

# Best Management Practices

## BMPs

For Improved Water Quality

# BMP's

- Methods or Techniques found to be most effective and practical to achieve a desired goal. Like preventing or reducing pollution, and maximizing current resources.

# Environmental Concerns

- Soil and Water Quality - primary concerns are nutrients, pesticides, and waste.
- Water Conservation- water is a finite resource but this is also the highway used to transport any pollutants off site.

# BMPs

- There are many BMPs in the FDEP golf course manual that are pre construction or are structural changes to the course.
- These changes would require capital investment that participants may or may not be willing to make.
- We are going to focus today on lower cost but still effective Management BMPs.

# Pesticide Storage BMPs

- Roofed concrete or metal structure
- Seamless floor constructed of metal or concrete
- Must be able to contain spills
- Provide close by storage for PPEs



# Pesticide Storage BMPs

- Provide adequate space for shelving to segregate herbicides, pesticides, and fungicides
- Provide adequate exhaust and emergency wash area
- Place dry materials above liquids

# Fertilizer Storage and Handling

Always store fertilizers separately from solvents, fuel and pesticides

Store fertilizer in a concrete building with a metal or other type flame resistance roof

Store fertilizer in an area protected from rainfall, where water can not flow across pad



# Fertilizer Storage and Handling

- Stationary liquid fertilizer tanks larger than 550 gallons are required to have secondary containment, but it's a sound practice regardless of size
- Clean all spills immediately
- Spilled fertilizer must be applied or disposed of properly



# Drainage BMPs

- Internal golf course drains should not drain directly into an open water body, but should discharge through pretreatment zones and/or vegetative buffers to help remove nutrients and sediments

# Stormwater Runoff BMPs

- Eliminate or minimize Directly connected imperious areas
- Disconnect runoff from gutters and roof drains from impervious areas, so that it flows onto permeable areas that allow the water to infiltrate near the point of generation.
- Golf course stormwater management should include “natural systems engineering” or “soft engineering” approaches that maximize the use of natural systems to treat water.
- Institute buffers and special management zones.

# Fertilizer Management

- Know the soil type- certain products may leach quickly through certain soils
- Soil sampling- to identify what nutrients need to be applied
- Should have a base line of water quality test for surrounding water bodies.

# Pesticide Management

- IPM -Integrated Pest Management- IPM is a method of combining proper plant selection, correct cultural practices, the monitoring of pest and environmental conditions, the use of biological controls, and the judicious use of pesticides to manage pest problems.

# IPM Key Concepts

- Scout- identify pest that are present in turf grass
- Use cultural, mechanical or physical conditions at the site to prevent problems from occurring
- When pest are discovered use the appropriate management practice
- Evaluate the effectiveness of the treatment for future decisions

# Lake Management

- Maintain a riparian buffer to filter the nutrients in stormwater runoff
- Establish a 25-foot-wide no-fertilizer special management zone around pond/lake edges
- Encourage clumps of native emergent vegetation at the shoreline
- Maintain water flow through lakes, if they are interconnected

# Lake Management

Establish wetlands where water enters lakes to slow water flow and trap sediments

Dredge or remove sediment before it becomes a problem



# Irrigation Management

The application rate must not exceed the ability of the soil to absorb and retain the water applied during any one application

The design operating pressure must not be greater than the available source pressure





# Irrigation Management

- Distribution devices and pipe sizes should be designed for optimum uniform coverage. The first and last distribution device should have no more than a 10% percent difference in flow rate. This usually corresponds to about a 20% percent difference in pressure
- Distribution equipment (such as sprinklers, rotors, and microirrigation devices) in a given zone must have the same precipitation rate
- Heads for turf areas should be spaced for head-to-head coverage
- Pipelines should be designed to provide the system with the appropriate pressure required for maximum irrigation uniformity

# Irrigation Management

- Turf and landscape areas should be zoned separately
- Non planted areas, especially impervious surfaces, should not be irrigated
- Install part-circle heads along lakes and ponds
- Technology- computerized controls, soil moisture sensors, rain shut off devices, ET clocks



## Mixing and Loading Practices

Locate operations well away from ground water wells and areas where runoff may carry spilled pesticides into surface water

An open building must have a roof with a substantial overhang (minimum 30° from vertical, 45° recommended) on all sides

# Mixing and Loading

- Ensure that workers always use all PPEs required by the pesticide label
- Assess the level of training and supervision required by staff
- Any material that collects on the pad must be applied as a pesticide or disposed of as a (potentially hazardous) waste
- Clean up spills immediately

# Environmental Stewardship

- Good stewardship starts with an understanding of the environment and how it can be harmed by ones own actions.
- For the entire manual or more information you can visit
- <http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/glfbmp07.pdf>