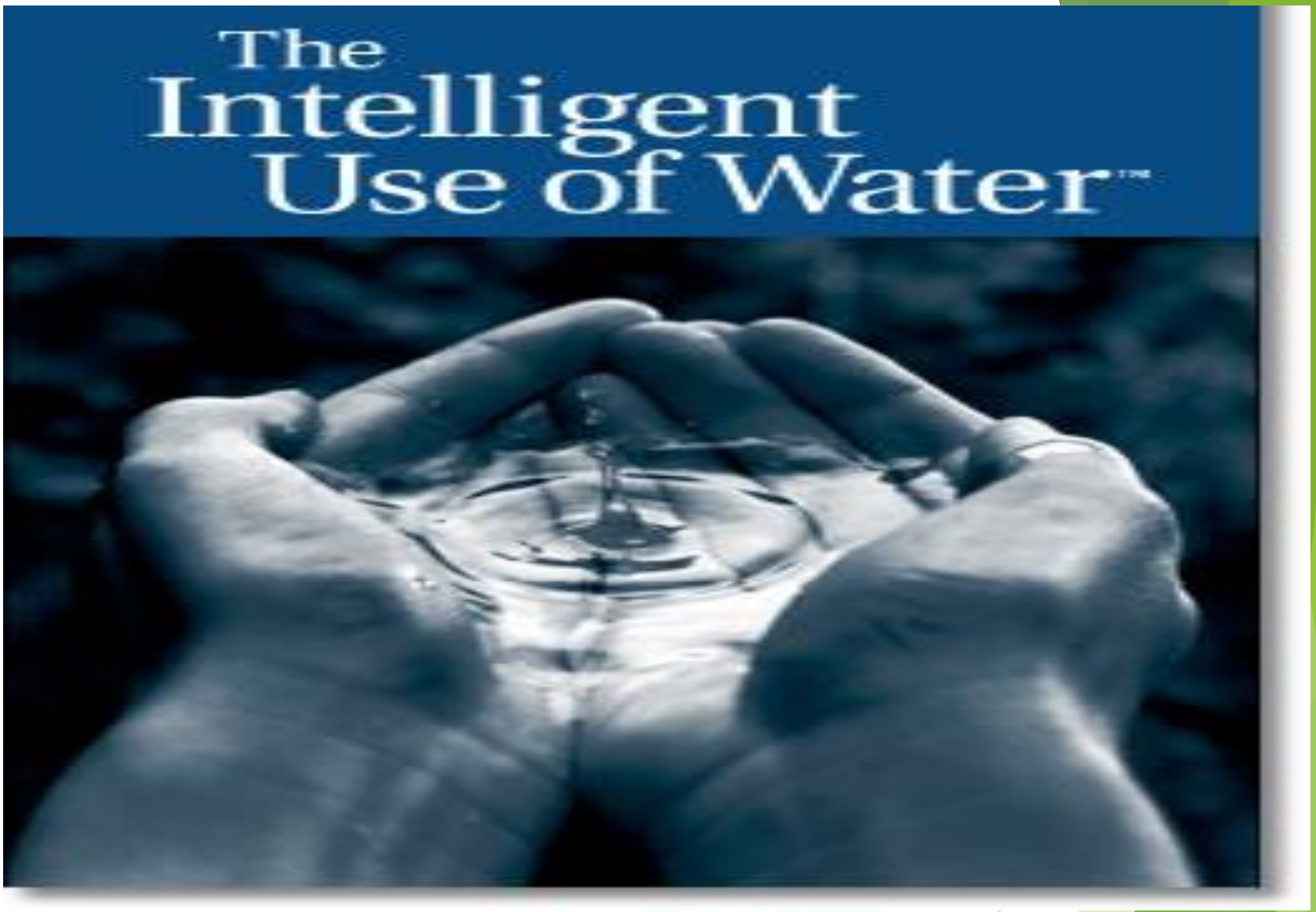


Ammon City Website
b.ci.ammon.id.us/parks-department

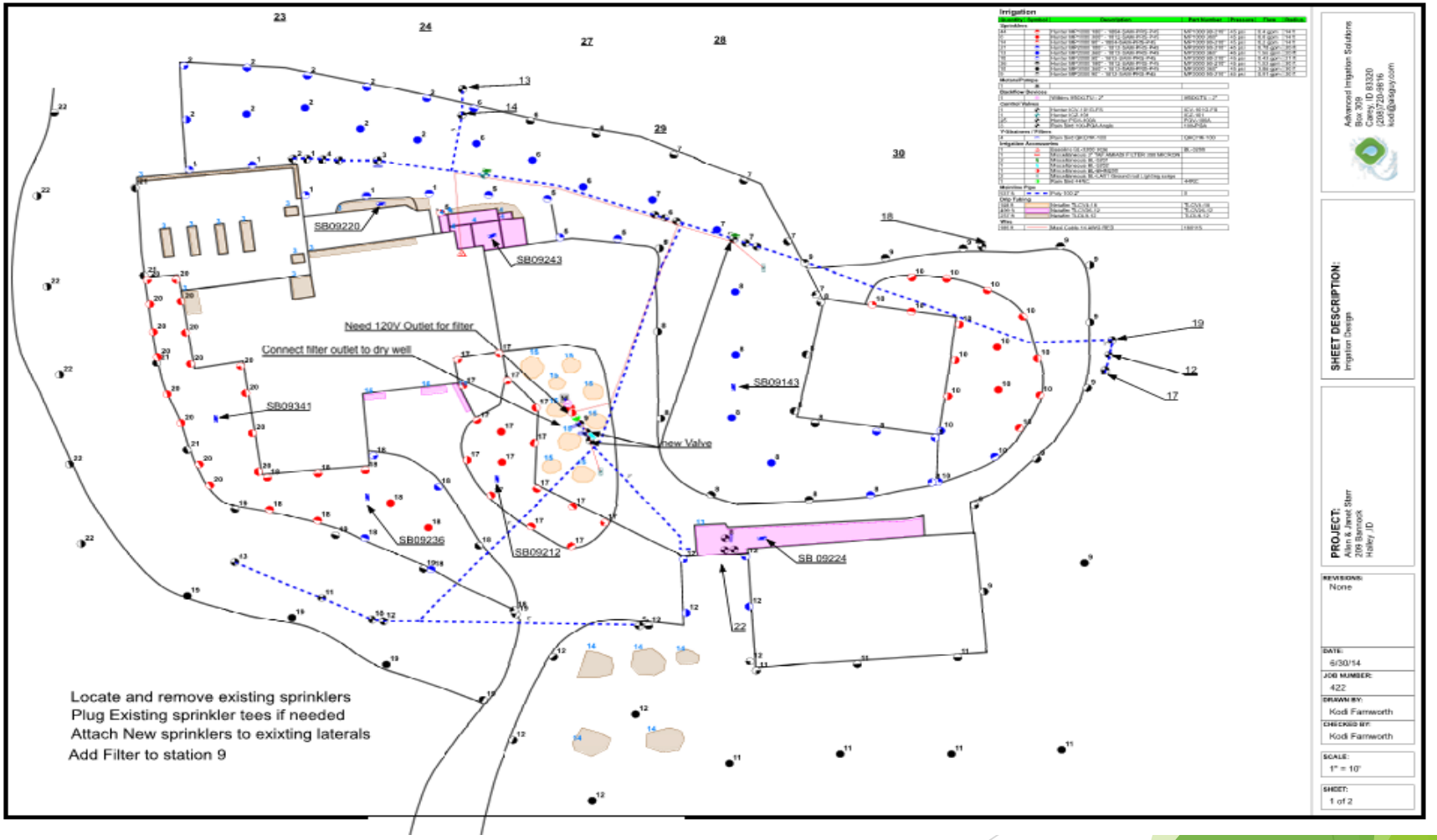
“When the well is dry, we learn the worth of water.”

Ben Franklin, Poor Richard's Almanac 1733

Keys To using water efficiently

- Good Design
- A Good Install(needs to have a system that meets minimum Uniformity of 70%)
- Smart Controller ET or Soil Moisture
- Have an audit done on any new install to make sure Contractor did a good job and you have a Sprinkler system with a 70% or better Uniformity

Good Design


SB09220
SB09243
Need 120V Outlet for filter
Connect filter outlet to dry well
SB09341
SB09143
new Valve
SB09236
SB09212
SB 09224
Locate and remove existing sprinklers
Plug Existing sprinkler tees if needed
Attach New sprinklers to exixting laterals
Add Filter to station 9
Irrigation
Advanced Irrigation Solutions
Box 909
Carey, ID 83320
(208)720-9816
kodi@aisguy.com
SHEET DESCRIPTION:
Irrigation Design
PROJECT:
Allen & Janet Starr
209 Bannock
Hailey ,ID
REVISIONS:
None
DATE:
6/30/14
JOB NUMBER:
422
DRAWN BY:
Kodi Farnworth
CHECKED BY:
Kodi Farnworth
SCALE:
1" = 10'
SHEET:
1 of 2

Plants Are Different

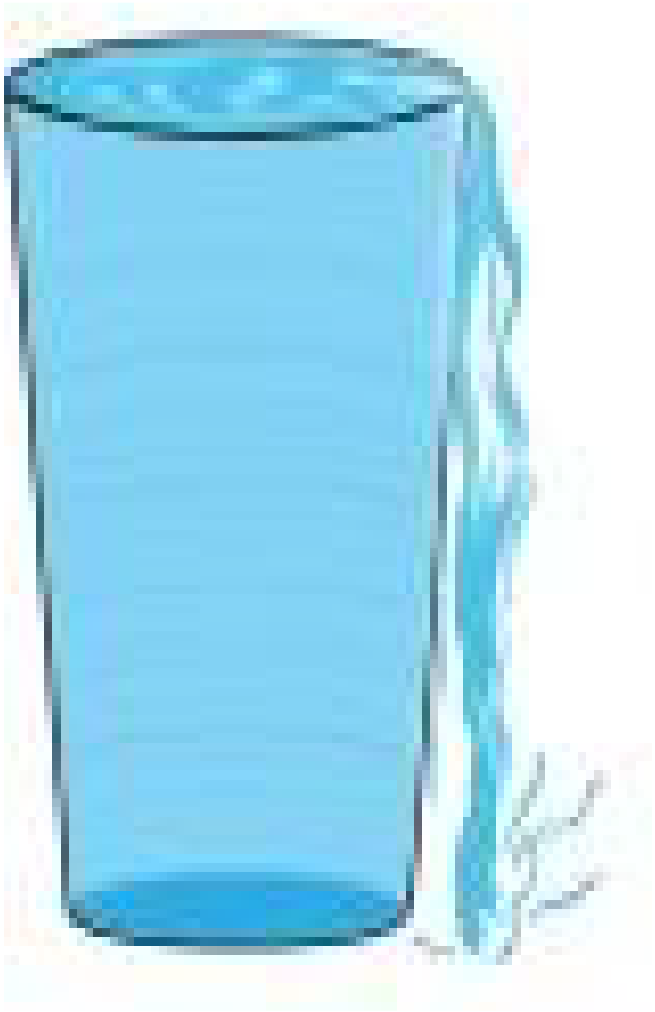
- The roots of a plant do more than just keep it anchored to one spot — they draw water and dissolved nutrients from the soil up through the plant and out through the leaf.
- This process is called transpiration. Different plants have different transpiration rates at different stages of growth, but all plants transpire. The nutrients dissolved in this water provide the plant nourishment.
- Some plants that are categorized as drought-tolerant, water-wise, or native will survive with limited water, but when water is present, they become water hogs and put out rampant growth.

What is a good irrigator trying to accomplish?

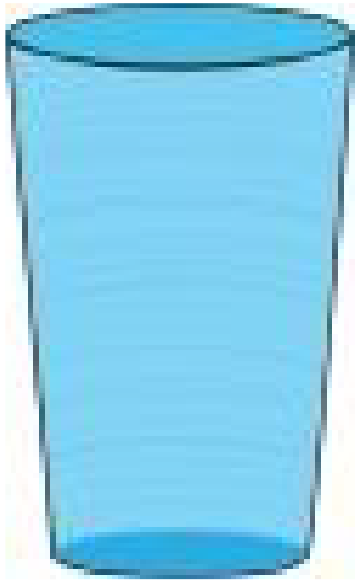
- To be a good irrigator, your number one goal is to use the least amount of water possible to keep the soil moisture content in the root zone at the appropriate levels. To meet this goal, you have to turn on the water before the moisture content drops below the lowest allowed level (maximum allowed depletion), and shut off the water before it goes above the highest allowed level (field capacity).

- Your second goal should be to water as infrequently as possible because this strategy will promote deeper plant roots while minimizing the incidence of disease.

- We know deep and infrequent watering can get complicated, and it is not always possible due to watering restrictions, available water supply, or events.

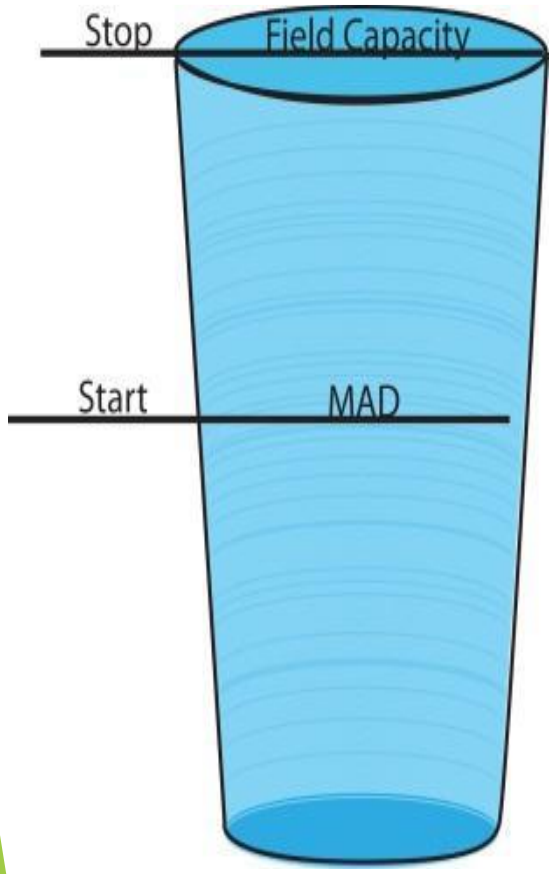


- **Saturation:** At the saturation level, nearly all of the spaces between soil particles are filled with water. After a soil has reached saturation, it does not become more saturated; although, in some situations where water is trapped, it can become flooded.



Field Capacity: When soil is at the field capacity level, it means that all excess moisture has drained freely from that soil. The amount of remaining moisture is the field capacity. Imagine dipping a sponge in a bucket and allowing it to soak up water (it becomes saturated). When you pull the sponge from the bucket, water drips freely. When the dripping stops, the sponge has reached field capacity.

- **Maximum Allowed Depletion (MAD):** When the soil moisture content reaches this level, irrigation needs to start. In most cases, the maximum allowed depletion level is just before the plants begin to show visible signs of stress.



- **Putting All These Factors Together**
-
- Think of your soil as a cup. Soil that holds a lot of water would be represented by a large cup. Soil that holds less water would be represented by a smaller cup.
-
- When the cup is filled with water, it's at field capacity. A lower water level is designated as the maximum allowed depletion (MAD).
-
- Think of the plant as a straw used to suck water out of the cup.
- Think of the irrigation system as a water source that refills the cup.

Why is it so challenging to water efficiently and effectively?

- On paper, your goals look pretty simple: turn water on, turn water off. In reality, using water efficiently and effectively is quite challenging.
- In order to meet the goals, you need to be part soil scientist, part hydrologist, part physicist, and part botanist. Fortunately, moisture sensors and weather station products can help you look like an expert in all these areas.

- **Understanding Soil Moisture Content Levels**
- In order to monitor your water use, you need to understand how the following levels of soil moisture content correlate with the availability of water in the soil. Having a familiarity with these levels will help you understand the way soil holds water.

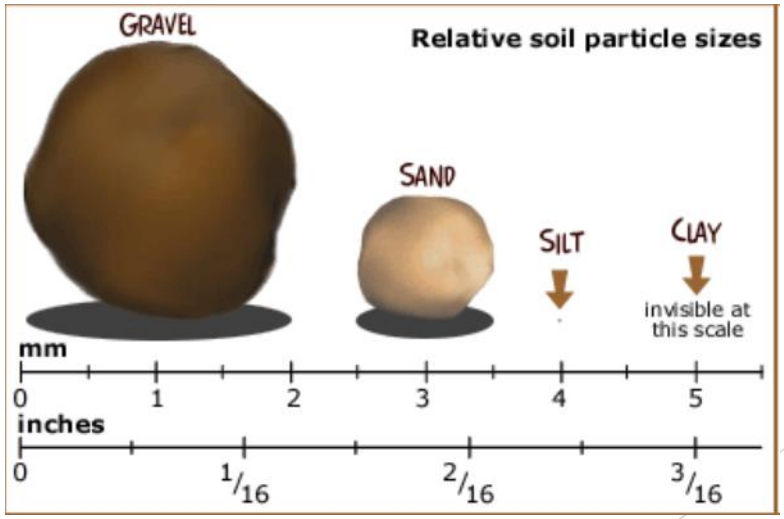
Good Install: Things that are important to using less water.

1. Soil type/ Root zone depth
2. Matched Precipitation
3. Uniformity (Properly designed & installed system)
4. Efficiency
5. Check Valves
6. Pressure regulated sprinklers
7. Drip VS sprays in beds
8. Does the system have ET Controllers or Soil moisture sensors
9. Plant types & Sun Exposures

Why is it necessary to know the soil type?

Not all soils are created equally

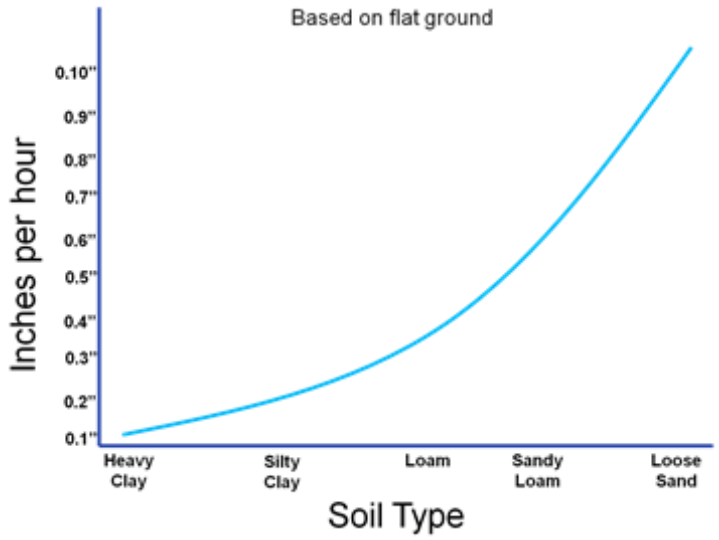
- The soil is the plant's water and food supply. Soil is made up of mineral particles weathered out of rock. These particles are identified by their size as sand, silt, or clay. The mineral particles are held together by organic matter. Soil is classified based on the relative proportions of sand, silt, and clay.



Infiltration and Water Movement

- The soil's infiltration rate is the rate at which the soil is able to absorb water.
- As water is added to the surface, it begins to work its way down in to the soil. Some soils can accept water much more quickly than others.
- For example, consider what happens when you dip a paper towel into water. At first, the water moves very quickly into the paper towel, and then it slows down and eventually appears to stop.
- This example demonstrates the effect of saturation on capillary action. The same thing happens in the soil when water is first applied to the surface — it fills the soil pores nearest the surface first, and as these pores fill up, the water moves deeper into the profile. The time it takes for water to move through the soil depends on the size of the spaces and pores between the soil particles.
- If you are trying to achieve your number one goal of "using the least amount of water possible to keep the soil moisture content in the root zone between field capacity and maximum allowed depletion,"

Because All sprinklers apply water faster than soils can intake it. A Clay soil intakes water at .10” hr. So we need to know our soil type to figure out how fast it absorbs water.



- How to test what type of soil you have.

- Jar Test?

- Jar test is very easy to do. You'll need :
- 1 clean quart jar tight fitting lid
- Clean water
- Soil sample
- Fill the jar about 2/3 full with clean water
- Next take a sample of soil (break the large clods apart so it will fit through the jar opening) and fill the jar and water until the jar is nearly full, leaving about ½" of air space at the top. Screw on the lid and shake it vigorously for a minute or two, until all the soil particles are broken down into suspension in the water.
- Now allow the suspended soil to settle for about a minute, place a mark on the side of the jar at the top of the layer that has settled out. This is the sand layer. it is made primarily of sand and large particles. Set the jar aside, being careful not to mix the sand layer that has already settled and wait approximately and hour. Now place a mark on the side of the jar at the top of the next layer to settle out . This is the silt layer. Again, place the jar aside for a full day , being careful not to shake or mix the layers that have settled out. After 24 hours, or when the water is once again clear, place a mark on the side of the jar at the top and final layer. This is the clay layer. The percentage of each layer tells you what kind of soil you have.

- Measure the size of total soil profile and divide each profile to determine the percentage that each profile occupies. Once you have this determined use the chart on the next page to determine soil type

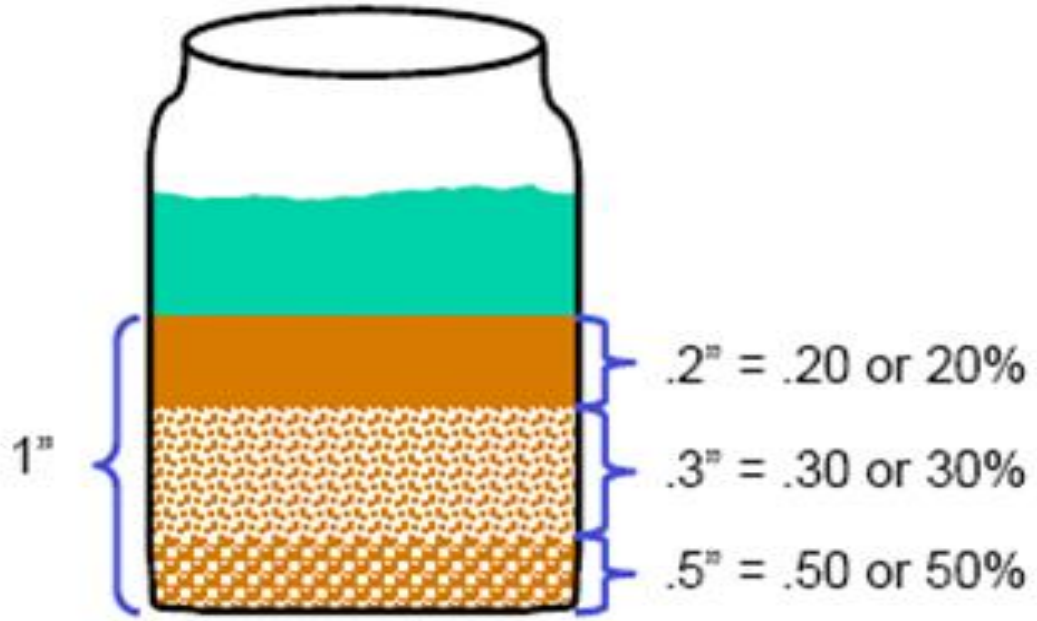
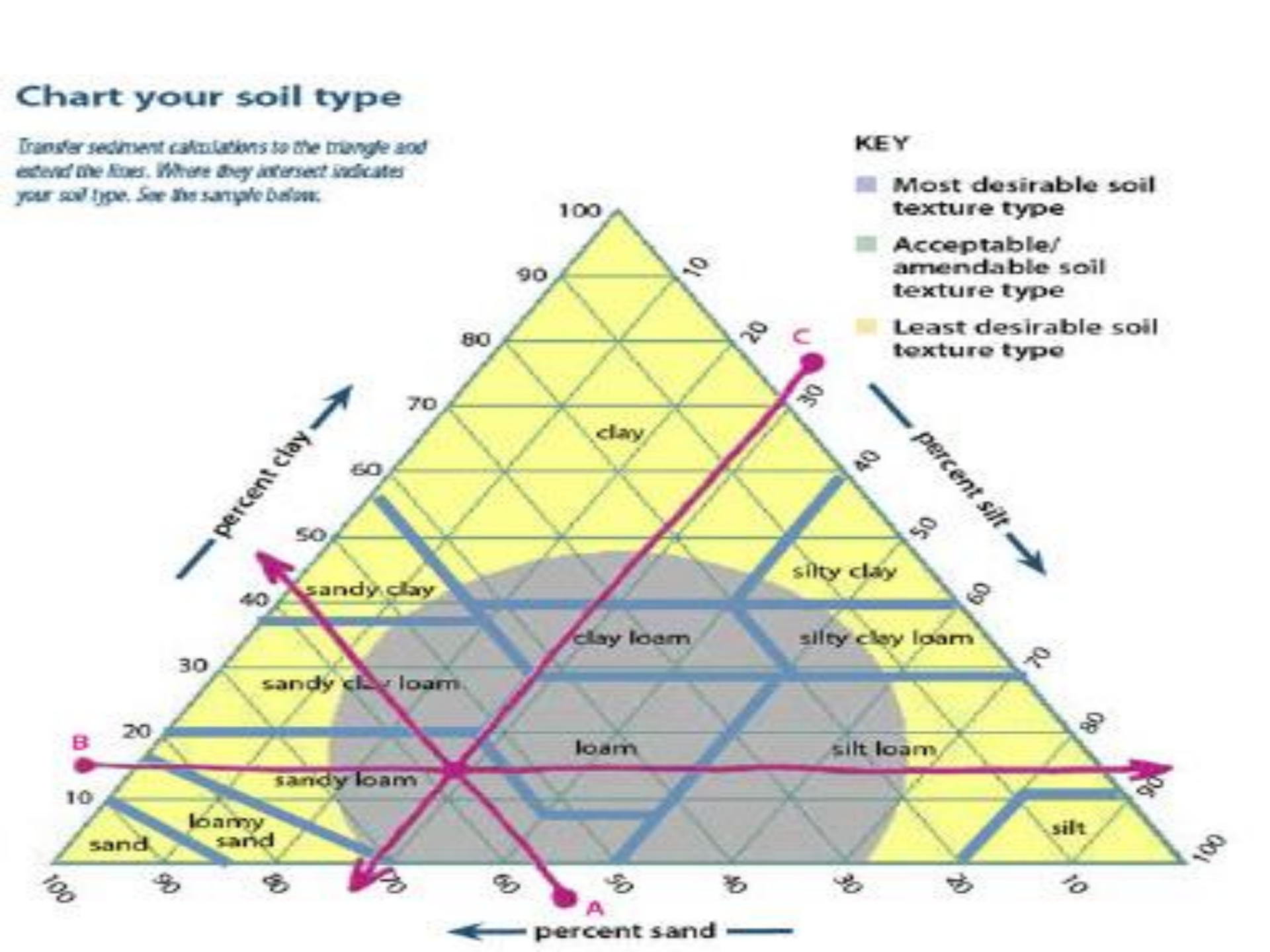


Chart your soil type

Transfer sediment calculations to the triangle and extend the lines. Where they intersect indicates your soil type. See the sample below.



Scheduling the Controller

1. How Much Time Should I Water?.
2. Should I water all at once?
3. How often should you water?

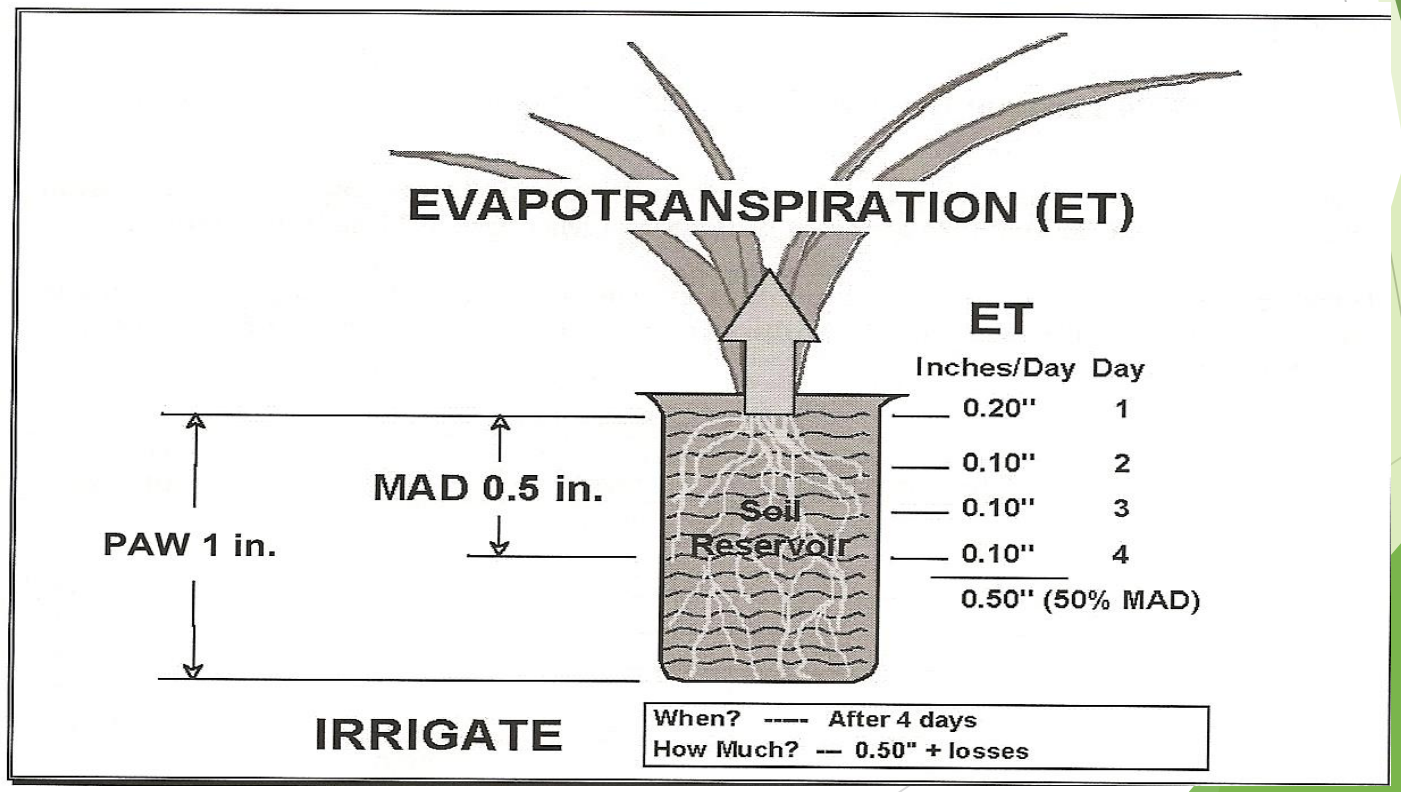
Sprinkler Application Rate hour
(how fast a sprinkler applies water)

#1 #2 #3 #4

.50 in/hr

ET - Evapotranspiration

This is a measure of the amount of moisture lost from the ground during each day in two ways, by direct Evaporation from the ground, and by Transpiration from the plant canopy.



How too figure out how much time each zone should run.

- If I need to apply **.26 inches of water daily or ET(average for July)** and my Sprinkler Precipitation rate is **1.8 inches(spray head) an hour "typical spray head"** (PR). And my soil is a clay soil my infiltration rate (IR) is .10 inches an hour .
- Total run time= ET/ PR x 60
- So if I take my daily ET and divide it by my precipitation rate, then times by 60. I then know how long I need to water my plant.
- .26 / 1.80 x 60 = 8.66 Minutes total runtime

- So now if I know I have a clay soil which intakes water at .10 inches hour and divide that by the sprinkler precipitation rate. Then times it by 60. I now know I can only run for 3 minutes before run off or puddling.
- **Cycle and soak** Time = IR / PR x 60
- .10" / 1.8 x 60 = I can only run for 3.33 minutes. Because of my soil type before I get runoff or puddling

- Total runtime / cycle runtime = cycles
- 8.66/3.33 =2.60 cycles for 3 minutes

- When you look at soil, it appears that the particles touch each other, but in reality there are spaces, called pores, in between.
- When soil is dry, the pores are filled with air, but after irrigation or rainfall, the pores fill with water.

- In sandy soil, the individual sand particles are larger than those in clay soil. The sand particles fit together in a way that creates large pores, but because the particles are large, there are fewer of them in a specified volume of soil, and the amount of total pore space is low.
- For these reasons, water moves through the large pores between the sand particles relatively quickly. Water adheres to the sand particles, but because there are relatively few of them, the amount of water retained in the sandy soil is low.

- In clay soil, the pores between the particles are small, but because the soil particles are also small, there are a large number of pores.
- Due to the greater number, the pores in clay soil can hold more water than the pores in sandy soil.
- And because there are more soil particles present, the amount of water adhering to those particles is greater than in a sandy soil. However, due to the small size of the pores and the large number of small soil particles.

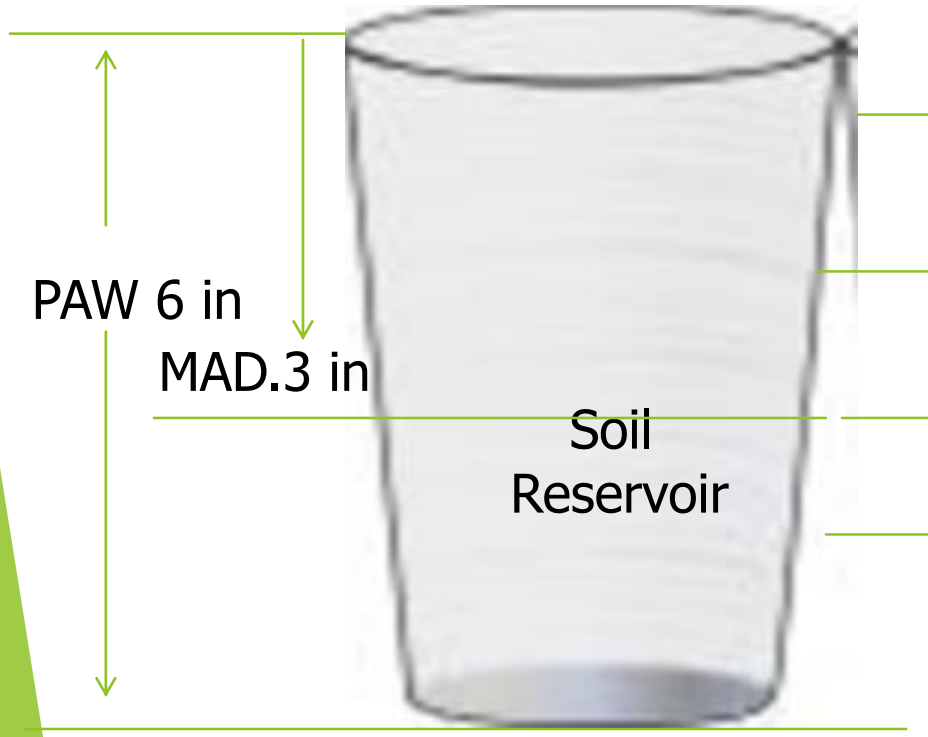
How much water each inch of soil holds. Based on soil type.

Textural Class	Plant Available Water Holding Capacity inch water/inch soil	
Coarse sand	.06	
Fine sand	.07	
Loamy sand	.08	
Sandy loam	.12	
Fine sandy loam	.15	
Silt loam	.17	
Silty clay loam	.18	
Silty clay	.17	
Clay	.17	

- Now if I have a clay soil . And I know my root depth I can figure out how many days a week I need to irrigate. Lets look at the next page.

Affects Of Root Depth

Aw= Available water(per inch of soil)
MAD= Maximum Allowed Depletion
AD= Allowable Depletion(Inches)



ET Inches/day	Days
.22″	1
.22″	2
.22″	3
.22″	4

Example 1
Root depth- 6”
Soil type- Clay
Aw per Inch - .17
MAD- 60%

.17 x 6” = 1.02” Paw

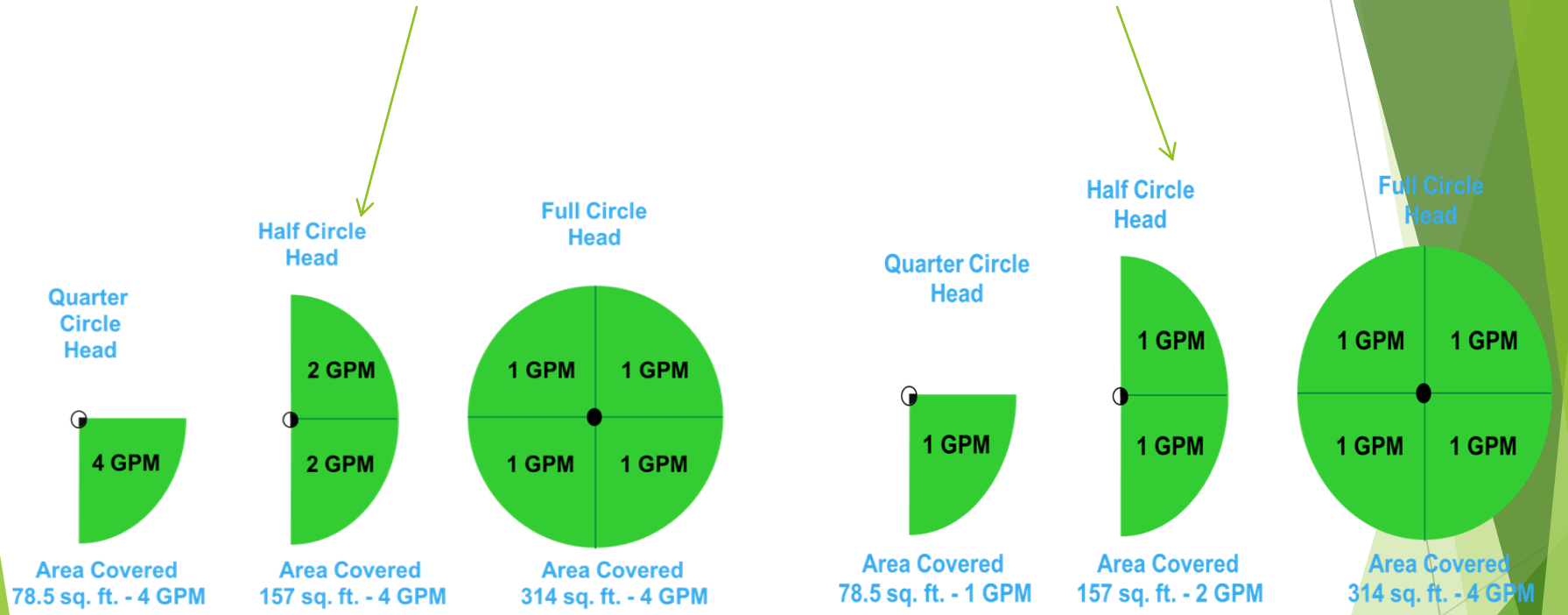
1.02 x .6= .612 AD
Water every 3 days

Example 2
Root Depth- 2”
Soil type- Clay
AW Per Inch- .17
MAD – 60%

.17 x 2”= .34” PAW

.34” x .6 = .204 AD
Water Every Day

Non matched & Matched

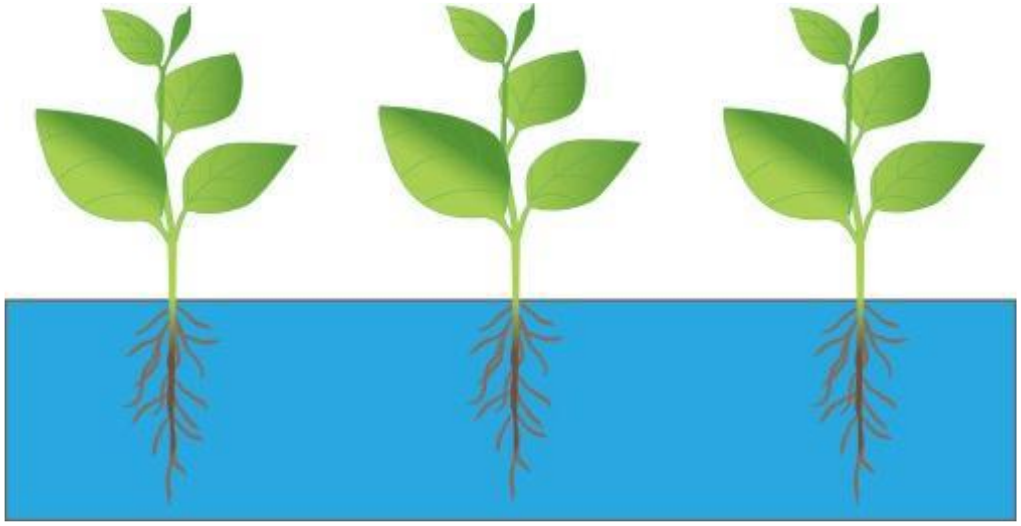


Not All Irrigation Systems Are Created Equal

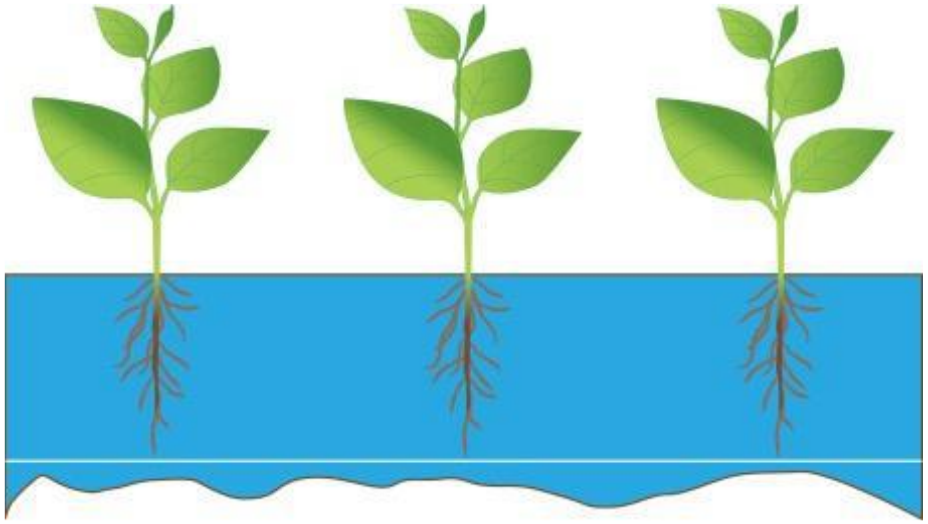
- Always remember that the smallest area the controller can manage is a zone. If you have a dry or wet zone, you can adjust it in several ways from the controller, but if you have a wet or dry spot inside the zone, you can either choose to fix whatever is causing the issue or you can carry on.

How Distribution Uniformity Affects Your Watering Goals

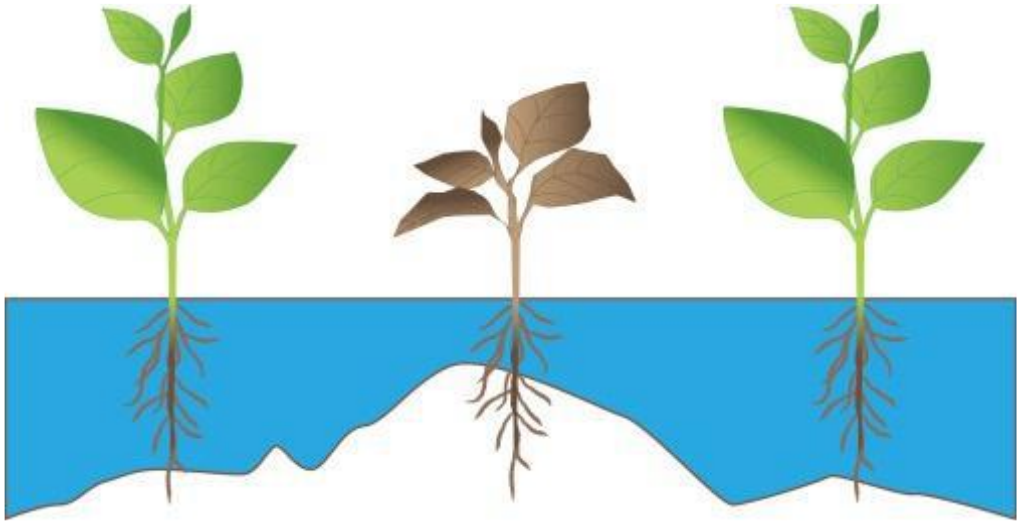
Perfect distribution uniformity (100%) is not really practical in landscape irrigation; however, it does help the irrigator understand the ideal situation. If you had 100% distribution uniformity, where the applied water infiltrates the soil consistently both laterally and vertically (as illustrated below) all plants would respond to soil moisture conditions equally.



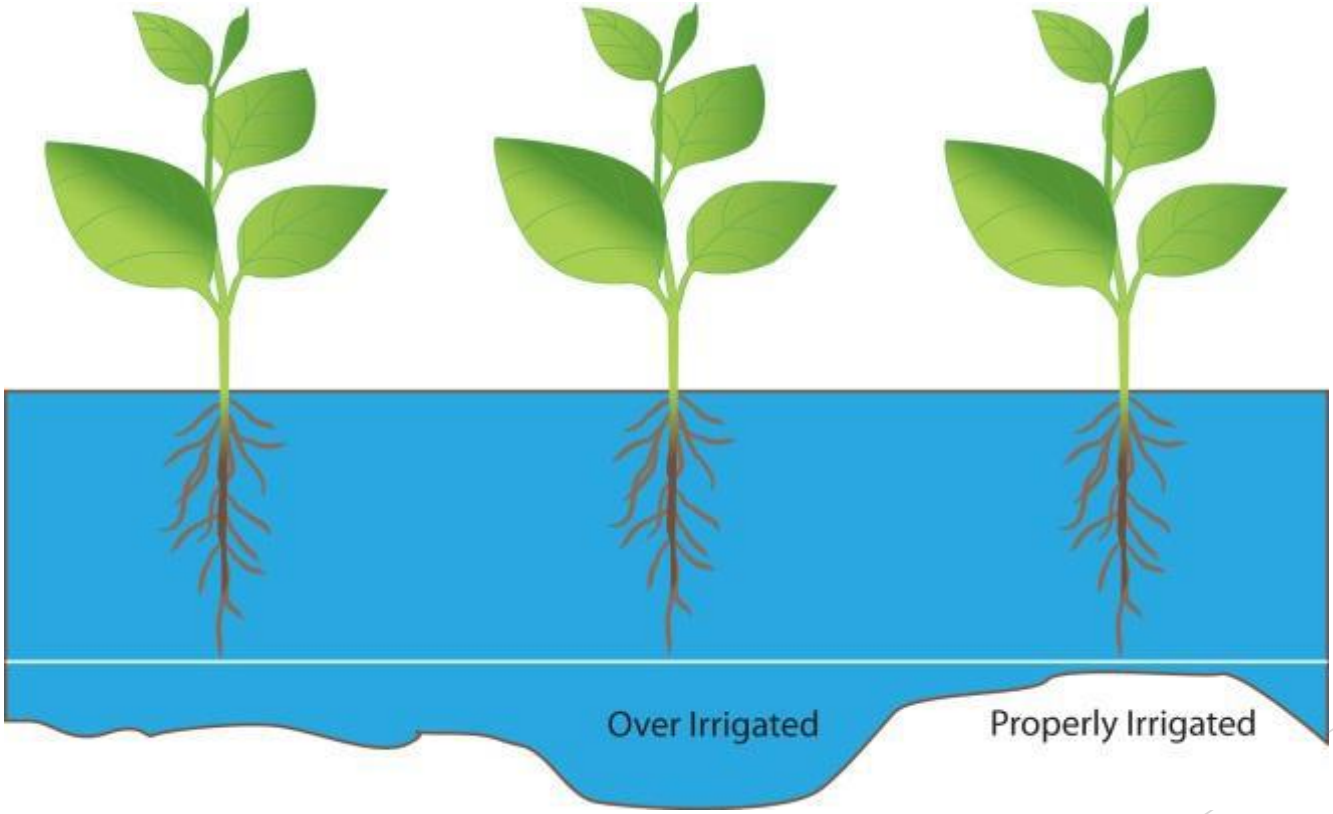
A sprinkler zone with good distribution will look more like the illustration below where you are forced to “over irrigate” the entire zone to ensure that the dry areas receive an adequate supply of water.



If you ignore the poor distribution uniformity in the zone, the soil moisture level in some areas will reach the permanent wilting point, and you will lose plants in those areas as shown in the illustration below.

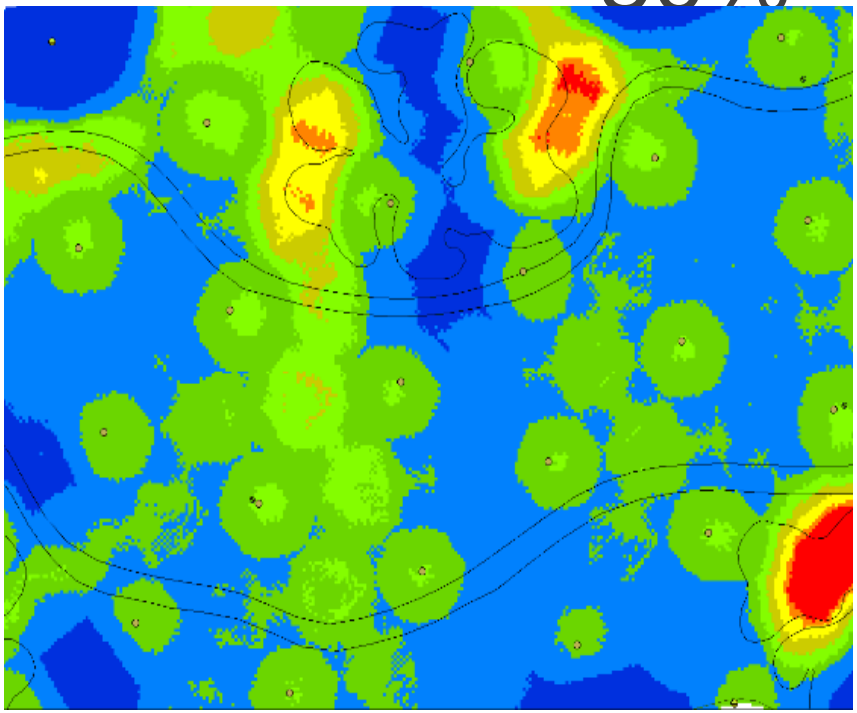


If a zone has poor distribution, you have two choices for keeping the plants green: one, over irrigate the zone in order to provide enough water to the dry area, or two, diagnose and fix the problem.

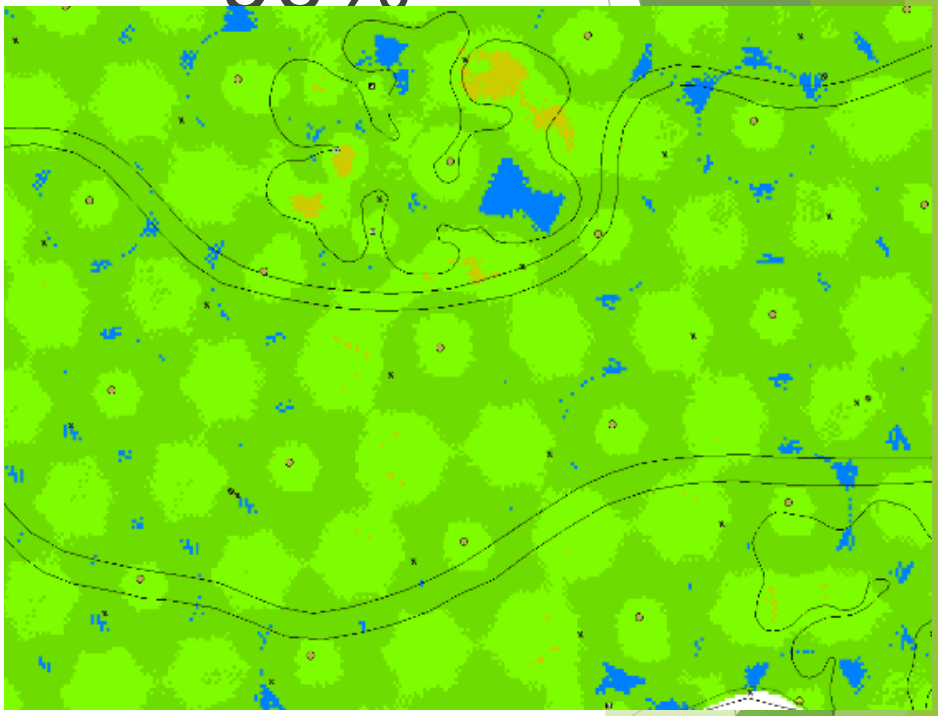


Sprinkler system uniformity

50%



90%



90% of the sprinklers systems in Idaho are 30% to 45% uniform

How Uniformity affects runtimes:

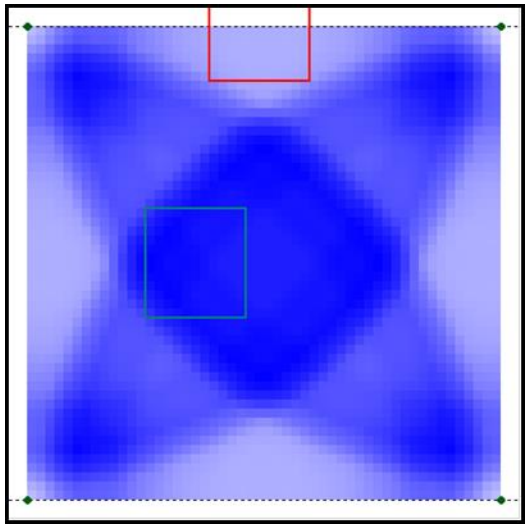
DU %	Plant Water Req.	\	DU	Runtime/ hrs.
30%	1"	\	.30	3.33
50%	1"	\	.50	2.00
70%	1"	\	.70	1.42

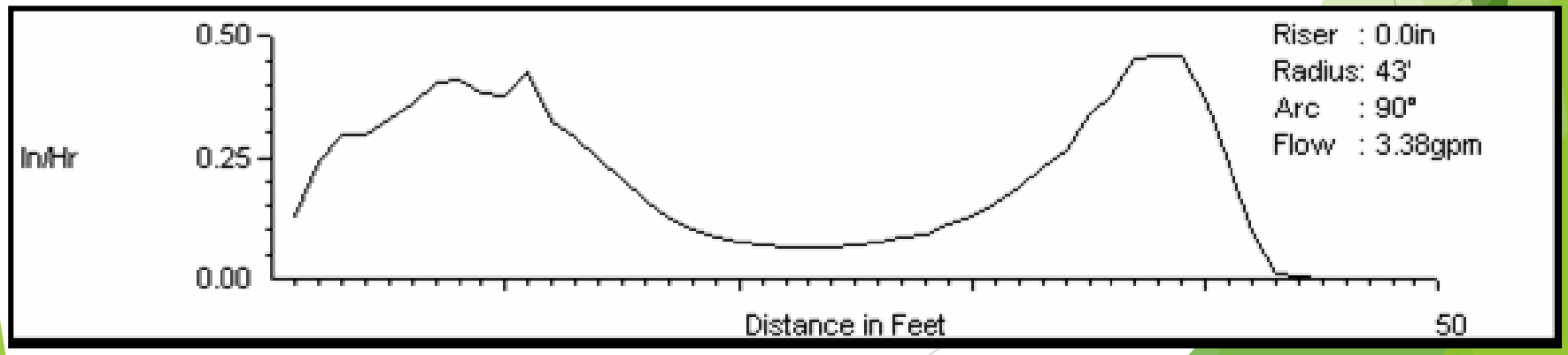
Think in terms of $$$'s for cost of water & pumps…..

Things Influencing Uniformity

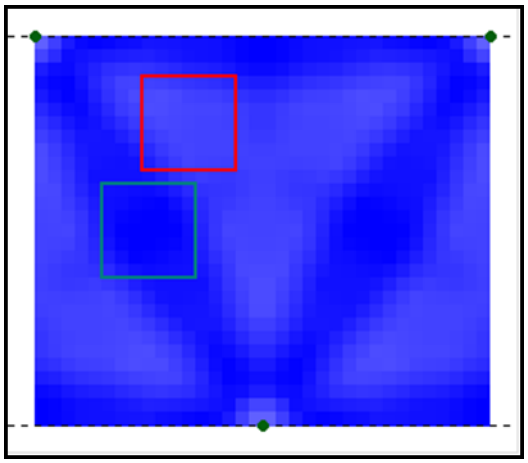
- Pressure! (LOW or HIGH)
- Pipe Sizing!
- Sprinkler Type!
- Sprinkler Spacing!
- Sprinkler Rotation Speed!
- Sprinkler Flow Rate (gpm)!

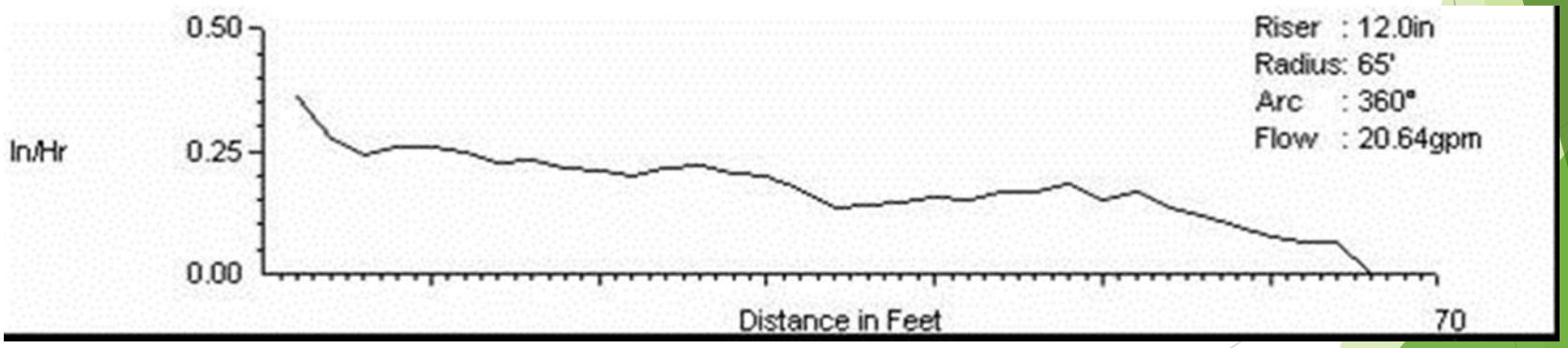
Example – Poor Pressure Coverage Problem



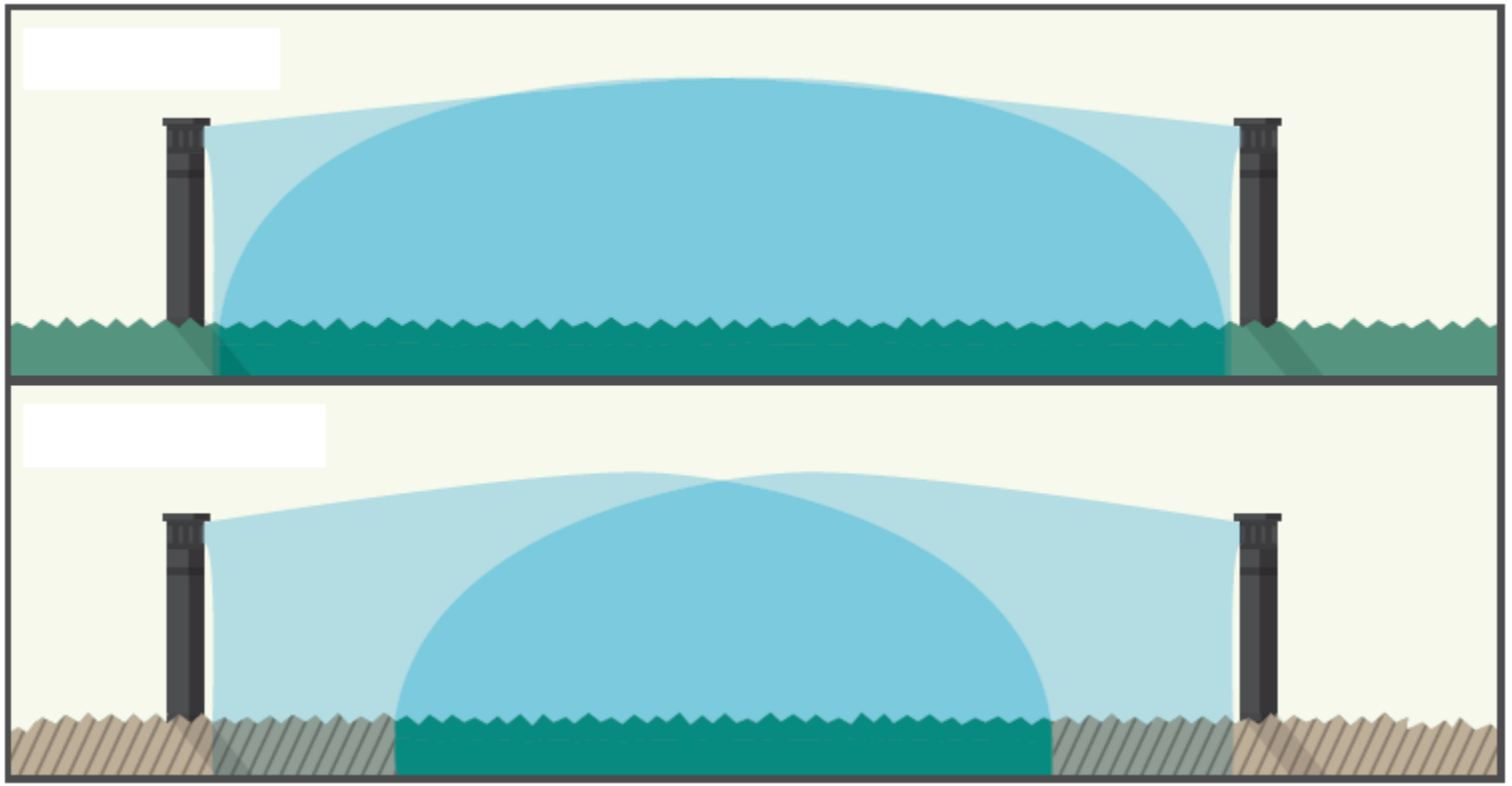


Example- Good Pressure Better Profile





CONSISTENT HEAD-TO-HEAD COVERAGE



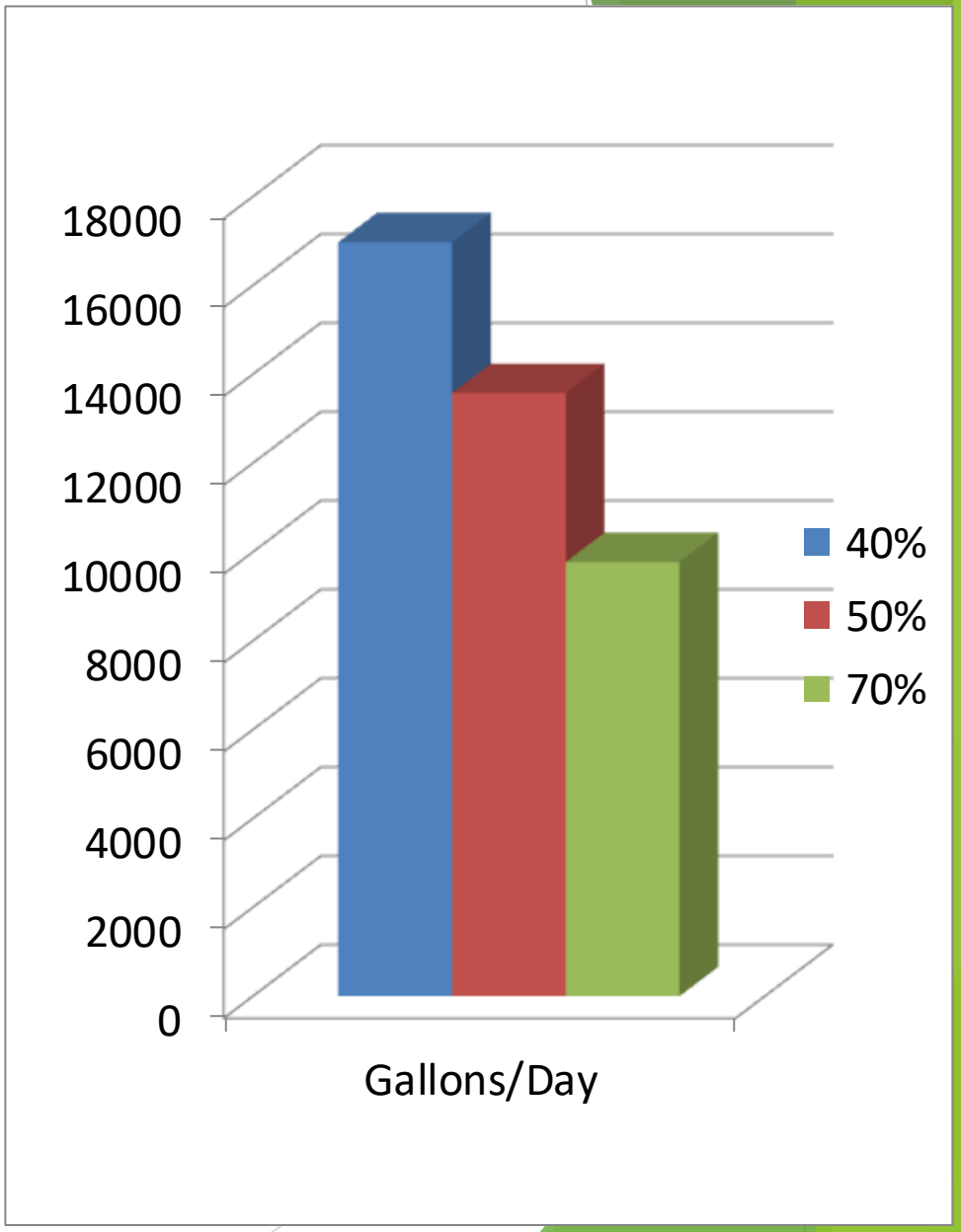
Uniformity example

For a 1 acre site

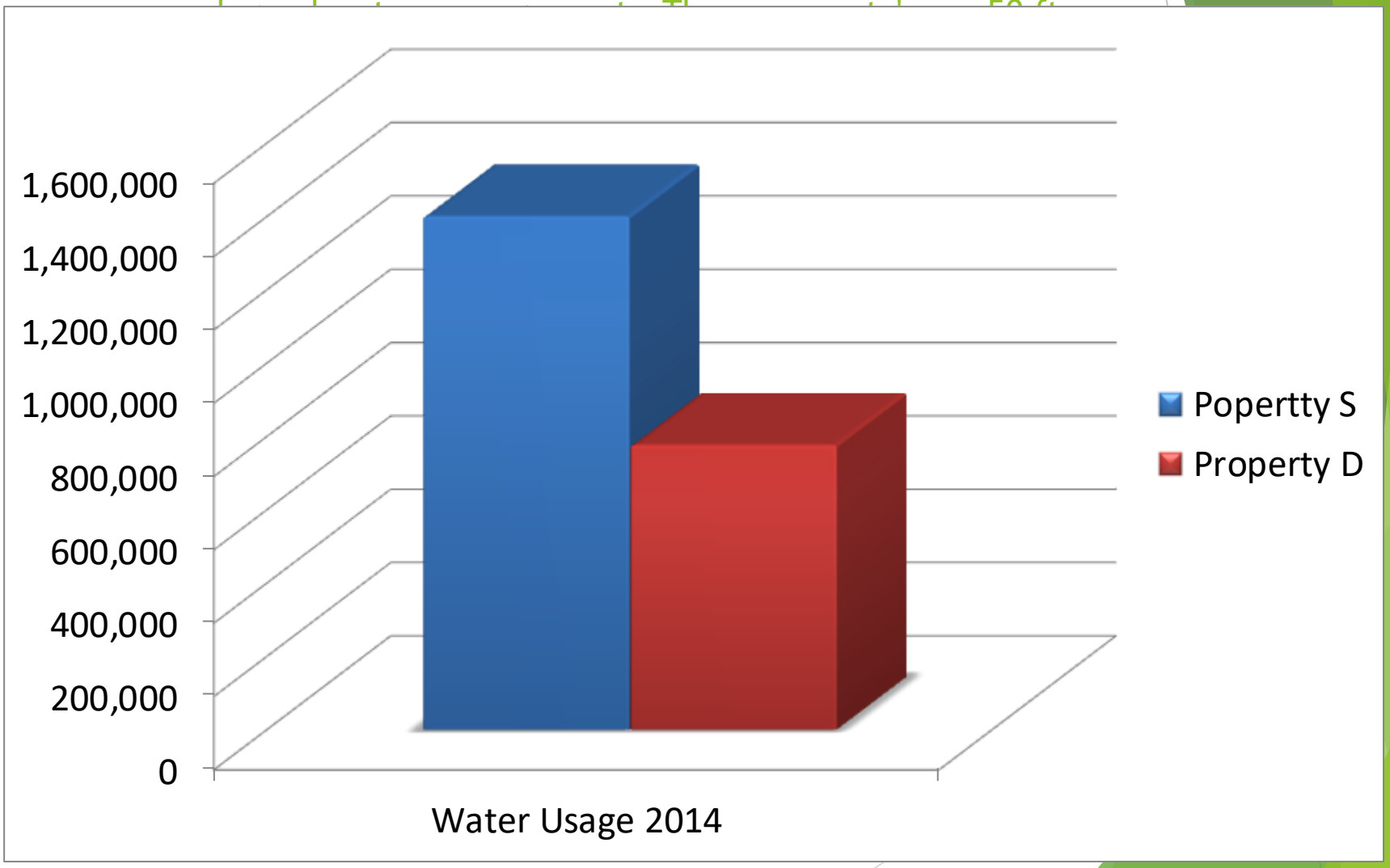
40% uniform 16,971 gallon per day

50% uniform 13,577 gallons per day

70% uniform 9,775 gallons per day



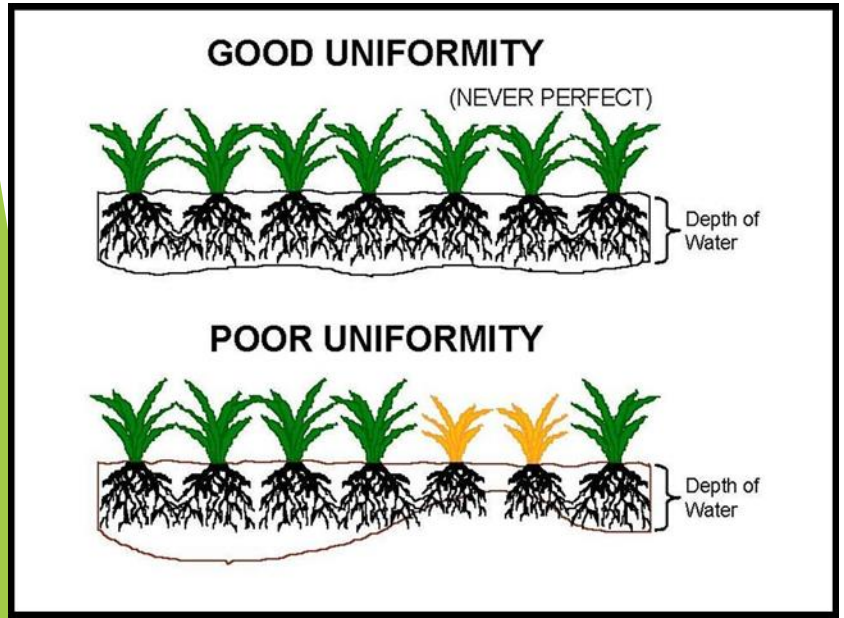
Water Usage on two 1acre Property's. Property S is a typical design & install by local contractor. Property D is a good design and good project management done . Along with a soil moisture

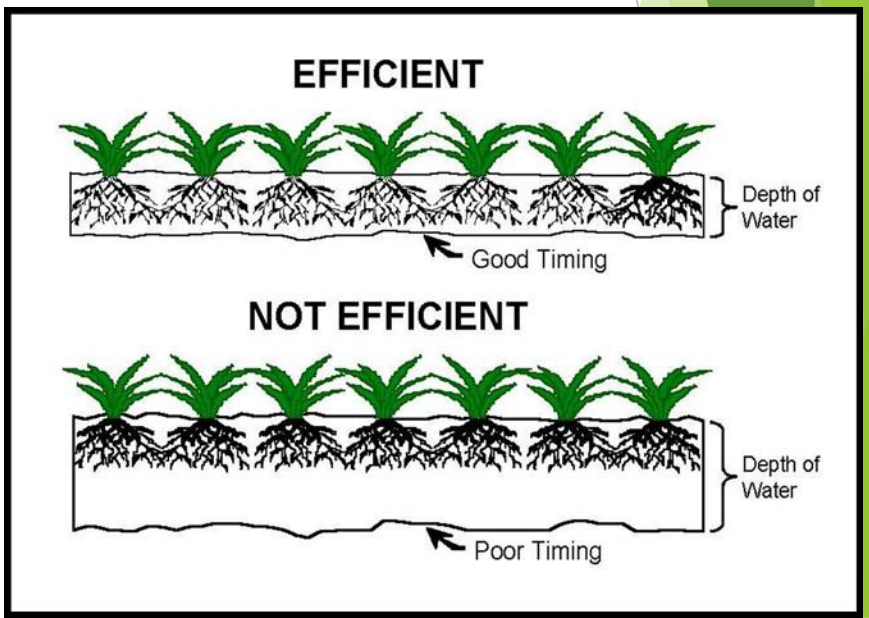


Uniformity & Efficiency

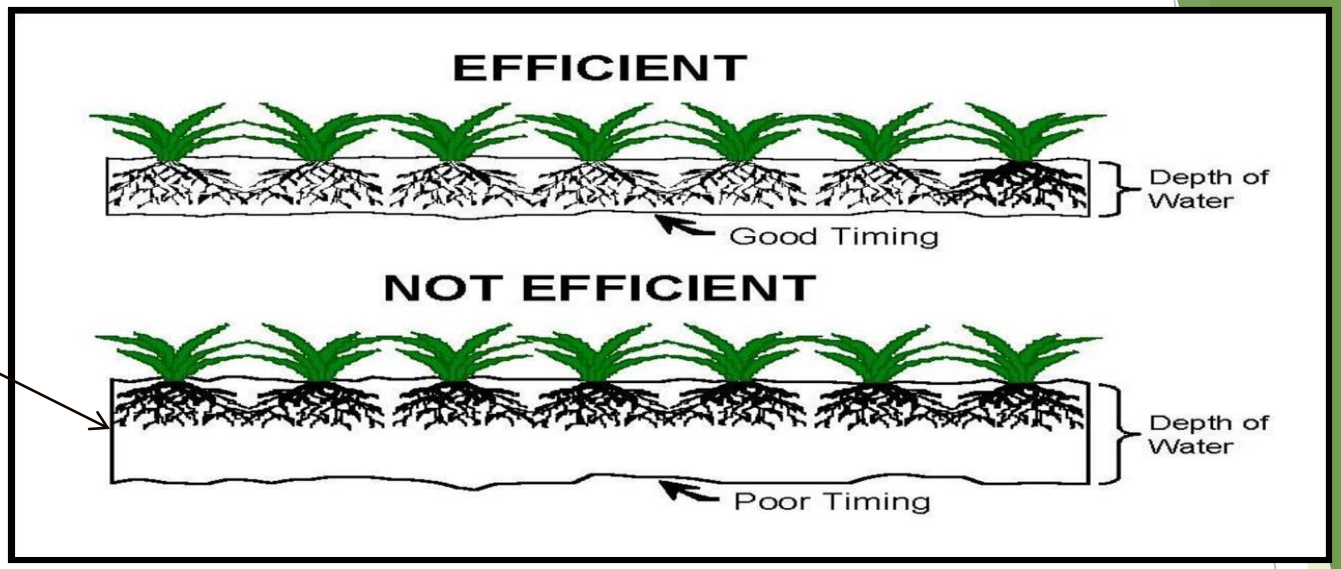
***Uniformity*: relates to how evenly the water is applied over an area. Equipment selection affects uniformity.**

***Efficiency*: is the ratio between how much water the plant beneficially uses compared to how much water the irrigation system applies.**





Deep Percolation



Run-Off

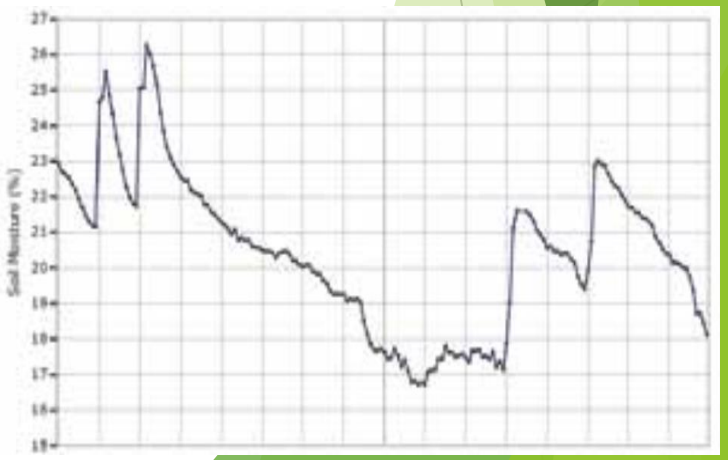
Efficiency

- The importance of smart technology: (Moisture sensors and ET Based Controllers)
- When we use smart technology. We take away the human factor. Meaning the human error of overwatering. Smart technology is great, But I caution the use of smart technology on a system that does not have a minimum of 70% uniformity along with matched precipitation rates and separated plant types and sun exposures.

Soil Moisture Sensors Are?

- **A Thermostat for your Landscape**
- **How it Works**

Sensors are as effective at irrigating your landscape as a thermostat is at keeping your home a comfortable temperature. Be carful which soil Moisture sensors you choose to use. There is a difference.

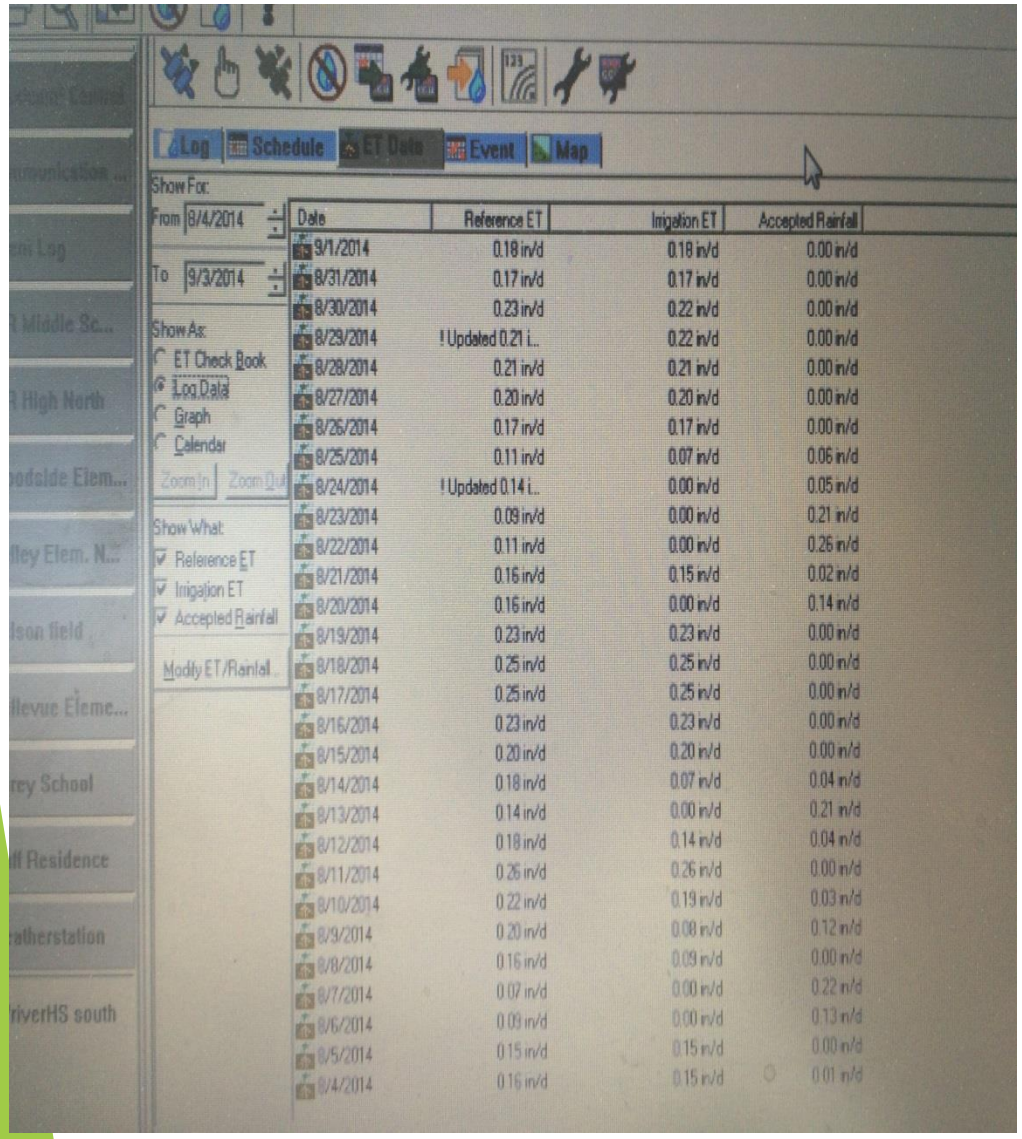


The solar sync is a good ET product
It takes it to account ET everyday and determines how
Much water to irrigate each day per zone. This is
acceptable way to do it
The only issue I have with this is it determine.
How much to irrigate based on a total runtime you
enter in for each zone based on the hottest part of
the summer. It does not take into account soil type,
Root zone depth, sprinkler type , plant type
And shade or sun. which are all things that are
important when determining how much to irrigate.

The rainbird SMT, I believe
does the best job when it comes
To residential ET. It takes in account
All the important things Sun, shade,
plant types, Root zone, soil type,
Sprinkler type, Uniformity when
determine how much to irrigate.
When choosing an ET system this
is what you are looking for.

- Keep in mind The ET and moisture systems shown were for small residential systems.
- There are other systems designed for commercial applications or large residential.

Examples
ET vs Soil Moisture Technology



Daily ET

If you'll Notice as you can see ET central control does a great job saving water It is connected to a $12,000 weather station. But after using both technologies. I have found that while both do a good job, Soil moisture technology does an even better job. If you look at the site next you'll notice that during the month of August in 2014 we got a lot of rain and that the majority of the stations on soil moisture technology never watered or only watered 8 times in the whole month. That's pretty awesome. Both sites are in the same geographic location. But if you look at the line that says Irrigation ET you'll notice it only it only shut off the irrigation 8 times in august. While it did reduce the water use some days. Most of the soil moisture stations didn't water for 23 days. I'd say that's a big difference in the technologies. Keep in mind each type of technology Soil moisture & ET has good and bad systems out there in both. I believe in this Comparison I have compared the two best in each technology.

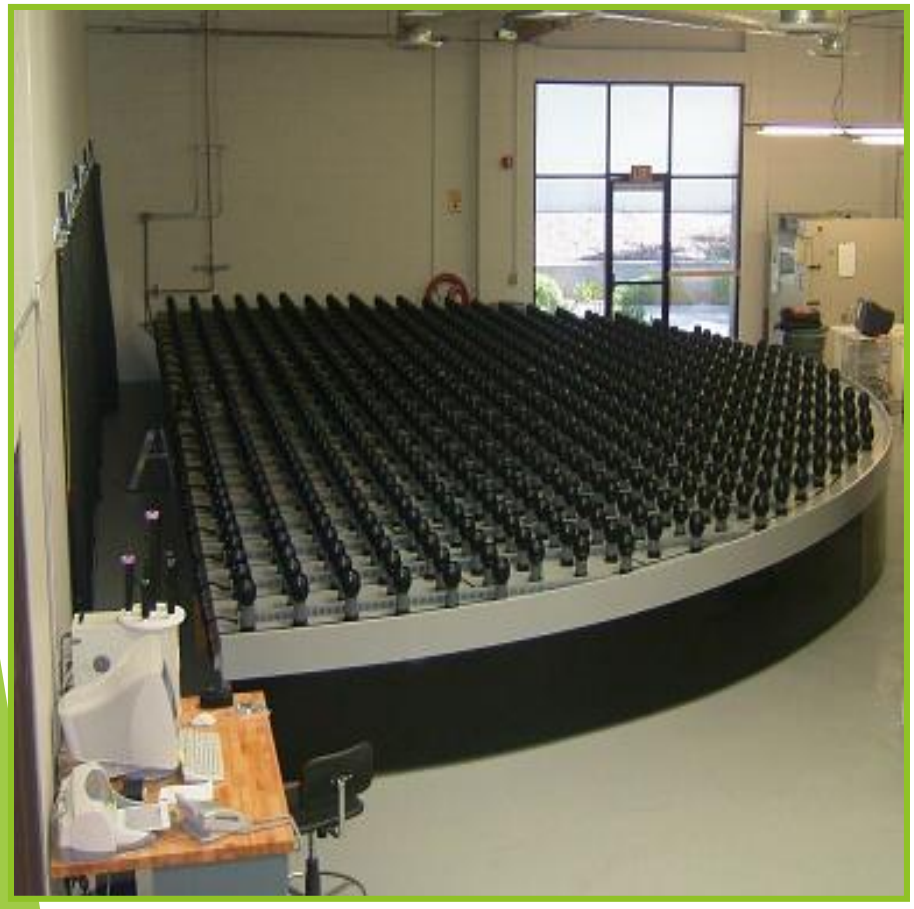
Station #3

Station three has a moisture sensor connected to it and only watered &

Station# 3 root zone 5”

In 1 year this station has a 3” root zone depth.

Spray & Rotor Profile Testing is used to make sure the sprinklers are applying the water as uniformly as possible.



Spray body's

4” Pop up Spray Body
(Designed For
Turf Grass)

Pressure regulated
Check valve(prevents low head
Drainage)

6” Pop up Spray Body
(Designed for
Turf Grass Left long
in summer)

12” Pop up Spray Body
(Designed For
Natural grass6”-12”)

Spray Nozzles

Fixed and adjustable arc nozzles for spray heads. Very high Precipitation rate.(Apply a lot of water very fast. Considered A flood irrigator by some designers. Be careful using on any Soil other than sandy soils. Range 4’- 18’. Optimum pressure 30psi.

MP Rotor nozzle. Very ideal sprinkler head. Great for all sizes of areas From 5”- 27’ range. Probably the best uniform sprinkler on the Market. And has a very low Precipitation rate ideal for loam and Clay soils. And is a perfect solutions for slopes.
Optimum pressure: 45psi at the sprinkler and the filtration of the System is 130 micron.

Rotor Sprinklers

4” Pop up Rotor Body
(Designed For
Turf Grass)

4” Pop up Rotor Body
Stainless steal
(Designed For
Sports field Turf Grass)

12” Pop up Rotor Body
(Designed For
Natural grass6”-12”)

Designed for residential to commercial for lawn and sports turf fields. Range 15ft-104ft

Optimum Uniformity
operating pressure
Rotor 17ft-45ft ,45psi
Rotor 45ft-70ft ,60-70psi
Rotor 70-100ft ,80-90psi

Sprinklers and there iformity

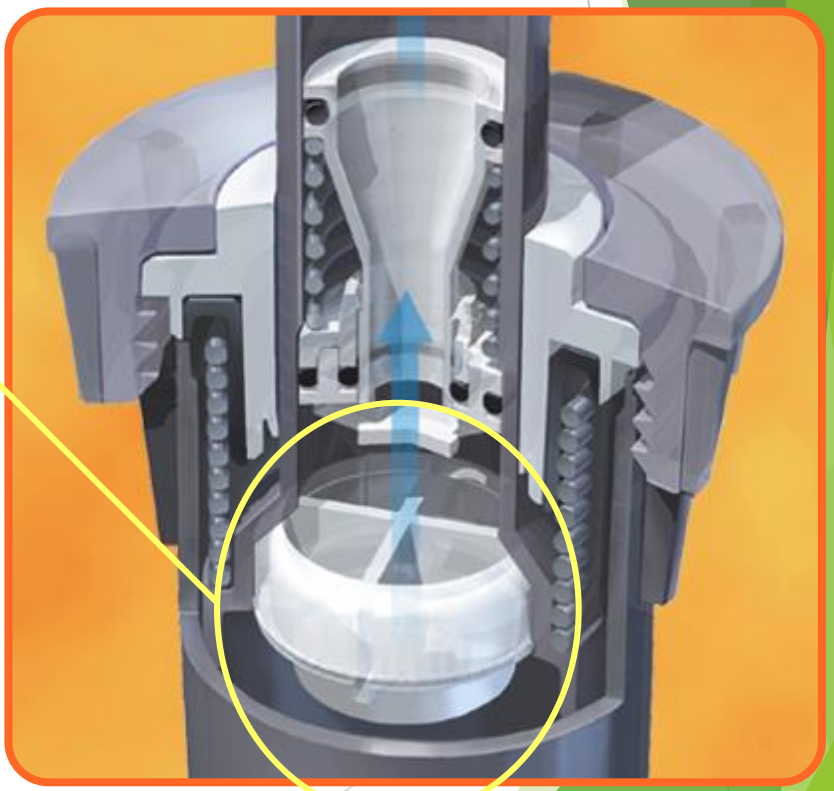
Spray Uniformity 50%-60%
High Precipitation rate

MP Rotary Uniformity 70%-85%
Lowest Precipitation rate

Rotor Uniformity 60%-75%
Low Precipitation rate

Check Valves

Check valve installed to control low head drainage.

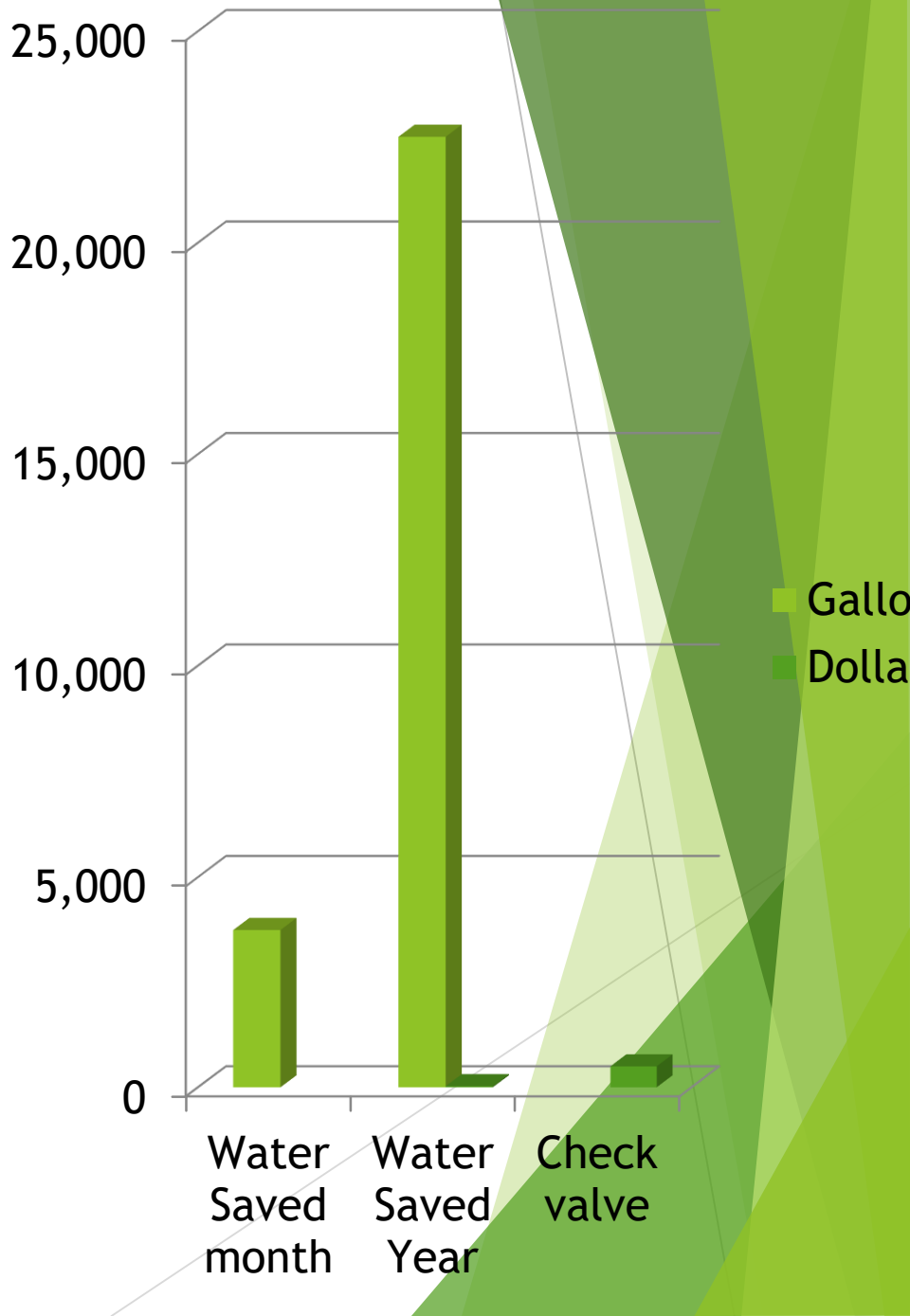


Pipe Water Holding Capacity

PVC Schedule 40		PVC Class 200		PVC Class 160	
Pipe Size	Gallons per 100 feet	Pipe Size	Gallons per 100 feet	Pipe Size	Gallons per 100 feet
1/2"	1.6	3/4"	3.5	1"	5.8
3/4"	2.8	1"	5.8	1-1/4"	9.6
1"	4.5	1-1/4"	9.2	1-1/2"	12.6
1-1/4"	7.8	1-1/2"	12.1	2"	19.7
1-1/2"	10.6	2"	18.9	2-1/2"	28.8
2"	17.5	2-1/2"	27.7	3"	42.7
2-1/2"	24.9	3"	41.0	4"	70.5
3"	38.5	4"	67.8	6"	152.9
4"	66.3	6"	146.8		
6"	150.4				

Average water lost to low head drainage on a 1 acre site.

22,506 gallons a season



Pressure Regulation

Non-Pressure Regulated

Pressure Regulated

High Pressure

Low Pressure

Pressure Regulated Sprinklers… 15’ – 180 degrees

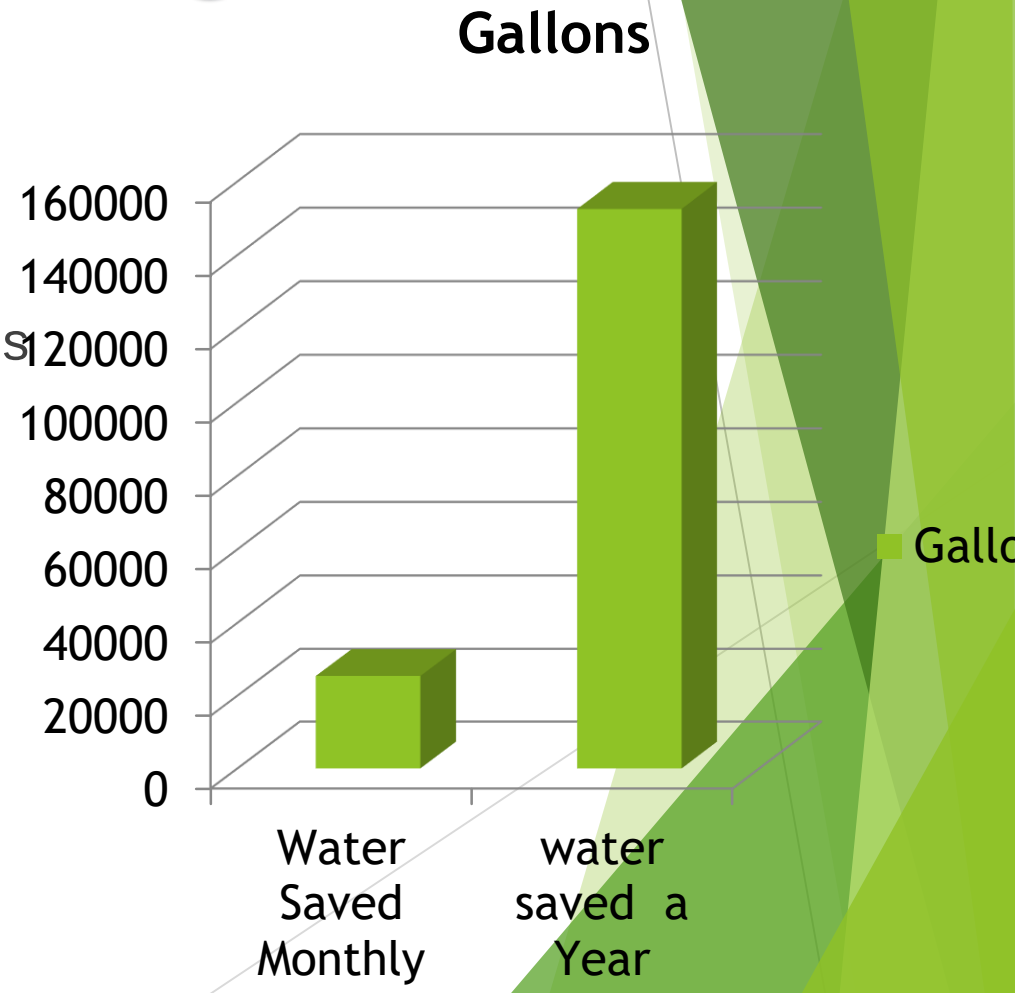
- Regulated @ **30 PSI**
- 1.86 GPM
- 10 minutes
- 18.6 gallons each
- 20 sprinklers/ zone
- 372 gallons/ zone

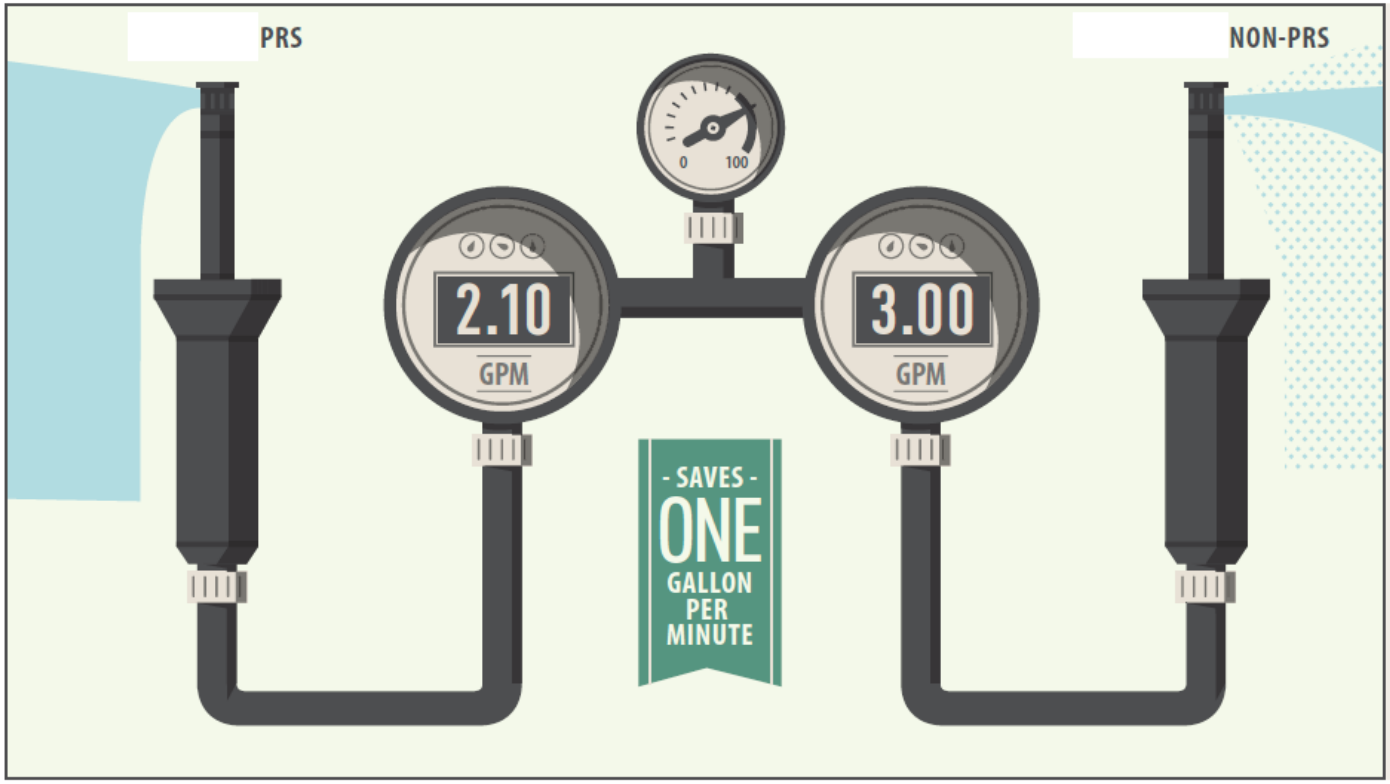
- Non Regulated @ **40 PSI**
- 2.27 GPM
- 10 minutes
- 22.7 gallons each
- 20 sprinklers
- 454 gallons per zone
- Waste 82 gallons

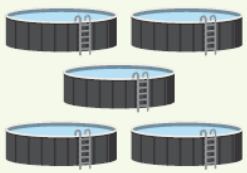
Pressure Regulated Sprinklers… 15’ – 180 degrees…..

Regulated @ **30 PSI**

- Ten Zones
- 10 zones X 82 gallons= 820 gallons saved per day
- 31 irrigation days
- 31 X 820 = 25,420 Month
- 25,420 x 6 months = 152,520







FIVE
FAMILY-SIZED
- POOLS -

PRS, YOU'LL BE SWIMMING IN SAVINGS

As the test proved, PRS conserves water. And these savings really add up over time. Based on a year of watering, PRS sprays can save 106,000 gallons or more.* That's enough to fill an average swimming pool five times over.

Water Saver #6
Drip vs. Spray

Drip irrigation overcomes the water waste problems from sprays and can save up to 60% of your water.

Sprays:

- Misting
- Overspray
- Wind drift
- Water runoff
- Water Collection on garden mulch
- Easily vandalized
- Promotion of plant disease
- Blockage from plant growth

Drip:

•Eliminates evaporation

•Eliminates wind drift

•Eliminates 'over spray'

•Reduces plant disease

•Deeper watering

•Reduced weed growth
•Reduces vandalism
•Aesthetically pleasing

Drip types

- 12” spacing- Perennials and annual plantings
- 18-24” Tree and shrub plantings
- CV- in line check valve on emitters. Prevents lateral drainage.

Techline CV General Guidelines

- **Shrub & Groundcover Table**

	Clay Soil	Loam Soil	Sandy Soil
Dripper Flow	0.26 GPH	0.4 GPH	0.6 GPH
Dripper Spacing	18”	18”	12”
Lateral Spacing	18”-20”	18”-2	16”-20”
Burial Depth	0 - 6”	6 - 8”	0 - 8”
Application Rate in/hr	.19-.14 in/hr.	.29-.21 in/hr.	.72-.58
Time to Apply ¼”	79-107 min	52-71 min	21-26 min

Step 1.. Determine recommendation from Table

Example: Shrubs w/ Loam Soil

Recommendation:

.4 GPH - 18” emitter spacing - 18-20” Row Spacing

Compare with .9 X12 – 12” Row Spacing

Advantages of Drip Irrigation

- Highly Efficient
  - Sprays 50% to 60% Distribution Uniformity (DU)
  - Rotors 75% to 85% Distribution Uniformity (DU)
  - Rainfall 92% to 95% Distribution Uniformity (DU)
  - Drip 92% to 98% Distribution Uniformity (DU)
  - Irrigation Association reports 60% water savings over conventional irrigation systems
- Lower pressure requirement
- No overspray
- Expands water window

Flow Rate Considerations

- The goal is to match soil infiltration rates
- The tighter the soil, the slower the flow rate
- Lower flows result in greater lateral spread
- Lower flows have longer run lengths
- Lower flows can have larger area per zone

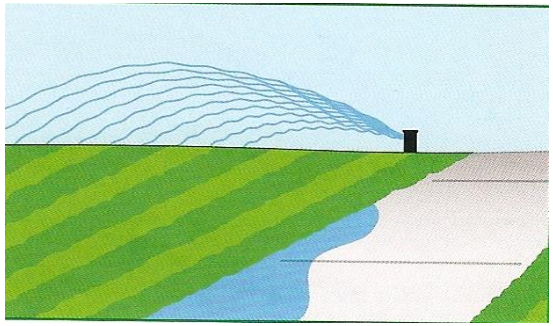
Grid Layout. Make sure to keep lateral layout uniform.
If you have a inline dripper spacing of 12” . Make sure
To keep lateral spacing 12-14” so that you are uniformly
applying the water. So that no matter were the plants are
planted you don’t over water between the inline dripper
while trying to soak water out between the rows

.26 Emitter vs. .6 Emitter

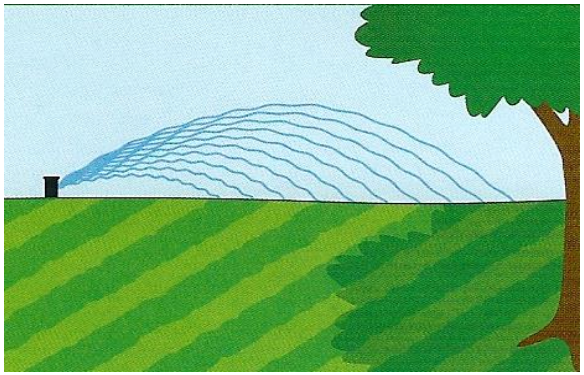
Lower flows result in greater lateral spread.

Think of the plant type also. Perennials, annuals shallow root zone. Ideal.

.26 emitter better lateral movement. .6 , .9 ideal for trees

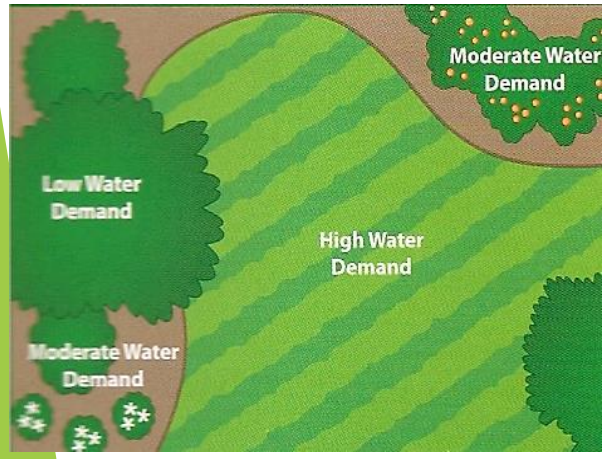


Properly adjusted sprinklers & Compacted soil can make a big difference in how much water is being used in a cycle. Compacted soil can cause water to run off onto hard surface before seeping into soil.



- **Sun exposures**

Another Issue of over watering is exposures to sun. watering north and east sides of houses on the same station or south and west or the opposite. Is a waste of water when added up over a years time.



- Different plant types:

Shrubs, trees, flowers, Natural grass and grass all need different amounts of water. Putting all these plants types on the same zone is a typical waste of water. Beds, Turf , Natural grass should all be on separate zones of irrigation to dial irrigation into each plants needs.

What is funny pipe

- Have you ever heard a lawn sprinkler contractor refer to something called "funny pipe"? Do you know what kind of pipe this silly name is referring to? "Funny pipe" is a flexible black tubing usually 1/4" thick made from Polyurethane or PE pipe.

  This type of pipe is not glued, but attached on barbed fittings and sometimes clamped. This type of pipe is now used to connect the lawn sprinkler heads to the PVC lateral line, through a "swing joint", which is made with about 1 foot of PE pipe with barbed spiral fittings at the end so it can thread into a threaded PVC fitting and sprinkler head.

  Older irrigation systems use hard PVC (usually schedule 80) nipples (threaded risers) to attach the sprinkler heads to the lateral line. Most irrigation and lawn sprinkler contractors do not build systems this way anymore. They now use swing joints, which are far better than the old way.

  The use of PE pipe has saved many sprinkler heads and PVC pipes from breaking. If a lawn mower were to run over a slightly raiser sprinkler head that is attached by a hard riser it will usually break the riser, the sprinkler head and sometimes the pipe.

  When this same case happens to a head that is attached by a swing joint, most often the pipe gives way because it is flexible, thus preventing the pipe from breaking and many times the head as well. If you have an older system, you can convert all of your heads by removing them, digging a small hole near each head, and installing a swing joint. Then screw the head on and set back in the dirt.

Poly vs PVC

- Here are the top reasons why to use Poly Pipe versus PVC

  1) Comes in 300' rolls whereas PVC comes in 20' sticks which you have to glue together

  2) More durable to cold conditions where to ground freezes and thaws, freezes and thaws

  3) PVC is very brittle and tends to break or crack if installed in rocky soil .

  4) Poly Pipe is the pipe that builders now use to run your main water line from the street to the house

  5) Poly is more flexible to bends . Easier to install.

Pipe hydraulic chart

What's an audit

- What is an Irrigation Audit: An audit is designed to take into account system performance along with soil type and root zone depth to determine the exact amount of water needed to water to the plant.

1. Site Inspection : To get information about systems DU, hardware type, System information
2. System Tune-Up: Fix any minor issues, titled sprinklers, pressure issues.
3. Catch can Test: Record the amount of net precipitation being applied to the turf. And show areas of lower DU.
4. Root zone depth & Soil type: Use soil probe to determine both.
5. Calculate a base Watering Schedule: Is important to developing a relationships in watering practices, By incorporating weather& plants, soil and irrigation.

Measure how evenly the water is applied by the sprinklers

What Does Irrigation Audit Tell You?

1. How uniform your system is.
2. Shows you issues with hardware of the system.
3. Soil types & root zone depths.
4. Calculate a base watering schedule?

What does an irrigation audit do for you?

- Shows you what to correct on the system to reduce water use 20%-60%
- Improved landscape(less wet and dry spots)
- Reduction of runoff
- Reduce deep percolation
- Reduce fertilizer and chemical use

Best time of day to water

- 10pm to 6am

“When the well is dry, we learn the worth of water.”

Ben Franklin, Poor Richard's Almanac 1733

- Video On Netflix
- **Last call on the oasis**

- **For More Info or help**
- **Web Site: Aisguy.com**
- **Facebook Page:** www.facebook.com/AdvancedIrrigationSolutions
- **Twitter:** twitter.com/onedropattime
- **Linkedin:** www.linkedin.com/in/KodiFarnworth

Local Distributors of quality commercial grade irrigation products.

- 2M Company
- Silver Creek Supply
- Pipe Co.
- John Deere Landscapes

Seed Germination time

- 3 to 4 weeks

Fertilizing best practices

- When
- How
- Why

• **Objectives and purpose of the turf area.**
If a homeowner
wants a greener and thicker lawn, then it
is likely that more fertilizer will need to be applied
than amounts required just to maintain the
turf. Also, if the area is subject to significant wear
and traffic, it may need a more intensive level of
maintenance, including nutrient management, to
maintain quality.

• **Grass species.** Nutrient
requirements vary widely among turf species.
Generally, the more aggressive the growth, the
greater will be the nutritional requirements

• **Environmental conditions.**
o **Soil environment.** Soil type has a big impact on
best fertilization practices of turf. Sandy soils
are usually more infertile and require more
intensive nutrient management than loamy or
clayey soils. Soil testing should be used to guide
turf management and fertilization decisions,
particularly for P and K. For example, some soils
are naturally high in P or K and will therefore
require less P or K from fertilizer.

- o **Water and irrigation.** Turf grass grows more vigorously
- with adequate water. Therefore, proper
- irrigation and/or adequate rainfall increases
- turf grass nutrient requirements. On the other
- hand, excessive rainfall can cause N leaching,
- may contribute to undesirable N loss in runoff,
- and result in turf N deficiency.

- o **Shade.** Shaded areas should generally not be
- fertilized as much as non-shaded areas. Grass
- in shaded areas usually has a lower rate of
- growth and therefore lower nutrient requirements.
- Also, turf in shaded areas tends to have
- a weaker root system and to be more succulent.
- • **Clipping management.** Whether or not clippings
- are left behind is an important consideration.

- Where lawn clippings are removed, fertilizer requirements
- will be higher since nutrients are being
- removed with each mowing.

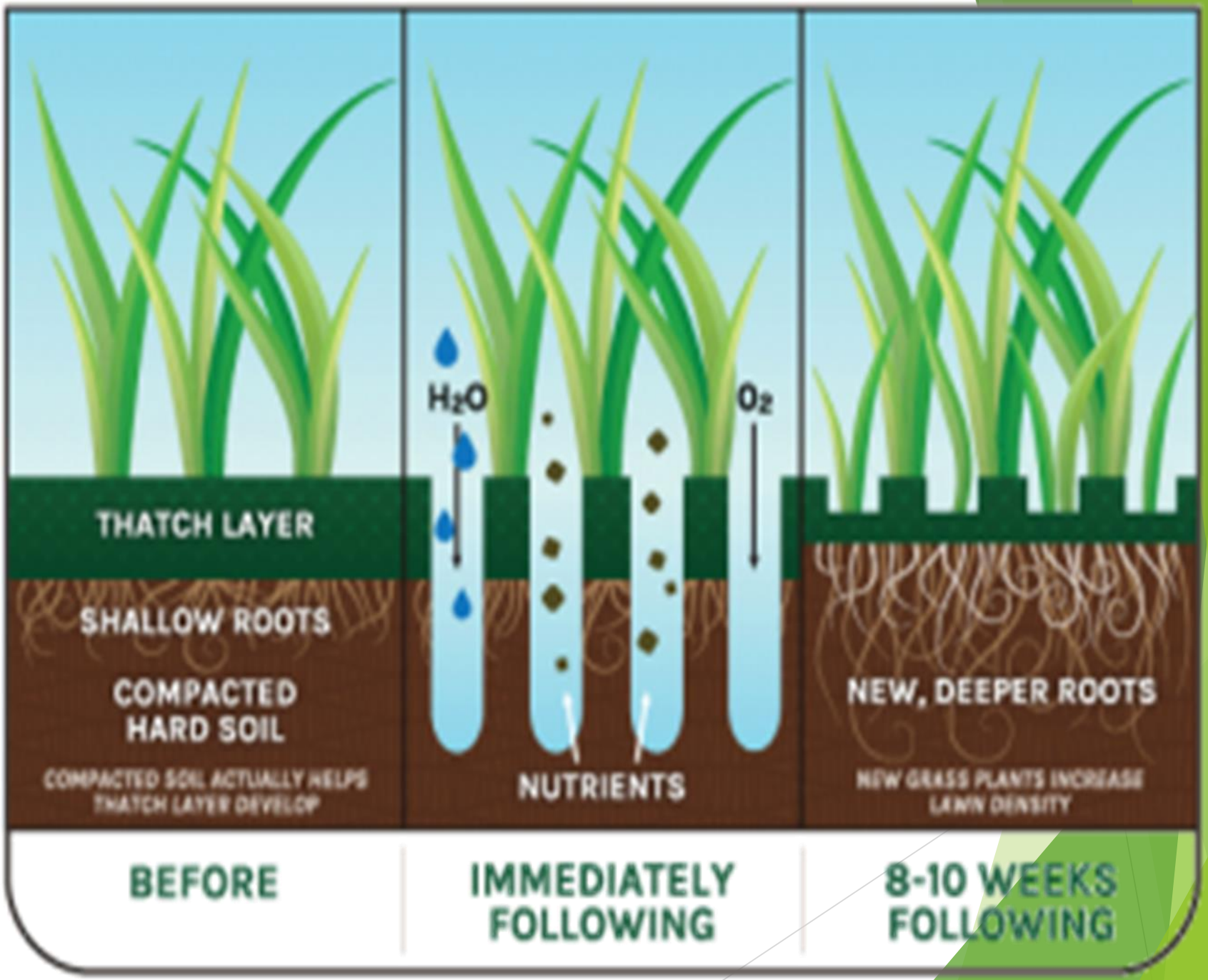
- • **Lawn age.** A new lawn will usually require more
- fertilizer, and a different analysis of fertilizer than
- an established lawn. Soil testing is especially important
- to guide the type

- **Fertilizer Placement**
- • Avoid off-target applications and do not leave
- fertilizer materials on impervious surfaces such as
- streets and driveways since this provides a direct
- path to storm drains.
- • Leave a low-to-no-fertilizer buffer strip around
- water bodies such as lakes or streams.

Aeration best practices

- Aeration vs Thatching
- Aeration and thatching are both used to improve the health of your lawn, but the terms are not interchangeable. They address different issues with your lawn, and both have their place in a healthy lawn program.
- **What Is Aeration?**
- Aeration pokes holes into the soil of your lawn, to allow oxygen, fertilizer and water to more easily penetrate the grass' root zone. Aeration is most commonly done in the spring or the fall, in lawns that are compacted. Spike aeration pokes holes in your soil, and core aeration pulls cores of dirt and turf. These are usually left on the lawn surface to decompose naturally, or broken apart.
- **What Is Thatching?**
- Thatching is sometimes called dethatching. It removes a dead layer of roots and stems that is found between the grass base and the native soil. When this layer is found to be more than a half-inch thick, it may interfere with the ability of oxygen, water and other nutrients to reach the grass roots.
- Thatching is done using power equipment in the spring or the fall. It tears out grass tissues. This is more stressful to your lawn than aerating is, and is generally only done if your lawn is thinning out due to thick thatch

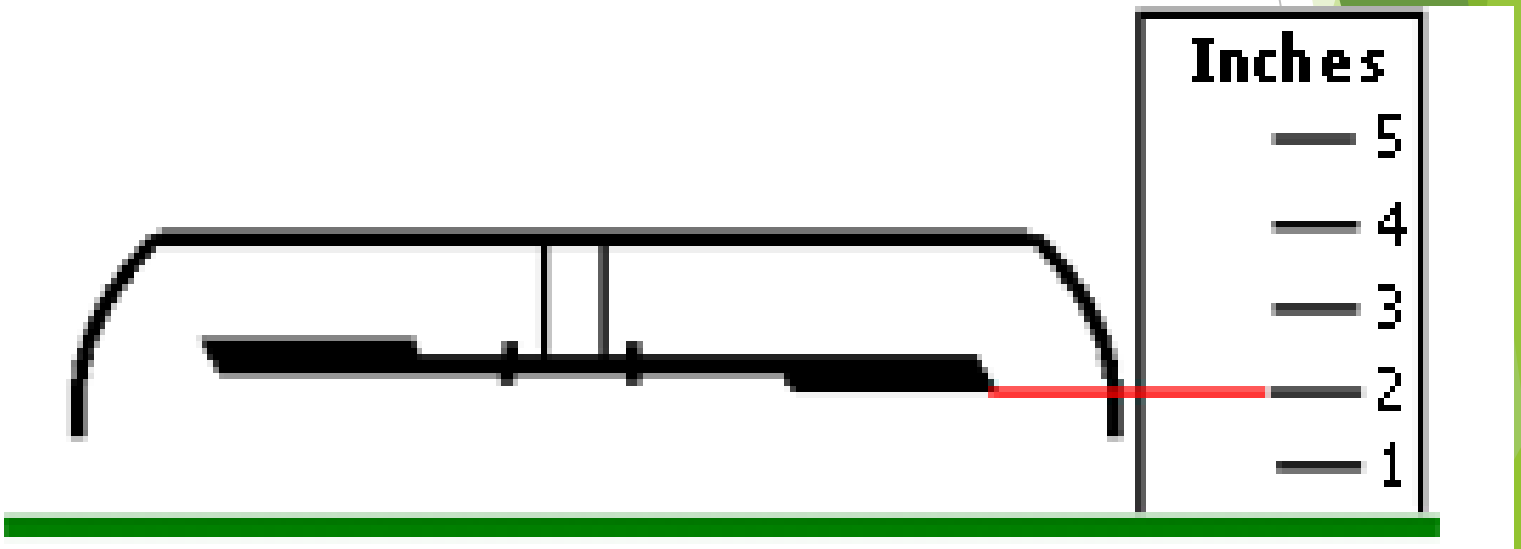
- If you are having your lawn over seeded, the landscaper needs good soil to seed contact and proper watering. Aerating and thatching are both commonly recommended if your landscape company plans to overseed the lawn.
- **How Does Core Aeration Help Your Lawn?**
- Core aeration is helpful is your soil is compacted. It will allow more nutrients and water to get to the roots of the grass. It does not expose a great deal of soil. As a rule, the holes are about 1/2” across, so the holes do not comprise more than 2% of your lawn. Leaving plugs on top of the lawn rather than raking them or breaking them up will leave some soil exposed. It increases the amount of exposed soil and can dry out swiftly


THATCH LAYER
SHALLOW ROOTS
COMPACTED HARD SOIL
COMPACTED SOIL ACTUALLY HELPS THATCH LAYER DEVELOP
H_2O
O_2
NUTRIENTS
NEW, DEEPER ROOTS
NEW GRASS PLANTS INCREASE LAWN DENSITY
BEFORE
IMMEDIATELY FOLLOWING
8-10 WEEKS FOLLOWING

- **How Is Thatching Beneficial?**
- Thatching removes the layer of thatch and exposes more soil. Detacher tines cultivate your soil, which may help the seeds to become embedded in your soil, rather than laying on top. A dethatching tool is helpful in grooming the grass roots that lie closer to the surface. This gives new roots room to grow.
- Thatch rakes also expose grassy weeds and crab grass, since the blades and stems may be longer than the grass.
- **How Much Thatching Is Too Much?**
- For most average lawns, the amount of thatch is usually about 1/4 to 1/2 inch thick. If it is any thicker, it may hamper growth by preventing water, nutrients and air from properly penetrating to root level. It will also create an environment for disease and pests to flourish. Your lawn care professional knows how much thatch to remove.
- Thatching is usually done with a rake, for smaller areas, or with a machine, for larger areas. Lawn care companies have the proper equipment to use for thatching. Thatching is often done in the late spring weeks, giving your lawn lots of time to recover and grow. The temperatures in the spring tend to be more moderate, which can also help your lawn to recover.
- Your landscape professional will know how many times your lawn will need to be thatched each year. The buildup of thatch is related to the kind of grass in your lawn. Warm season grasses like Bermuda and Buffalo grass usually have more thatch. It is best for the lawn to be dethatched before it gets thick; so, many homeowners have it done once a year.

- **How High Should I Cut the Grass?**

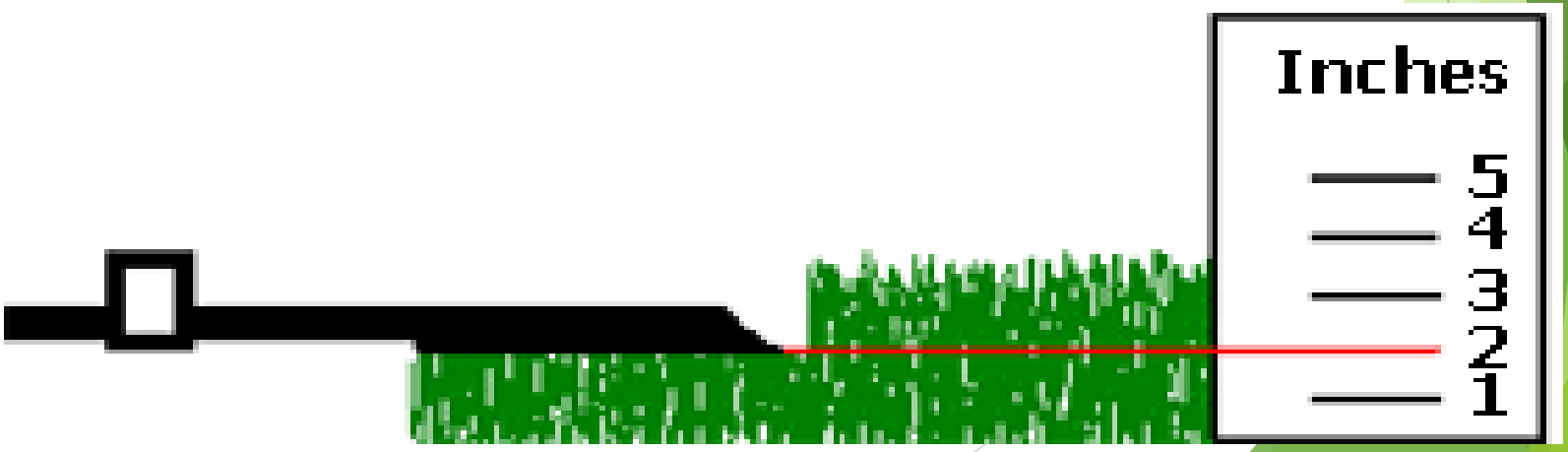
- How high should it be cut? Well, first it depends on what type of grass you have . In order to help determine the suggested mowing height). From the table, you should be able to determine what type of grass you have and the recommended mowing height for each. For example, if you identified your lawn as Common Bermuda grass, then your suggested mowing height should range from 3/4 to 1 1/2 inches. As a rule of thumb, it is best to stay **at the high end of these suggested heights**, especially during seasonal droughts and heat waves.



Grass Mow Height

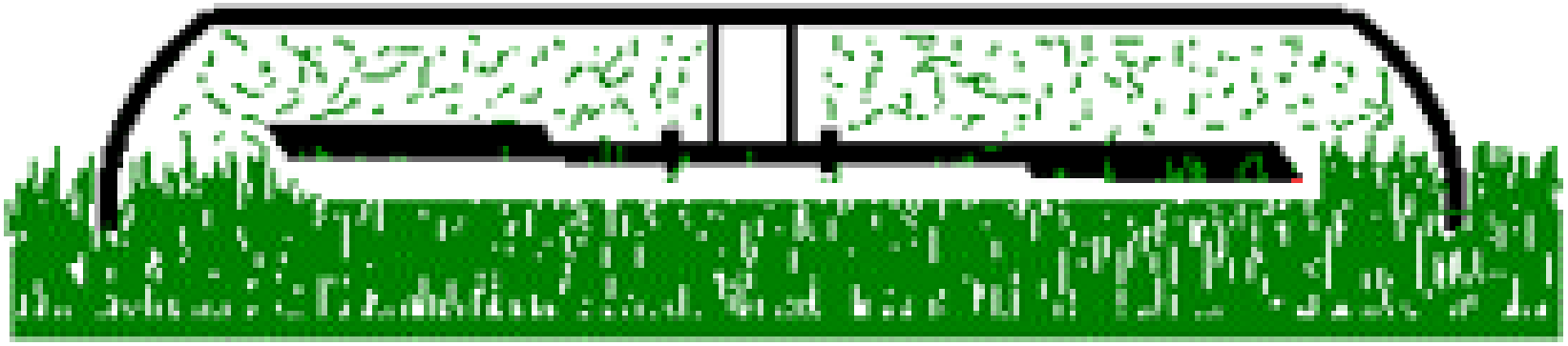
- **Grass Height Chart**
- No matter the kind of grass you have, there is a simple; rule of thumb to follow when mowing your lawn. Never remove more than one-third (1/3) of the leaf surface each time you mow. Leaf surface, or cutting height, refers to the length of grass above the soil.
- Cutting below the optimum height impedes root development, which is key to having a dense, healthy lawn. Use the following chart to determine the best growing height for your kind of grass and when to mow it again"
- The list can be read, simply by looking at the numbers. Type of Grass, the second number is the Best Mowing Height the third is Mow when it reaches.
- Bluegrass - 2in. - 3 in.
  Perennial ryegrass - 2in. - 3 in.
  Tall fescue - 2in. - 3 in.
  Fine Fescue - 2in. - 3 in.
  St. Augustine - 2in. - 3 in.
  Buffalo grass - 2in. - 3 in.
  Bermuda - 1.5. - 2.25 in.
  Zoysia - 1.5. - 2.25 in.
  Centipede - 1.5. - 2.25 in.

- In general, the longer you let your lawn grow, the deeper the root system will develop, thereby increasing its chance of withstanding periods of drought and severe heat. Higher grass also allows for increased ground cover to help protect soil from drying out and lets the grass absorb more sunlight. Conversely, **if you cut too low**, your lawn may develop a shallow root system, making it susceptible to drying out and requiring more maintenance to stay healthy. Additionally, too low a cut may also provide just enough sunlight for weeds to germinate and gain a foothold. The only negative side effect to growing taller lawns is



Mulching best practices

- With the increasing use of mulching mowers, people often wonder if and when to mulch their clippings. Mulching mowers discharge grass differently than conventional side-discharge mowers by using a special mulching blade that returns the grass clippings to the lawn through a continuous cut and re-cut motion. This process eventually drops the finely cut clippings back into the lawn as shown: Notice we didn't say onto the lawn. Many people who don't follow the 1/3 mowing rule, mow to quickly, or lack sufficient horsepower provided by the mower and will often times leave large clumps of grass on the lawn. These clippings are not sufficiently mulched to the point where they drop into the lawn



- In general, mulching your lawn is a good idea because it helps provide the soil with increased ground cover to hold moisture, and acts as a fertilizer. Clippings can contain up to 80% water and 5% nitrogen that can continuously fertilize your lawn! Additionally, mulching can reduce the amount of fertilizer you need to apply to your lawn. Mulching also reduces the headache of bagging your lawn and disposing of cut clippings. Again, the common side effect to mulching is development of Thatch in your lawn. As a rule of thumb, mulching is recommended during times of seasonal droughts, heat waves, and after fertilization and lawn development. Conversely, it is recommended that you try to bag your clippings occasionally, especially when you witness either a build-up of clippings on the lawn surface or an excess development of thatch in the lawn.

  Buying Tip

- It is recommended when buying a mower you find one with combined mulching and bagging capabilities. Even though you may only want to mulch your lawn, a "mulching only" mower does not give you a second option. With a combination mulching/bagging mower you can do both if needed. It may cost a few dollars now, but it could save you a lot of headaches and money in the future!

Local Nurseries

- Sunnyside Gardens 208-522-4660
- Eagle Rock Nursery 208-529-3305
- Town and Country Gardens 208-522-5247

County Agencies.

- Bonneville County Weed Department

  208-529-1397

- Bonneville County Extension Office

  208-529-1390

Local Distributors of Quality Commercial Grade Irrigation Products.

- 2M Company 208-524-2515
- Silver Creek Supply 208-523-0078
- Pipe Co. 208-523-5500
- John Deere Landscapes 208-227-0695
- Falls Plumbing 208-524-4640