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Growing

# PEONIES

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# GROWING PEONIES

By HENRY M. CATHEY, Crops Research Division, Agricultural Research Service

Peonies are hardy perennial plants. They need little care and live through severe winters. After they become established in a garden, peonies bloom each spring for many years. They are the backbone of the perennial border and make good cut flowers.

Plant peonies in clumps of three, in masses, or among other plants. Planted singly, they contribute little to good landscaping. Like iris, daylily, and chrysanthemum, their leaves make an excellent background for small plants; grow them in beds at least 4 feet wide. Group them with phlox and plantain lily for contrast of foliage and time of blooming.

Most peonies are grown in States north of South Carolina and Texas. Some varieties will grow farther south, but they seldom bloom because winter temperatures are not low enough for flower buds to develop properly.

## KINDS OF PEONIES

Two kinds of peonies are grown. Garden, or herbaceous, varieties have full, bushy stems that grow 2 to 4 feet tall. Tree peonies often grow to eye-level height on woody stems with few branches.

### Garden Peonies

Garden peonies are grouped into five types according to the shape of

the petals. These types are single, semidouble, double, Japanese, and anemone. Each type includes many varieties.

Single, or Chinese, peonies have one row of broad petals that surround a cluster of yellow, pollen-bearing stamens. Other flower types have central petals in the place of stamens. Semidouble peonies have broad central petals; double peonies have central petals that are as wide as the outer ones; Japanese peonies have long, thin central petals; and anemone peonies have broad central petals.

Peonies bloom in May and June. Colors are white, yellow, cream, pink, rose, and deep red.

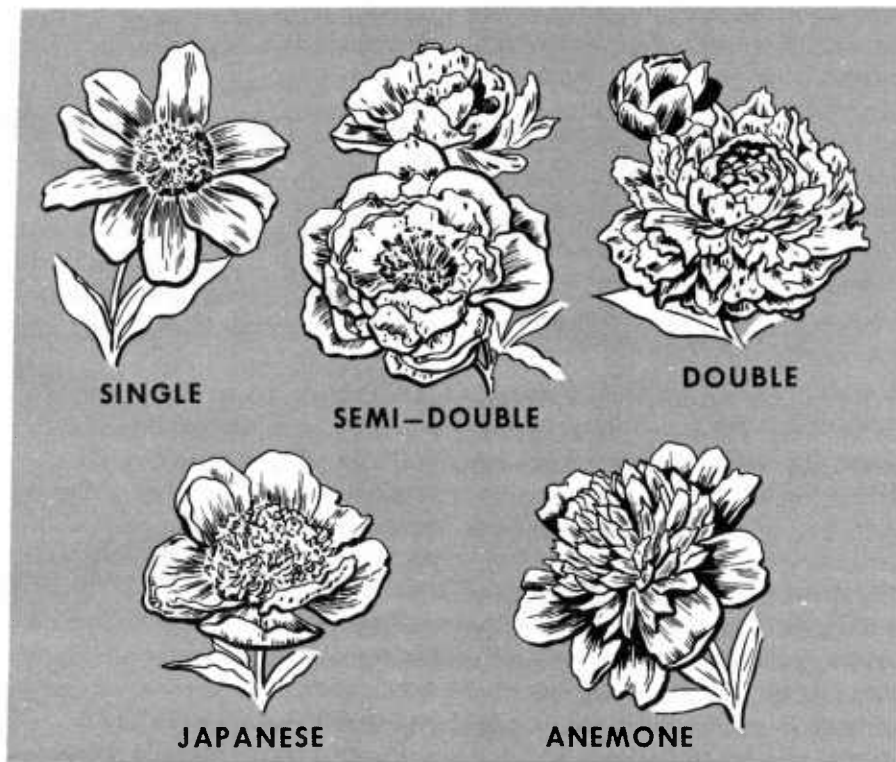
Some popular, dependable varieties of garden peonies are: Early blooming—Festiva Maxima (white); midseason blooming—Mary Brand (red) and Mikado (red); late blooming—Myrtle Gentry (pink) and Sarah Bernhardt (mauve rose).

### Tree Peonies

Tree peonies produce many flowers on a single shrublike plant. Colors are yellow, pink, white, rose, crimson, scarlet, black, and purple. The centers of the flowers are yellow, pink, or red. Petals are mottled at the base.

The stems of these peonies stay alive all winter. They are less common than garden types.

## Types of Peonies



Many varieties of tree peonies have been developed. Some of the dependable ones are Argosy, Flambeau, Flora, La Lorraine, Souvenir de Ducher, and Yeso-no-mine. All of these bloom early.

### HOW PEONIES GROW

Peonies grow from tubers, or underground stems, that store food produced by the leaves. New growth develops from buds, or eyes, on the tuber. A single tuber may have many eyes, but it must have at least three to thrive.

Plants grown from tubers with less than three eyes may take 3 to 5 years to produce more than a few

small blooms. But, peonies grown from tubers with three to five eyes may flower well the second year after planting.

Immature shoots are bright red, succulent, and easy to damage; mature leaves are dark green and shiny.

Peonies develop a taproot and many short, thin roots. The taproot is a straight, thick, central root that extends farther into the soil than other roots. Often, it grows 12 to 15 inches deep.

You can buy hybrid tree peonies. They produce larger flowers than regular tree peonies.

Both hybrid and regular tree

peonies have a serious fault. The stems are weak at the top.

Tree peonies grow either from seed or from grafts. When grown from seed, they take at least 6 years to bloom. Plants grown from grafted tubers usually bloom the third year after planting. Because grafting is difficult, the average gardener should buy tubers that already have grafts on them.

## BUYING PEONIES

Buy peony tubers that have three to five eyes. Tubers without eyes, or with only one or two eyes, often rot in the ground. And tubers with more than five eyes often fail to produce large flowers.

Tubers are sold in late summer and fall. Some dealers sell fully grown peonies in the spring, but these plants are expensive and few of them live through the dry weather of summer. It is better to buy and plant tubers in the fall.

Select peonies whose colors will harmonize with your garden. Since color combinations often change, selection depends on personal taste. See the flowering plants at neighborhood gardens, nurseries, or botanical gardens before selecting colors.

## PLANTING PEONIES

Plant tubers of both garden and tree peonies in September or early October so they will have time to become established in the soil before winter.

You can plant fully grown peonies in the spring. They are much harder to keep alive than are tubers planted in the fall because they are already growing when you plant them.

Plants need well-drained soil. They grow best in slightly raised beds that provide good drainage. Roots quickly rot in soil that holds water around them. Peonies thrive in deep, fertile, clay loam, although they will survive in any good garden soil.

Although peonies will grow in spots that are shaded 2 or 3 hours each day, they will not produce large flowers when they grow beneath trees or shrubs because the roots of these plants take up water that peonies need.

Plant peonies where they will be sheltered from strong winds. However, good air circulation helps control fungus diseases.

Peonies need carefully prepared beds because they remain in place for many years. They will not grow well in poorly prepared soil.

Prepare the soil 2 to 4 weeks before planting time, so that it will settle thoroughly by the time you plant.

Spade organic matter—compost, well-rotted manure, or peat moss—into the soil.

Dig a hole 18 inches across and 18 inches deep for each tuber. Space the holes so that the plants will be at least 3 feet apart. Pile loose soil at the side of the hole and break up all lumps.

Fill the hole about half full of soil mixed with a handful of 10-6-4

fertilizer. Leave the rest of the soil at the side until planting time.

Plant a garden peony tuber with the uppermost eye not more than 2 inches below the ground surface. Put a little soil around the tuber and water thoroughly. Then fill the hole with the remaining soil, and press it down firmly. Water again to settle the tuber.

Plant a tree peony tuber with 4 or 5 inches of soil covering the graft. You can recognize the graft by the ridging on the stem and the different texture of the bark. Deep planting allows the grafted section to establish its own roots in the soil. Add soil and water in the planting hole the same way you would for a garden peony.

## CARING FOR PLANTS

### Mulching

Mulch peonies in both winter and summer. Winter mulch prevents al-

ternate freezing and thawing that pushes plants out of the soil. Summer mulch keeps the soil from drying out and prevents weed growth.

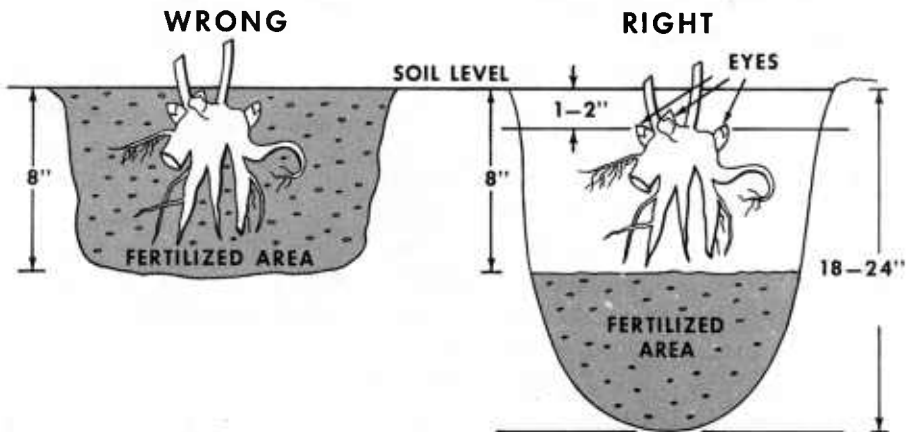
Immediately after the ground first freezes, cover the clumps with 1 to 2 inches of straw or peat moss and a layer of evergreen boughs.

In the spring, when the danger of freezing has passed, remove and burn the winter mulch, and spread a summer mulch of straw or peat moss 1 to 2 inches thick around the plants. In the fall, remove and burn the summer mulch before you spread a winter mulch.

### Weeding

Weeds use water, fertilizer, and space that peonies need. Ordinarily, a summer mulch will keep weeds from growing. But if you must remove them, hoe only deep enough to cut off the weeds. Do not disturb the peony roots.

In early spring and again in mid-summer, dig up a strip of ground



Plant peony tubers at the proper depth in a carefully prepared planting hole.

between your peony beds and any nearby trees or shrubs to limit the growth of tree and shrub roots. Dig at least 3 feet from the peony clumps.

### Watering

Water peonies frequently after tubers are planted in the fall and again during the spring and summer of the first growing season. Frequent watering is needed the first season to establish the roots in the soil.

After the first year, normal rainfall usually provides enough water except during long dry periods. In dry weather, water peonies often enough to keep the soil slightly damp, but not wet. Allow the soil to dry between waterings.

### Fertilizing

Fertilize peonies moderately if you want them to produce large flowers. The first spring after planting, apply a handful of 10-6-4 fertilizer to the soil around each clump before the shoots emerge.

Be careful not to get fertilizer directly on the roots, stems, or leaves of the plants. It will burn them.

In the spring of subsequent years, apply fertilizer to the soil when the flower buds are pea size. For maximum flower production, drench the soil with a liquid fertilizer (20-20-20 or equal) 1 teaspoon in a gallon of water or a solution prepared from 1 cup of dried sheep manure in a gallon of water. Repeat the appli-



Stake peonies with a circular wire ring covered with green paper or plastic. Staking allows the plant to keep its natural shape.

cation once or twice during the growing season.

If you fertilize your plants well, you can leave them in place for 10 to 15 years before they become too crowded.

### Staking

Stake plants when they grow tall. Specially made stakes are available in garden supply stores, but you may improvise with small limbs, wood dowels, bamboo, or wire. Select stakes that will be 6 to 12 inches shorter than the grown plant.

Sink the stakes behind the plants where they will be out of sight. Never put them in the center of the clump. Loosely tie the plants to the stakes, using wire covered with green paper or plastic. Do not use string or uncovered wire. String is

unsightly, and uncovered wire breaks the stems.

Tie the plant, making a double loop of the wire with one loop around the plant and the other around the stake. Never loop the wire around both stake and plant—the plant will hang to one side and the wire may girdle the stem.

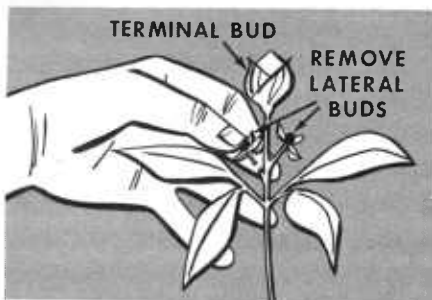
### Disbudding

Remove the side buds on each stem as soon as they are visible. If you remove them later, the stump will be unsightly. Roll the buds out with your finger to keep from leaving scars on the stem.

Leave the terminal bud on each stem tip. Each will develop a large, showy bloom.

### Cutting

Cut flowers as soon as they fade so that seeds will not develop. Seeds use up needed plant food. Leave all foliage on the stems; the plants need green foliage for flowering the next year.



Disbud peonies by rolling the buds out with your finger.

When the foliage of garden peonies turns brown in the fall, cut the plants back to ground level. Burn the cut leaves and stems.

Tree peonies usually are grafted on garden, or herbaceous, peonies and they will not overwinter if cut back to ground level. However, you must remove all shoots that grow from below the soil line. Otherwise, the plants will grow like garden varieties. Allow flowers to develop only on the woody stems.

### FLOWERS

A few flowers appear 2 or 3 years after planting. When plants are well cared for, blooms increase in number and quality each season for several years.

Peonies will bloom earlier in the season if you plant them where they have a southern exposure and place a protective screen around the beds. They will bloom later if you cover the beds during winter with snow.

If you want flowers for indoor arrangements, cut the stems when buds begin to unfold. Often, they can be kept in a refrigerator for 1 to 3 weeks. When cut flowers are handled, the stems may crack and fall over. Attach each stem to a florist wire to support the flower.

Pale pink flowers are at their best when they open in shade. Put a plastic or cheesecloth screen over the plants, or cut the budding stems and let them open indoors.

When you cut flowers for indoor arrangements, try to leave two-

thirds of each cut stem. And, where possible, leave three leaves on the stump of each stem you cut. The leaves store food in the roots for next year's growth.

## FAILURE TO BLOOM

Often, peonies fail to bloom although roots and tops appear healthy. If your plants do not bloom, look for signs of disease, and examine the growing site. Too much shade—especially in dry soil under trees—and poor drainage may prevent blooming.

Peonies will not bloom if you plant tubers too deep in the soil or cut back the plants in the fall before the foliage turns brown.

Other causes of failure to bloom are lack of growing space because of tree or shrub roots and late frosts that kill flower buds in the spring.

## DIVIDING PEONIES

If peonies are originally planted in a favorable site with adequate spacing, they should grow well for years without dividing.

Divide and replant peonies only when they become crowded, usually in 10 to 15 years. Never divide a plant that is less than 3 years old because transplanting upsets the plants and retards flowering for several years.

Divide plants in early fall. Carefully dig around and under the plants. As you dig up the clumps, be careful not to break off the roots, especially taproots.

With a heavy stream of water, wash off any soil that clings to the clumps. Strip off the leaves.

Cut tubers apart with a sharp knife that you have sterilized over a flame or in alcohol. Each section should have three to five eyes. Be sure to leave a taproot attached to each tuber that has eyes on it. As you cut, look for signs of diseases. To keep cuts free of disease organisms, dust cuts with zineb; you can buy it in large garden supply shops.

Replant tubers immediately in a new area. Follow planting directions given on page 4.

## DISEASES

Peony diseases disfigure foliage, reduce flowering, and rot the roots. Buy disease-free stock from a reliable nursery. Plant resistant varieties if they are available. To prevent the spread of foliage diseases, water plants early enough in the day for foliage to dry before dark.

Most fungus diseases can be controlled by fungicides applied before the disease appears or at first signs of infection, repeating every 7 to 10 days and after rains. More frequent applications may be needed during periods of damp weather.

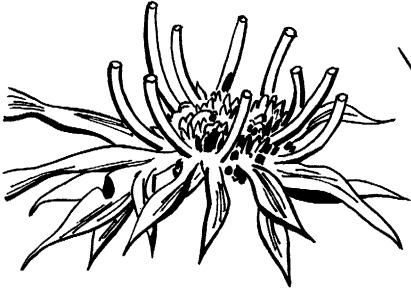
### Fungus Diseases

#### *Botrytis Blight*

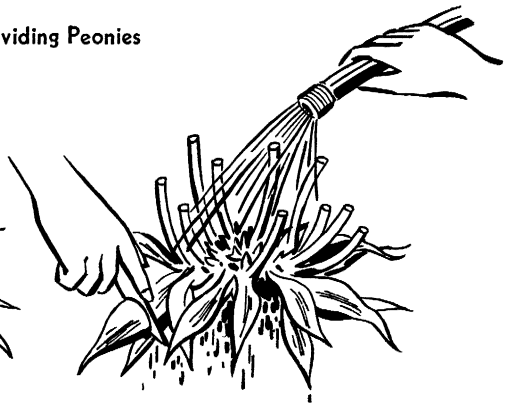
Botrytis blight is caused by a fungus that overwinters in dead peony leaves, stems, and roots. The



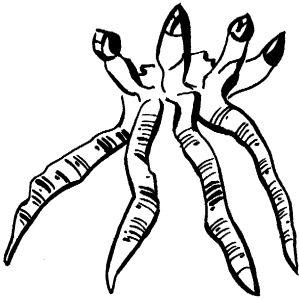
## Dividing Peonies



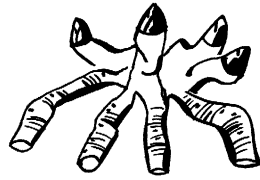
1. The tubers on established plants look like a collection of fat sweetpotatoes.



2. Wash away all soil and cut away any damaged parts.



3. Cut clump apart so each piece will have three to five eyes and strong tubers.



4. Shorten tubers to 4- to 6-inch stubs.

disease usually appears in midsummer. It is most damaging in cool, rainy weather.

Early in spring, infected shoots turn gray-brown. Mature stems rot at ground level. A mass of gray-brown feltlike spores appear on leaves and stems. Young buds dry up, and shoots and mature buds and flowers soften and rot. Infected petals drop onto healthy leaves and spread the disease.

*Control.*—Remove diseased parts as soon as you notice them. Pull out and burn badly infected plants. Cut plants to the ground after the foliage turns brown in the fall. Burn dead material.

As a preventive aid, spray just as the new shoots emerge in very early spring. Repeat two to three times at 10-day intervals and during prolonged periods of wet or humid weather. Use 1½ to 2 tablespoons of

65 to 76 percent zineb or ferbam; two tablespoons of basic copper sulfate (containing 53 percent of metallic copper equivalent); or one-eighth pound of dry bordeaux mixture (containing 12.75 percent metallic copper equivalent) per gallon of water. Do not apply during blooming period.

Select varieties that are resistant to botrytis blight.

### **Phytophthora Blight**

Phytophthora blight is less common than botrytis blight, but it causes more damage to individual plants. Infection spreads down the stem from the buds. Stems dry up and turn dark brown and leathery. Plants rot at the ground line, or crown, of the plant.

*Control.*—Remove diseased parts as soon as you notice them and pull out and burn badly infected plants. Cut plants back to the ground in the fall. Burn dead material.

Spray new shoots with zineb. Use 1 to 1½ tablespoons of 65 to 75 percent zineb for 1 gallon of water. Repeat at 7- to 10-day intervals.

### **Wilt**

Wilt is caused by a fungus that lives in water-conducting tubes of stems. Infected plants wither and die quickly.

*Control.*—Dig plants out immediately. Do not replant peonies in the same spot until at least 3 years after wilted plants have been removed.

### **Leaf Blotch**

Leaf blotch, or measles, is a disease that usually occurs after

plants bloom. Leaf blotch fungus overwinters in dead plants. Infected plants have small red or reddish-brown spots on stems, leaves, and flowers. The spots on the leaves later enlarge into purplish-brown blotches on the upper surfaces. Dull brown blotches appear on lower surfaces.

*Control.*—Cut plants to the ground in the fall. Remove diseased leaves as they appear in the spring and summer. Spray foliage with 1½ tablespoons of 50 percent captan in 1 gallon of water every 7 to 10 days, beginning when leaves unfold.

### **Other Leaf Spot Diseases**

One type of leaf spot produces circular spots with grayish-white centers and reddish-brown borders. The spots appear on leaves and stems. Another disease produces long, reddish spots on the leaves. Later, the centers of the spots turn gray; sometimes edges of leaves pucker.

*Control.*—In the fall, cut plants to the ground. In the spring, remove diseased leaves as they appear. Spray foliage with 1½ tablespoons of 50 percent captan in 1 gallon of water every 7 to 10 days, beginning when leaves unfold.

### **Crown and Stem Rots**

Crown rot is caused by an unidentified fungus that rots the area where roots join stems. Sometimes small, circular spots appear on the roots of infected plants.

Two stem rot diseases—each caused by a fungus—attack peonies. The diseases rot shoots and full-grown stems. They cause white molds on the surfaces of stems and leaves. Both fungi produce sclerotia—small brown or black resting bodies about the size of a mustard seed. Sclerotia overwinter in stems or on roots. They reinfect new shoots in the spring.

*Control.*—In the fall, dig up infected plants. Cut away decayed areas. Burn badly damaged plants. Soak the crown-rot-infected roots in a corrosive sublimate solution. Prepare a 1 to 1,000 solution according to the label directions, and soak roots for 30 minutes, then plant immediately.

Replant treated peonies in a different spot in your garden. If you want to put plants back in the same place, remove a few shovels of the contaminated soil and replace with new soil.

If you use manure in peony beds, mix it thoroughly with the soil around the clumps. Do not use it on top of the crowns; used this way, manure fosters development of crown rot.

### **Lemoine Disease**

Lemoine disease is a root disease. Its cause is not known. Infected plants do not produce flowers. Shoots are weak. Small knobby swellings appear on the small roots, and soft yellow areas appear on the large roots.

*Control.*—Dig up and burn infected plants.

### **Root Knot**

Root knot, or root gall, is caused by nematodes. Nematodes are tiny worms that feed on many kinds of plants. They are most damaging where winters are mild, where the growing season is warm, and where the soil is light.

Nematode-infected plants lack vigor. They produce only a few small flowers. Stems are short and thin. Leaves are light green. Large roots become swollen and stubby. Small roots develop knobby out-growths.

*Control.*—Dig out and burn heavily infected plants. If possible, plant lawn grass on the infested soil and let it grow 2 years before you replant peonies.

You can sterilize the infested soil with a nemotocide if you wish to replant peonies within a few weeks.

For information on the use of nemotocides, ask your county agriculture agent or see Agriculture Handbook 286, "Chemical Control of Plant-parasitic Nematodes." You can obtain a copy of the handbook from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, at 15 cents a copy. Include your ZIP Code in your return address.

If only one or two plants are infected with nematodes, dig up infected plants in late summer and burn them. Take up and discard the soil around them. Do not let this soil drop in other parts of the garden. Replace with fresh soil.

## Virus Diseases

Mosaic is the most common virus disease of peonies. It produces yellowish blotches and rings on leaves, but it does not cause much damage. Infected plants are not dwarfed or deformed.

Crown elongation, another virus disease, causes many long branched crowns to develop from the tubers. Plants develop many slender, weak shoots. These dwarfed shoots produce no flower buds.

Leaf curl, or curly leaf, virus causes plants to become dwarfed. Leaves grow close together on the stem and curl up. Leaf surfaces crinkle. No flower buds form.

*Control.*—Dig up and burn plants infected with any of the virus diseases.

## INSECTS

Insects seldom attack peonies. Those that sometimes damage the plants and flowers are rose chafers, stalk borers, and flower thrips.

For information regarding the identification and control of these insects, see Agriculture Information Bulletin 237, "Controlling Insects on Flowers." This publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, at 45 cents a copy.

## PRECAUTIONS

Pesticides used improperly may cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Some States have special restrictions on the use of certain pesticides. Before

applying pesticides, check State and local regulations.

Keep pesticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them.

When handling a pesticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of pesticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of pesticide dusts or mists.

Avoid spilling pesticide concentrate on your skin, and keep it out of your eyes, nose, and mouth.

After handling a pesticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying a pesticide.

If you get a concentrate on your skin, wash it off immediately with soap and water. If you spill a concentrate on your clothing, remove the clothing immediately and wash the skin thoroughly. Launder the clothing before wearing it again.

Avoid drift of pesticide to nearby wildlife habitats, bee yards, crops, or livestock. Do not apply pesticides under conditions favoring drift from the area to be treated.

Many pesticides are highly toxic to fish and aquatic animals. Keep pesticides out of all water sources such as ponds, streams, and wells. Do not clean spraying equipment or dump excess spray material near such water.

Do not apply pesticides to plants during hours when honey bees and other pollinating insects are visiting them.

Dispose of empty pesticide containers at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies. If you have trash-collection service, wrap small containers in heavy layers of newspapers and place them in the trash can.

It is difficult to remove all traces of herbicides from equipment. For this reason, do not use the same equipment for applying herbicides that you use for insecticides and fungicides.



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