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a sparagus

a sparagus is a perennial plant whose roots send up tender, delectable shoots. it grows wild in marshy parts of e urope and a sia. a sparagus was cultivated by the ancient Greeks and r omans. in e urope, during the middle ages, the plant was prized for its purported medicinal qualities; it was seen as a restorative to compensate for a poor winter diet. most of the asparagus eaten in the United s tates is grown



in Northern California. a sparagus is a member of the lily family.

in this country, green asparagus is more readily available than purple and white varieties. in e urope, particularly France, the white asparagus is held in high esteem and is considered a delicacy. White asparagus is the result of chlorophyll deprivation. Farmers grow the plants under rows of dark plastic so that they have no exposure to the sun. as a result, the plant's chlorophyll is not activated, and the asparagus spears are an ivory color with a mild flavor. This technique, called *blanching*, is also used for chicory and a few other vegetables.

Seasonality and Growing Conditions

a sparagus is the quintessential spring vegetable, available to California growers from February to may. Farmers start their asparagus crop from *crowns*, roots that are grown from seed by a nursery. Before planting, farmers carefully prepare the soil by using rich compost and fertilizer so that the asparagus has a nutritious environment in which to grow. The plants take up to three years to produce a sizable crop yield, and each asparagus plant produces many spears for harvest. The perennial nature of the plant means that the same plant can produce for 10 to 15 years.

a sparagus plants require winter chilling in order to produce good spears. The spears that are commonly eaten are the first new shoots that the asparagus root puts out in the spring. if the shoots are not harvested, they grow into branches covered with leaves that look like ferns. a sparagus fern is not really a fern despite its name.



Asparagus requires sunny, rich, deep, well-drained soil. The roots can penetrate up to five or six feet into the ground and may have the same spread outwards. They are planted far apart in well-composted trenches. Once established, the plants will thrive with little care for many years.

Keeping asparagus beds weed-free and away from trees (tree roots may interfere with the asparagus's extensive root system) and removing slugs and snails are the key to growing healthy plants.

Farmers harvest the spears by hand when the spears reach a height of six to 10 inches. They carefully snap the spears at or just below the soil so that the roots are not damaged or exposed. Each plant can withstand a harvest for a certain number of weeks, then it must be left to grow and develop its shrubby tops (they are related to the asparagus fern). In that way, the plant's energy can be redirected to the roots for the long dormant period that follows each growing season.

Selection, Storage, and Nutrition Information

When you select asparagus at the market, it is important to remember that, like corn, the spears begin to lose their sweet flavor as soon as they are picked and the plant's natural sugars are converted to starch. You may purchase tender, pencil-thin spears or the thicker, tougher, and more intensely flavored spears. In either case, look for bright green spears that have tight tips, and avoid spears that are pale, fibrous, and have dried-out bases. You can store asparagus tightly wrapped in plastic in the refrigerator for up to four days, but it is best to cook it right away.

Asparagus is high in folate and a good source of vitamins A and C.

Asparagus with Lemon & Parmesan

preparation Time: 25 minutes
 Cooking Time: 5 minutes
 Total Lesson Time: 60 minutes
 recipe level: easy

Background

students may enjoy this recipe because it allows them to closely examine asparagus spears and their fascinating structure. allow students to cut spears crosswise and lengthwise to explore the internal structure. after the students have shared their observations, use different-sized asparagus to prepare this simple recipe. This procedure will allow students to notice the differences in preparation and cooking time and taste spears of different sizes.

This dish may be served cold as a salad or warm as an appetizer. Use a block of parmesan cheese instead of pre-grated because it is fresher; it has a sweeter, fuller taste; and grating is fun.

Objectives

Students will be able to:

- identify the parts of an asparagus spear.
- Compare spears of different thicknesses.

Ingredients

For a class of 20:

- 40 asparagus spears
- 2 lemons
- salt to taste
- 1/4 cup extra virgin olive oil
- 7 ounce piece of parmesan cheese
- 4 cups water

Materials

For the class:

- colander
- 1 large mixing bowl
- measuring spoons
- 6-quart pot with lid
- slotted spoon or tongs
- hot plate
- cheese grater
- vegetable peeler

For each group of 4:

- 2 cutting boards
- 2 knives
- 2 peelers
- 4 napkins
- 4 plates
- 4 forks
- journals

**Preparation**

1. have students wash their hands. discuss proper methods of handling food.
2. after washing the asparagus and drying it in the colander, separate it into five equal portions.
3. Bring salted water to boil on the hot plate while students make observations about the asparagus.

Safety Precautions

review safety precautions for using knives and the hot plate.

Making the Recipe

1. demonstrate how to peel the asparagus and remove any woody sections at the bottom. students will need to peel the thick spears but not the thin ones. discuss the reasons for peeling the larger spears. have groups prepare their asparagus and place it on a plate.
2. Collect the plates and place them on the demonstration table next to the hot plate. have the students gather around the demonstration table. select two students to place the asparagus in the pot to cook briefly (about two to five minutes, depending on thickness). The spears should be just tender enough to allow a knife to pierce through the middle. ask two other students to cut lemons into quarters and another to grate the parmesan cheese. alternatively, students may use a vegetable peeler to “shave” thin pieces of cheese.
3. remove the spears with a slotted spoon or tongs (tongs are much easier to use) and place them on plates. While the asparagus cools, discuss any changes that students observe in the smell, color, or texture. (*Note:* To cool the asparagus quickly and, therefore, preserve its green color, you may want to put the hot asparagus in a bowl of cold water or run tap water over it.) ask the students to make predictions about the taste.
4. When the asparagus is cool, have a student drizzle olive oil and squeeze lemon juice on it. mix the spears to coat them well. let another student sprinkle or place the parmesan cheese on top. serve and eat.
5. While the students are eating, discuss the differences between the thick and thin spears.
6. Clean up materials. if you have a school or classroom compost or worm bin, place the food scraps there.

Asparagus with Oyster Sauce

preparation Time: 20 minutes
 Cooking Time: 10 minutes
 Total Lesson Time: 60 minutes
 Recipe Level: advanced

Background

This is a tasty and easy recipe to make. In addition to examining the parts of the asparagus spear, students can observe a variety of cooking techniques. Peeling the asparagus is necessary only when the stalks are big with tough, fibrous ends.

The sesame oil and the oyster sauce give this dish a strong flavor, so you may wish to use small amounts and have students taste it before serving.

Objectives

Students will be able to:

identify the different parts of an asparagus spear.

observe different cooking techniques.

Ingredients

For a class of 20:

- 40 asparagus spears
- 5 small garlic cloves
- 9 tablespoons oyster sauce
- 1½ cups water or chicken stock
- 4 tablespoons canola oil
- 6 teaspoons sesame oil
- 6 teaspoons rice wine vinegar

Materials

For the class:

- colander
- 1 large mixing bowl
- 3 small mixing bowls
- measuring cup
- skillet
- wooden spoon
- serving spoon
- measuring spoons
- hot plate

For each group of 4:

- 2 cutting boards
- 2 knives
- 2 peelers, optional
- napkins
- 4 plates
- 4 forks
- journals

**Preparation**

1. have students wash their hands. discuss proper methods of handling food.
2. separate asparagus and garlic into five equal portions.

Safety Precautions

review safety precautions for using knives and the hot plate. When adding ingredients to the hot oil, have students stand at least three feet from the hot plate to avoid spatter from the hot oil.

Making the Recipe

1. Give each group of students two spears and ask them to identify the different parts. have them cut each spear crosswise and lengthwise to explore the internal structure. encourage students to draw in journals and discuss their observations.
2. demonstrate how to trim, peel, and cut the asparagus. demonstrate how to peel and slice the garlic. have the students prepare the vegetables and place them on separate plates. ask a student from each group to collect the plates and place them on the demonstration table.
3. have students gather around the demonstration table. put the asparagus into a large bowl and the garlic into a small bowl. have one student measure out the oyster sauce and the water or chicken stock into two separate small bowls so they are ready for cooking.
4. put the skillet on the hot plate to heat on medium. When the skillet is hot, add the canola oil. have one student add garlic while another student stirs. sauté the garlic until it sizzles but do not wait for it to brown. add asparagus and stir. let the asparagus sauté for 2 minutes, stirring constantly.
5. have another student add the chicken stock or water and stir over high heat until the mixture simmers. stir in the oyster sauce and rice wine vinegar. simmer until the asparagus is tender (a knife should be able to easily pierce the center of a spear). during the last minute, stir in the sesame oil.
6. serve on plates. While students eat, discuss the different cooking techniques used and how they affect the preparation of the dish.
7. Clean up materials. if you have a school or classroom compost or worm bin, place the food scraps there.

making a Worm Compost Bin

preparation Time: 30 minutes
 Total Lesson Time: 45 to 60 minutes to set up and then some time periodically over the next several months for observation

Background

Almost all the recipes in this guide generate some sort of food scraps. If your class or school does not already have a worm bin, here is how to get one started. The cycle of gardening, cooking, and eating completes itself when the class maintains a *vermicomposting* system, known commonly as a worm bin. The use of a worm bin not only demonstrates the process of decomposition but also allows students to feed worms the organic waste generated by cooking in the classroom. The compost bin or system is a habitat in which worms are only part of a small but complex food web. The natural by-product of the vermicomposting process—worm castings—may be used as a natural soil or potting mix amendment, thus recycling nutrients and organic matter.

For more information about worm composting, see Mary A. Ppelhof's *Worms Eat My Garbage: A Children's Activity Book* (Flower Press). For suggestions about school or classroom vermicomposting activities, see Mary A. Ppelhof's *Worms Eat Our Garbage* (Happy Dranch).

Objectives

Students will be able to:

- help build a worm compost bin.
- Understand how to recycle vegetables and fruit.
- demonstrate how to compost food waste.

Materials

For the class:

- newspaper
- vegetable or fruit scraps
- 2 pounds red worms (check your local nursery)
- 2 quarts water
- 1 plastic storage container with lid (1 foot by 1 foot by 1 foot)
- large, slotted spoon
- drill with $\frac{1}{2}$ -inch and $\frac{1}{4}$ -inch bits
- 5 buckets

**Preparation**

1. save the scraps from recipes that generate fruit or vegetable waste. Be sure to keep scraps covered to minimize odors and flies
2. drill holes of varying sizes ($\frac{1}{2}$ inch and $\frac{1}{4}$ inch) in all four sides of the plastic storage container. holes should be about 4 inches apart from each other.

Doing the Activity

1. ask students for their ideas about different ways to dispose of food scraps. if they do not mention it, tell them about composting as one way to recycle food wastes and explain about worm composting.
2. introduce the activity by showing the worms to the students and asking them what kind of home the worms will need.
3. provide each group of four students with a section of newspaper, a bucket with one pint of water, a large handful of soil, and a large handful of leaves.
4. have students shred the paper lengthwise into one-inch strips and place them in the bucket.
5. have each group of students use their hands to mix the paper, soil, leaves, and water.
6. place the newspaper strips in the plastic container. add the worms.
7. place organic garbage (no meat or dairy products) underneath the layer of bedding.
8. have students wash their hands after construction is completed.
9. after the students have constructed the worm bin, ask them to examine the components of the bin. Who are the inhabitants of the bin? What is their shelter? What are their meals? Where do they spend most of their time? how does this home compare with our homes? after the discussion, ask students to write a story from the worm's perspective about how it might feel to live in a worm bin.
10. make sure the bin is covered and placed in a cool place, out of direct sunlight (optimal room temperature is 60 to 75 degrees). add organic material once or twice per week in a different location of the bin. after two to three months, the worms should have digested the bedding and garbage and produced fertile worm castings.

Fong Farm

In Yolo County, between the towns of Esparto and Woodland, Cliff Fong and his brother stoop and cut stalks of pencil-thick asparagus.

They use a special, long-bladed knife that allows them to cut the asparagus without having to bend forward too much. Cliff Fong has been farming for more than 20 years on the same farm where he grew up; his father was the first to farm. While he was growing up, Cliff did not think he wanted to be a farmer. In fact, he recalls, “Growing up, I wanted to get as far away from the farm as possible.”

While taking some time off from college, Cliff Fong traveled to several island countries where he was struck by the way people lived a simple life in balance with the earth. For Cliff, that journey away from the farm ultimately brought him back to his childhood home. He returned to his father’s farm looking for a simpler way of life. He also returned with the firm belief that people should try to produce foods organically.

Fong Farm began to cultivate its asparagus in 1991. The spears of thin or thick asparagus seen at farmers markets and grocery stores come from asparagus plants more than three years old. For the first few years, growers must let the asparagus plants grow and just cut them back at the end of each season. This process allows the plants to store energy in their roots so that the next year, after a dormant winter, they will have energy to send up their shoots, the aspara-

gus spears. Only after the plants have been cut back for two to three years will the stalks be thick enough for harvesting and eating.

The older the plant, the thicker the spears grow. The first harvest has a short season, lasting only a few weeks. Most of the plants’ energy must still go back into the fleshy storage roots. But after the fourth harvest season, spears can be harvested for about two months. Asparagus plants can yield crops for many years.

Cliff Fong notes, “Unlike other crops, planting asparagus means a long commitment. These plants last for up to 14 years.” Fong Farm produces two varieties of asparagus: a type developed by the University of California, called UC157, and the Atlas variety. In order to keep the ground fertile and rich with nutrients, Cliff Fong uses compost, feather meal, and special guano (bird or bat droppings) from Peru.

To deal with such pests as the European asparagus aphid, Cliff inspects his plants closely, especially in August, when aphid populations peak. Cliff makes sure there are enough ladybugs in his field to gobble up those pesky aphids.

When the asparagus is ready to harvest and the stalks have been cut, there is one last task that needs attention if the asparagus is going to make it to market fresh and green—the packing.



a sparagus stalks need plenty of moisture and cool air or they will wilt. The stalks are bunched together with rubber bands and then placed in crates lined with moist pads. These pads keep the cut ends of the stalks damp and prevent them from becoming limp.

The trucks that transport the asparagus from the farm to market are equipped with refrigeration units that keep the inside temperature at a chilly 36 degrees.

Cliff chuckles, “i learned the hard way about how delicate newly cut asparagus stalks can be,” when he tells how he lost some because of careless handling. But one bad experience did not faze him. it is just a part of what he has always known: “Farming takes a long time and a lot of experience.”

o ranges

O ranges were probably domesticated in China, where their cultivation is attested as early as 4,000 years ago. o ranges are members of the citrus family. This familiar group includes lemons, limes, pomelos, grapefruit, and tangerines. There are two species of oranges: the familiar sweet orange and the bitter orange, also called seville orange or sour orange.

Christopher Columbus introduced the bitter orange to the New World during his second voyage in 1493. o ther colonists later introduced the sweet orange. popular varieties of sweet orange include Valencia (the juice orange of retail food stores), Washington navel, and blood orange. The blood orange has crimson flesh, juice, and rind and a sweet, perfumed flavor.

Seasonality and Growing Conditions

o range trees are broadleaf evergreens. They thrive on warm summer days, but they need cold (not freezing) winters for the fruit to ripen. The cold weather helps to increase the sugar level in the developing fruit. The trees, which are not hardy, must often be protected from a cold spell by the use of oil or gas heaters, burning wood, or wind machines placed in the orchards to heat the air.

irrigation is the most important factor in orange production. most varieties require about 35 inches of water per year. The trees also require a well-drained, aerated, fertile soil. o range trees require more fertilization than most fruit trees. Cover crops are used to provide additional nutrients and organic matter in addition to added fertilizers.

o range trees may grow up to 40 or 50 feet high, but dwarf varieties are also available for the small garden. The trees usually bear fruit at about four to six years of age. o ranges are





susceptible to a variety of insect pests, including whiteflies. Beneficial insects, such as ladybugs, can be used as a control measure, as can the fungus *red a schersonia*. Insects, such as scales, are controlled by the use of dormant oil sprays well before harvesttime. The black, sooty mold often seen on citrus leaves and fruit grows on the excrement of scales and aphids.

Selection, Storage, and Nutrition Information

Citrus fruits are a source of high-potency vitamin C and are high in fiber. Citrus fruits were routinely included on long sea voyages hundreds of years ago because they helped

travelers avoid scurvy, a disease resulting from vitamin C deficiency. Processed products, such as orange juice, lose some of the nutrients during pasteurization.

When choosing oranges, look for weighty, firm fruit with smooth, thin, shiny skin. Oranges should be stored in a cool, dry place out of direct sunlight. To get the maximum juice yield from an orange (or any citrus fruit), first roll the fruit firmly on a countertop to loosen the pulp.

Orange, Radish, & Olive Salad

preparation Time: 20 minutes
 Cooking Time: None
 Total Lesson Time: 45 minutes
 recipe level: easy

Background

This salad is very popular in Spain, North Africa, and throughout the rim of the Mediterranean sea, where the main ingredients of this recipe are commonly grown. These ingredients are also grown in many parts of California that have a similar climate.

include a red onion in this recipe only if it is mild tasting and the students can cut it finely. Alternatively, substitute one bunch of green onions, in which case you would not use the chives as garnish. To save a step, you may buy pitted black Kalamata olives. The dish needs cured olives.

Note: For more recipes using oranges, see Chapter 7, “Tangerines.” you may substitute oranges for the tangerines used in those recipes.

Objectives

Students will be able to:

- define the following words: *pith, zest, membrane, and citrus.*
- examine and identify the parts of an orange.

Ingredients

For a class of 20:

- 12 navel oranges
- 1 small red onion (optional)
- 1 cup black Kalamata or oil-cured olives (optional)
- $\frac{3}{4}$ cup olive oil
- pinch cayenne pepper
- $1\frac{1}{2}$ teaspoons salt (2 teaspoons if olives are omitted)
- 3 to 4 bunches radishes (about 2 lbs)
- 6 tablespoons lemon juice (from 1 to 2 lemons)
- $\frac{3}{4}$ teaspoon ground cumin
- 1 teaspoon paprika
- 1 tablespoon sugar
- $\frac{1}{4}$ lb baby arugula leaves or 1 bunch chives for garnish

Materials

For the class:

- measuring spoons
- measuring cup
- large serving platter
- vegetable peeler
- cutting board
- knife
- small bowl
- whisk
- scissors

For each group of 4:

- 2 cutting boards
- 2 knives
- 4 plates
- 4 forks
- napkins
- journals

**Preparation**

1. have students wash their hands. discuss proper methods of handling food.
2. divide the oranges and radishes (and onions and olives, if using them) into five equal portions, one for each group.
3. Wash and dry the arugula leaves in a salad spinner.

Safety Precautions

review safety precautions for using knives.

Making the Recipe

1. provide materials for each group of students.
2. show an orange to the class. With a vegetable peeler, peel off the zest, the colored part of the peel that is often used for cooking. show the oil pores on the peel. Bend the peel so that the oil from the peel squirts into the air. it is very fragrant, so make sure students smell it when they investigate their orange (but warn them that the oil can burn if it gets in someone's eyes). identify the pith, the white part of the skin just below the zest; it has a bitter taste. separate the segments that hold the citrus sacs and seeds in a thin skin, or membrane. identify the seeds and the sacs (the tiny, individual pouches where the juice is stored).
3. demonstrate how to peel oranges to remove all the pith, slice the oranges, and remove their seeds. demonstrate how to remove greens from radishes and slice them thinly. demonstrate how to prepare the onion (if using): cut an onion in half, remove the peel, hold the onion with the flat side down, and then chop it very finely. demonstrate how to pit the olives (if using): place an olive between your thumb and index finger and squeeze.
4. have students peel and slice the oranges, slice the radishes into thin rounds, peel and chop the onions, and pit the olives. have students place the sliced oranges, chopped onions, and pitted olives on separate plates.
5. have students measure out oil, cumin, paprika, salt, and sugar. squeeze the lemons and measure the lemon juice. Whisk these ingredients in a small bowl. add a pinch of cayenne. Taste and adjust the seasoning.
6. Collect the plates and set them on the demonstration table. have students gather around the demonstration table. ask two students to arrange the oranges on the serving dish and have another student cover the orange slices with a thin layer of radishes, olives, and chopped onion. ask another student to drizzle with the vinaigrette. Garnish with arugula leaves or chives (snip with scissors over the platter).
7. allow students to serve themselves and eat while discussing how the divergent tastes come together in this salad.
8. Clean up materials. if you have a school or classroom compost or worm bin, place the food scraps there.

Uncovering Cover Crops

preparation Time: 10 minutes
Total Lesson Time: 20 to 30 minutes

Background

Farming requires a close connection to the seasons, as temperature and precipitation change over the course of the year, so do farm activities. In California, spring is a time for getting the soil ready for planting.

Farmers who practice sustainable agriculture often use a technique called *cover cropping*, which uses nature to help prepare the soil for planting. Cover cropping is the practice of growing plants to cover otherwise fallow fields with crops that help to build soil fertility. Before the cover crop goes to seed, it is tilled into the soil in a process called *green manuring*.

Cover cropping and green manuring improve soil by:

- increasing the nutrient content of the soil.
- decreasing the leaching of nutrients that occurs when water runs through the soil.
The roots of cover crops act as a net to hold the soil and use the water, thus preventing the water from leaching the nutrients out of the soil.
- holding the soil in place, reducing erosion.
- providing channels for water percolation, worm and bacteria movement, and gas exchange.
- reducing weeds by choking unwanted plants or shading low-lying weeds that need sun to grow.
- reducing the extremes of heat and moisture that can affect bare soil.
- loosening the soil and improving its texture.

Farmers use many different kinds of cover crops, depending on what they plan to plant in their fields. Common cover crops are legumes (including vetch, sweet peas, and fava beans) and grasses (including grains, such as wheat, rye, and sorghum). Mixes that include several different grasses and legumes are common. Some farmers let cover crops flower before tilling the plants under because the flowers attract beneficial insects.

Objectives

Students will be able to:

describe differences in results when watering bare soil compared with grassy soil.

Name at least two ways that cover crops can help soil.

Materials

For the class:

- 1 watering can with sprinkle head (or empty tin can with holes punched in the bottom with a nail)

water

**Preparation**

Find two different 3-foot by 3-foot areas on the school grounds for students to observe: one with bare soil and the other with grassy or weed-covered soil. if possible, both areas should be level. mark each area with string or yarn.

Doing the Activity

1. Take students to one of the two different areas. ask them what they think will happen when you sprinkle the area with water from the watering can (or from a tin can with holes punched in the bottom). sprinkle water on the entire area and have students observe for about 5 minutes what happens. does the water carry away soil? does the water sit on top of the soil? does the water percolate into the soil?
2. ask students to describe what they observed.
3. Take students to the other area and ask them what they think they will observe when you sprinkle this area with water. if they think there will be differences in their observations, ask them their reasons for thinking so. sprinkle water on the entire area and have students observe for about 5 minutes.
4. ask students to describe what they observed.
5. Back in the class, explain to students what cover crops are and ask students why farmers might use cover crops.

Heath Family Farm



It might seem strange that such sweet fruit as oranges and tangerines are grown right next to snow-covered mountain ranges, but cold weather makes citrus fruits develop their sugar content.

The majestic snowy peaks of mount shasta and mount Lassen stand in the background as the heath family—ron, melanie, and their two grown children, zachary and marisa—perch on their picking ladders reaching through lush green foliage for their bright navel oranges.

“We get real nice, sweet oranges here,” says ron heath. “This cold really brings up the sugar.” he adds that orange and tangerine trees develop and ripen their fruit in winter temperatures of 32 to 60 degrees.

sometimes his fruit even become ice-coated and look like round orange popsicles. But although this cool climate benefits the heath Family Farm most of the time, it can also spell trouble if the weather stays freezing for a prolonged period of time.



in 1990, the farm was hit by a freeze that not only wiped out most of that year's crop but also killed 40 percent of the trees. For the first few days and nights of the subfreezing weather, the heaths turned on their irrigation sprays. They do this in freezing weather because a thin coat of ice protects the fruit and foliage. But when the subfreezing weather continued to hold its icy grip on the region, the trees and fruit on the heath Family Farm became frozen waterfalls and looked like eerie ghosts of ice.

"mother Nature can be rough on us," ron heath comments wryly. The heaths say that the worst part of the disaster was the waiting that followed. Not until nine months later could they tell which of the devastated trees were totally lost and which would show signs of life—a little bud or root shoot. With the help of friends, including his wholesaler, who formed a work party to help clean up the damage, the heaths were able to recover from the freeze.

Now the heath Family Farm once again thrives with Valencia oranges, satsuma tangerines, Clementine mandarins, blood oranges, and some sour oranges that are good for making marmalade.

The 19-acre farm is thickly carpeted with soft grass, creating a parklike setting for the rows of older trees, which are as much as 30 feet tall, as well as for the younger, head-high citrus trees.

part of this parklike setting is created by the heaths' organic practices. To combat infestations of scale, a tiny insect that causes disease, the heaths regularly release scale-eating wasps and ladybugs on their farm. To keep up the fertility of the soil, they spread aged horse manure around the orchard and plant cover crops of bell beans and grass. The heaths are so firmly committed to organic farming that they helped pioneer the organic certification standards for citrus growers.

The fright of the 1990 freeze made the heaths rethink some of their practices. They have planted citrus that ripen in early winter as well as a wider variety of trees. ron has been experimenting with the new red navel oranges, the Cara Cara, which originated in Venezuela, and some new varieties of mandarins that can be harvested in the early, middle, or late part of the season.

although ron and melanie did not start out as farmers (ron worked as a full-time jeweler), when they bought the farm in 1978, they were already committed to organic practices. They also knew it would be a great place to raise their children. Keeping the farm organic and on a small scale allows them to manage the production and operation of the farm as a family. Their son, Zachary, a student at Chico state University studying plant and soil science, sees the farm as the future for himself and his fiancée: "When i was traveling in Germany, i saw farms that had been in the same family for hundreds of years. That appeals to me."