MANAGING A MULTI PURPOSE FIELD: Turf Health in a High Traffic Environment

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GOALS FOR A SPORTS FIELD

Turf Manager's Perspective

- Safety
- Playability
- Aesthetics
- Consistency

GOALS FOR A SPORTS FIELD

How are these goals met?

- Prudent agronomics and cultural practices
- Sufficient field maintenance budget
- Awareness of the sports field conditions
- Following strict maintenance schedules
- Managing play to limit field usage
- Employing experienced and reliable labor
- Control of the turf surface environment

FAILURE

Athletic Fields Fail Due To:

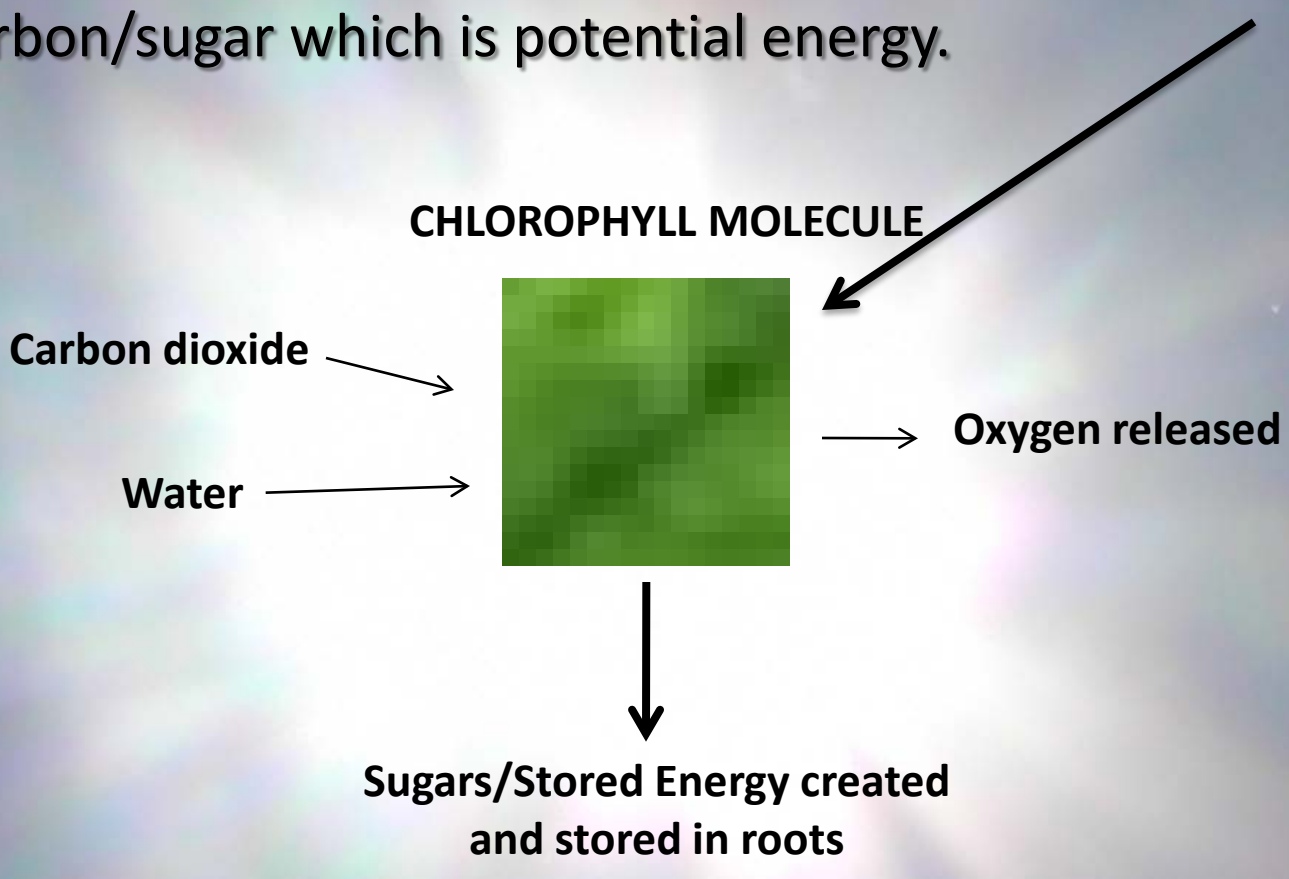
- Overuse and abuse
- Not enough or not the right equipment
- Not enough money for materials
- Initial design or construction issues
- Wrong maintenance practices
- **Poor understanding of agronomics**
- **Poor turf manager/coach/AD/GM relationships**

PHOTOSYNTHESIS

- Limiting factor in turfgrass growth
- Lack of light affects recuperative ability
- Carbohydrate storage = result of plant photosynthesis
- Carbohydrate storage occurs mostly in plant roots
- Carb reserves are used to battle through stressful periods

THE PHOTOSYNTHETIC PROCESS

Photosynthesis is the process of creating and storing carbon/sugar which is potential energy.



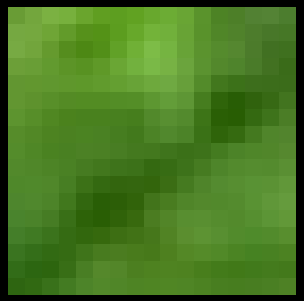
PHOTOSYNTHESIS FACTS

- Photosynthesis is highest in bright sunlight
- Cool season turf- max photosynthetic potential at about 1/3 full sun
- Warm season turf- less efficient at photosynthesis in low light or cool temperatures

THE RESPIRATION PROCESS

Plants respire at night in the absence of light which releases energy.

CHLOROPHYL MOLECULE



→ **Carbon dioxide**

↓

Sugars/Stored Energy released

THE RESPIRATION PROCESS

ENERGY

Respiration also occurs when plants are under heat stress.

Sugars/Stored Energy released

RESPIRATION FACTS

- Carbohydrates are broken down to release energy, water and CO2
- Respiration is very high in cool season plants in hot weather
- Prolonged heat respiration may deplete all of the carbohydrates in the plant
- Warm season plants tend to have lower respiration at high temperatures

PROMOTING PHOTOSYNTHESIS

- Plant and establish shade tolerant grasses
  Decrease shade surrounding turf
- Raise HOC to increase leaf blade surface area
- Avoid leaving objects directly on turf (i.e. mats, tarps, benches, goals, etc)
- Maintain micro-nutrient fertility levels in soil

SOIL

- Soil for sports fields performs two functions:
  - serve as a medium for turf growth
  - provide a uniform hard surface
- Playability – is measured by the soil's ability to return to a playable condition after:
  - heavy rain
  - excessive dry conditions
  - heavy usage

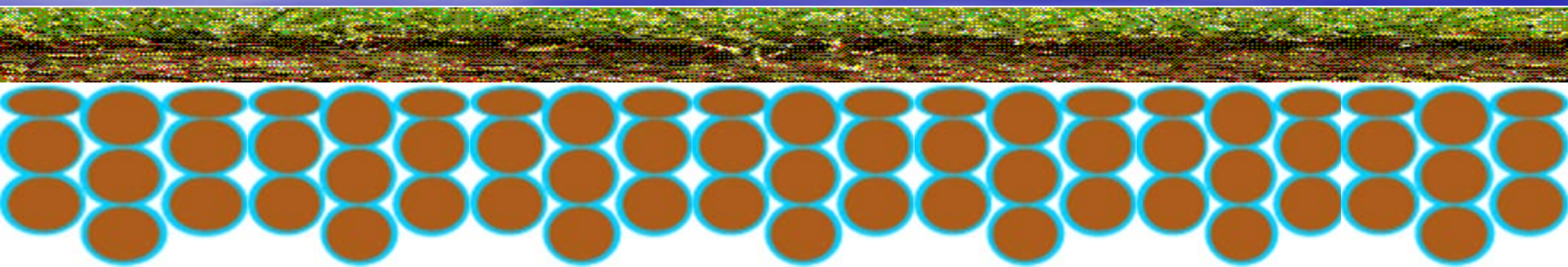
SOIL CHARACTERISTICS

- PH
- Cation Exchange Capacity
- Soil Texture
- Temperature
- Soil Analysis

SOIL POROSITY

- medium for longer root system
- increased turfgrass vigor and quality
- proper soil aeration
- decreased compaction under high traffic
- influence on soil temperature
- drainage of excess water from playing surface- maximum use potential

OPTIMUM SOIL POROSITY



COMPACTION

- overused and abused turf areas
- poor water management leads to compaction
- reduces size and amount of pore space
- decreases water infiltration rate
- restricts root growth
- suffocates root zone of oxygen
- lowers water holding capacity of soil

FIGHTING COMPACTION

- Topdress wear areas with crumb rubber
- Topdress with sand prior to heavy use
- Incorporate calcined clay into root zone
- Raise HOC in wear area to protect crown
- Restrict cart equipment and vehicles on turf
- Drill holes by hand into compacted area

FIGHTING COMPACTION

- Shift fields to eliminate wear patterns
- Paint alternate goal boxes and yard lines
- Move portable goals around for practice drills
- Direct traffic flow on field
- Avoid excessive mowing
- Close areas as necessary

AERATION

- Playability - turf health, levelness and uniformity of the surface, consistent thickness of turf cover, and the ability of the field to accommodate precipitation
- Decreases effects of surface compaction
- Increases pore space in soil
- Promotes drainage of excess water on surface

AERATION EFFECTIVENESS

- Shorter mowing heights promote deeper penetration of tines
- Moist soil allows deeper penetration of tines
- Aeration in “+” or “x” pattern for tighter spacing
- Aerate when roots are actively growing
- Aerate before heavy precipitation

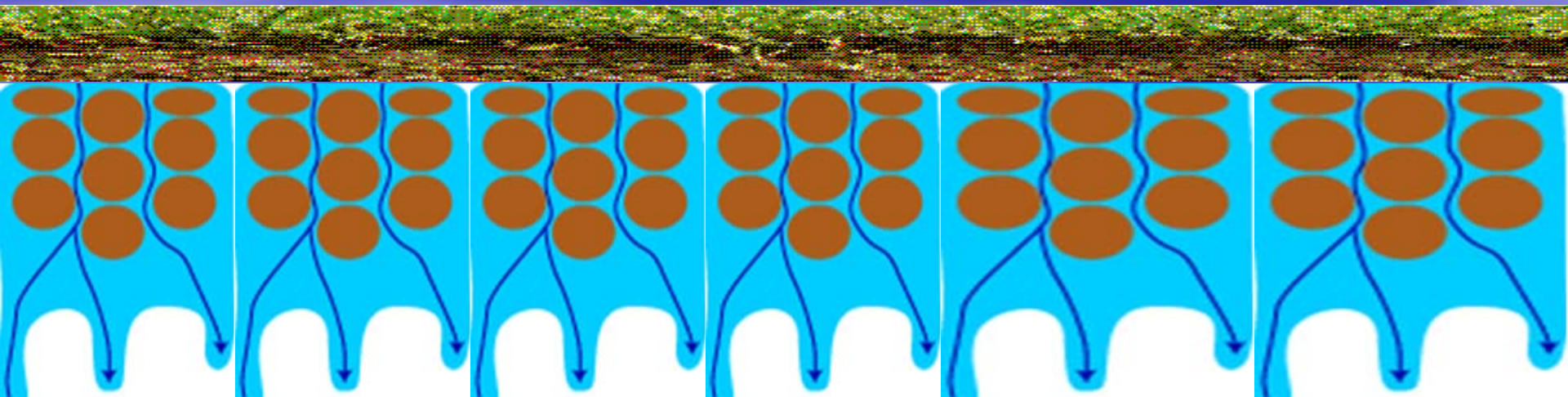
WATER MANAGEMENT

- Soil texture
- Irrigation water suitability
- Runoff water properties
- Water is the new oil

IRRIGATION STRATEGIES

- Soil conditions + athletic schedule= irrigation schedule
- Irrigate only to support plant life
- Importance of dry field
- Maintenance practices to maximize H20 usage

OVERWATERING



FIELD CAPACITY

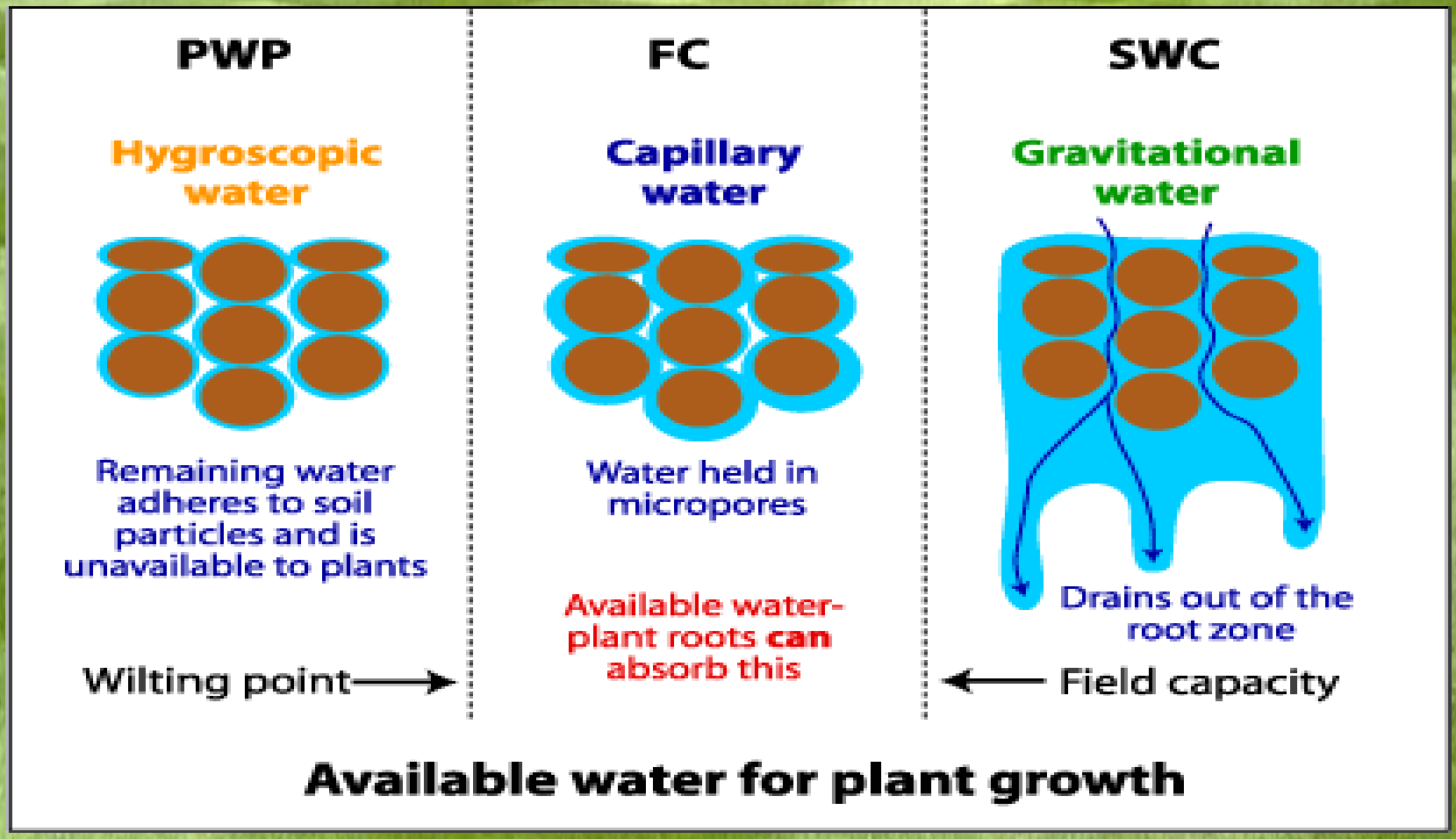


Image courtesy of See Ya Later Irrigator Magazine

FERTILITY

- PH
- Nitrogen
- Phosphorus
- Potassium
- 1:1 N to K ratio
- Micronutrients – Fe and Mn

NUTRIENT AVAILABILITY

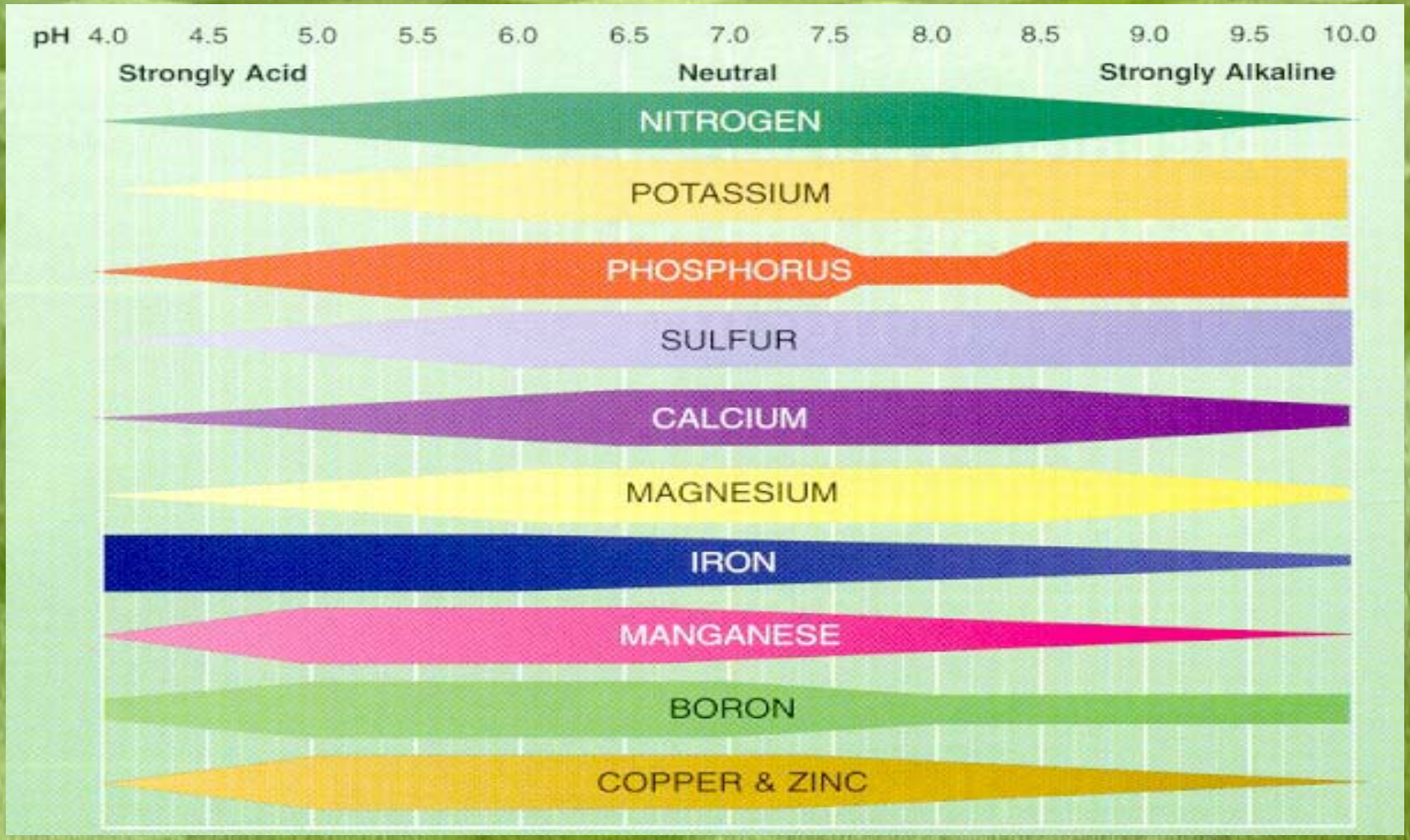


Image courtesy of Michigan State University

FERTILIZER APPLICATION EFFECTIVENESS

- Fertilize promptly after aeration
- Fertilize a week prior to aggressive aeration
- Avoid fertilization in the middle of the day
- Mow before applying fertilizer
- Avoid driving on turf after application
- Recycling clippings vs. collecting clippings

HEIGHT OF CUT

- Dictated by turfgrass species and area
- Sports turf cut at 1 inch or below for speed
- Heights at 3” fail to form uniform and knit turf
- Cool season turf raised in heat to encourage root growth
- Warm season turf lowered in summer

HEIGHT OF CUT

	PROS	CONS
Lower HOC	•Increased turf density •Speeds up playability •More efficient aeration (exposure to air, water, sunlight) •More efficient topdress	•Increased water and fertility requirements •Decreased traffic tolerance •Decreased photosynthesis •Increased exposure to heat and stress
Higher HOC	•Improved traffic and stress tolerance •Decreased water and fertility requirements •Increased photosynthesis	•Decreased turf density •Microclimate in canopy promotes disease development •Slows playability

HEIGHT OF CUT

Playability considerations

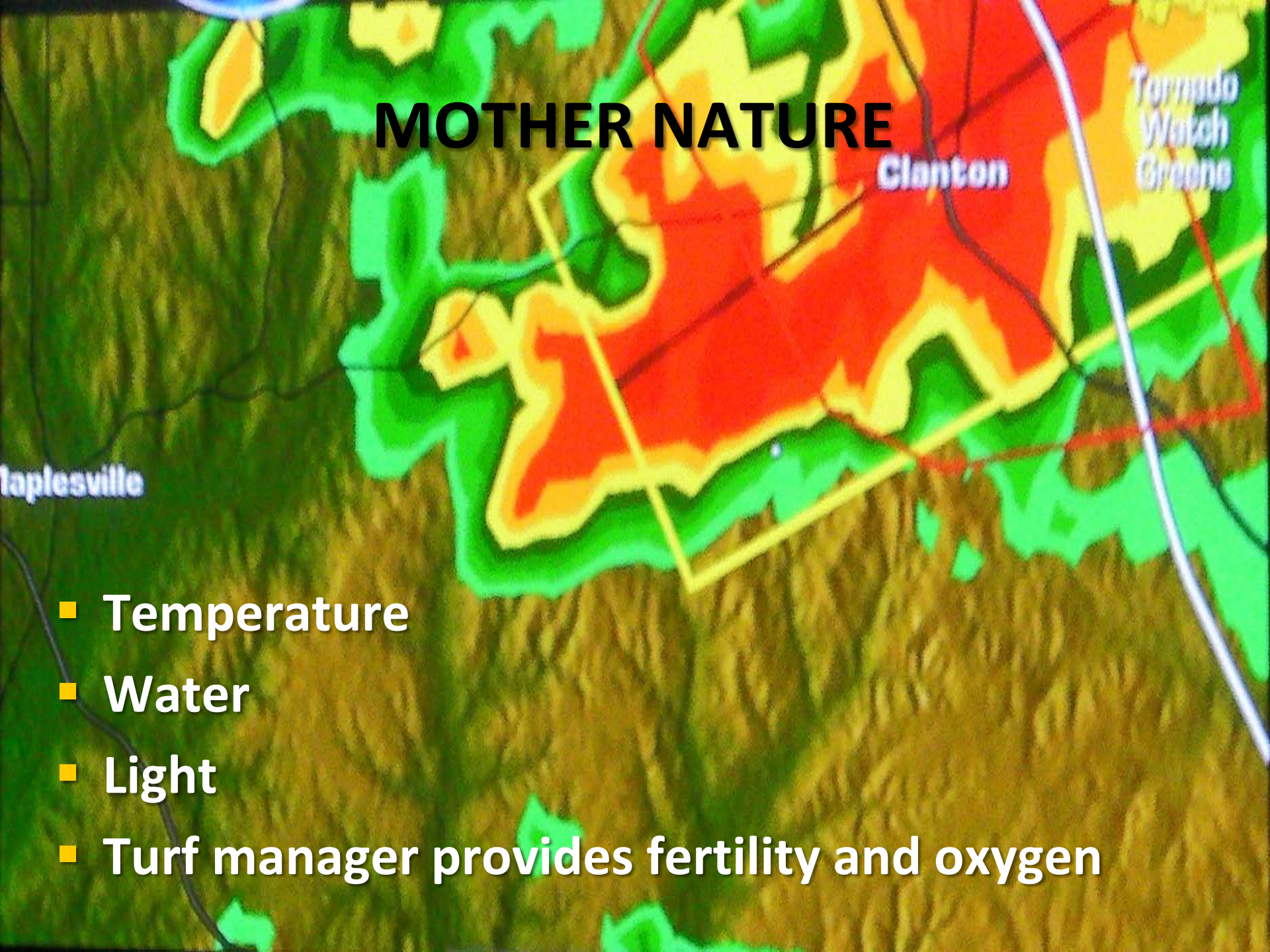
SPORT	FOOTING	BALL ROLL	HOC
Baseball	X	X	Bermuda- 5/8”-1.0” KBG/PR- 1.0-2.5”
Field Hockey	X	X	Bermuda- 5/8”-1.0” KBG/PR- 1.0-2.5”
Football	X	MINIMAL	Bermuda- 5/8”-1.0” KBG/PR-1.5-2.5”
Lacrosse	X	MINIMAL	Bermuda- 5/8”-1.0” KBG/PR- 1.5-2.5”
Soccer	X	X	Bermuda- 5/8”-1.0” KBG/PR- 1.0-2.5”
Softball	MINIMAL	MINIMAL	Bermuda-5/8”-1.0” KBG/PR-1.5-2.5”

FREQUENCY OF CUT

- Determined by growth rate
- Avoid setting schedule
- Avoid mowing too frequently
- KEEP YOUR BLADES SHARP!
- Mowing removes photosynthetic potential
- Mowing enhances respiration/use of carb reserves

AESTHETICS

- PERCEPTION IS IMPORTANT!
- Be on the field
- Showcase a “game field”
- Hide wear areas by burning in mowing patterns
- Paint lines in two directions for brighter lines
- Paint logos for special games
- Display wear areas “bandaged up”



MOTHER NATURE

- Temperature
- Water
- Light
- Turf manager provides fertility and oxygen

MANAGING WEAR AREAS

The "Band-aid Effect"

- Seed bank
- Turf blankets
- Pre-germinated divot mix
- Closure of areas
- Tighter spacing on aeration
- Walk aerate/pitchfork areas
- Isolated irrigation

PROTECTING THE INVESTMENT

Turf Healthcare Strategy

- Promote photosynthesis in growth season(s)
- Provide porous soil for optimum root growth
- Limit traffic or stress for optimum root growth
- Provide adequate nutrients in growing season(s)

GROWING SEASONS

ACTIVE GROWING SEASON

More roots= more carb storage

Image courtesy of American-Lawns.com

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PROTECTING THE INVESTMENT

Turf Healthcare Strategy

- Monitor mowing practices in growing season(s)
- Implement proper water management strategy
- Take advantage of mother nature
- Maintain the band-aid look

TURF HEALTHCARE STRATEGY

Treat it like a seed

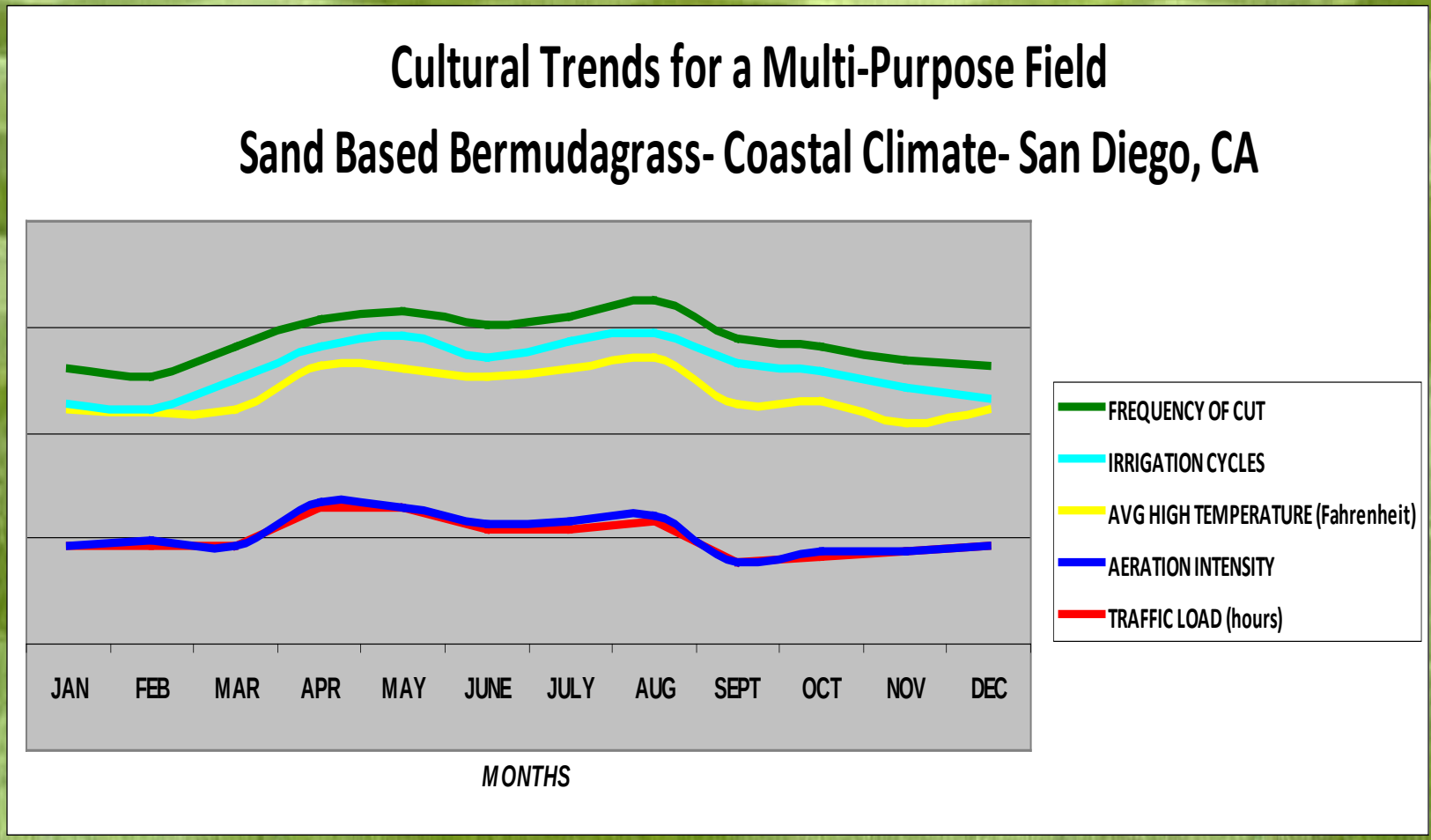
- Light
- Oxygen
- Water
- Fertility
- Temperature

- The field is always in a recuperative state

PROTECTING THE INVESTMENT

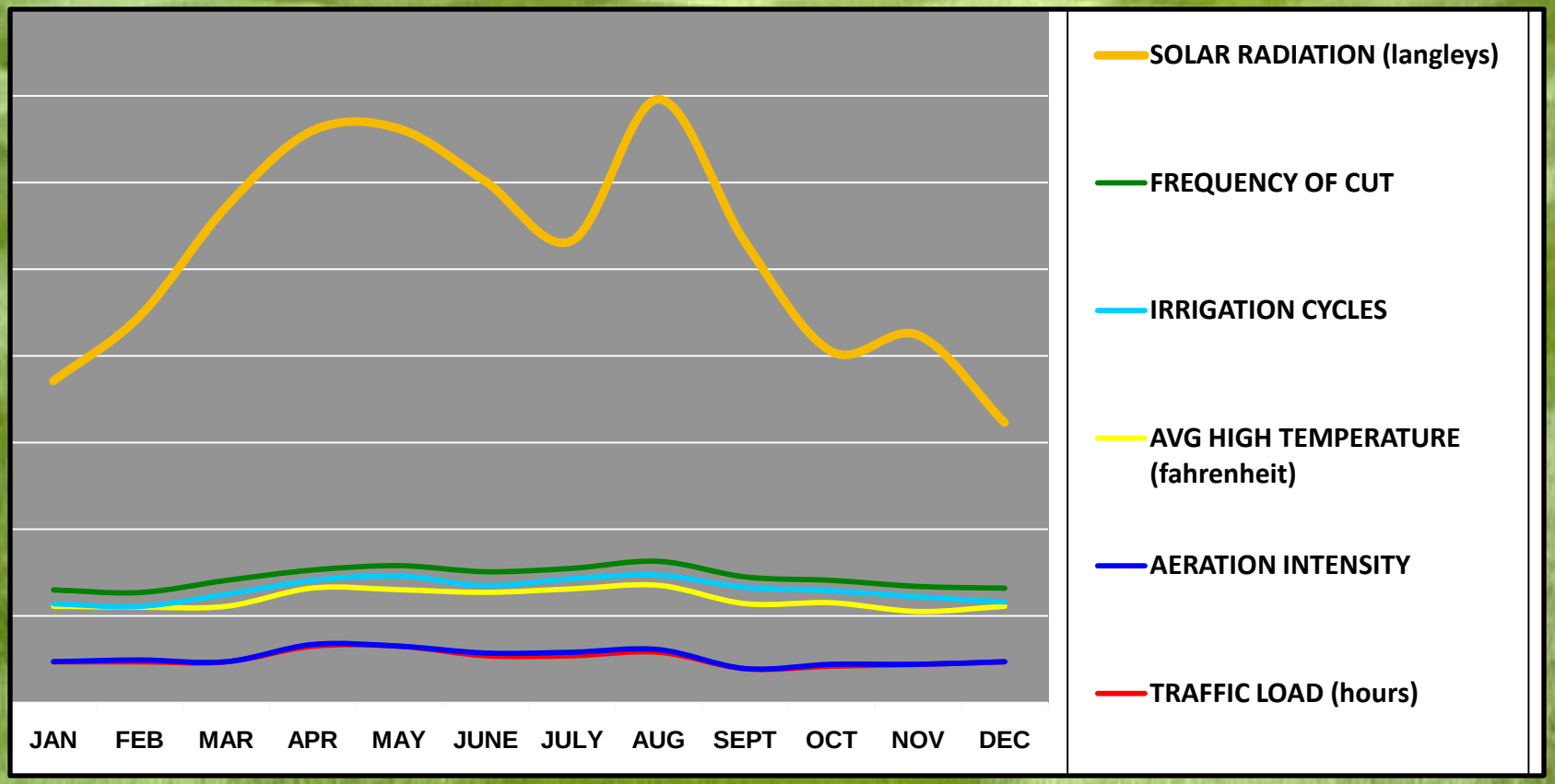
- Develop turf healthcare strategy
- Establish rules for field usage
- Maintain vigilance of field usage
- Prioritize and budget effectively
- Track healthcare strategy progress

CULTURAL TRENDS



SOLAR RADIATION

Coastal Climate – San Diego, CA



COACH/TURF MANAGER RELATIONS

- Compare agendas and game plans weekly
- Keep field maintenance low visibility
- Put field preparation in the limelight
- Wrap up preparation when teams arrive
- ALWAYS wish the coach good luck
- Be visible at games and some practices
- Never say “no” to a coach

COACH/TURF MANAGER RELATIONS

- Consistent communication and compromise
- Pro-actively plan for results- keep your word
- Provide a consistent product during season
- Welcome assistance- create ownership
- Leave the field maintenance to the turf manager
- Maintain communication with the same coach

KNOW YOUR ROLE

- You are the advocate for the turfgrass and the expert on field maintenance
- You are a part of the aesthetics of the field
- Importance of soft skills
- Never wear another team for a work uniform
- Understand how your operation affects others
- Never compromise the importance of it

UNDERSTAND THE GAME

Field Layouts/Dimensions, Rules and Regs etc.

www.nfhs.org	www.ncaa.org	www.littleleague.org	www.fifa.com
www.fihockey.org	www.irb.com	www.mlb.com	www.nfl.com
www.uslacrosse.org	www.futsal.org	www.usafootball.org	icc-cricket.yahoo.net

ENVIRONMENTAL STEWARDSHIP

- Monitor mowing frequency
- Promote water conservation
- Limit fertilizer applications
- Limit pesticide usage
- Paint selection (VOC free)
- Place recycle bins around field
- Employ green waste management

SUCCESS

Athletic Fields Thrive Due To:

- Vigilance, knowledge and oversight of facility usage
- Establishment of rules for field usage
- Prioritizing workload and budgeting effectively
- Proper planning of construction
- Development of turf healthcare strategy
- **Basic understanding of agronomics**
- **Constructive turf manager/coach/AD/GM relationships**

SDJA FIELD

- 609 hours traffic/year
- 4.1 acre sand based root zone
- Aerate 6 times/year
- Field is mowed 168 times/year
- 11-12 lbs/1000 sq. ft. of Nitrogen/year
- 2-3 lbs/1000 sq. ft. of Phosphorus/year
- 8-9 lbs./1000 sq. ft. of Potassium/year

SDJA FIELD

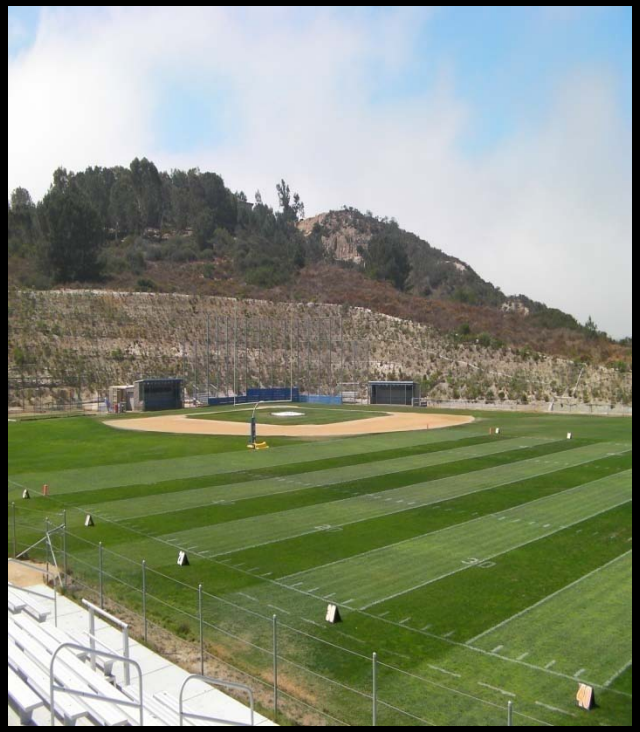
- 375 langleys/day/year of solar radiation
- Average high temperature- 68 degrees
- 2.96 miles from the Pacific Ocean
- Total rainfall- 9.40 inches
- 130 total irrigation cycles/year

FALL FIELD CONVERSION

Bermudagrass/Perennial Ryegrass- 1.25”

FALL FIELD CONVERSION

August- November



Fields 2 HS Football Teams, 1 MS Flag Football Team, Youth Football Academy
(Hosts total of 16 Games)

WINTER FIELD CONVERSION

Perennial Ryegrass- 1”

WINTER FIELD CONVERSION

November- February



Fields 4 Soccer Teams (Hosts total of 40 Home contests)

SPRING FIELD CONVERSION

March-June

Perennial Ryegrass/Bermudagrass- 7/8”