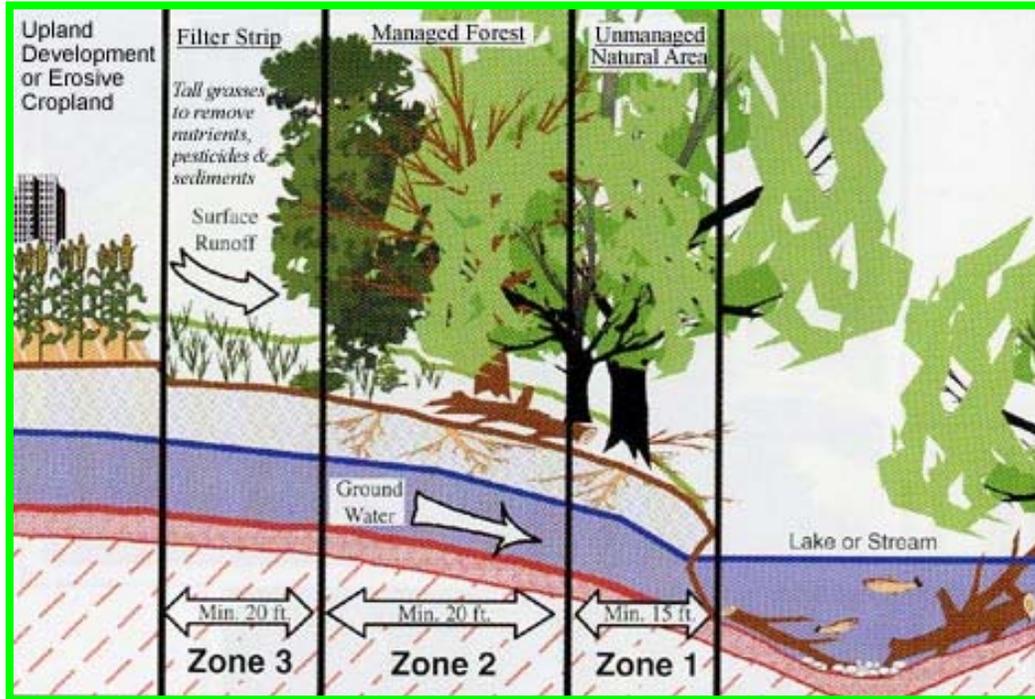


SPECIFIC USE GUIDELINES

TABLE OF CONTENTS

SPECIFIC USE GUIDELINES	1
<i>Protection of Riparian Corridor, Waterways and Buffer Zones</i>	2
<i>Road Rights of Way</i>	3
Benefits	3
Cultural Control Methods	4
Physical/Mechanical Control Methods.....	4
Biological Control Methods.....	4
Chemical Control Methods	4
<i>Developed Landscapes</i>	4
Planning and Design	5
Drainage.....	5
Plant Selection	6
Maintenance impacts.....	6
Environmental Issues	7
Plant Health.....	7
Mulch.....	8
Automatic Irrigation Systems.....	8
<i>Lawns & Turf</i>	9
Drainage.....	10
Healthy Lawn Care	11
Simple steps in Lawn & Landscape Maintenance.....	11
<i>Natural/Open Spaces</i>	14
<i>Attachments</i>	14
<i>Pesticide Handling</i>	15
Pesticide Storage Facilities	15
Building a New Storage Facility	16
Modifying an Existing Storage Facility	17
Mixing and Loading Practices.....	17
Spills and Cleanup Practices	18
Application.....	18
Unwanted Pesticide and Container Disposal.....	19
Other Management Considerations	19
<i>Attachments</i>	20

Protection of Riparian Corridor, Waterways and Buffer Zones



A riparian corridor is unique plant community consisting of the vegetation growing near a river, stream, lake, lagoon or other natural body of water. It serves a variety of functions important to people and the environment as a whole by:

- Preserving water quality by filtering sediment from runoff before it enters rivers and streams.
- Protecting stream banks from erosion.
- Providing a storage area for floodwaters.
- Providing food and habitat for fish and wildlife.
- Preserving open space and aesthetic surroundings.

Santa Clara County recognizes the special sensitivity of the riparian corridors ([Santa Clara County Riparian Protection Ordinance](#); [Study](#)), freshwater rivers, streams, lakes, ponds, and drainage systems. Pesticide use and pest management activities will focus in an effort to minimize the potential for pesticides to enter waterways and impact these sensitive habitats, including impacts to threatened or endangered species. The County IPM Manager will work with the Department IPM Coordinators, Fire Marshal, Department of Agriculture and Planning office of Environmental Resource Agency to establish guidelines and limitations regarding pest management and pesticide application/maintenance methods and materials for riparian corridors, waterways and buffer zones.

It is the intent of that the IPM guidelines should complement the special management zones and buffer zones as established by the County and various State or Federal agencies. Critical or sensitive areas ordinances of local jurisdictions should be consulted as well; the most restrictive rules or guidelines should be the ones followed.

Pesticide Use Guidelines (Under development, additional information on this subject will follow soon):

- Riparian Corridors
- Within Streams
- Within Pond and Lake Areas
- Within Biofilters and Pollution Reduction Facilities (PRFs)
- Within Bioswales
- Special Exception Areas
- Water ways and Buffer Zones at Golf Courses

Road Rights of Way

Roadside vegetation management within the Santa Clara county area varies from urban to rural settings. It is the intention of Department of Roads and Airport under this ordinance to approach vegetation management from an IPM standpoint that encourages protection of air and water quality and endangered species habitat.

These specific road right-of-way guidelines apply generally to undeveloped roadways without curbs and sidewalks, and do not apply to such developed street areas as landscaped medians, islands and planter strips; the latter areas are covered under the developed landscapes guidelines.

Roadside vegetation maintenance activities are subdivided into the four basic control or management methods that cover the scope of integrated pest and vegetation management. These four areas of control are ***cultural, physical/mechanical, biological, and chemical***. Specific actions within each area are considered Best Management Practices for road right-of-ways.

Benefits

All four of these integrated options, when used alone or in conjunction with each other, provide positive outcomes to essential functions of the roadway and the safety of the traveling public. These benefits include:

- Public safety
- Improved drainage
- Reduced icing
- Reduced fire hazard
- Promotion of non-motorized use

- Reduction in the spread of noxious weeds and undesirable vegetation
- Limited erosion
- Increased biofiltration
- Improved visibility of signs and structures
- Facilitation of the inspection and maintenance of other features and structures
- Improved visibility of shoulder for emergencies and obstacles
- Increased sight distance
- When used in conjunction with each other, lower herbicide use.

A few examples of these practices are as follows. These practices are discussed in details under Best Practices and Alternative Practices channel of SCC IPM Web.

Cultural Control Methods

- Hydro seeding products should not enter flowing water, wetlands, ponds, or lakes.

Physical/Mechanical Control Methods

- Mow grass and brush at heights that avoid "scalping" of soil.
- Mow native vegetation at heights that promote its growth.
- Carry spill kit appropriate for equipment used.

Biological Control Methods

- Incorporate biological controls; such as use of beneficial predators, into road IPM practices wherever appropriate.
- Obtain appropriate permits.

Chemical Control Methods

- Use only as part of an integrated approach to pest and vegetation management.
- Follow all [California Department of Pesticide Regulations](#) pertaining to pesticide application.
- Follow the Riparian Corridor, Waterways and buffer zone guidelines, when within 25 feet of any waterway.
- Use only pesticides from Santa Clara County "Approved List of Pesticides."
- Follow all label directions.
- Do not spray in windy or wet conditions.
- Do not spray within eroded areas where vegetation would be beneficial.
- Carry spill kit appropriate for equipment and pesticide used.

Developed Landscapes

Many parks, public grounds, yards surrounding public buildings and other facilities, and groomed roadside medians, islands and planter strips along urban streets are developed landscapes to varying degrees. These landscapes require careful design and maintenance in order to maximize their desired uses while

minimizing pest problems. The following specific guidelines apply to developed areas. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web:

Planning and Design

A successful landscape requires comprehensive analysis and planning in a variety of areas when anticipating new site or redevelopment projects. Consider the following when planning or designing a landscape:

- Evaluate physical site characteristics (e.g., soil characteristics, slope issues, and proximity to sensitive areas, etc.).
- Consider how the site will be used and how it will affect neighboring properties.
- Identify existing plants for retention or salvage, as appropriate.
- Develop a program theme with stakeholders.
- Identify maintenance impacts.
- Debrief completed project with team.

Drainage

Healthy plants are easiest to maintain when site and soil conditions are proper for the plants. Drainage patterns, slope, sun exposure, soil type, nutrients present, plant species present, and patterns of use all play a role in determining how plants will grow in a particular location.

Most plants do not grow well in saturated soil. Plants need two types of drainage, surface and sub-surface. First, planting areas need a surface shape that has no low spots where water can puddle and a slight slope so that some water from heavy rains can run off. Second, plants need a soil profile that is well drained, where water can percolate through to below the root-zone. Properly designed drainage systems can help provide the correct environment for growing healthy plants. The following are design guidelines to assist in site drainage plan design. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web:

- Ensure the project manager and maintenance supervisors have provided adequate staffing and funding for ongoing maintenance of any drainage plan.
- Minimize alteration of natural drainage patterns around existing vegetation that is to be preserved.
- Conform to natural drainage patterns.
- Provide opportunities for surface runoff of water to replenish the groundwater table.
- Minimize soil erosion by dispersing water flow across the ground surface.
- Reduce water velocity and increase soil permeability with plantings and mulch.
- On steep slopes or areas that are prone to landslides, avoid using plants that require supplemental irrigation.

- Implement erosion control devices as a form of preventative maintenance, e.g., application of compost or other organic soil amendments, slope protective material, protective berms, silt fences.
- Avoid installation of permanent irrigation systems in landslide hazard areas.

Plant Selection

The successful landscape or grounds maintenance of an area is dependent on the initial plant selection in the design phase. Plant selection should be guided by four criteria. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web:

- Aesthetic and thematic schemes. Use of indigenous native plantings should be considered first, especially in large areas. The full range of horticultural species and cultivars may be appropriate for high use, high visibility landscapes.
- Match environmental conditions of the site with the cultural requirements of the plant. It is essential that the cultural and environmental requirements of the plants be matched with the site conditions.
- Healthy landscapes are easiest to maintain when site and soil conditions are proper for growing the plants chosen.
- Drainage, slope, sun, soil texture and structure, nutrient levels in the soil, plant species and cultivars present, and patterns of use all play a role in determining how plants will grow in a particular location.

Maintenance impacts

These practices are discussed in details under [Best Practices and Alternative Practices](#) of SCC IPM Web.

- Pruning: To avoid routine pruning, select plant cultivars based on their size and shape when mature. When specific site issues override pruning concerns and when associated resource impacts are identified, plants requiring frequent pruning may be considered. Plants such as roses and sheared hedges may be appropriate for specialty gardens and selected focal points.
- Weed management: Plant selection and placement should embrace IPM principles. Vigorous groundcovers, mulches, shade canopies and plant spacing are factors that can reduce the need for weed control. Noxious weed laws and quarantines should be followed. In existing plantings, IPM principles should be applied to weeds and other pests.
- Plant pest management: In new plantings, use species and cultivars that are resistant to insect infestations and plant disease. Only in limited situations (example: replacement of ornamental historical plantings) should exceptions occur. It is important to follow IPM principles.

Environmental Issues

These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web. Environmental issues to be considered in plant selection include:

- Provide native wildlife habitat whenever possible, such as when adjacent landscapes currently provide habitat.
- Select plants with water needs appropriate to the site. Limit high-water-use plants to specialty plantings or where the natural water table will support the plants without supplemental irrigation. Group plants with similar water needs together.
- Avoid plants that will require significant pest management. Select native plants or disease resistant cultivars and avoid insect-prone species.
- Avoid plant species with invasive growth or seeding habits. See noxious weeds section for more guidelines.
- Prevent surface soil erosion by covering soil with plants or mulch.
- Select plants with similar horticultural needs for groupings.
- Avoid the use of commercial wildflower seed mixes. These tend to contain weed seeds and introduce exotic invasive plants and noxious weeds. If a seed mix is used, use only weed-free mixes from reputable local sources.

Plant Health

Healthy plants are better at reducing pest infestations and out-competing weeds, and they need less water. The following are guidelines for environmentally responsible maintenance of plant health. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- Plant in the fall, when feasible, to take advantage of fall and winter rains and to reduce the need for supplemental irrigation.
- Prior to planting, assess and monitor soil conditions. Soil tests are the most effective method of determining soil conditions. Monitor regularly and modify practices accordingly. If necessary, amend the soil appropriately; include organic material such as compost.
- When replanting beds or turf areas, mature compost (about 20 percent by volume) should be incorporated to a depth of 8 to 12 inches or, preferably, the full rooting depth of the plants to be installed.
- Base fertilizer applications on soil test and plant requirements. Fertilizer sources should be chosen to minimize leaching and toxicity. Natural organic and synthetic slow-release fertilizers should be considered before soluble fertilizer sources. Avoid applying phosphorus unless a soil test indicates that it is necessary.
- Avoid over-watering plants to conserve water, improve plant health and minimize leaching into surface and ground water. Over-watering is a primary cause of plant disease and demise.

- Determine the seasonal evapotranspiration (ET) rate for the site and use it to estimate the amount of irrigation water needed to replace that lost as ET.
- Use weed-free compost, gravel and mulch materials.

Mulch

Use of organic material as a soil topping improves soil conditions in the following ways. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- Helps reduce evaporation
- Improves water infiltration
- Reduces run-off and erosion
- Enriches soil fertility and texture
- Immobilizes or degrades pollutants
- Inhibits the growth of competing, nutrient-absorbing weeds

The following are guidelines for using mulch in plantings:

- Do not apply mulches where they may migrate or leach nutrients or tannins into waterways.
- Maintaining a 2-inch minimum layer of mulch in planted areas is recommended.
- Mulch less zone around the base of tree trunks is recommended to discourage root-rotting fungi.
- Wood chips should be used whenever appropriate. On-site chipping simplifies the maintenance process by providing chips that are effective, free, readily available, and have a natural look. In addition, using wood chips generated on-site for mulch reduces the need to haul green-wastes, thereby saving energy. It should be noted that, where wood chips are used for mulch, nitrogen might need to be added (5 pounds/1000 square feet).
- Other acceptable materials include compost, shredded bark
- When purchasing mulch materials, specify that they should be "weed- and disease-free."
- Unless disease problems are present, allow leaf litter to accumulate upon the soil within -planted areas that are not intended to have a manicured appearance.
- Prevent weed infestations by covering mulch, soil and compost piles with plastic tarps, as needed.

Automatic Irrigation Systems

Efficient use of irrigation water conserves water and reduces runoff. Irrigation of landscapes is one of the most publicly visible landscaping activities, reinforcing the need for effective water management by public entities. Agencies should seek the advice of their local water purveyor for

conservation planning. The following guidelines will assist in conserving water for landscape maintenance. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- Identify site irrigation needs based on use, plant needs, soil permeability, and topography.
- Use water efficiently.
 - To achieve maximum efficiency, perform system maintenance and repairs. Check and repair all problems at system turn-on in the spring.
 - Inspect backflow preventers annually, consistent with state law.
 - Conduct a complete system audit during design and when major changes occur to the system.
 - Once an effective schedule is established, it should be monitored bi-weekly to avoid "brown outs."
 - Avoid irrigating in the heat of the day.
- Conserve water.
 - Reclaimed water is desirable where it is available to promote the conservation of limited potable water
 - Cut back on irrigation as weather indicates. Use historic evapotranspiration (ET) data for your area.
 - Reduce irrigation incrementally in late summer.
 - Many planting areas can be irrigated less as the plants mature and become established. Plantings designed with native or drought tolerant species should gradually be weaned from all irrigation on a 3 to 5 year schedule.
- Create a permanent irrigation record system that documents where, when and how much water was used to "fine tune" a system, rather than recreate it each year.

Lawns & Turf

Lawns and turf areas are an important subset of developed landscapes that demand specific attention regarding IPM implementation. Lawns are used for a variety of purposes. Lawn maintenance can significantly affect the environment in a negative way if not carried out with attention to proper environmental practices. The intended use of a lawn or turf area will determine many of the maintenance specifics. Healthy lawns can resist disease, pests and drought damage and can out-compete most weeds without reliance on chemicals. Properly maintained lawns also require less supplemental irrigation.

The following guidelines will assist in maintaining lawns and turf areas in an environmentally responsible manner. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- Assess the condition of the lawn or turf. Look for turf density, turf species present, percent weed cover, and color.

- Determine previous maintenance schedule and assess effectiveness. Consider whether acceptable results can be achieved at lower maintenance levels or significant improvements can be realized through minor program adjustments. The following areas should be addressed:
 - Soil testing and results
 - Mowing and edging
 - Irrigating
 - Fertilizing
 - Hand weeding
 - Pesticide application
 - Aerating
 - De-thatching
 - Over seeding

Drainage

Develop maintenance standards and threshold levels for categories of use and types of turf. For example, low use, low visibility turf areas have higher weed and pest thresholds than heavily used and high visibility lawns do. Develop maintenance schedules that reflect the assessment for each of the elements of 2 above. Use the following maintenance practices for high use turf areas. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- In general, mow high, mow often, and leave the clippings. Mow at correct mowing height for the grass species in the turf. Mow at least weekly in spring.
- Fertilize lightly in the early fall and late spring with a natural organic or slow-release fertilizer.
- Water deeply to moisten the root zone, but water infrequently. Lawns newly planted in spring, however, need frequent watering.
- Avoid using quick-release fertilizers and weed-and-feed formulations. Avoid or minimize the use of pesticides.
- Follow buffer recommendations contained in the Waterways section where lawns abut streams, lakes or other waterways.
- Annually aerate lawns in the spring or fall to improve root development; high-use turf should ideally be aerated two to three times a year.
- Consider purchasing electric mulching mowers, when new machines are needed.

Some lawns are non-irrigated or minimally irrigated and brown out in the summer. Where it is possible, irrigate deeply once each summer month; this will help keep the crowns of the desired grasses alive. Continue mowing throughout the summer months to reduce the quantity of weed seeds produced. Turf that is heavily used should be irrigated, if possible, to avoid serious degradation. Improving cultural practices such as fertilizing, over seeding, and aerating can make a lawn more drought resistant.

Healthy Lawn Care

Organic lawn care is not rocket science...it's basically soil science. The goal throughout the Simple Steps process is to create a [microbe and nutrient-rich healthy soil system](#) in which to develop deep-rooted, dense turf that competes successfully with weeds, and is low-maintenance, drought, insect and disease-tolerant and beautiful!

While the market demand for an organic approach to lawn and landscape services is growing at a rapid rate, professionals actually trained and/or experienced in organic lawn and land care in your local area may still be scarce. In some cases, however, the consumer needs to direct the transition from a chemical program to an organic approach- not an easy task for most people, although there is plenty of material available to turn to for help.

It's not hard to have a healthy lawn that's also healthy for people, pets, and wildlife. "A vigorously growing turf resists pest damage and weed invasion," according to the University of California's integrated pest management program. Other lawn experts agree! When you focus on soil building, mowing, and watering, your lawn will grow vigorously. You'll have few insect, disease, or weed problems, and pesticides will be unnecessary.

SIMPLE STEPS IN LAWN & LANDSCAPE MAINTENANCE

The facility manager should incorporate the following simple steps in Lawn & Landscape maintenance activities. For more information, standards and specifications refer to [The UC Guide to Health Lawns](#) by University of California, [Sustainable Landscape Series](#) by University of Minnesota, [IPM Based Landscape Designs](#) by efn.org and [Xeriscape](#) by Colorado State University.

[Building a Microbe and Nutrient Rich Health Soil System](#)

Fertilize Naturally: The guiding principle of organic lawn care is to nourish the soil. Grass grows best in a biologically active soil where soil organisms like earthworms recycle plant material so that nutrients are slowly released in the root zone of the grass. Probably the most important soil-building technique for lawns is fertilization.

Nourish your soil with natural and organic products such as finished compost, well-aged manure, grass clippings and/or slow-release organic fertilizers. Organic fertilizers, including compost, release nutrients slowly, are less likely to run off into streams, and support microorganisms that increase soil fertility and fight lawn diseases. In this way, it differs fundamentally from chemical lawn care, which focuses on feeding the grass.

Top-dress with Compost: Nourish soil by sprinkling finished compost over your lawn. Grass clippings and compost can be applied in small amounts throughout the growing season but slow-release organic fertilizers are best applied in late summer - early fall.

[Recycle Grass Clippings:](#) Instead of collecting and putting clippings out for garbage, leave them on lawn. Grass clippings are the perfect fertilizer for lawns. They are free, convenient, chalk full of nutrients and organic matter and able to boost soil fertility by up to 30 per cent. They also return moisture to your soil and shade it from the drying rays of the sun.

An early spring application is also acceptable. Finished compost has an earthy odor, spongy texture and rich-brown color. It contributes a wide range of both macro and micronutrients, which are released slowly over a long period of time. It also contributes microorganisms, which help decompose thatch and other organic matter. Unlike quick-release chemical fertilizers, these natural and organic products will not burn grass or contaminate ground and surface water.

You need to apply fertilizer in the right amounts and at the right time. Most lawn care experts recommend fertilizing lawns three or four times per year. The optimal dates, amounts, and nutrients for your lawn vary depending on local climate, soil, and the type of grass growing in lawn. For more information & advice contact the County IPM Manager or ask the University of California Extension-Santa Clara County.

Aerate: Aeration is the most overlooked and yet the most necessary lawn operation one can perform to build healthy soil. The benefits of lawn aeration include better soil oxygen levels, increased water and nutrient penetration, less irrigation runoff from slopes, reduced disease levels, and better rooting of turf plants.

Aeration removes cores of soil from your lawn and is used when your lawn has become compacted. Aeration relieves compaction and cultivates the soil. It is best done in the spring or fall prior to fertilization. Aeration increases air and water penetration and movement in the soil. You can ensure continual, natural and free aeration by attracting and protecting earthworms in soil.

A sign that your lawn needs to be aerated is that water puddles or runs off instead of soaking in. Aeration should be done in the spring after rain or irrigation has softened the soil. Your goal is to remove soil cores between 3 and 4 inches deep and about 6 inches apart. Leave the cores on lawn to break down, and leave the holes unfilled.

Remove Excess Thatch: Thatch is the partially decomposed grass stem, roots, and leaves found between the green part of a lawn and the surface of the soil. If your lawn has about 1/2 inch of thatch, it helps reduce soil compaction and prevents some weeds seeds from germinating. A thicker thatch layer can be a problem because grass roots grow in the thatch instead of the soil and make your lawn less tolerant of drought.

Thatch problems are caused by excessive fertilizing and watering, infrequent mowing, and frequent pesticide use.

For smaller areas using a thatching rake can reduce thatch. Simply pull it across the lawn and discard the debris. For larger areas, a vertical mower (dethatcher) is required. It should be run across the lawn, and then a second run perpendicular to the first. Later rake up the debris and dispose of it.

Spring and fall are the best times to remove thatch in California.

Over-seed: Lawn is comprised of millions of individual grass plants. Like any other living thing, these plants eventually die. It is important to over-seed once every year to keep your lawn thick and healthy. A dense lawn will crowd out

weeds like dandelions and crabgrass that crop up in bare or thinly covered patches. Choose [grass varieties](#) that suit the light, moisture and soil conditions.

Over-seeding is also a great way to introduce hardy, pest-resistant and low-maintenance grass varieties such as endophytic perennial ryes and fine fescues into lawn. A lawn with diverse grass types is better able to deal with and recover from stresses such as droughts, pest outbreaks, diseases and traffic. For best timing to over-seed refer to

Mow High: Mowing is one of the most important aspects of organic lawn care. The simple practice of mowing high contributes enormously to the health of a lawn. Taller turf also shades the soil more than shorter turf thereby helping to keep soil cool and moist.

For each grass species, there is a range of optimal mowing heights. Mowing your lawn at the high end of this range allows the grass to develop a deeper root system and tolerate drought, heat, shade, disease, and pests. Recommended mowing heights are 3 inches for tall fescue, 2 1/2 inches for perennial ryegrass, and 1 inch for bent grass.

Experts recommend at least 3 inches because it shades out sun-loving weeds and encourages good root development.

To have a high quality lawn you need to mow frequently when the grass is growing fast. You want to remove no more than 1/3 of the length of the grass blades so the grass is not stressed. For example, a perennial ryegrass lawn should be mowed when it gets to be about 3 3/4 inches tall with the mower set to mow at 2 1/2 inches. Weekly, or even more frequent mowing may be necessary when your lawn grows quickly.

The One-Third Rule: A general rule is to never cut off more than one third of the blade at once. Cutting off more than one third of the blade may cause the grass plant to go into shock as a huge portion of its food factory is eliminated. It will also result in longer clippings that take longer to decompose and may suffocate some grass plants. If grass is overgrown, mow twice; first at a high setting and then at a lower one.

Sharpen the Mower Blade: Once a Year Another way to ensure grass remains healthy and strong is to cut it with a sharp blade. Dull blades tear and stress grass blades, thereby increasing the potential for disease and infestations. It works best if you mow frequently, when the grass is dry, and with sharp mower blades. Sharp blades cut cleaner and easier and leave lawn healthier and better looking. Mulching mowers have an extra blade that finely chops and distributes the clippings, but you can use a regular lawn mower for grass cycling just by removing the bag.

Water Wisely: The facility managers should ensure that all landscape sites undergo annual irrigation water-audit and irrigation systems are fully operational, in good repairs, set on auto configurations/ programmable to suite the seasonal needs. A lawn requires no more than one inch of water a week. Sometimes, rain will provide lawn with all the water it requires. At other times, irrigation is required. As a general rule, water deeply once a week during the early morning

or early evening. Watering during the late evening is not recommended because cooler temperatures and sitting water invite disease. Frequent, light watering produces a shallow-rooted lawn. Over watering leaches grass nutrients, promotes certain weeds, and causes oxygen starvation of grass roots. This means that it's important to give your lawn the right amount of water.

There are three ways to tell if your lawn needs water. If your lawn is dark green and doesn't spring back when you walk on it, it needs watering. Or, dig a small hole and look at the soil. If the top two inches are dry, it's time to water. You can also push a six-inch screwdriver into the lawn. If it goes in easily, the soil is still wet. If it takes effort, then it's time to water. If a lush lawn is not your priority, you can water less often.

When you water your lawn, you want to avoid runoff. More frequent, shorter irrigations may be necessary if you have clay soil.

Natural/Open Spaces

Natural or open space lands should be managed under the following general guidelines. These practices are discussed in details under [Best Practices and Alternative Practices](#) channel of SCC IPM Web.

- Conserve wildlife habitat and foster native species. This may include restoring degraded natural areas to increase their habitat and educational values.
- Maintain, enhance and restore vegetation for its ecological and wildlife habitat value and visual benefits.
- Emphasize the use of drought tolerant plants and native vegetation in site development and restoration to minimize the need for irrigation and reduce damage caused by non-native species.
- Use proper plant selection with regard to natural site moisture conditions.
- Work with other agencies to maintain the necessary quality and quantity of water in streams and lakes to provide for plant communities, suitable fish and wildlife habitat and recreational use.
- Develop and apply environmentally sensitive maintenance techniques and best management practices as responsible stewards and caretakers of the system.

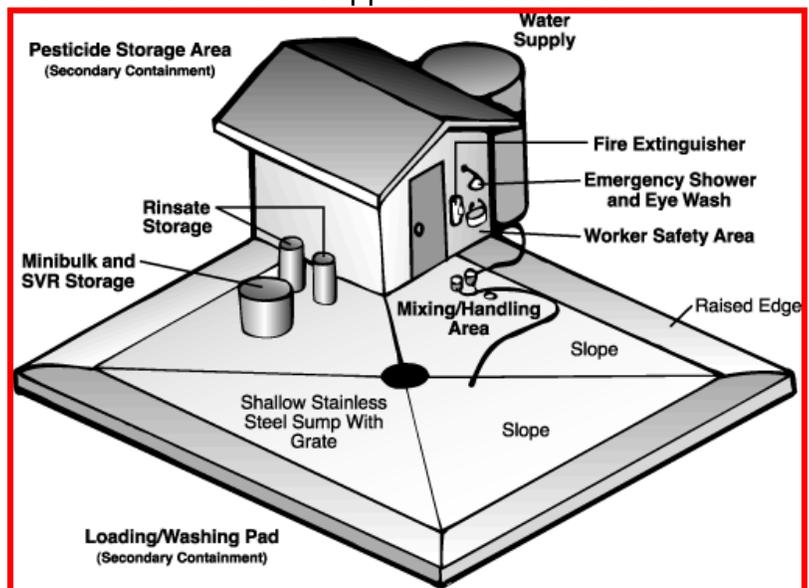
Attachments

1. [Understanding pesticide persistence and mobility for groundwater & surface water protection](#) – Oregon State University – Extension Service
2. Understanding [Turf Grass Management for Protecting Water Quality](#) – University of Minnesota Extension Service
3. Understanding [Pesticide and Water Quality](#) – University of California Statewide IPM Program
4. Understanding [Sources of Indoor Air Pollution](#) – Pesticides – U.S. Environmental Protection Agency

Pesticide Handling

When a decision is made to use a pesticide as part of a specific IPM strategy, precautions should be followed for storage, mixing, loading, application, cleaning and disposal, to ensure public health and safety as well as environmental protection. These practices are discussed in details under [Resources/Areas of Concern/Pesticide Info](#) channel of SCC IPM Web. If pesticides are not handled carefully, they can leach through the soil to the groundwater after a leak or spill, or they can enter a well directly during mixing and loading due to back siphonage. If a pesticide is present in drinking water in large quantities it may cause acute health effects (toxic effects apparent after only a short period of exposure) such as chemical burns, nausea and convulsions. Pesticides normally are not present in high enough concentrations in water supplies to cause acute health effects. Instead, they typically occur in very small amounts and the concern is primarily for their potential for causing chronic health problems from prolonged exposure.

Taking voluntary action to prevent pesticide contamination of groundwater will help assure the continued availability of pesticides for responsible use. Drinking water is least likely to be contaminated if appropriate management procedures are followed or pesticide wastes are properly disposed. Proper off site disposal practices are essential to avoid risking contamination of groundwater that could affect water supplies and the health of others. The enclosed diagram illustrates a well-designed facility for pesticide storage and handling.



Pesticide Storage Facilities

If stored in a secure location, pesticides pose little danger to the environment. Short-term storage (during season of use) poses a lower risk than year-round storage, but storage for any length of time may pose a risk to groundwater.

If a spill does occur in a storage area, an impermeable (waterproof) floor, such as concrete, will prevent chemical seepage into the ground. Putting a curb around an impermeable floor will prevent chemicals from spreading to other areas.



Secondary containment will provide an impermeable floor and walls around the storage area, and it will minimize the amount of pesticide seeping into the ground if a bulk liquid pesticide storage tank leaks.

Building a New Storage Facility

Building a new facility just for pesticide storage may be expensive, but generally it will be simpler than trying to modify areas meant for other purposes.

When building a new facility, keep in mind a few principles of safe pesticide storage:

- Locate the building down slope and at least 100 feet away from the water well or spring. Separation from the water source should be greater if the site has sandy soils, fractured bedrock, or sinkholes near the land surface. The risk of pesticide contamination of groundwater is influenced by properties of both the pesticide and the soil.
- In the event of a fire, contaminated runoff water should drain to a confined area.
- The pesticide mixing and loading area should be close to the pesticide storage facility, to minimize the distance that chemicals are carried.
- The building foundation or secondary containment floor should be well drained and located high above the water table. The finished soil grade should be 3 inches below the floor and sloped to provide surface drainage away from the building. The subsoil should have a low permeability.
- Pallets should be provided to keep large drums or bags off the floor. Shelves for smaller containers should have a lip to keep the containers from sliding off. Steel shelves are easier to clean than wood if a spill occurs. Dry products should be stored above liquids to prevent wetting from spills.
- For large bulk tanks, a containment area should be large enough to confine 125 percent of the contents of the largest bulk container, plus the displaced volume of any other storage tanks in the area.
- A locked storage area or building provides security. Preventing unauthorized use of pesticides reduces the chance of accidental spills or theft. Signs or labels should be provided to identify the area as a pesticide storage area. Labels on the outside of the building give fire fighters information about pesticides during an emergency response for fire or a spill. It's a good idea to keep a list of the chemicals and amounts stored. Keep a copy of the list in a building away from the storage area.
- Adequate road access should be provided for deliveries and access by emergency equipment.
- Various pesticides should be kept separate, according to pesticide type, to prevent cross-contamination. Herbicides, insecticides and fungicides should be kept on separate shelves or areas.

- For information on other factors to consider in the design of a storage facility, such as ventilation, water access, temperature control and worker safety, contact your County Extension office.

Modifying an Existing Storage Facility

If you decide to improve an existing pesticide storage building, following the above principles can be expensive. However, compared with the cost of a major accident or a lawsuit, modifying an existing storage facility could be the least expensive option. Items 5-9 above are particularly important points to consider for existing storage.

When an existing building must accommodate other activities, pesticide storage could compromise the safety of people and the environment. For example, fire in a storage area presents a special hazard to people and the environment. Storing chemicals in a separate facility reduces the risk associated with fire or accidental spills. Pesticides should never be stored inside a well/pump house or a facility, which contains an abandoned well.

Mixing and Loading Practices

Groundwater contamination can result even from small spills of a pesticide in the mixing and loading area. Small quantities spilled regularly in the same place can go unnoticed, but the chemicals can build up in the soil and eventually reach groundwater.

To contain pesticide spills and leaks, an impermeable (waterproof) mixing and loading pad is required. The pad should be large enough to contain leaks from bulk tanks, wash water from cleaning equipment, and spills from transferring chemicals to the sprayer or spreader. The size of the pad depends also on the equipment used. It should provide space around the parked equipment for washing and rinsing.

The pad should be kept clean. Rainfall can mix with spilled pesticides and therefore the runoff may require proper disposal. Storage of rainfall increases the required size of the sump.

The pad should be located next to the storage area. Water from the pad should be diverted away from the well. At sites where runoff water could reach the well, a diversion should be constructed.

Spills and leaks of pesticides are bound to occur from time to time. Even if there is no impermeable mixing and loading pad, groundwater contamination can be minimized by following some basic guidelines:

- Avoid mixing and loading pesticides near a water well or spring. One way to do this is to use a nurse tank to transport water to the mixing and loading site. Ideally, the mixing site should be moved each year within the field of application.
- Avoid mixing and loading on gravel driveways or other surfaces that allow spills to sink quickly through the soil. A clay surface is better than sand.
- Avoid mixing and loading near a sinkhole.

- Install an anti-backsiphon device on the well and hydrants. Never put the hose in the sprayer tank. Provide an air gap of 6 inches between the hose and the top of the sprayer tank.
- Always supervise sprayer filling. For restricted-use pesticides, a trained and licensed applicator must supervise operations.
- Consider a closed handling system, which transfers the pesticide directly from storage container to applicator equipment (through a hose, for example).
- Use rinsate for mixing subsequent loads.

Spills and Cleanup Practices

Dry spills are usually very easy to clean up. For dry spills, promptly sweep up and reuse the pesticide as it was intended.

For liquid spills, recover as much of the spill as possible and reuse as it was intended. It may be necessary to remove contaminated soil from clay pads. There should be sawdust or cat litter available for concrete pads to adsorb unrecovered liquid. Have an emergency response plan for the site. Know where the runoff water will go, how to handle your particular chemicals, and whom to call for help.

A confined mixing and loading area, such as a sump, allows settling before transfer to rinsate storage tanks. Having several rinsate storage tanks allows rinsate from different chemicals to be stored separately. Rinsate can be used as mixing water on subsequent loads.

Application

When mixing and applying pesticides, all label precautions must be followed. It is a violation of federal and state laws to disregard label directions.

- Spot treat only the area or pest where the problem occurs, following the selected IPM strategy. Avoid broadcast application.
- Follow label directions for PPE and for weather and other conditions appropriate for treatment. Do not spray or otherwise treat if it is too windy (> 5 mph) or too wet. The pesticide should reach only the intended target.
- If pesticide is spilled on skin or clothing, remove clothing and wash skin thoroughly.
- Leave no-spray buffer strips near surface waters.
- Be prepared for spills. Have clean-up materials available for immediate use.
- Keep people and animals off of sprayed areas as noted in the label directions.
- Post appropriate signage at applied areas, following Santa Clara County ordinance requirements.
- **Cleaning of pesticide application tools:** presents another significant opportunity for spills or other contamination incidents. Caution should be exercised.



- Clean equipment after each use unless it will be used for the same chemical the next time.
- Rinse equipment thoroughly- triple rinsing is the standard. Rinsate should be saved for use in the next application. If rinsate is used in further applications, it must be applied according to label directions and the selected IPM strategy.

Unwanted Pesticide and Container Disposal

Containers, equipment and unused, surplus or waste pesticide product must be disposed of in ways protective of public safety and the environment. The only acceptable management practices for pesticides are to use the pesticide according to current label directions or arrange for disposal with a hazardous waste contractor or dealer. When the EPA bans a pesticide it provides a "buy-back" and disposal program for a period of time. Pesticides purchased in mini-bulk tanks or returnable containers allow the return of excess chemical to the cooperative or retail store. Leftover pesticides that cannot be disposed of in any of these ways should be stored safely until they can be disposed of through a community hazardous waste collection program or a hazardous waste contractor.

Unwashed and improperly stored containers can lead to groundwater contamination if chemical residues are allowed to leak into the ground.

Some basic guidelines can help avoid problems:

- Rotate stock of chemicals so the oldest is used first. As often as possible, use returnable containers and minibulks, and return empty containers to the dealer.
- Pressure-rinse or triple-rinse containers immediately after use, since residue can be difficult to remove after it dries. Pour the rinse water into the spray tank. Puncture containers and store them in a covered area until you arrange to take them to a licensed landfill.
- Recycle plastic and metal containers whenever possible.
- Shake out bags, bind or wrap them to minimize dust, and take them to a licensed landfill.
- Do not bury pesticide containers or bags on your property or dispose of them in sinkholes.
- Follow all applicable Santa Clara County and California state laws and regulations, using a licensed hauler and permitted treatment, storage and disposal facility if required.

Other Management Considerations

Reducing pesticide use and loss makes financial as well as environmental sense.

- Buying only what you need makes long-term storage unnecessary. In addition, you avoid cold weather problems, which can make some pesticides less effective.
- Record keeping may seem like a task unrelated to groundwater contamination, but knowing what you've used in the past and what you

have on hand allows you to make better purchasing decisions. Keep records of past field application rates and their effectiveness.

- Keep records on other information such as the manufacturer's name and address, pesticide types and handling precautions. This information can be important if you must respond quickly to an accident.
- Use older products first to keep your inventory current and effective. Before using chemicals that have been stored for a few years, though, check with your county Extension agent about possible restrictions on their use.

Attachments

1. [Manual of Procedural Guidance for Pesticide Enforcement Personnel](#) – California Department of Pesticide Regulation Chapter 13 General Policy Guidelines
2. [California Code of Regulations \(Title 3. Food and Agriculture\) Division 6. Pesticides and Pest Control Operations](#)
3. [Pesticide Program at Purdue University](#) – The Purdue Pesticide Programs has been very active over the last few years in publishing a series of pesticide publications. These publications are written for professionals who work in government, universities, associations, and also for the general public who want to understand pesticide issues beyond the headlines.
4. California DPR Worker Health and Safety Branch developed [Pesticide Safety Information Series \(PSIS\)](#) leaflets primarily as a training aid for employees. California regulations require these documents to be part of pesticide handler and field worker training. The "N" series documents are for use in poultry and fish-producing business, structural pest control, landscape and maintenance firms, rights-of-way maintenance organizations, or similar businesses.
5. [California Pesticide Illness surveillance program](#) – Information for Physicians