IRRIGATION BASICS

valve/backflow

sprinklers

cutoff valve

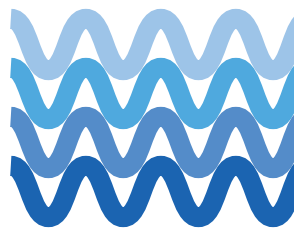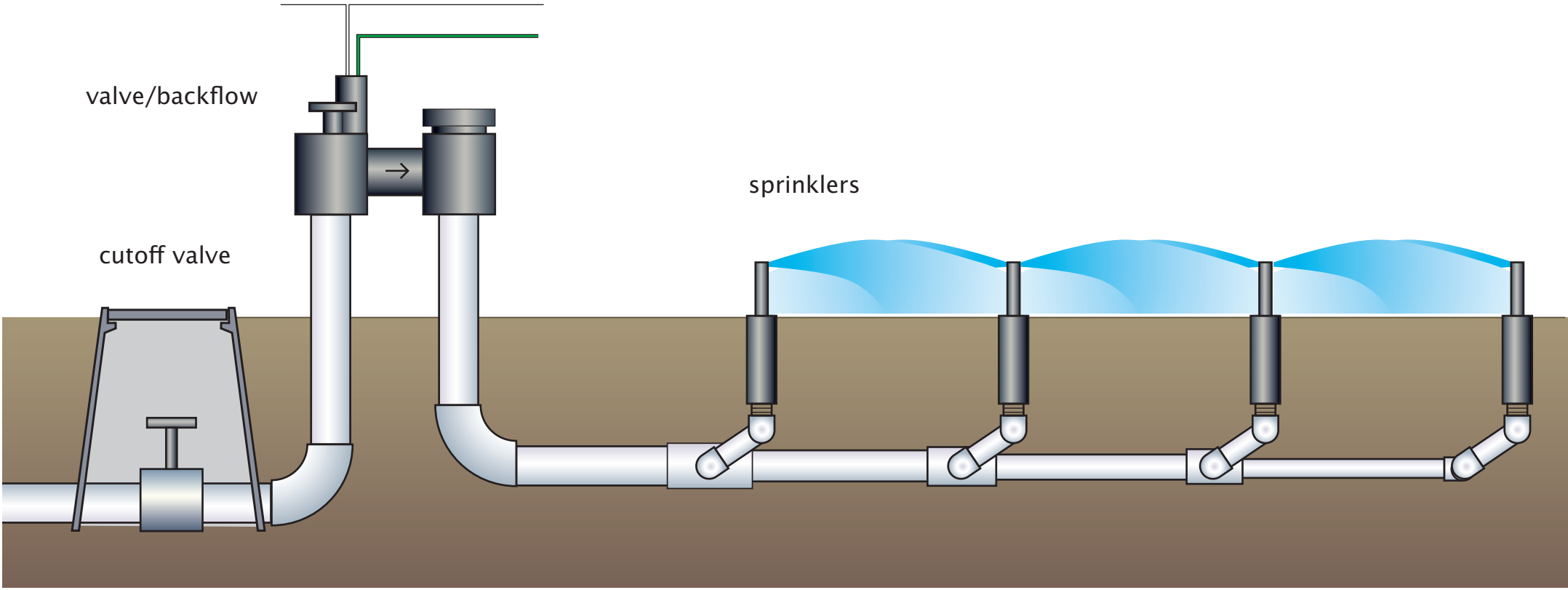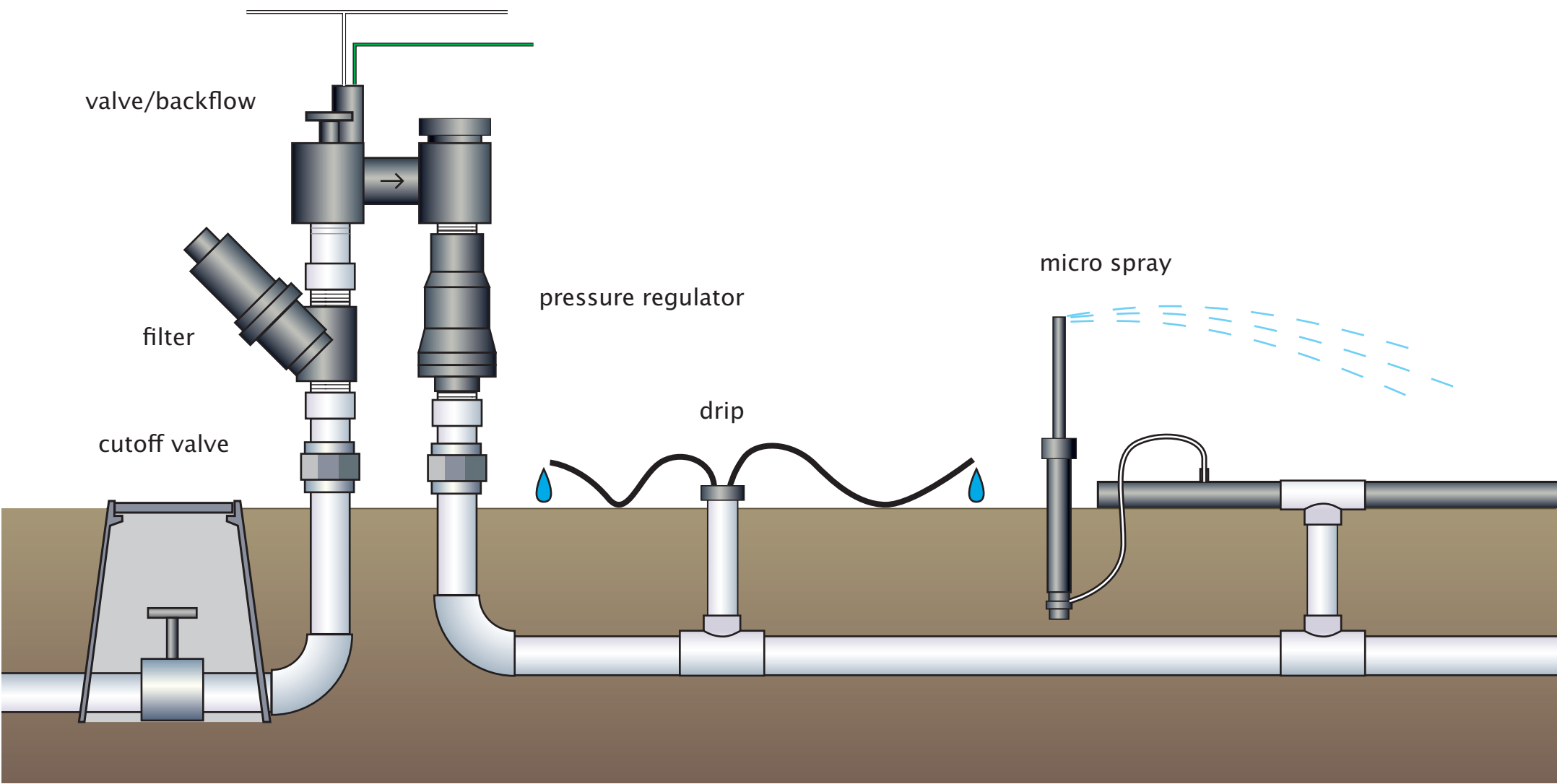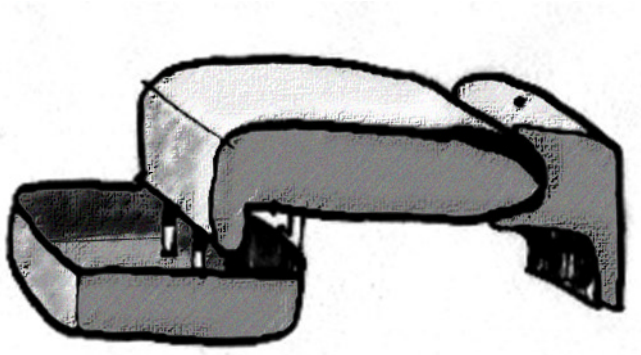## Typical spray system

This type of system is best used for turf and dense plantings. Drip irrigation is more efficient for shrubs and sparse plantings.
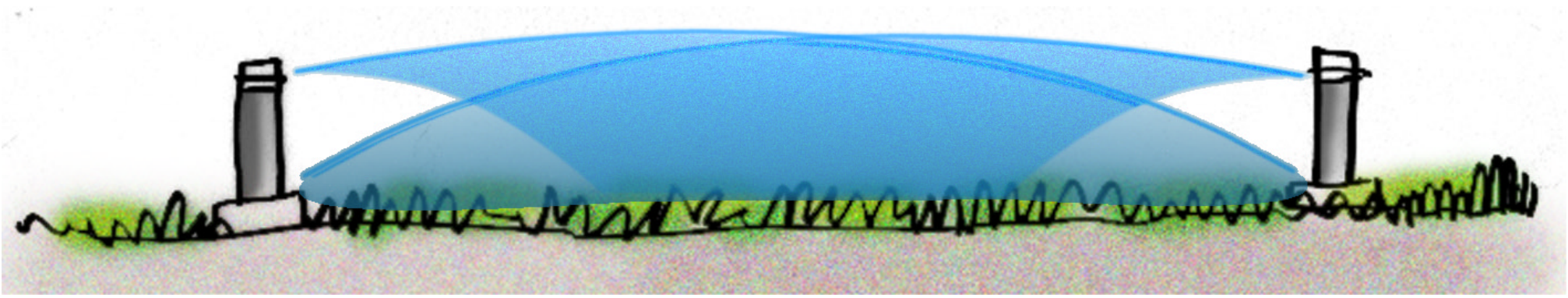
Use head-to-head coverage

Spray heads are designed to spray towards each other, so that watering areas overlap. This gives even coverage.

valve/backflow

filter

pressure regulator

micro spray

drip

cutoff valve

Typical low volume system

Drip irrigation uses the same valve and backflow prevention as spray systems, but requires a "Y" strainer and a pressure regulator.

Get a good controller

Your controller should be flexible enough to allow multiple start times and allow for different run times. If you're using both drip and spray irrigation, it should have multiple programs and allow for scheduling in hours as well as minutes.

TU 10:36

Install rain shutoffs

These devices work with any controller since they just interrupt the circuit using the common wire. They automatically reset once they've dried out. These are a great help in preventing irrigation during unexpected wet periods.
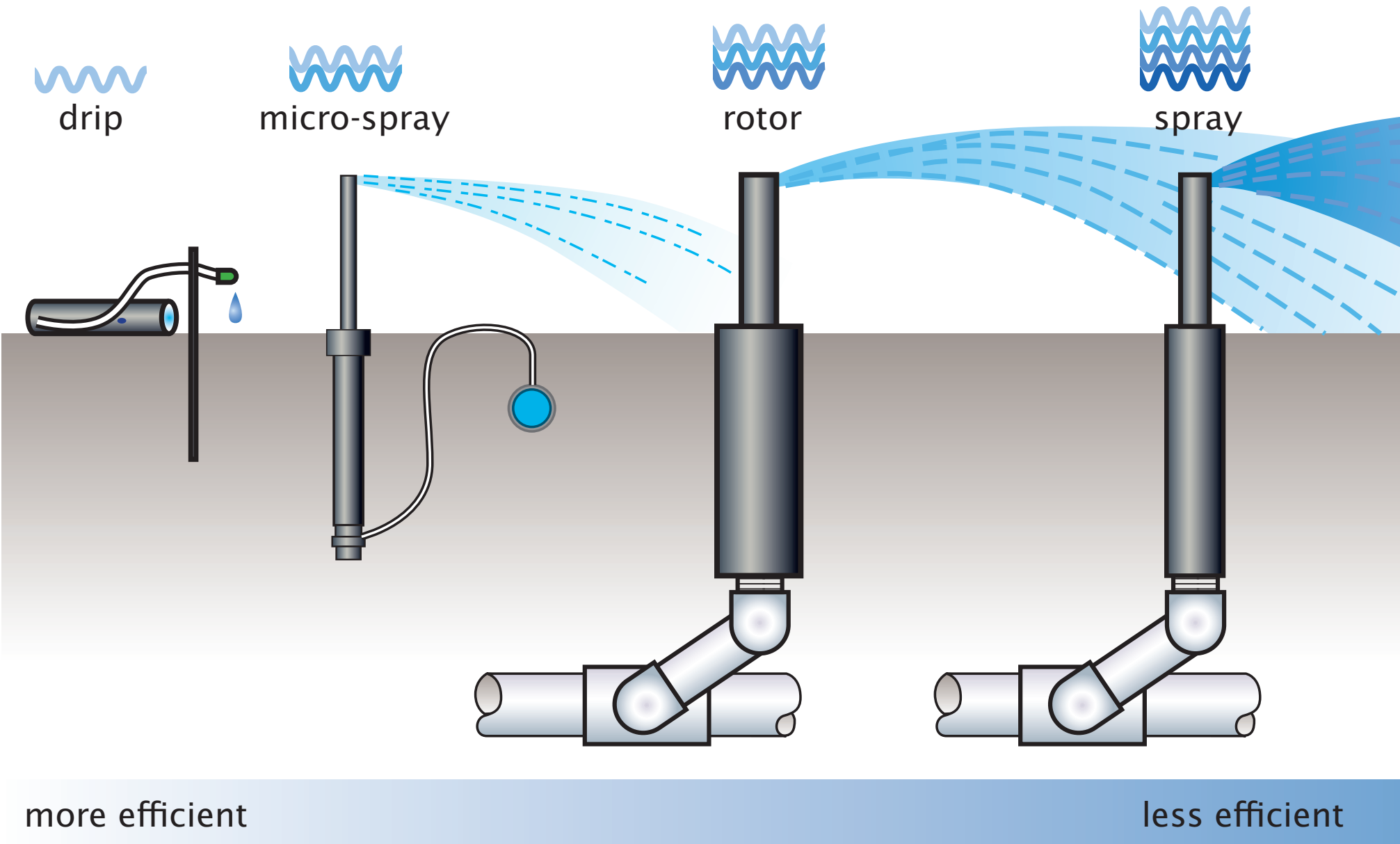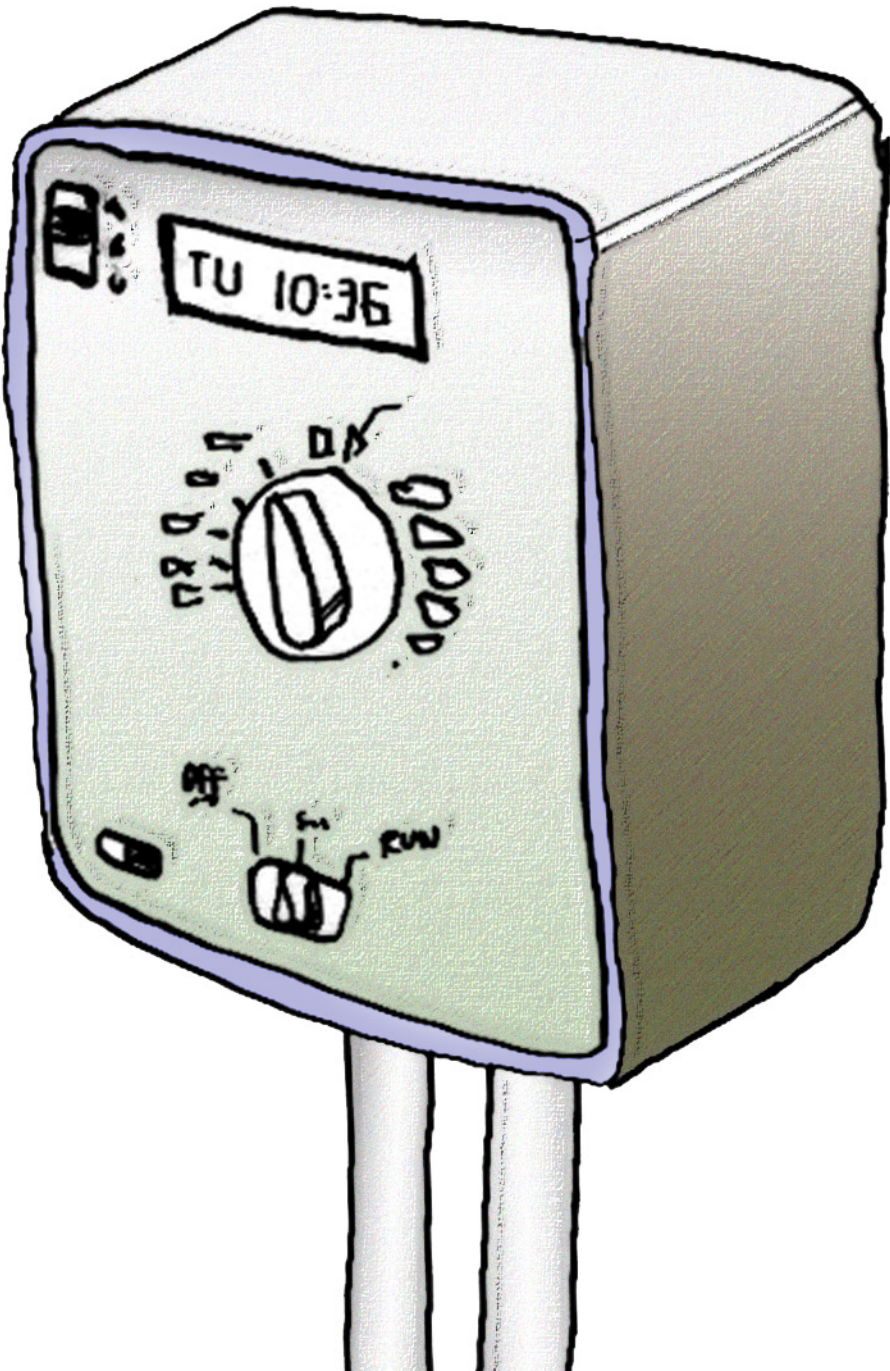
drip   micro-spray   rotor   spray

more efficient   less efficient

Water conservation by irrigation type

Some types of irrigation equipment are better at saving water than others. Drip is best because it supplies water directly to the root area, minimizing loss by evaporation. Rotors are better than sprays since they apply water more slowly than sprays, reducing the chance of runoff.
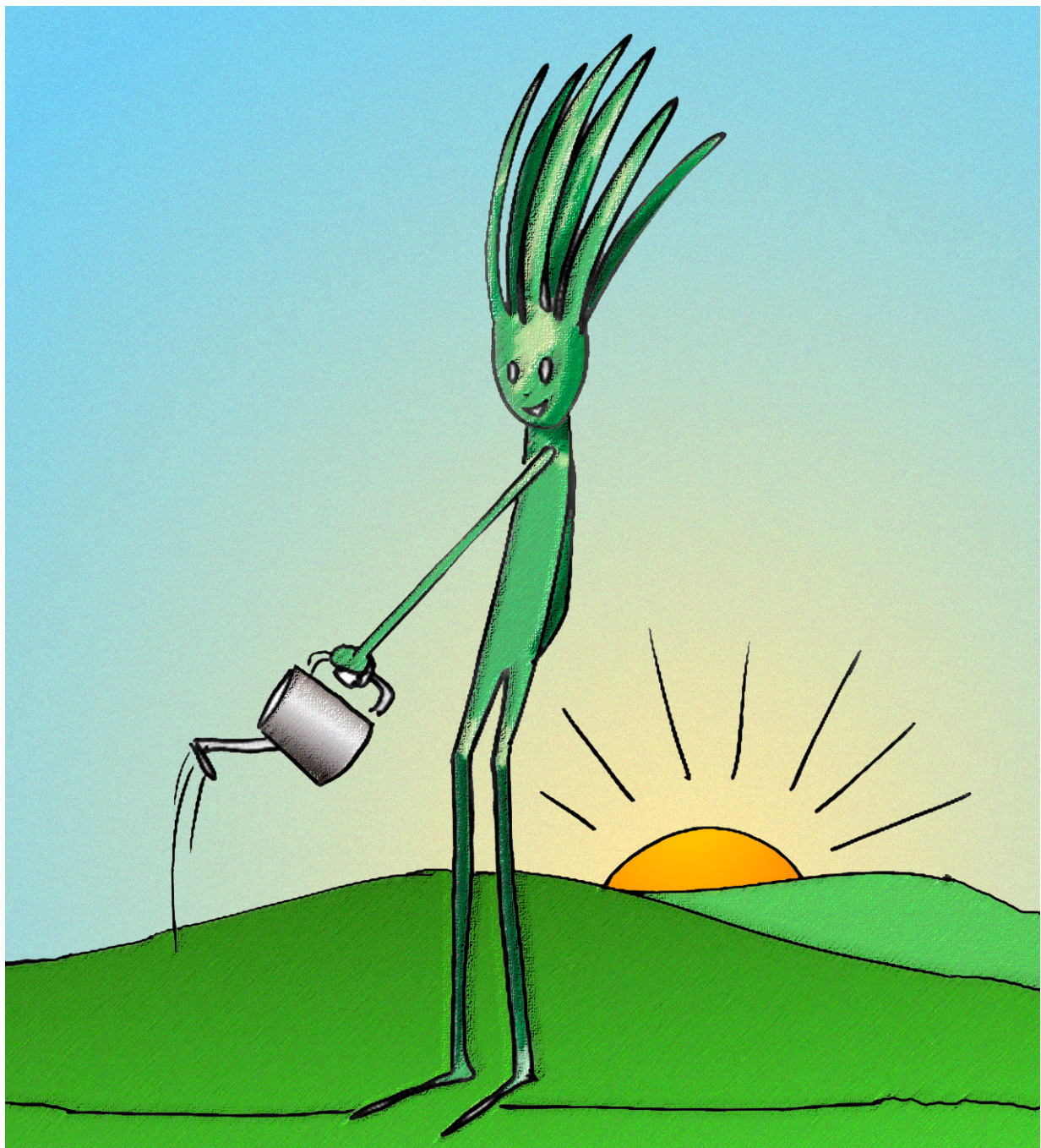
Water early

- Watering early allows the water to sink into the soil instead of evaporating off the surface.

- Set your controller to start watering before sunrise so that all your irrigation stations will have run before 6:00 AM.

- Watering between midnight and 10:00 am, avoiding 5:00 am to 8:00 am, will help lessen demand at peak times and decrease energy consumption.

- Avoid all unnecessary water use during energy 'blackouts'.

Temperature

IRRIGATION NEEDED

Rainfall

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
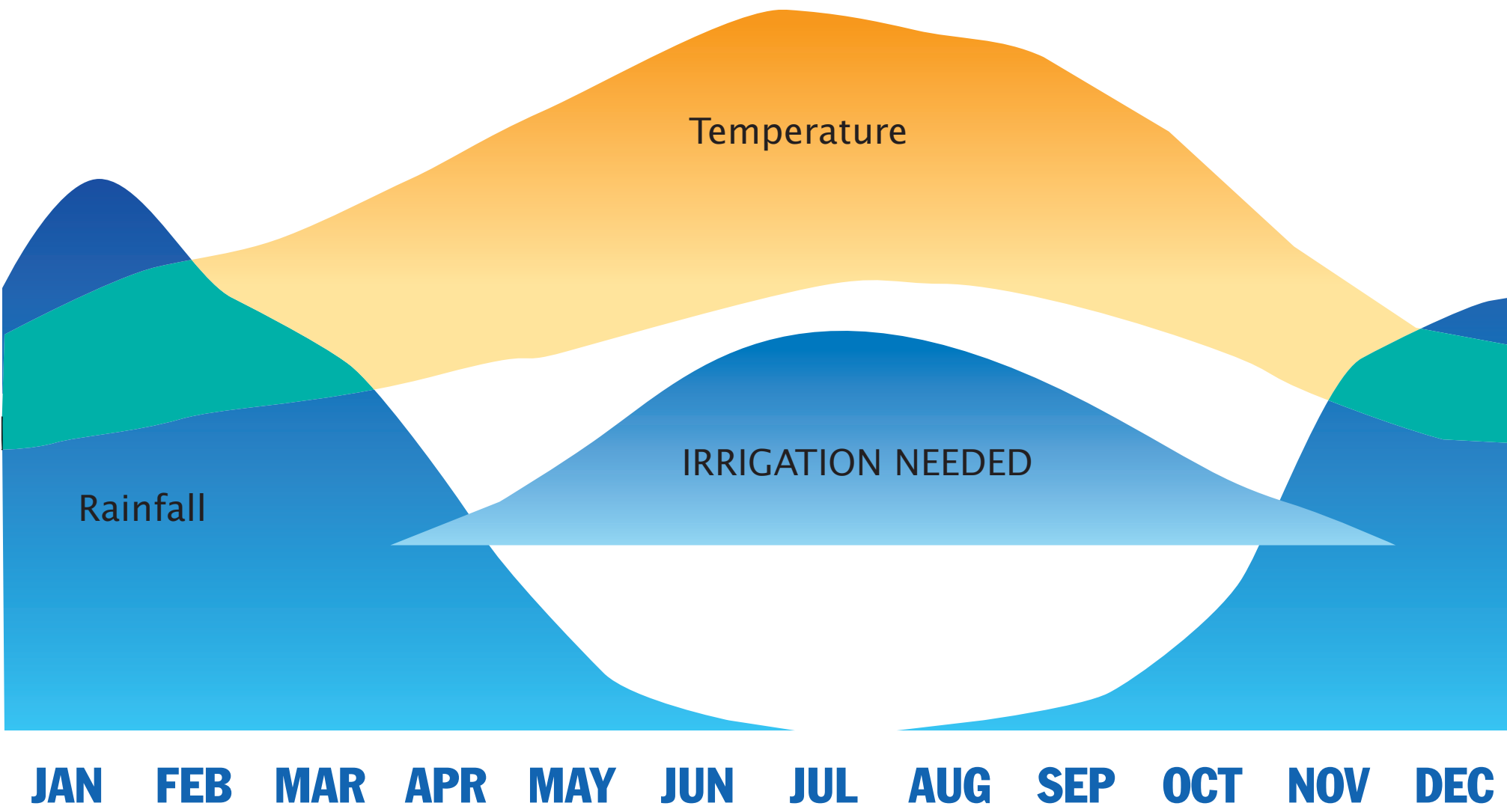
Adjust watering seasonally

With our Mediterranean climate, we usually have all the water we need in winter. We need to water a lot more during our hot, dry summers.

LAWNS

Water wisely

- Deep, less frequent watering encourages grass roots to grow deeper into the soil. Once the lawn's roots have grown deeper, it will be less affected by surface drying.

- Check for runoff. Most irrigation systems apply water much more quickly than it can be absorbed by the soil. If you have runoff, you need to set your sprinklers to stop watering before water starts running off your lawn. For example, if you need to water for 9 minutes, but you start to have runoff after only 3 minutes, you need to divide the watering into 3 segments of 3 minutes each, with enough time in between for the water to penetrate the soil. Your controller should be capable of multiple start times.

- Don't water in winter if natural rains meet your lawn's water requirements.

- Adjust your watering according to the season. Water less in spring and fall and perhaps not at all during the wet season.
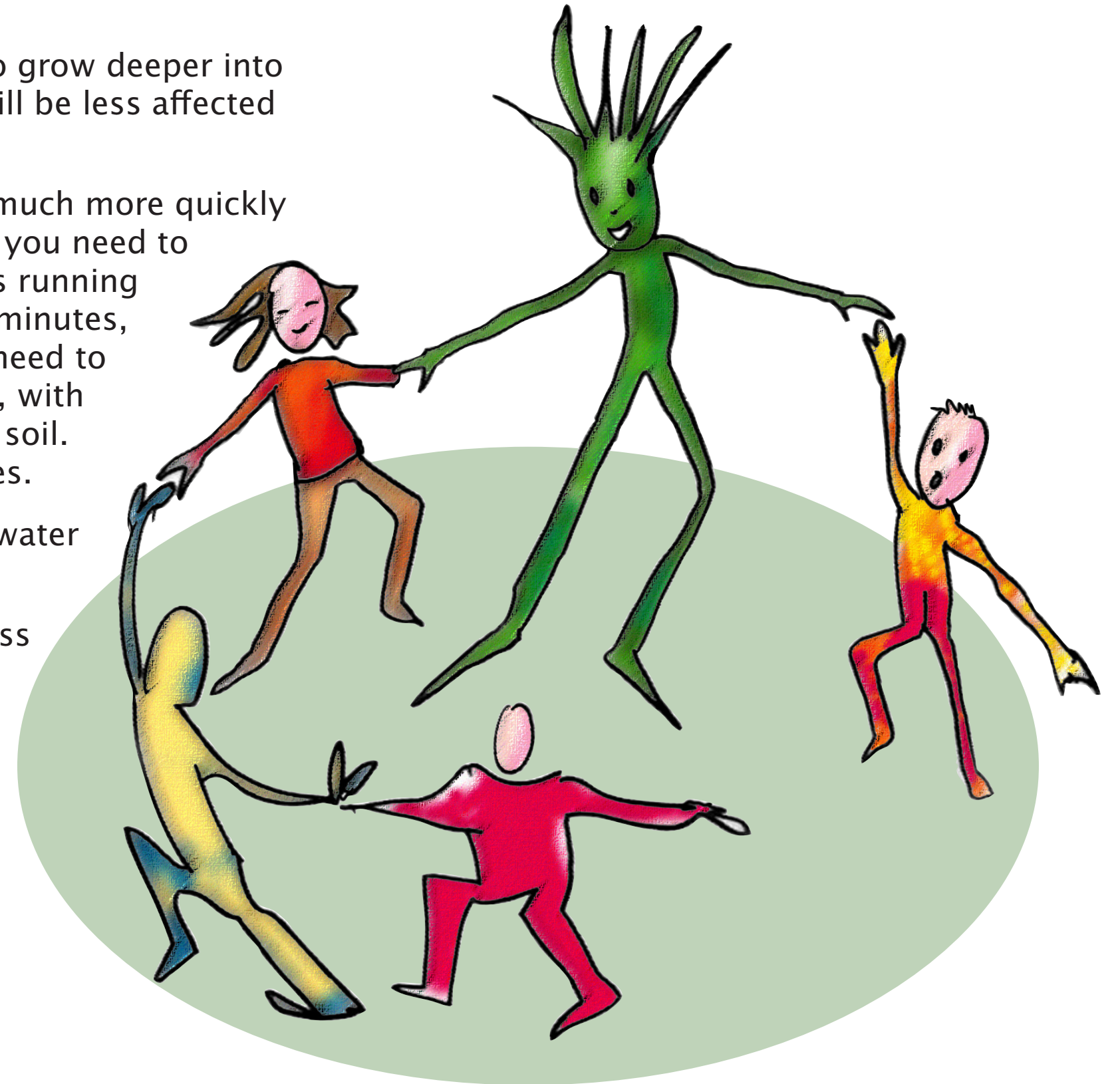
Replant with more water conserving varieties

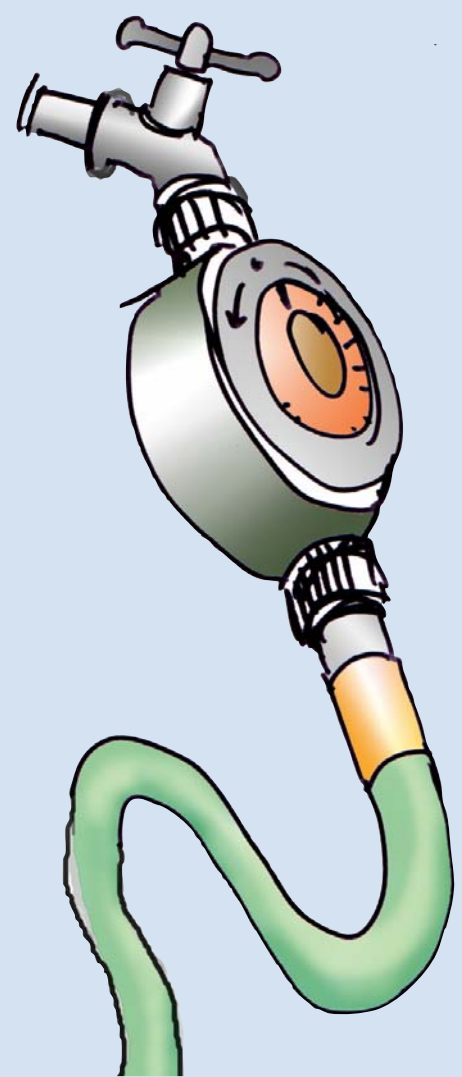Lawn is usually a blend of different grasses, all of which vary in their water conserving abilities.

- In general, Bermuda grass and Tall Fescue are more drought tolerant than other varieties. Bermuda grass goes completely dormant in winter and requires no water during this time. Tall Fescue varieties remain green all year but require minimal winter irrigation.

- New varieties of grasses and grasslike plants are continually being tried for use as lawns. Contact your local nursery for more information on these plants.

Landscape watering consumes nearly half of the water used by most homes during the warmest months of the year.

When to use lawn

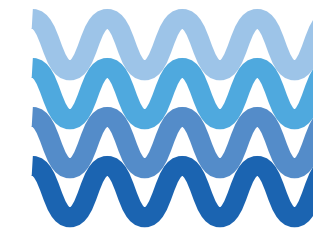- The area is used for play.
- The lawn gets heavy foot traffic

Use a shutoff timer

If you don't have an automatic irrigation system, use an automatic shutoff timer, or indoor timer. These timers are either spring driven (less expensive) or battery powered (more expensive).

- Set it for a short watering time to prevent runoff, and repeat later until the soil is "deep watered"

- Remember to water during early morning. Battery powered timers typically let you set the watering time, day and duration.
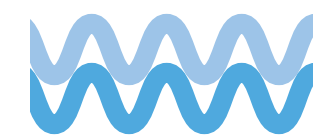
When to use ground cover

- Foot traffic is light
- The area is planted for aesthetic purposes
- On moderate slopes

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When to use shrubs

- There is no cross traffic
- On moderate to steep slopes (lawn should not be used on steep slopes).

Aerate & de-thatch

Aeration is the removal of plugs of soil from the lawn.

- Aeration allows air, water & nutrients to penetrate into the soil.

- You can rent a power aerator at your local rental yard.

- You should aerate your lawn annually if possible, especially if it receives heavy use.

De-thatching removes built-up dead stems and leaves beneath your lawn's blades of grass. It has similar benefits to aeration.
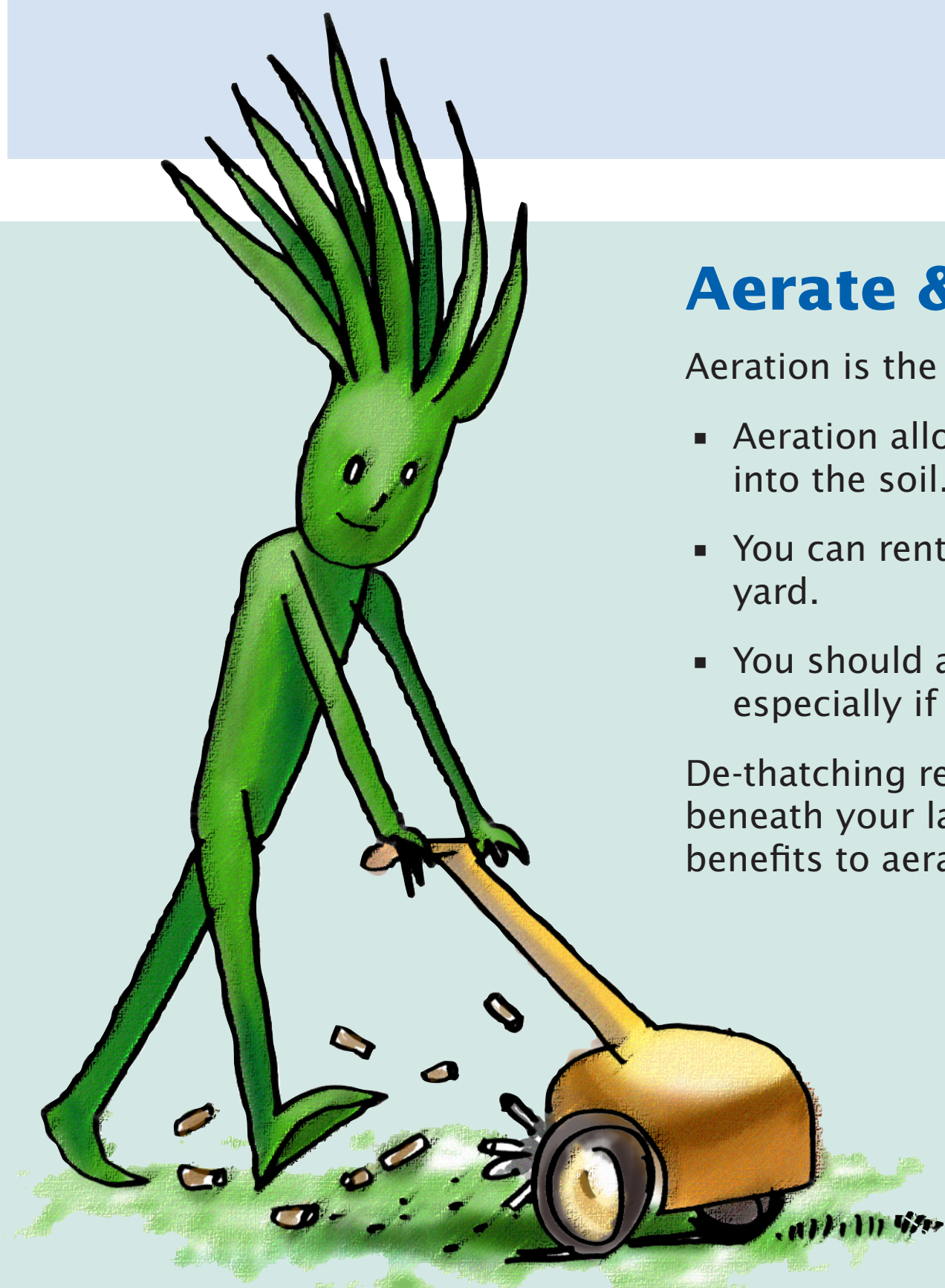
Set your mowing height

- Longer grass shades the soil and reduces moisture loss.

- Recommended mowing heights are:

  2-1/2" - 3" for tall fescue

  1-1/2" - 2" for Blue grass

- In general, you should never cut off more than 1/3 of the blade of grass at each mowing.

- Remember to keep your mower's blades sharp.
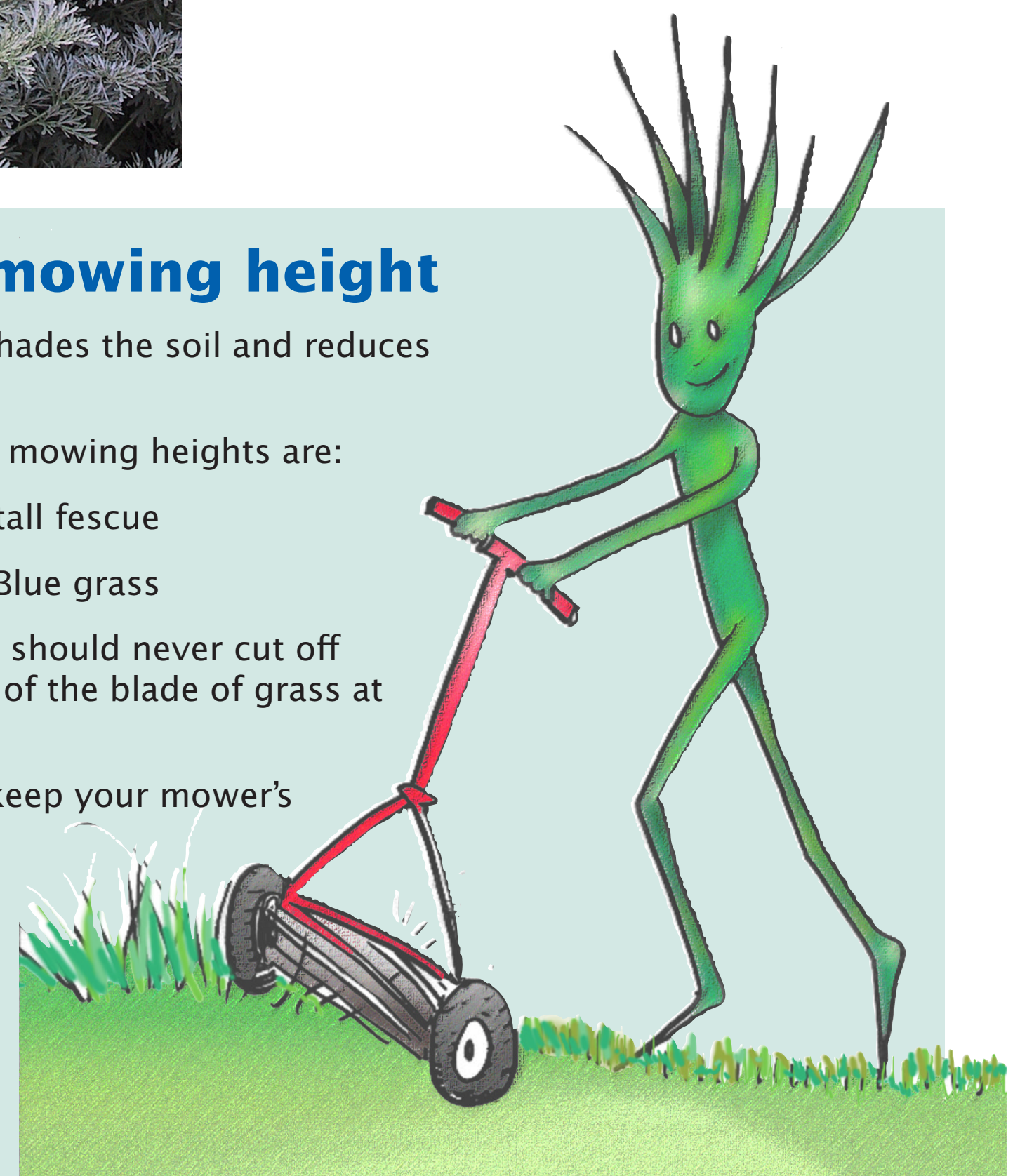
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WATER WISE DESIGN

Woolly Thyme (*Thymus pseudolanuginosus*)

Lawn Alternatives

It's often possible to find an alternate to lawn for sitting areas & patios.

- Walk-on ground covers such as creeping thyme or chamomile.
- Use stepping stones and water conserving ground covers for paths.
- Use permeable paving such as decomposed granite or pavers on a sand bed if you just want to create a sitting area. You can use a small recirculating fountain to make the space feel cooler.

Roses

Restrict water loving plants to high use zones

- If you want some thirsty plants, go ahead and plant them, but place them where you'll really enjoy them, and try to limit their area.
- Use water conserving plants for the remainder of your garden.

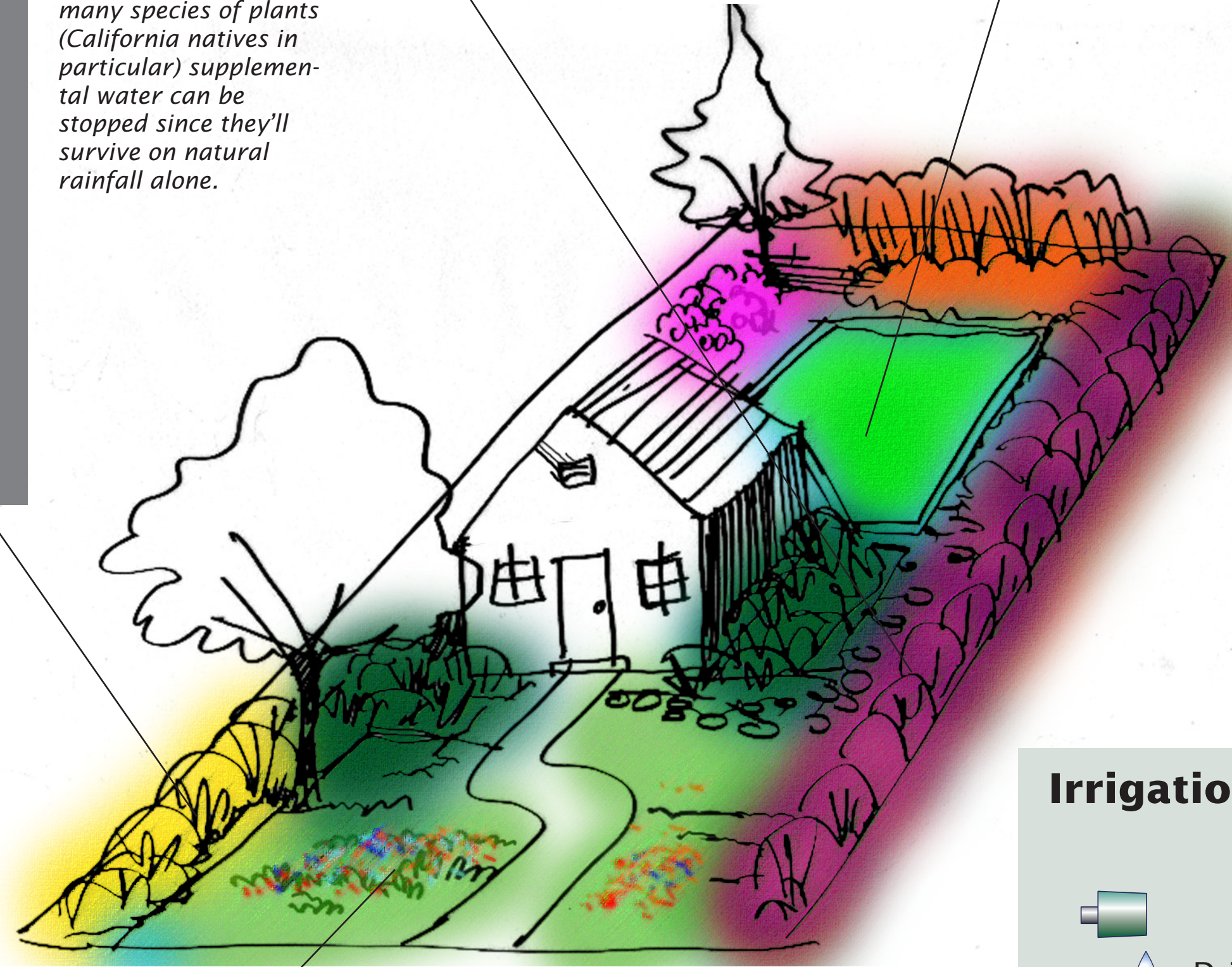*Water conserving perennials & shrubs. Water deeply but not often.*

Turf zone - requires frequent water. Make sure that there's no runoff or runoff is directed to a planting area that likes a lot of water.
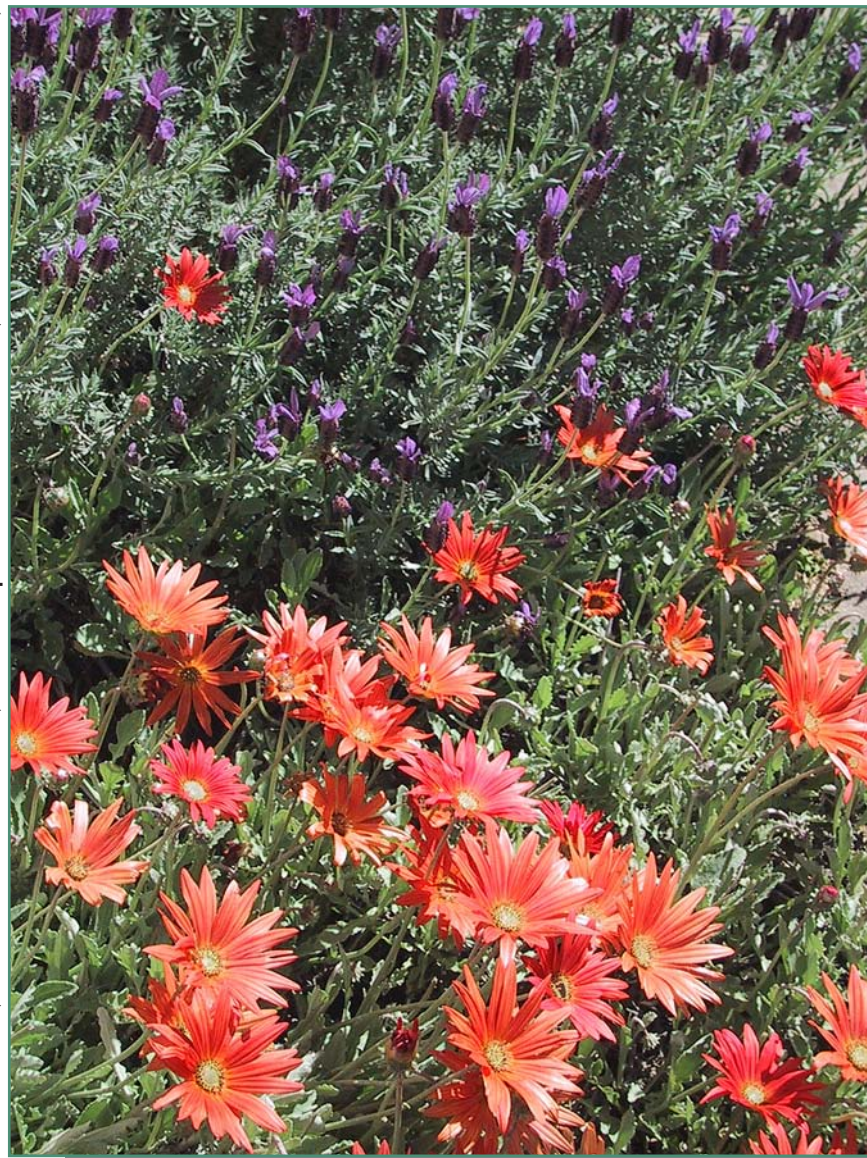

Rockrose (*Cistus x skanbergii*)

Established water conserving shrubs. With many species of plants (California natives in particular) supplemental water can be stopped since they'll survive on natural rainfall alone.

Artemisia 'Powis Castle'

Match your irrigation system to your plants - create "Hydrozones"

- Group plants with similar water requirements together on the same irrigation valve (hydrozone).
- Use a separate valve for plants on a slope. If you have a north facing slope and a west facing slope, use two separate valves, since these areas will have different water requirements, even if they are planted the same. Use separate valves for the top and bottom of slopes to avoid run-off.
- Plants in shaded areas should be on the same valve.
- Each zone should have the appropriate type of irrigation for the plants being watered. Don't mix irrigation types in a zone.

Established unthirsty perennials and shrubs can be watered with a manual valve with a timer a few times to get them through the summer.
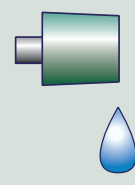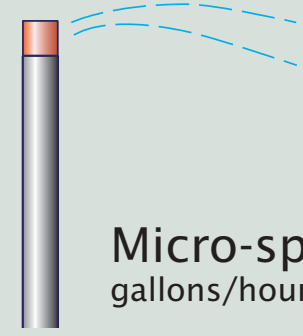

Irrigation Types

Drip
gallons/hour

Micro-spray
gallons/hour

Spray/Rotor
gallons per minute

Spanish lavender (*Lavandula stoechas*)

Gazbera (*Gazania x Gerbera*)

Pond design

- Use a pump to recirculate water in the pond and create waterfalls.
- Make the pond deep so that it stays cool and reduces evaporation. (Check with the city to see if you need a pool fence and permit before you start).
- Put the pond in a shady area if you're not growing sun-loving water plants.
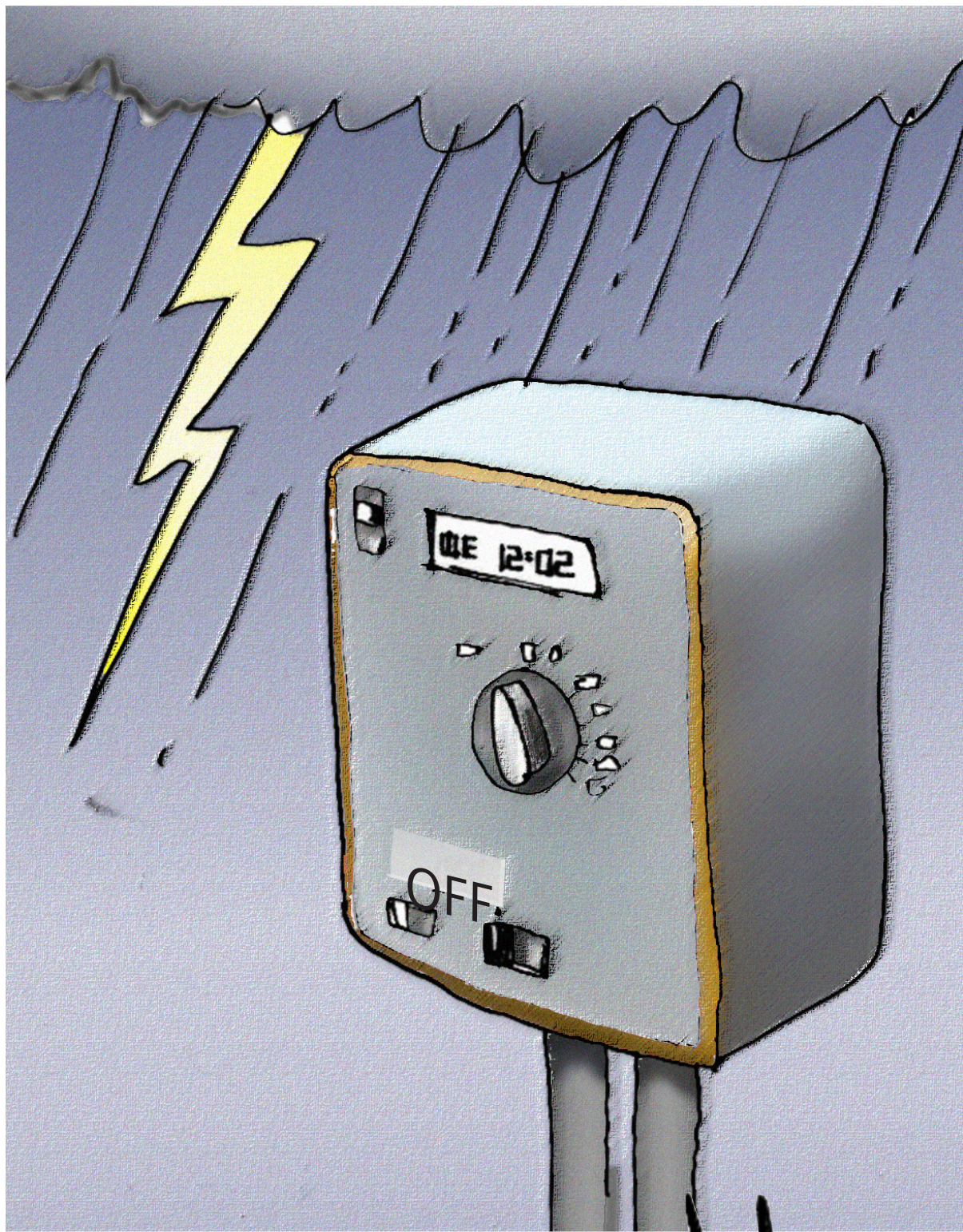

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MAINTENANCE

Turn your system off during the wet season

- During our rainy season, you shouldn't need to water at all unless the storms aren't coming.

- If you've installed rain sensors on your system, your system will turn itself off in rainy periods.

- After a series of heavy rains, wait until your soil's surface has dried out. Heavy soils may not require irrigation for quite a while after being wet.
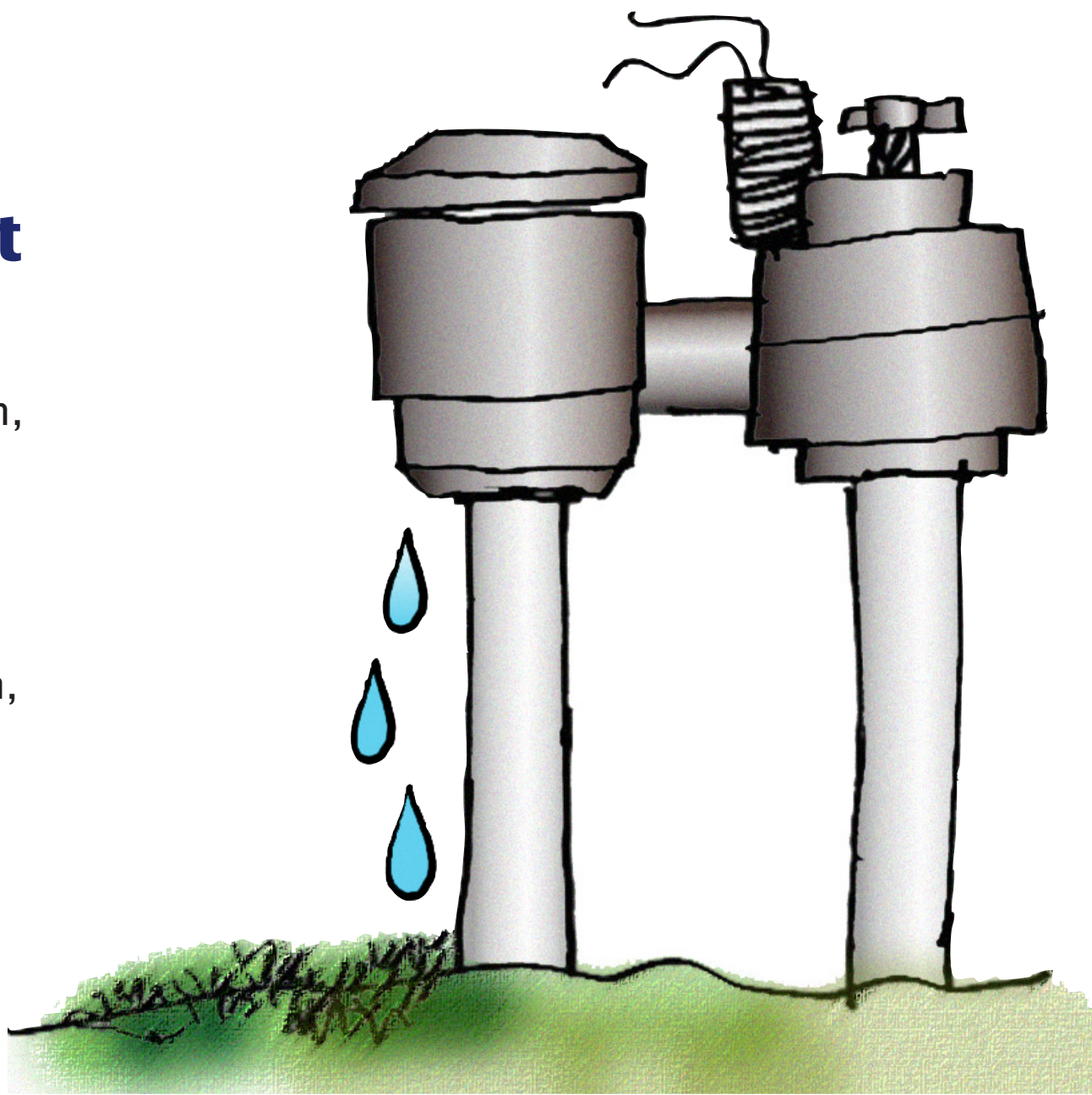
Check your irrigation system for leaks

- Even if you don't see dripping water, your system might be leaking after it runs. Check for constantly damp areas near your remote control valves.

- Test your system occasionally to make sure that there aren't any broken laterals, heads, or drip lines. Walk each irrigation line while it's running, look and listen for leaks.

- Don't forget to check your hose bibs for leaks. Immediately repair or replace any leaky valves.

- One drip per second wastes more than 2,400 gallons per year.
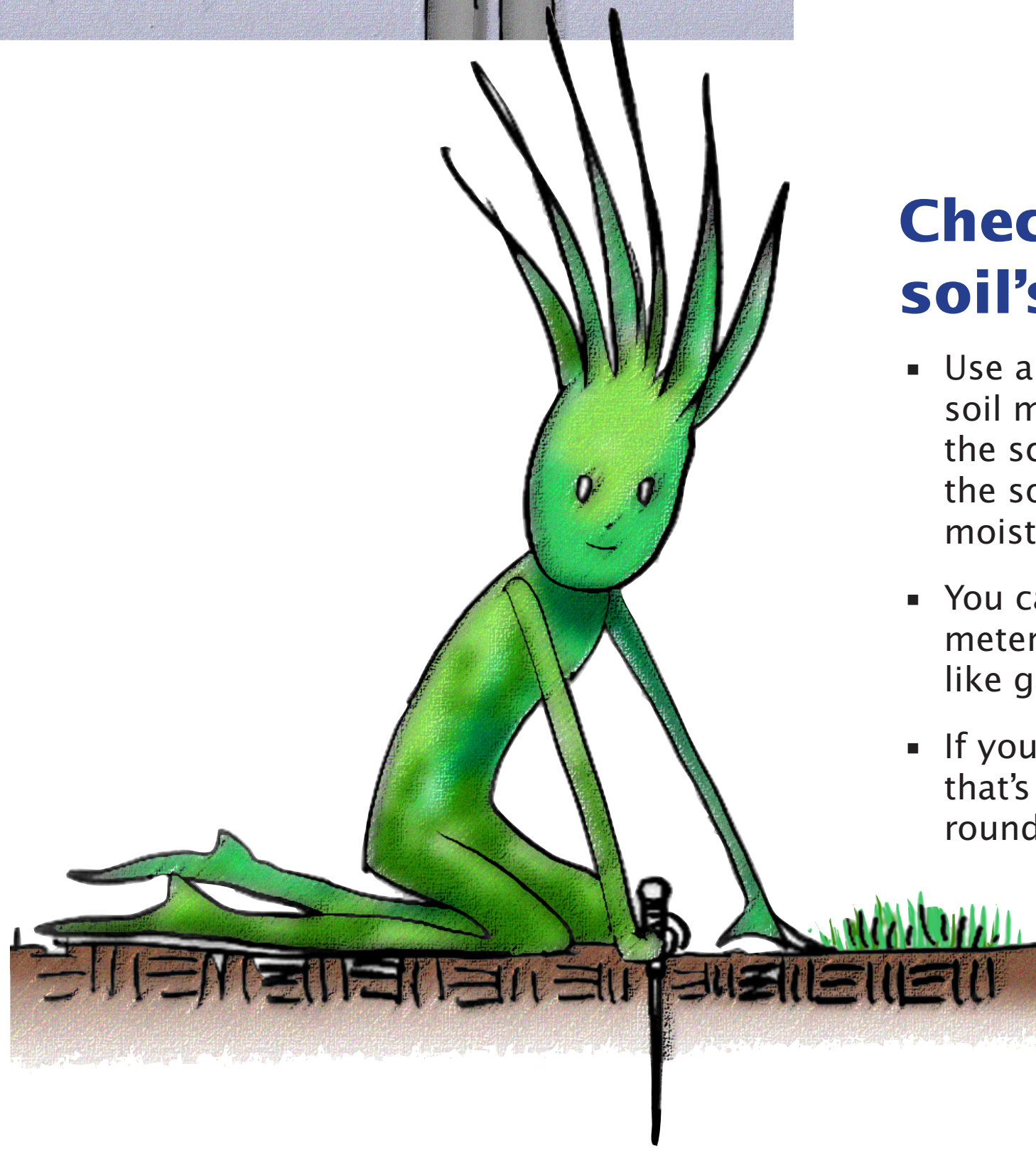
Check your soil's moisture

- Use a screwdriver to test soil moisture. If the tip of the screwdriver penetrates the soil easily, it's probably moist.

- You can also use a moisture meter or soil probe, if you like gadgets.

- If you have a wet spot that's not lower than the surrounding soil, you may have a broken water line underground. Look for leaks during sprinkler operation.

Use a checklist

WEEKLY "IN SEASON" CHECKLIST
- ✔ STRAIGHTEN CROOKED SPRINKLERS
- ✔ CHECK FOR CLOGGED NOZZLES / EMITTERS
- ✔ CHECK FOR ADEQUATE PRESSURE
- ✔ AVOID RUN-OFF
- ✔ CHECK COVERAGE
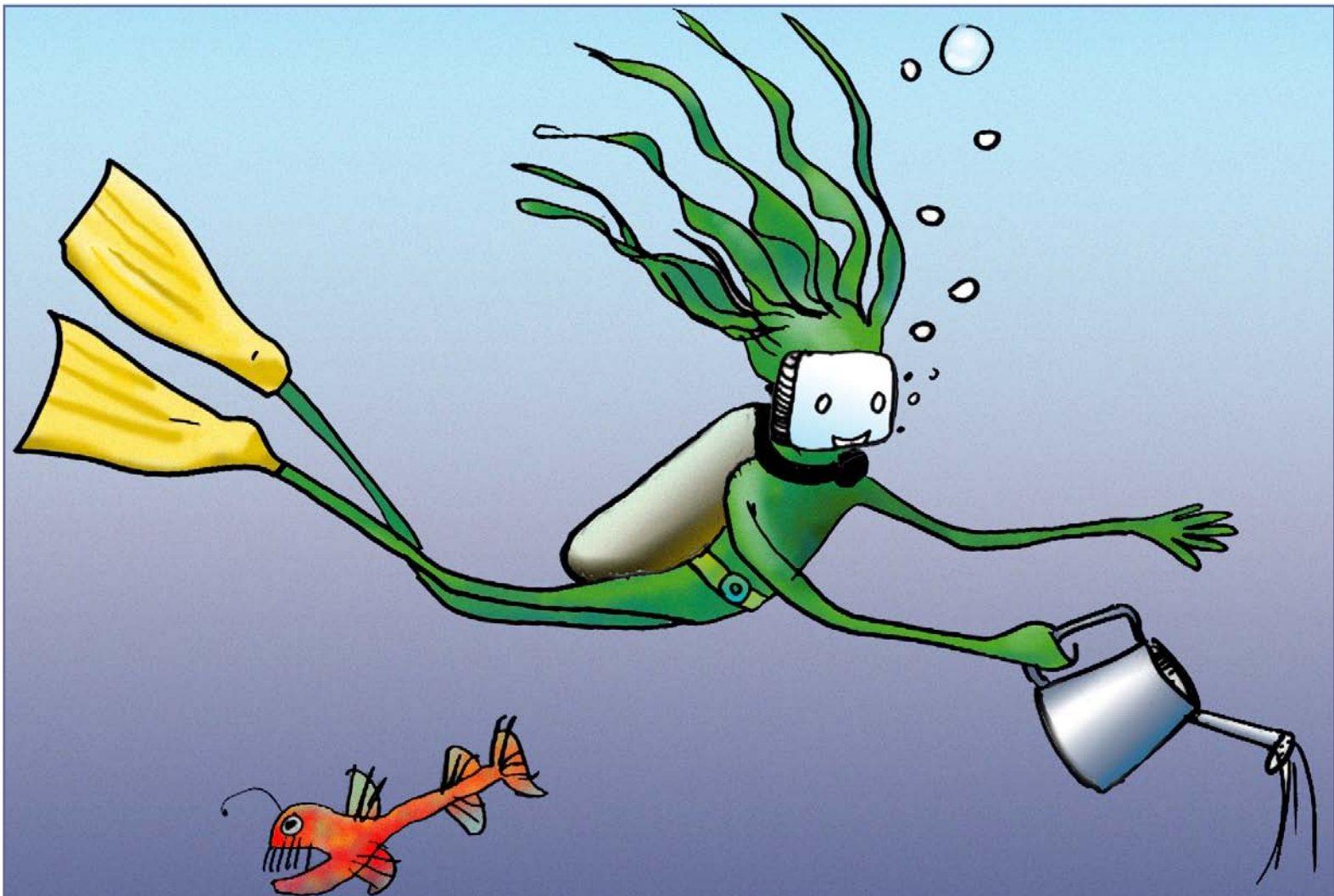
Deep water

- Train your plants roots to grow deeper by watering less frequently, but in a manner that gets the water deep into the soil.

- If you have heavy soil, you may need to water several times for short periods to let the water penetrate the soil without excess runoff. Many irrigation controllers allow automatic "pulse" watering.
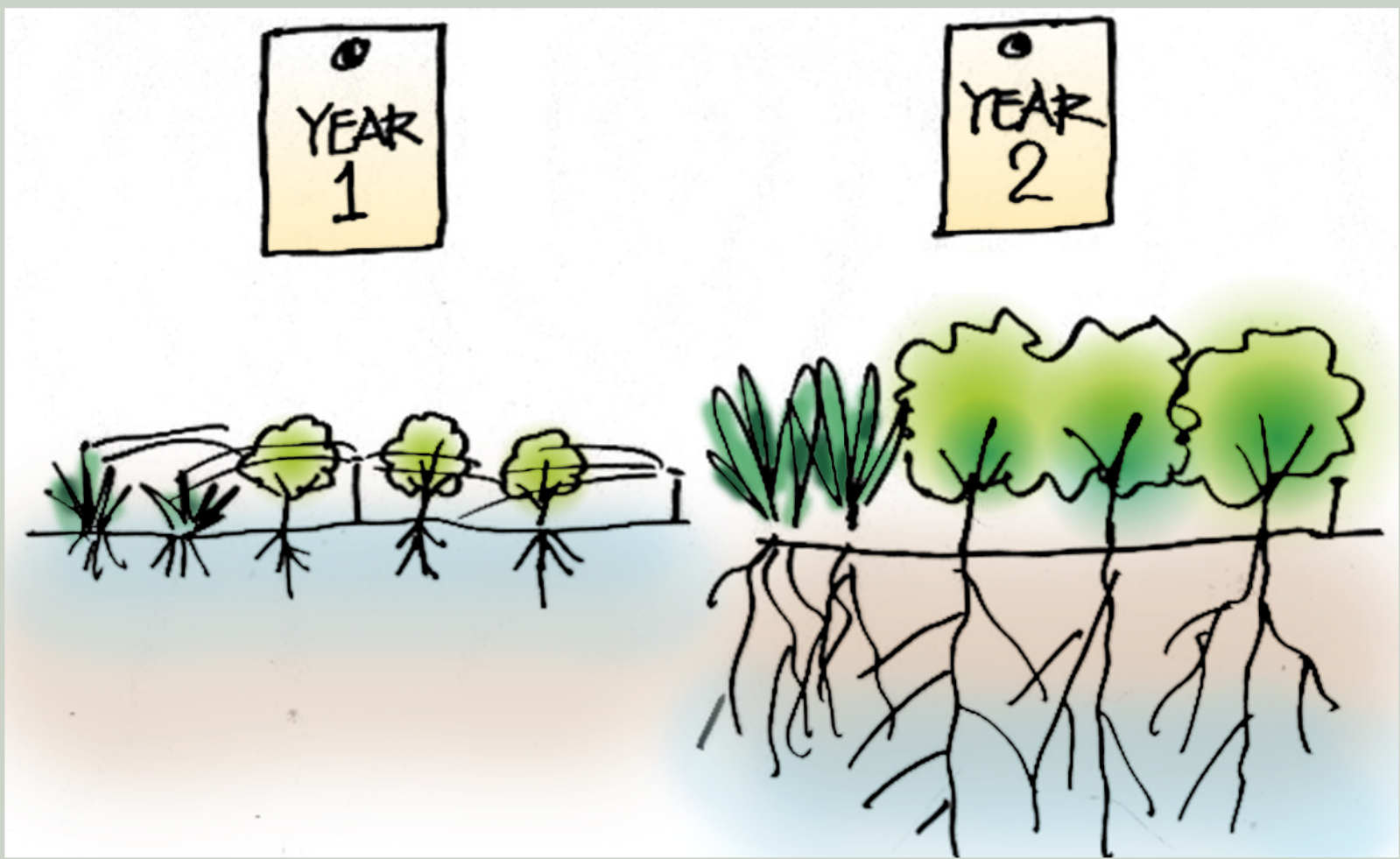
Adapt your watering habits as your plants grow

- Because they have shallow, undeveloped root systems, new plantings need frequent watering. As the plants grow, their root systems develop and you can water less often but more deeply.

- If you've planted native or well-adapted plant species, you might eventually stop watering them entirely - they can often grow on natural rainfall alone once they're established.

Use a schedule

STATION	PLANT	RUN TIME	DAYS	PROG/START
1	FRONT LAWN	10 MIN	M/TH	A/3 AM
2	FRONT SHRUBS	5 MIN	F	B/4 AM
3	REAR LAWN	10 MIN	M/T	A/4 AM
4	GARDEN (DRIP)	1 HOUR	W/SA	C/8 AM

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PLANTS, SOIL & WATER

The effects of overwatering

Plants' roots need air as well as water to thrive. When the soil is saturated with water, this drives out the air, and the roots can "drown". If only some of the roots are damaged, the plant won't die, but it may require more water. If all the roots are damaged, the plant will die.

Orchid Rock Rose (*Cistus x purpureus*)

Know your soil

Check your soil's drainage. Dig a hole, fill it with water, then come back in an hour to see if all the water has drained out. Fill it again (unless it hasn't drained), wait another hour, and see if it's still draining. If the hole still has water in it, you don't have well-drained soil.

Another way to check your soil is to wet some of it and shape it into a ball about the size of a marble. Does it hold together? If not, you probably have a sandy or gravelly soil that drains very rapidly. If it holds together, form it into a "spindle" by rubbing your hands together. Try bending the spindle. If it bends easily without cracking, you have a clay soil. If it bends a bit then cracks and breaks, you probably have a loamy soil.

- Choose your plants to match your soil type. Most gardening books indicate clearly what kind of drainage each plant requires.

- By choosing plants adapted to your soil, you'll not only reduce watering needs, you'll also have a healthier landscape.

Three types of soil texture

- Clay soil has very fine particles, holds moisture a long time, and may not admit air into the root zone.

  Remedy: add organic matter or gypsum to cause the clay particles to clump together.

- Loam soil is a mix of clay, silt and sand particles. These soils are generally considered ideal for plant growth.

- Sandy soils have coarse particles, drain rapidly and dry quickly.

  Remedy: add organic matter. It will act as a sponge to keep the water in the root zone longer.
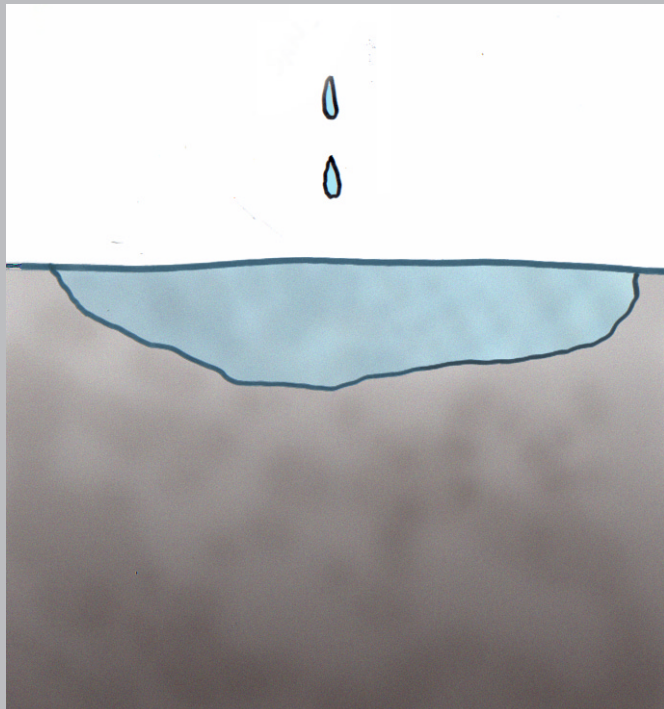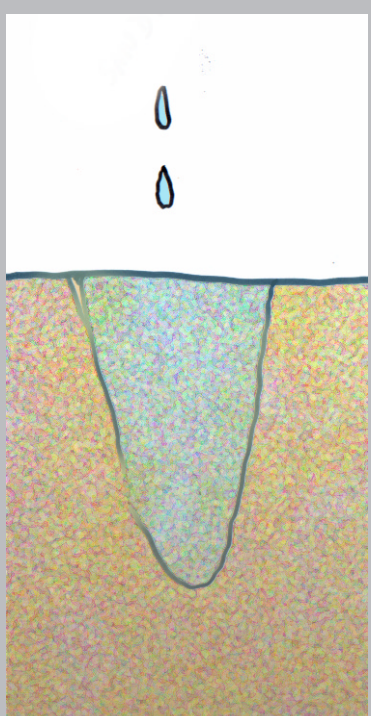
Clay

- Clay particles are very small, invisible to the naked eye.
- Water penetrates clay soils slowly - but it does spread
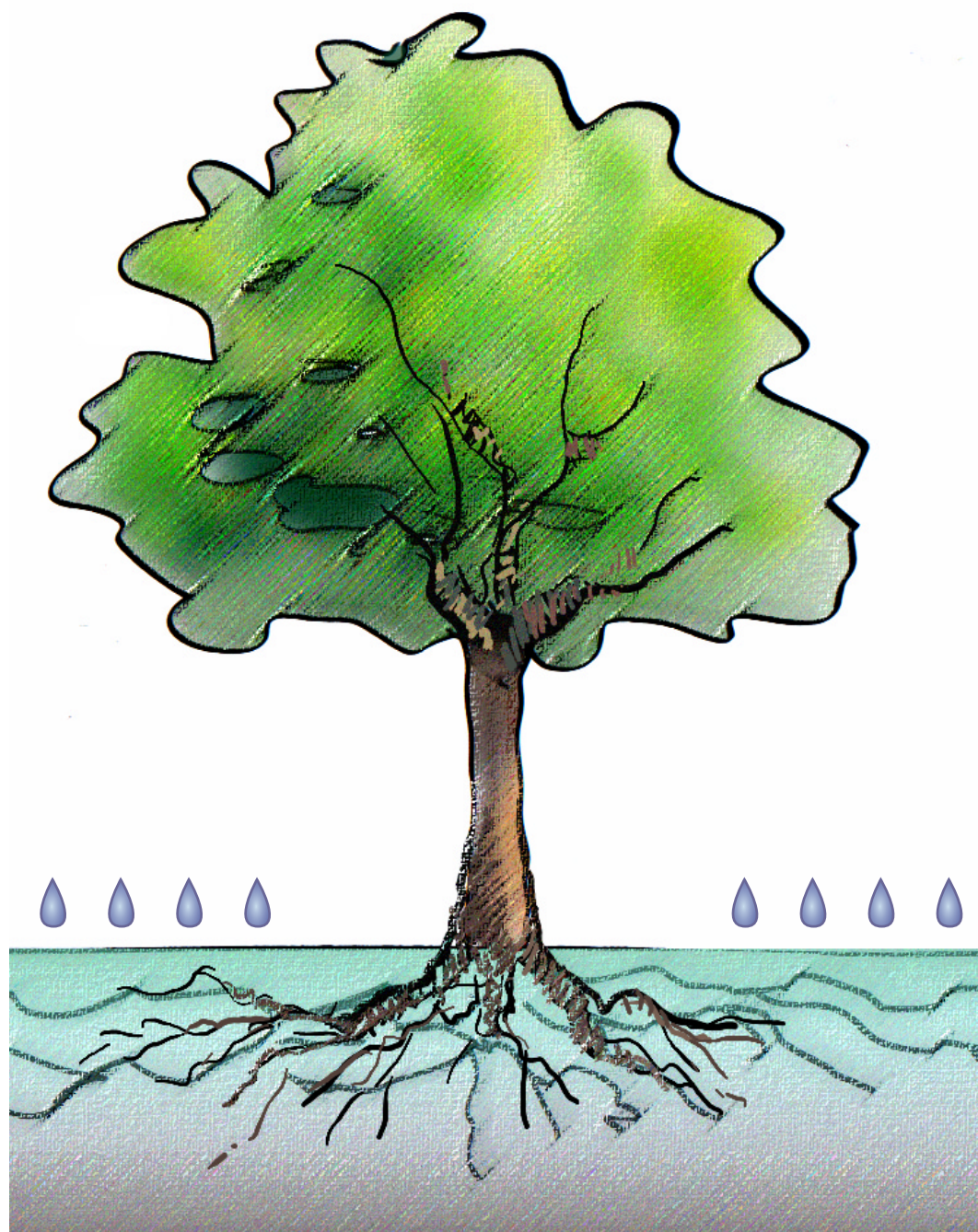- Retains water well, but compacts easily.
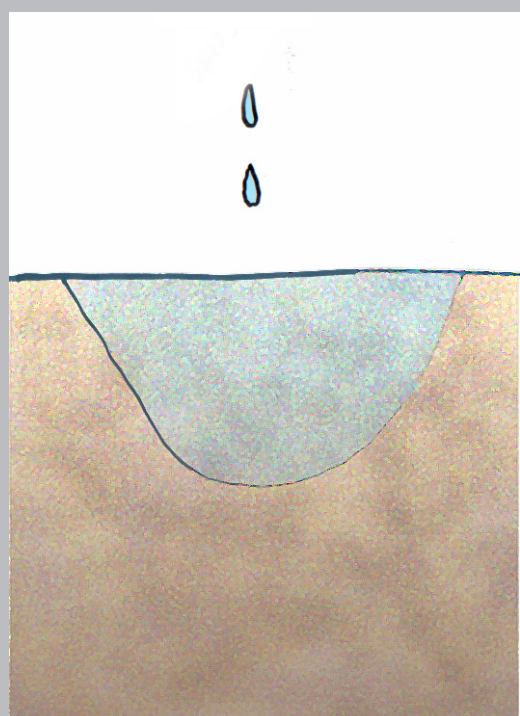
Silt

- Silt is intermediate between clay and sand.
- This is generally a good soil for plant growth.

Sand

- Sand particles are coarse, visible to the naked eye.
- Water penetrates quickly, and does not remain in the soil.

Roots only grow where they're happy.

Roots need both air and water to grow well. In well aerated soils (sand and loam) roots will go deeper. In clay soils, roots lack air and so tend to stay near the surface.

Mature trees should not be irrigated near the trunk, since this is not where the roots are. Roots can actually extend 2-3 times beyond the drip line in many species.
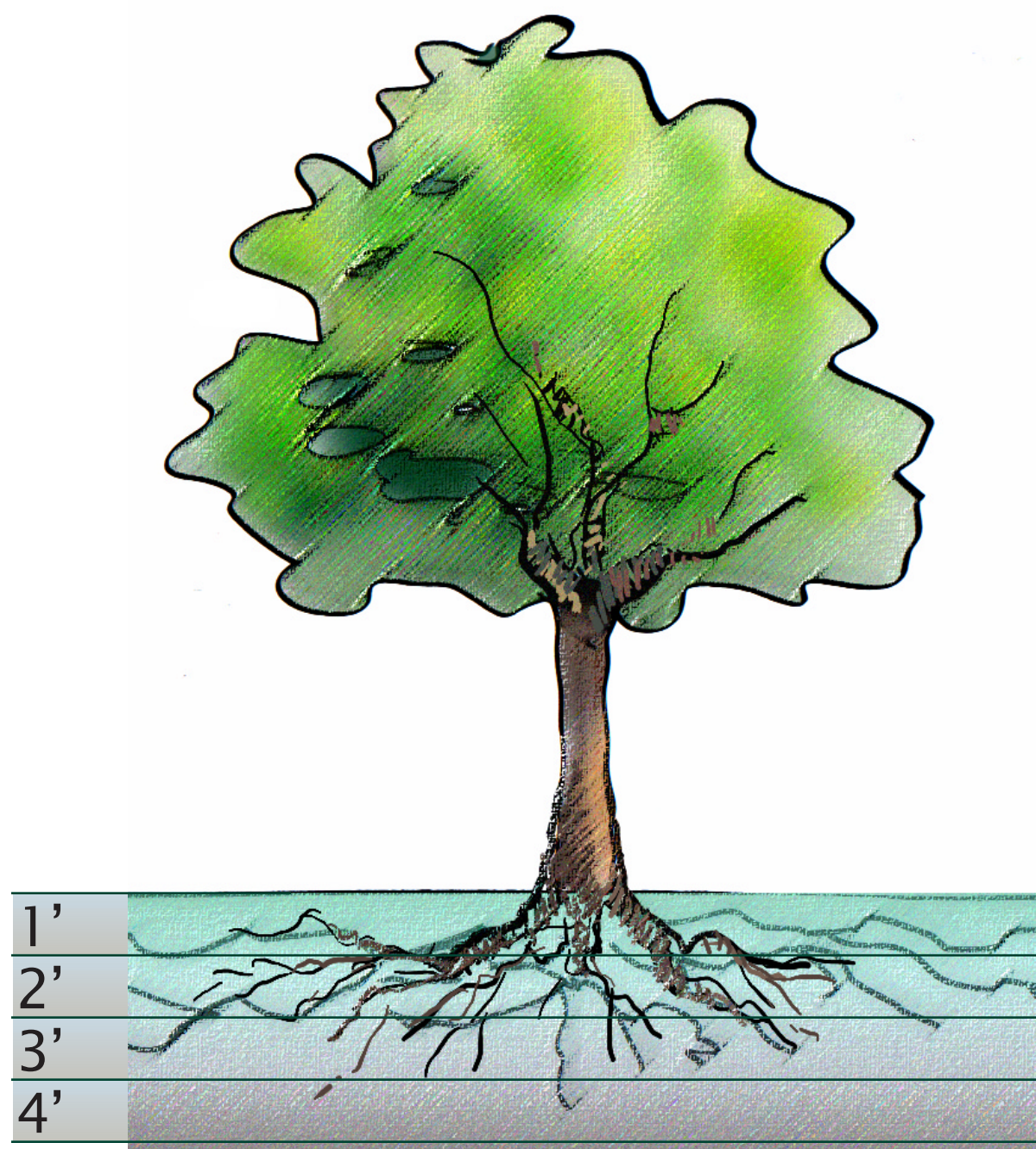
Most of the absorptive roots of even large trees are within the top two feet of soil. Deeper roots serve primarily to anchor the tree and store nutrients. However, do not assume that lawn irrigation will supply the needs of trees growing in turf

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