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Agriculture & Natural Resources

COOPERATIVE EXTENSION • YOLO COUNTY

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MANAGING LAWNS ON HEAVY SOILS

Irrigation, fertilization, mowing, and pest control require special consideration when lawns are to be maintained on heavy (clay) or compacted soils.

Irrigation. Deep, less frequent irrigations are preferable to shallow, frequent irrigations. Deep irrigations encourage deep rooting, leach accumulated salts, and increase the total soil moisture available for plant use. If deep irrigations are spaced far enough apart to allow the soil surface to dry, the likelihood of disease infection, soil compaction or invasion of turf by shallow-rooted annual weeds is also reduced.

It is essential to know the delivery rate (inches/hour) and distribution pattern of your sprinklers. To estimate the delivery rate, place small juice or coffee cans at 5-foot intervals on lines radiating from the sprinkler head. Operate the sprinklers for a planned length of time, then measure the water in the cans and calculate the average water depth per can. The following example illustrates how to use this average to calculate the proper length of irrigation time with your system: If, after 20 minutes of operation, the total amount of water in 10 cans around a sprinkler head is 2½ inches, the average depth per can is ¼ inch. Therefore, to deliver ½ inch of water this sprinkler must operate for 40 minutes. But remember, heavy soils have low infiltration rates.

A weekly application of 1 to 1½ inches of water is generally adequate for lawns if there is no runoff. During extended hot spells, two irrigations may be necessary. Lawns on very shallow soils (less than 8 inches) may require more frequent irrigations and less water per irrigation.

Water penetration into turf is typically ½ inch per hour or less on heavy soils; water applied faster will run off the surface or into low spots instead of soaking in. Infiltration rate is therefore as critical as delivery or application rate. To handle a low infiltration rate, turn off sprinklers as soon as runoff occurs; resume and complete irrigation only when previously applied water has percolated to deeper levels of the soil. Aerifying (removing soil cores) provides another option for overcoming poor water penetration. Use proper tools to remove soil cores. Spading forks or other “spiking” tools are not recommended because they compact soil on the sides of the holes they make (water will fill such holes but not penetrate into the surrounding soil). Lawns on slopes may benefit in particular from aerification since holes will trap water, which would otherwise run off.

Aerification is an effective method for correcting poor water penetration precisely because poor penetration is, in most cases, the result of the physical rather than the chemical nature of the soil. For this reason, soil amendments applied to existing lawns are generally of no benefit when a low infiltration rate is the problem. Even gypsum, often sold for “softening” hard soils is useful only under alkaline conditions, i.e., when soils or water are relatively high in sodium. Adding organic matter can benefit the physical structure of heavy soils when mixed with the soil prior to planting.

Remember the following when irrigating lawns on heavy or compacted soils:

- Water deeply and less frequently.
- Consider both water application rate and infiltration rate.
- Use proper equipment when aerifying to aid water penetration.
- Modify irrigation practices on steep or very shallow soils.

Fertilization. Turfgrasses grow best when given adequate nutrients. Nitrogen, phosphorous, and potassium are the nutrients needed in the largest quantities by turfgrasses. In most of California’s heavy soils, phosphorous and potassium are the nutrients needed in the largest quantities by turfgrasses. In most of California’s heavy soils, phosphorous and potassium are



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naturally present in adequate amounts. Nitrogen, however, must be applied on a regular basis for optimum grass growth. Moderate application of nitrogen at regular intervals is the key to healthy, weed-free turf. If clippings are regularly removed, it may be desirable to apply a complete fertilizer (i.e., one containing phosphorous and potassium as well as nitrogen) annually. The percentage of each nutrient is shown on every bag of fertilizer. A 20-15-5 fertilizer, for example, contains 20 percent nitrogen, 15 percent phosphorous, and 5 percent potassium.

Cool season grasses (e.g., Kentucky bluegrass, perennial ryegrass, and tall fescue) grown on heavy soils need no more than 4 pounds of actual nitrogen per 1000 square feet of lawn per year. Apply no more than ½ to 1 pound of actual nitrogen per 1000 square feet per application (maximum 4 pounds per year). Applications should be made in spring and fall only. Warm season grasses (e.g., Bermudagrass) should be fertilized monthly during their growing season (while grass is green) with no more than ½ to 1 pound of nitrogen per 1000 square feet per month.

When fertilizing consider the following:

- Apply dry fertilizers only when grass is dry. Use liquid fertilizer as directed by the manufacturer.
- Distribute fertilizer uniformly. Dry fertilizer may be applied by a spreader or broadcasted by hand. Spread one-half the total amount while moving in one direction, the balance while moving in the opposite direction.
- Do not overfertilize.

Mowing. Severe or too-frequent mowing reduces lawn vigor and increases weed invasion. Bluegrass and ryegrass lawns should be cut to a minimum height of 1½ inches and a maximum of 2¼ inches. Tall fescue lawns should be cut at 2 to 3 inches; Bermudagrass lawns are best maintained at ½ to 1 inch. Lawn appearance is greatly affected by mower sharpness. Grass blade tips torn by a dull mower will create a pronounced light brown “haze” on the turf surface. Tearing also leaves grass more susceptible to disease infection than does a clean cut.

Lawn clippings may be left on a lawn only if it is mowed regularly and at fairly short intervals. In this case, clippings dry and decompose relatively quickly, adding nutrients to the soil. The activity of microorganisms responsible for clipping decomposition is limited in heavy soils; therefore, the thick layer of clippings, will decompose slowly when mowings are irregular or spaced too far apart. Undecomposed clippings may smother underlying grass and will contribute to the development of thatch (a layer of organic matter at the soil surface). Thick thatch is itself a physical impediment to air and water movement and compounds the problem already present in heavy soils.

Insect and Disease Control. Both insects and diseases attack home lawns. Proper irrigation is the most important practice in preventing or reducing disease and insect problems in lawns on heavy soils. However, if necessary, several good fungicides and insecticides are available on the market.

Weed Control. Proper irrigation, fertilization, mowing, and periodic hand weeding will control most lawn weeds. However, extensive weed infestations may require chemical control. Selective herbicides are available for treating broadleaf weeds in grass lawns, and for treating weedy grasses in dichondra lawns. Weedy grasses in grass lawns can be removed by spot treatment with nonselective herbicides, or by the use of pre-emergence herbicides in the use of annual grassy weeds.

Precautions for using chemical pesticides:

- Follow the manufacturer’s directions precisely.
- Prevent chemical sprays from drifting to nearby ornamentals.
- Apply chemicals only to healthy, actively growing grass.

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