw, or wood chips.

Pick for Peak Flavor

By Kris Wetherbee
Photos by Rick Wetherbee

The secret to enjoying garden-fresh produce at its prime is knowing when to harvest. If you've ever eaten a melon that lacked sweetness, or green beans that were fibrous and tough, you know how crucial timing can be. Just as different vegetables have their own distinct needs for planting, fertilizing and growing, each also will give certain clues when it is ready to pick.

A few vegetables are very accommodating and can stay in the ground for weeks until you're ready to eat them. Others need continual picking to ensure ongoing production of a crop, but most have a short window of time during which they can be gathered at peak flavor. After a vegetable passes its prime, it undergoes permanent changes that alter its taste, appearance, quality and, sometimes, its future production. Sugars turn to starches, and the texture becomes mushy, like an overripe melon or chewy green beans.

On the other hand, if you pick too soon, you will harvest a vegetable that has not had adequate time to develop peak flavor, substance and nutrition.

Here's a guide to help you know precisely when your summer and fall fruits and vegetables have reached their peak of perfection and are ready to be picked and eaten:

BEANS should be checked daily for harvesting. Snap beans/green beans are ready when the pods have filled out but the seeds are still tiny, which, depending on weather conditions, is usually some two to four weeks after bloom. The pods should be firm and crisp, with pliable tips. Pick haricot (French filet) types when the pods are about one-eighth inch in diameter, while they're still young and very slender.

BEETS can be picked when the roots are from 1½ to 3 inches in diameter, and most taste best when they are about the size of a pingpong ball or golf ball. White and golden varieties are tasty and tender until they reach baseball size, but storage (winter-keeping) varieties remain tender until they reach softball size or even slightly larger. When harvested past their prime, beets have a strong taste and tough, pithy texture.

BROCCOLI should be harvested when the buds are still tight and before the florets begin opening their yellow flowers. For the first harvest, cut the central stalk at a slant about 5 to 6 inches below the base of the head. This prevents rot and encourages production of new side shoots, which can be harvested at a later date.

BRUSSELS SPROUTS develop a sweet flavor after the plant has gone through a couple of mild frosts. The buds at the base are the first to mature, so pick from the bottom up when sprouts become firm and are about 1 inch in diameter. To encourage larger sprouts, which mature more uniformly, cut the top of the plant back by about 4 inches about four weeks before the harvest is to begin.

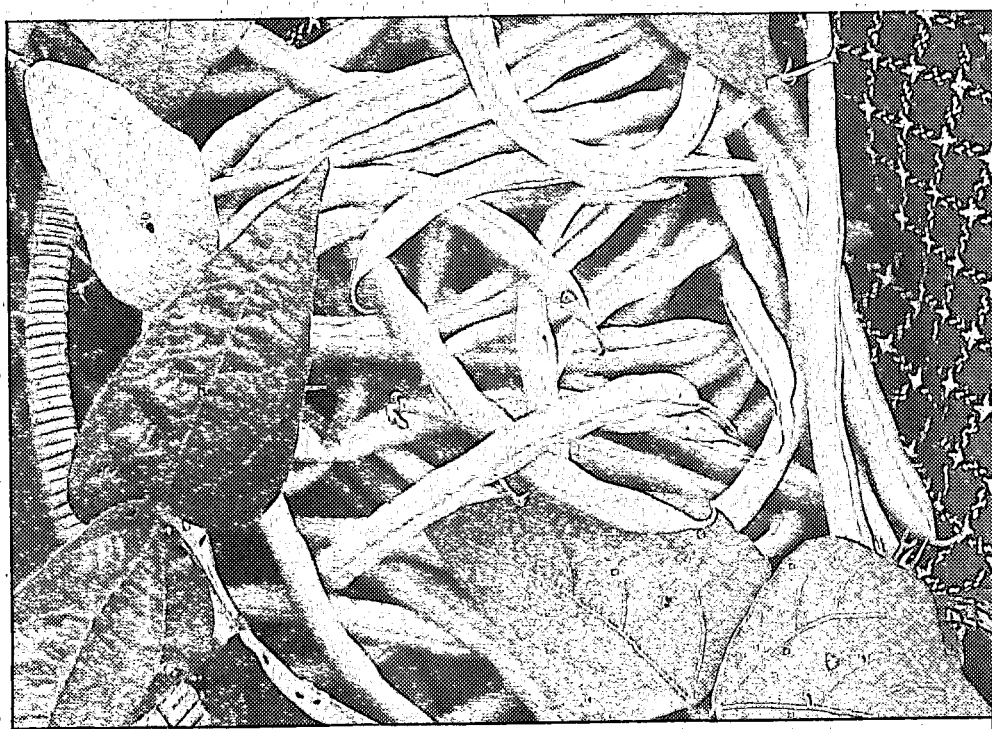
CABBAGE offers some leeway as to when it can be picked at perfection, though larger heads are more likely to split than smaller ones. If a head is threatening to split, twisting it a quarter turn will slow down the splitting. Cabbage heads that have split are still tasty and should be picked; they just won't store as well as solid heads. Begin harvesting cabbage anytime after developing heads become solid and firm.

CARROTS usually hold well in the ground and can be harvested over a long period of time. Begin as soon as the roots color up and grow to from a half to 1 inch in diameter. Continue harvesting until the last frost-sweetened carrots are dug before the ground freezes for winter. Careful digging, rather than pulling, is best as a harvest method; only pull the roots if your soil is extremely friable. The texture of a fresh carrot is at its finest in the young ones, but the sugar content heightens as they mature.

CAULIFLOWER is at its best when 6- to 8-inch, fully formed heads are firm and the curds in them are solid. If you wait until after the curds open (they resemble rice grains), you have passed the window of opportunity for harvesting optimum-quality heads.

CORN should be picked when the kernels have swollen to their maximum juiciness, usually about 20 days after the first silk strands appear. When the silks begin to turn dry and brown, partially peel back the husks and pierce a kernel with your thumbnail. If a milky juice squirts out, the corn is ready to eat. To harvest, snap off the ear by pulling it downward, then twisting and pulling again. If allowed to overripen, corn will loose its sweet flavor and become starchy.

CUCUMBERS grow fast, so check them daily if you plan to keep up with the peak of harvest and ensure continued production. For fresh use, a cucumber should be filled out enough to be crisp and juicy, and measure from 6 to 9 inches long. For sweet pickles, cucumbers are best harvested when



'Totem' snap beans, picked at the peak of perfection, when the seeds inside still are tiny.

they measure from 1½-to-2½-inches long; for dill pickles, the ideal length is from 3 inches to 4 inches.

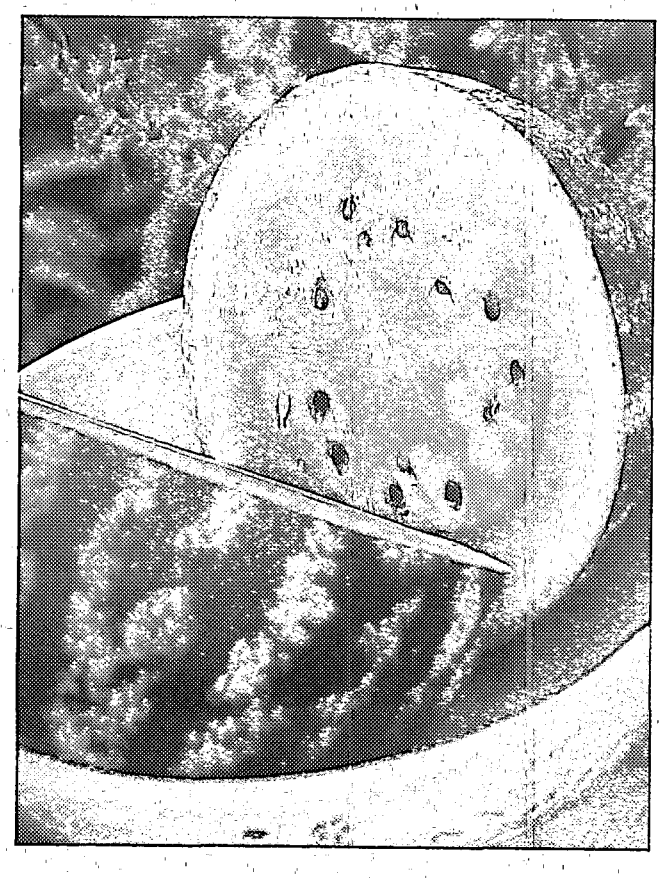
EGGPLANT has received a bad rap as a bitter-tasting vegetable because of the oversized fruits often sold in supermarkets. Eggplant past its prime is soft, pithy and laden with seeds, which are what give it the bitter taste. Fruit harvested while still young and firm actually is rather sweet and very tender; that's when the vegetable measures from 4 inches to 8 inches in length, or about one-third of its mature size. Use strong scissors or pruning shears to harvest the fruit, rather than pulling, which will injure the plant.

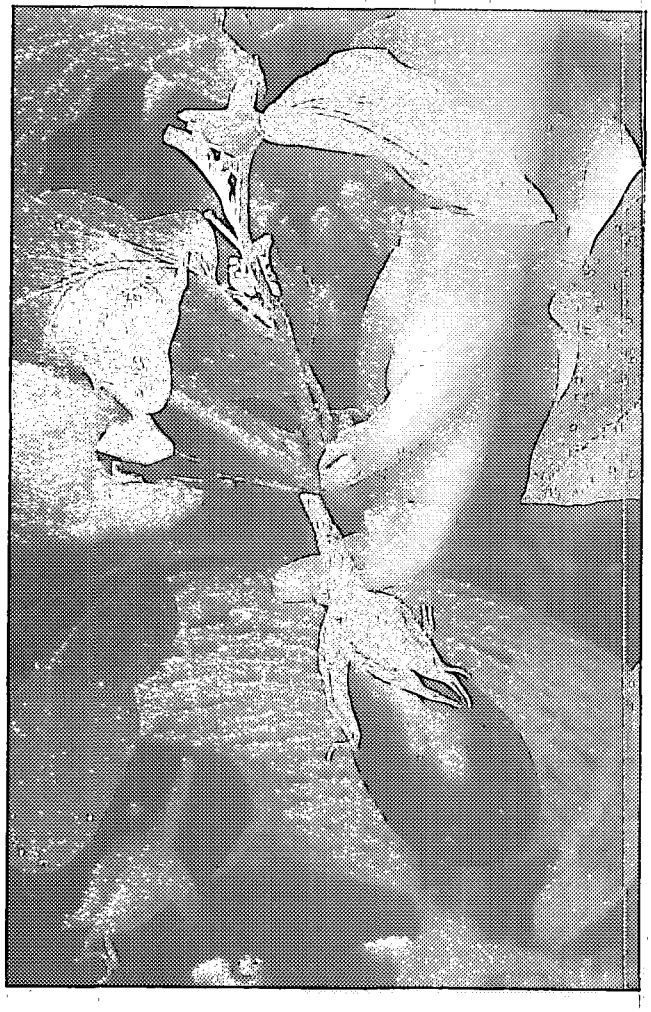
KALE leaves — a fall green — usually can be harvested about 40 days after planting, however, a frost really sweetens and enhances the flavor, so wait until then if you can. Harvest by taking off outer leaves as needed; because the plants are frost-hardy, in mild winter areas, you can pick fresh kale at its prime well into December.

LEEKS can be pulled from the ground anytime the stem is an inch in diameter or larger. Use them when they still are very small for the mildest, most delicate flavor. Cut off the roots and most of the top green portion before storing in the refrigerator. (Save the green part to use in soup stock.) Many varieties will overwinter in mild climates and remain harvestable into March. After that, they can develop a hard core in the center that will not soften even when cooked.

LETTUCE can be picked in stages: tiny leaves for a gourmet salad mix or larger leaves for a main dish. For loose-leaf varieties, pick outer leaves as needed, or cut the head an inch above ground for a cut-and-come-again crop. Butterheads, romaines and crispheads should be harvested when the head begins to form, and for peak perfection, before the center begins to elongate, which means that the plant is preparing to flower. After that point, the lettuce will taste bitter. For refrigerator storage, run washed leaves through a salad spinner, place in a sealable plastic bag with a paper towel or tea towel, and store in the crisper section of your refrigerator.

MELONS can be a challenge, but several telltale signs can help you decide when the fruit is perfectly ripe. On some





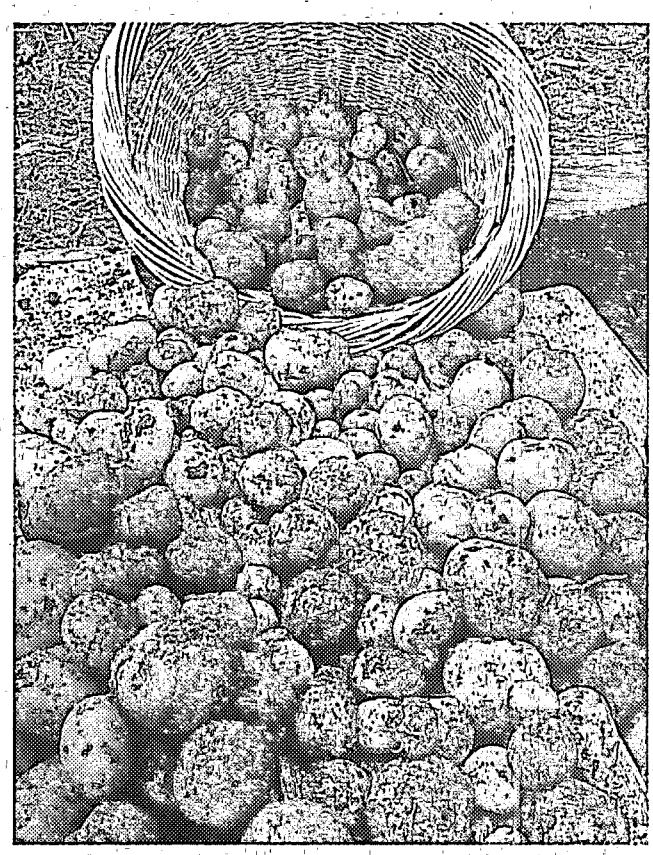
Above: Watermelons are ripe when the skins lose their gloss and the belly sides turn creamy yellow. Right: For peak eggplant flavor, pick the fruits when they are young and still firm.

cantaloupes, which also may be called muskmelons, "netting" ("venation") that overlays the skin becomes more pronounced and the melon will separate easily from the vine when it's fully ripened. True cantaloupes and honeydew-types soften and give slightly to pressure on the blossom end, and the background color will change; cut these from the vine as they will not slip from the stem. Pick for optimum quality after the tendril closest to the fruit turns completely brown. On watermelons, the surface of the fruit loses its gloss, the belly side touching the ground changes from white to creamy yellow and the tendril turns brown and begins to shrivel. Thumping as a measure of ripeness is a matter of luck; it works for some and not for others. Those who claim the gift say the thump should sound hollow and deep.

OKRA should never be allowed to get too big. Harvest short-pod varieties when they are from 2 to 3 inches in length, usually about four to six days after flowering. Long-pod types such as 'Cow Horn' are best picked at 6 to 8 inches in length. Tips of tender pods will snap, but those on older pods won't because pods mature from the tip down, which means the tip turns fibrous first. Check pods daily because they can go from prime to pitiful in 24 hours' time.

ONIONS can be harvested in two stages: The green "scallion" stage or the bulb stage. Green onions are best when tops are 6 to 8 inches tall and stems are the thickness of a pencil. For maximum size and mature bulbs, wait until more than half the tops have fallen down, then push over the remaining tops. A week later, harvest the bulbs and set them in the sun for a day or two (cover at night). Cure the bulbs with tops intact for about a week in a sheltered, dry area; during this time, the outer layers form a dry skin. After that, cut the tops about an inch above the bulbs, trim off the roots and store the onions in a well-ventilated, dry, cool and dark location.

PEAS are best harvested in the early morning or early evening, but the stage at which to harvest the pods depends on the type. Both snap peas and snow peas are eaten pod and all. For best flavor, pick snap peas when plump and well colored but not as fully filled as garden peas. Pick snow peas before the pods fill out, when they are young, tender and thin. In contrast, garden peas, often referred to as shell peas, are ready to harvest and shell when the pods are bright green and fully filled. Then, the peas inside are sweet, plump and tender — a true taste treat of the early summer garden.



You can start harvesting new potatoes when they are golf-ball size. Without digging, gently brush the dirt back from the stems and pick out a few potatoes. Then, cover the stems again, and the plants will continue to set more potatoes.

garden&yard

PEPPERS can be harvested anytime in the immature green stage — the more you pick, the more your plant will produce. However, for a fully flavored and sweet pepper, wait until it changes color. (Some varieties turn red, others gold, some yellow and still others orange.) Hot peppers also usually take on more flavor when their color changes as they mature.

POTATOES give an easy signal as to when they're ready to harvest: their tops die down. About two weeks after that happens, dig the potatoes; the delay gives them time to toughen their skins for long-term storage. You can leave potatoes in the ground longer; just be sure to dig them before frost or rain sets in. Carefully dig tubers with a spading fork, allow them to dry for a few hours in the sun, then cure them for about two weeks at 50 to 60 degrees under shelter, in a well-ventilated, high-humidity area. After they are cured, potatoes store best at 40 to 50 degrees.

SOUTHERN PEAS, such as black-eyed peas and crowder peas, are not peas at all but rather a type of bean that grows in warm locations. Pods are ready to harvest when well filled with fully developed seeds. Harvest purple pods when the hulls turn mostly red, and green pods when the hulls turn a light yellow-green but not too yellow.

SUMMER SQUASH is at its best if harvested on the small side, while skins are still tender. For zucchini, straightneck and crookneck types, harvest when fruits are 4 to 8 inches in length; for patty pan varieties, up to 3 inches in diameter. Don't let your squash get too big or the plant's production will falter.

TOMATOES are tops if picked between the semi-firm and semi-soft stages, when the fruits are fully colored (whether gold, pink, orange, red, black or white). Second best is to pick fruits a few days early and allow them to finish ripening indoors, an added benefit when temperatures are too hot or frost threatens. Tomatoes are best stored at temperatures higher than 50 degrees — never in the refrigerator, which turns their texture to mush.

WINTER SQUASH that passes the thumbnail test (the skin should resist puncture from your thumbnail) usually is fully ripe and ready to harvest. The stem hardens and the skin color deepens: Spaghetti squash turns a mellow golden yellow, butternut deepens to a subtle orange-tan and a splotch of orange-yellow often will appear on the underside of acorn, delicata and buttercup types. Most winter squash will keep up to four months after harvest if you follow these tips: Harvest after the first light frost to enhance sweetness but before a hard frost; never handle squash by the stem (fruits can rot in just a few weeks after the stem breaks); cut — don't pull — squash from the vine, and leave 2 inches of the stem attached; wipe off any dirt but don't get the fruits wet; cure fruits in a warm place (80 to 85 degrees is ideal) for a couple of weeks. Once cured, store in a cool, dry location at 50 to 55 degrees. ⊖

Worth the Wait . . .

When harvest time finally arrives, the fun really begins! Scrutinize the fruits of your labor daily. Keep handy a sharp knife, pruning shears, and a bucket or a basket. At the very moment your (now) discerning eye sees "ripe," whisk those prime morsels out of your garden and into your kitchen, and devour them with gusto.

Or, preserve them for future gusto. Handle every piece like the delicate jewel it is, and avoid bruises and nicks that would invite decay and jeopardize your enjoyment of the essence of perfection.

Gardening Records Made Simple

Pamela Powell, Extension Educator, Churchill County
Wayne S. Johnson, IPM Specialist, University of Nevada Cooperative Extension;
Associate Professor, Department of Resource Economics, College of Agriculture,
Biotechnology and Natural Resources

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SP-05-03

Introduction

Good record keeping is crucial to any successful activity. We record our medical data to evaluate prescription effectiveness. We maintain financial records to plan for our retirement. In every activity we evaluate, we must make and maintain an appropriate method of record keeping. The same is true for those of us who enjoy home gardening. In order to be a successful gardener, or to improve our landscape, we must keep good records so we can evaluate successes and failures in the garden. While initially we may not realize the importance of recording this information, it provides an opportunity to evaluate our garden if problems arise, and to help us remember what we did.

Telling Your Story

As with good writing and storytelling, effective records always include: what, when, where, why and how. The "who" is obvious, it is you, unless of course, you hire someone to do the work, or you rely on your relatives for help. By tracking your efforts, you will have a "story" of your garden that will help you share your successes with others. (While we don't necessarily share our failures, we still learn from them if we have kept good notes.) A good record will also help you solve problems when seeking advice from a horticulturist.

Many different types of gardening record books exist on the market. You only need to search at the bookstore, on the internet, or at your library to find them. You may even have a method that you developed that has worked well for you. The following is one method that will help you track your gardening efforts. It is divided into four sections; Garden/Landscape Design; Preparing and Treating Your Garden; Planting Schedule; and Growth and Harvest Chart.

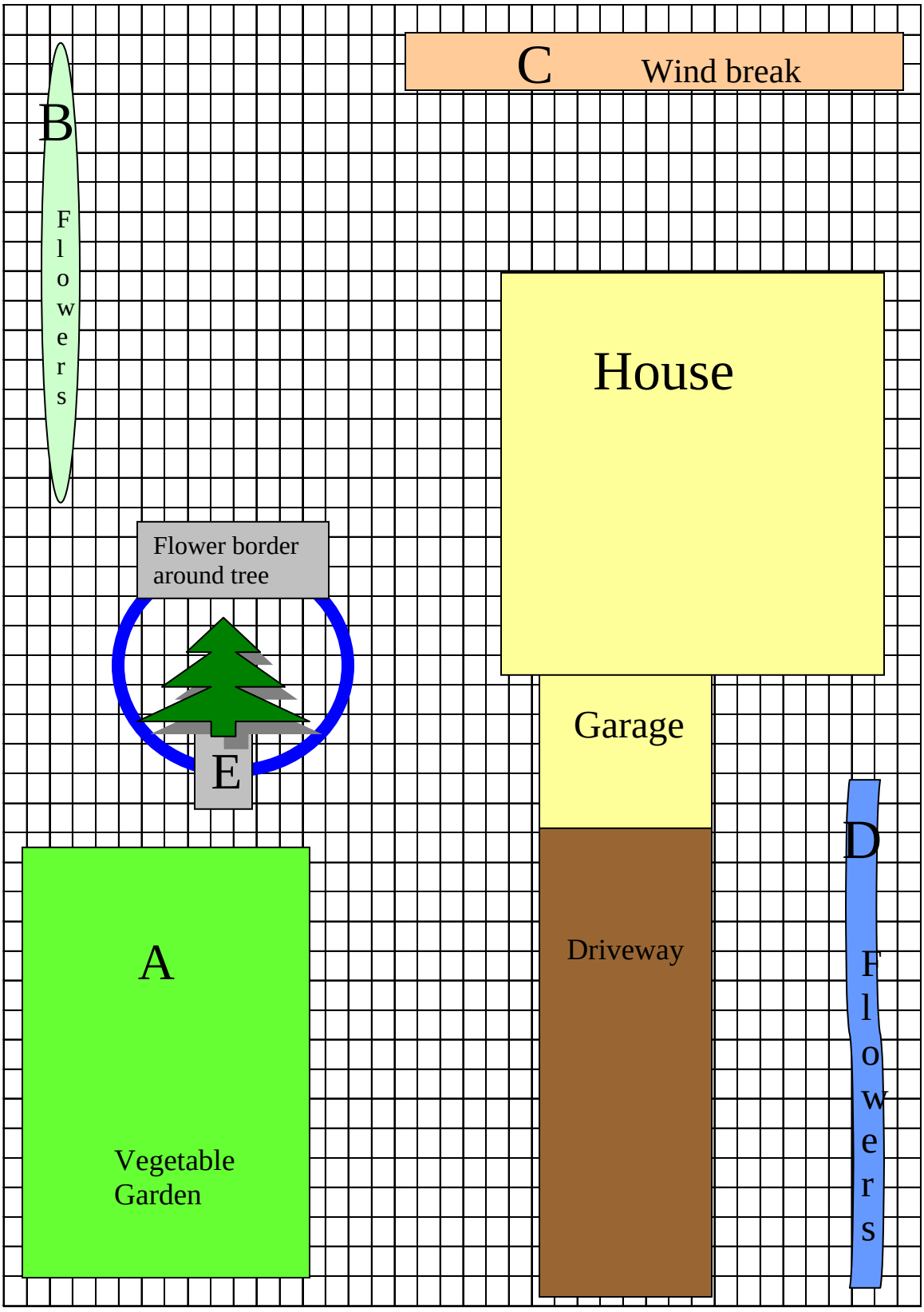
Designing Your Garden

Chart 1 represents one example of how to use this Garden/Landscape design. Because gardens and landscape plantings vary in size and shape, you must designate the measurement or scale for the grid. Some may have a small garden and the grid square may represent a few feet on the ground while a large landscape or planning area is represented with many feet per square on the chart. Chart 1 represents one example of how to use this Landscape/Garden Design.

You will notice that each garden or planting has been given a corresponding section letter, i.e. the Vegetable Garden is Section A; the Flower Garden is Section B, and so on. Because garden or landscape designs are unique to each property, your design will be unique to your surroundings. Even if you have only a small property, or if you are gardening in flower pots in a house, you can still use this layout design to help you track your planting and plant care. Do not limit your record keeping. **Adapt the records (charts) to fit your needs** whether you have more plantings, or fewer plantings, than the example shows. Remember to include irrigation lines, sprinkler heads, utility lines, etc.

Begin by drawing a picture of your garden or landscape design

Garden / Landscape Design Grid



1 square = __4 feet__ (Unit of measurement is dependent upon garden or landscape size)
Include irrigation lines, sprinkler heads, utility lines, etc.

Example Chart 1

Preparing and Treating Your Garden

With our layout design drawn and in hand, transfer your design sections to the "Preparing and Treating Your Garden" (See Example Chart 2). Below each section heading, i.e. A, B, etc. there is blank space to list soil test results (pH, SAR, fertilizer requirements and amendments), if taken, as well as other information you deem important or necessary. As in Example Chart 2, spaces are provided for you to write down when and how you prepared your soil. It also includes a column to record any problems you may have encountered, when they occurred, as well as the remedy or type of pest control used. If you apply any treatment to the garden/landscape, there is a column to record that as well. While most gardens often receive the same treatment throughout the entire garden, space is provided for you to list several interventions within each of the sections. Remember, you can modify these forms to fit your needs.

Planting Schedule

The third sheet "Planting Schedule" allows you to write down each plant you are growing by section of the garden or landscape (See Example Chart 3). There is a place for you to record the sowing date of each species, as well as any transplanting date, if required, by the plant type. It is also important to record the date, type and amount of fertilizer applied. Since watering is very important for a successful garden, recording the irrigation schedule may provide important information at a later date. (*Irrigation should be managed to wet the soil profile 8"-12" deep. This may take a few minutes in sandy soils or require repeated on and off irrigations with wait times of several hours in between the on times in heavy clay soils.*)

Growth and Harvest Chart

The last sheet is titled "Growth and Harvest Chart" (See Example Chart 4). This chart provides space for you to list the plant name in each of the sections. Because cultural practices affect plant growth and production, it is important to measure plants at various stages of development. This information helps us know whether or not our management is improving plant growth or not. While some plants may not have a harvest date, such as trees and shrubs, this space may be used to record the annual growth, bloom date, and/or fruit harvest.

Now It's Your Turn

At the end of this publication is a blank copy of each of these forms. You may copy them or change them as you determine is appropriate for your needs. Examples of how to fill out these forms (outlined in Example Charts 1 through 4) are provided. Again, remember that these forms are a guide for record keeping. You may discover that some of the categories do not apply to you.

As with any record keeping, it is only as valuable as you make it. If you are dedicated to tracking your efforts, whatever that may involve, you will be able to make informed decisions in the future based upon actual data. Tracking will also give those whose advice you seek a more informed understanding of your endeavors to date.

Preparing and Treating Your Garden

_____Year

Section	Soil Preparation Date/What/Results	Problem(s) Date/What/Results	Pest Management What/When/Results	Treatment(s) Date/What/Results
A pH – 7.8, sandy loam soil, wind blown, 6” organic matter incorporated, applied fertilizer per soil test recommendations. (See attached soil test)				
All	4/1 6" Manure, Plowed	5/2 Too Wet	5/2 Gopher	5/5 Set Traps
B pH – 7.8				
Annual Planting Areas	4/1 6" Manure, Tilled			
C pH – 7.8, soil is sandy, drains too well, draughty				
All Installed irrigation	4/1 6" Manure, Tilled 5/12			
D pH – 7.5, mixed perennial and annual flowers				
All Set pole fence Installed irrigation	4/1 6" Manure, Tilled 5/10 5/10			
E				

Example Chart 2

Planting Schedule

Year_____

Plant Name	Planting/Sowing Date/Rate	Transplanting Date/Spacing	Fertilizer Date/Rate	Irrigation Schedule
A 2" of composted mulch for week control outside seeded row and not covering crop plants.				
Gro-great tomato [1]	4/1 12 – 6 packs	5/20 3' OC^2, 200" row	6/20 16-20-0 1#N/1000ft^2	Furrow 3x/week, soak in
Happy corn	5/10 0.3#/1000ft^2	8-12" x 30" row	5/12 16-20-0 1#N/1000ft^2	Furrow 1x/week/20min
Summer Delight Squash	5/17 0.12#/1000ft^2	2' x 3' row	5/17 16-20-0 1#N/1000ft^2	Furrow 2x/week/1 hour
B				
Lobelia	100 Boysen Nursery	5/15 6"OC^2, 50/row	5/10 16-20-0 1#N/1000ft^2	Sprinkler 3x/week/30min
White Petunia	75 Boysen Nursery	5/15 12"OC^2 75/row	5/10 16-20-0 1#N/1000ft^2	Sprinkler 3x/week/30min
Giant Marigolds	60 Boysen Nursery	5/15 15"OC^2 75/row	5/10 16-20-0 1#N/1000ft^2	Sprinkler 3x/week/30min
C Roto-tilled in 4 inches of composted manure into a six foot planting circle for each, mulched beds 4 inches deep with stringy bark. Emitters were placed under the bark.				
Colorado Spruce	5 Clare's Warehouse	4/15 20' OC^2	4/1 16-20-0 1.5#N/1000ft^2	4, 4 gal/hr emitters/tree
Upright Junipers	7 Clare's Warehouse	4/15 20' OC^2 staggered	4/1 16-20-0 1.5#N/1000ft^2	4, 4 gal/hr emitters/tree
D Tilled the planting areas to kill the weeds, 2X before planting the area. Mulched with 3 inches stringy bark.				
Ramblem Roses	8 Boysen Nursery	4/15 10' OC^2	4/1 16-20-0 1.5#N/1000ft^2	3, 2gal/hr emitters/plant
Yellow Rose Potentilla 1	15 Boysen Nursery	4/15 5' OC^2	4/1 16-20-0 1.5#N/1000ft^2	3, 2gal/hr emitters/plant
Butterfly Bush	3 Clare's Warehouse	4/15 10' OC^2	4/1 16-20-0 1.5#N/1000ft^2	3, 2gal/hr emitters/plant
E				

1. **At transplanting, applied 1 qt/plant of 8-24-8 fast start soluble fertilizer 3#/50gals**
2. **OC – On Center**

Example Chart 3

Growth Chart and Harvest Yield

_____Year

Plant Name	Growth One Date	Growth Two Date	Growth Three Date	Harvest Date/Yield
A				
Tomato	5/15 12 inches	6/30 23" x 20"	7/30 30" x 36"	8/10-183# 8/20-210#
Corn	5/25 3" 2 leaves	6/30 2' 3"	7/30	8/15
B				
Petunia	6/10 fair growth	7/10 Plants filled in		
Giant Marigold		7/10 18" tall		
C				
D				
E				

Example Chart 4

Garden / Landscape Design Grid

1 square = _____ (Unit of measure is dependent upon garden or landscape size)
Include irrigation lines, sprinkler heads, utility lines, etc.

Chart 1

Preparing and Treating Your Garden

_____Year

Section	Soil Preparation Date/What/Results	Problem(s) Date/What/Results	Pest Management What/When/Results	Treatment(s) Date/What/Results
A				
B				
C				
D				
E				

Chart 2

Planting Schedule

Year_____

Plant Name	Planting/Sowing Date/Rate	Transplanting Date/Spacing	Fertilizer Date/Rate	Irrigation Schedule
A				
B				
C				
D				
E				

Chart 3

Growth Chart and Harvest Yield

_____Year

Plant Name	Growth One Date	Growth Two Date	Growth Three Date	Harvest Date/Yield
A				
B				
C				
D				
E				

Chart 4

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