WATER QUANTITY AND QUALITY

WATER QUALITY INTERPRETATIONS

Soil interpretations and ratings in this subsection of the FOTG are used to evaluate hazards to ground water or surface water where the application of pesticides and/or nutrients occur.

WATER QUANTITY AND QUALITY

WINDOWS PESTICIDE SCREENING TOOL (WIN-PST)

WIN-PST is a pesticide environmental risk screening tool that can be used to evaluate the potential for pesticides to move with water and eroded soil/organic matter and to affect non-target organisms. WIN-PST goes beyond previous NRCS screening tools to consider the impact of water table depth, irrigation, residue management, and pesticide application area, method and rate. Pesticides can be specified by product name or active ingredient. Long-term human and fish toxicity data and ratings are also included. These toxicity ratings can be combined with the off-site movement potential ratings to provide an overall rating of the potential risks from pesticide movement below the root zone and past the edge of the field.

SOIL RATINGS FOR PESTICIDES

An indicator is needed to determine which of the two pathways, leaching or runoff will be the most likely pesticide loss pathway. Selected properties of soils have been used to develop a screening procedure for runoff and leaching potentials of soils. This screening procedure is called, "Soil/Pesticide Interaction Screening Procedure version II (SPISP II)". The SPISP II is used in the "Windows Pesticide Screening Tool (WIN-PST)". The SPISP II ratings of pesticides, soils, and pesticide/soil interaction that indicate potential for pesticide movement are the following:
H – High
I – Intermediate
L – Low
V – Very Low (Leaching Only)

LEACHING (SPISP II Soil Leaching Potential - SLP)

The Soil Leaching Potential (SLP) is the sensitivity of a given soil to pesticide leaching below the rootzone. It characterizes those soil properties that would increase or decrease the tendency of a pesticide to move in solution with water and leach below the root zone. A high rating indicates the greatest potential for leaching.

Factors that determine the soil leaching potential are:
Hydrologic Group
Soil K Factor
% Surface Horizon Organic Matter Content
Depth of the First Soil Horizon, in inches

If Hydrologic Group = D and K Factor = 0 use a K Factor of 0.02.

WATER QUANTITY AND QUALITY

Rating	Criteria
HIGH	Hydrologic Group = A and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon <= 30 or Hydrologic Group = B and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon <= 9 and the K Factor is <= 0.48 or Hydrologic Group = B and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon <= 15 and the K Factor is <= 0.26
LOW	Hydrologic Group = B and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon >= 35 and the K Factor is >= 0.40 or Hydrologic Group = B and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon >= 45 and the K Factor is >= 0.20 or Hydrologic Group = C and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon <= 10 and the K Factor is >= 0.28 or Hydrologic Group = C and % Surface Horizon Organic Matter Content X Depth of the First Soil Horizon >= 10
VERY LOW	Hydrologic Group = D
INTERMEDIATE	All other conditions.

The Soil Leaching Potential ratings are indicated in the Soil Report for each soil type in a selected county within WIN-PST.

RUNOFF (SPISP II Soil Solution Runoff Potential – SSRP)

The Soil Solution Runoff Potential is the sensitivity of a given soil to pesticide loss dissolved in surface runoff that leaves the edge of the field. A high rating indicates the greatest potential for solution surface loss.

Factors that determine the soil solution runoff potential are:
Hydrologic Group

Rating	Criteria
HIGH	Hydrologic Group = C or Hydrologic Group = D
LOW	Hydrologic Group = A
INTERMEDIATE	Hydrologic Group = B

The Soil Solution Runoff Potential ratings are indicated in the Soil Report for each soil type in a selected county within WIN-PST.

WATER QUANTITY AND QUALITY

RUNOFF (SPISP II Soil Adsorbed Runoff Potential - SARP)

The Soil Adsorbed Runoff Potential represents sensitivity of a soil to pesticide loss adsorbed to sediment and organic matter that leaves the edge of the field. It characterizes those soil properties that would increase or decrease the tendency of a pesticide to move in surface runoff attached to soil particles. A high rating indicates the greatest potential for sediment /pesticide transport.

Factors that determine the soil adsorbed runoff potential are:
Hydrologic Group
Soil K Factor

If Hydrologic Group = D and K Factor = 0 use a K Factor of 0.02.

Rating	Criteria
HIGH	Hydrologic Group = C and K Factor >= 0.21 or Hydrologic Group = D and K Factor >= 0.10
LOW	Hydrologic Group = A or Hydrologic Group = B and K Factor <= 0.10 or Hydrologic Group = C and K Factor <= 0.07 or Hydrologic Group = D and K Factor <= 0.02
INTERMEDIATE	All other conditions.

The Soil Adsorbed Runoff Potential ratings are indicated in the Soil Report for each soil type in a selected county within WIN-PST.

RATING ADJUSTMENTS FOR SITE CONDITIONS

Certain site conditions may increase or decrease the initial leaching and runoff ratings. WIN-PST allows the user to select any of the site conditions listed below if they exist onsite.

Abbreviations for Site Conditions and Management Techniques

m - There are macropores in the surface horizon deeper than 24".
w - The high water table comes within 24"of the surface during the growing season.
s - The field slope is greater than 15%.

WATER QUANTITY AND QUALITY

ADDITIONAL PESTICIDE RATINGS

Soil Related Use Restrictions for Triumph 4E Insecticide [tm] are applicable in certain conditions. Please note the label for the conditions. The soil related conditions are as follows:

Triumph can not be used on soils that have:

1. A permeability of six inches per hour or more (rapid or very rapid permeability) and

2. A water holding capacity of 0.10 inch per inch of soil or less (low or very low water holding capacity) in all horizons to a depth of 80 inches or to bedrock if bedrock is within 80 inches of the surface.

The ratings for the use of Triumph are indicated in Soil Legends of Section II of the FOTG under the heading of "Triumph2use".

The following Soil Related Use Restrictions for Temik 10G [tm] (aldicarb) exists if the pesticide is to be applied to citrus.

Temik can not be used within 1000 feet of a drinking water well unless it is known that the well is cased to 100 feet below ground level or to a minimum of 30 feet below the water table on soils that have:

1. A permeability of twenty inches per hour or more (very rapid permeability) and

2. A water holding capacity of less than 0.06 inch per inch of soil (very low water holding capacity) in all horizons to a depth of 80 inches or to bedrock if bedrock is within 80 inches of the surface.

The ratings for the application of Temik are indicated in Soil Legends of Section II of the FOTG under the heading of "Temik2use".

SOIL RATINGS FOR PHOSPHOROUS

Where the use of nutrients causes potential surface water problems, phosphorous is normally the nutrient that limits the amount of animal and fertilizer that may safely be applied. For example, applying manure to meet crop nitrogen needs may overload the soil with phosphorous. Phosphorous overloading on some soils can impair surface water or ground water quality.

Although phosphorous water quality hazards are normally surface water related, certain soils that are shallow to porous limestone bedrock present a ground water hazard. Other soils that are uncoated sands overlying limestone bedrock present a similar problem. Such soils have been identified in the Suwannee River Basin and other areas in Florida.

WATER QUANTITY AND QUALITY

PHOSPHOROUS RATINGS

Factors that determine the phosphorous related water quality ratings are the permeability of the upper 80 inches of the soil as well as the hydrologic group and slope of the soil, as follows:

Rating	Criteria
HIGH	Soils in hydrologic group D in their natural, undrained state.
MEDIUM	Soils in hydrologic group C; and soils in hydrologic group B (in their natural, undrained state) that have a permeability of less than 6.0 IN/HR within 20 inches of the surface.
LOW	Soils in hydrologic group A; and soils in hydrologic group B (in their natural, undrained state) that have a permeability of 6.0 IN/HR or greater in all of the upper 20 inches of the soil profile.

Exceptions:
1. Soils that are frequently flooded during the growing season are rated HIGH.
2. Soils rated LOW are changed to a rating of MEDIUM where the slope is greater than 12 percent.
3. Soils rated MEDIUM are changed to a rating of HIGH where the slope is more than 8 percent.

The soil ratings for phosphorous are the same as those for "Runoff" and are indicated in the Soil Legend of Section II of the FOTG under the heading of "Soilrun". Soils with a rating of high or medium rating are considered to pose a potential hazard.

SOIL RATINGS FOR PHOSPHORUS INDEX

The soil rating for phosphorus is an indication of potential leaching and runoff and is to be used only as part of the phosphorus index. The Phosphorus Index, which is found in the Florida Agronomy Field Handbook (Chap. 9), will be used to evaluate the application of animal manure, and/or organic by-products, or any site within a designated phosphorus limiting area, e.g., Lake Okeechobee, Everglades Protection Area, Lake Apopka, and Green Swamp regions, relating to nutrient budgets including the potential for phosphorus movement.

The County Phosphorus Index Soil Rating Tables are located behind the Phosphorus Index.

WATER QUANTITY AND QUALITY

PHOSPHORUS RUNOFF AND LEACHING POTENTIALS RATINGS FOR FLORIDA SOIL SURVEY MAP UNITS

The runoff and leaching potentials were created by comparing soil survey estimated soil properties with the above criteria. The potentials presented herein are interpretations; not fact. As with all interpretations based on information in a published soil survey or other sources of estimated soil properties, phosphorus runoff and leaching potentials should be confirmed by on-site investigations. However, a soil survey is an excellent place to initiate investigations before making more time consuming on-site determinations.

Due to the variability of percent ground cover, range in characteristics of some soils, and slope ranges of some map units, the following footnotes are needed to explain the County Phosphorus Index Soil Rating Tables.

FOOTNOTES TO PHOSPHORUS RUNOFF AND LEACHING POTENTIAL RATINGS FOR FLORIDA SOIL SURVEY MAP UNITS

Due to the variability of percent ground cover, range in characteristics of some soils, and slope ranges of some map units, the following footnotes are needed to explain the County Phosphorus Index Soil Rating Tables:

***Rate Very Low** where percent ground cover is greater than 75%.

****Rate Low** if thickness of loamy/clayey layers is more than 10 inches; many soils such as Shadeville and Pople have ranges that include less than 10 inches and more than 10 inches of loamy/clayey material.

*****Rate Very High** if combined thickness of layers with chroma 3 or more and Bh horizons is less than 20 inches; many soils such as Adamsville and Narcoossee have ranges that include less than 20 inches and more than 20 inches of these materials.

#Rate High if combined thickness of layers with chroma 3 or more and Bh horizons is more than 20 inches; many soils such as Adamsville and Narcoossee have ranges that include less than 20 inches and more than 20 inches of these materials.

##Rate Very Low if thickness of Bt is more than 10 inches; many soils such as Aripeka, Vizcaya, Parkwood, Pellicer, and Nutall have ranges that include less than 10 inches and more than 10 inches of loamy/clayey material.

###Rate Low or Very Low (where percent ground cover is greater than 75%) if slope is less than 8 percent.

$Rate High where slope is 8 percent or less.

$$Rate Medium where slope is 5 percent or less.

WATER QUANTITY AND QUALITY

SOIL RATINGS FOR NITRATES AND OTHER SOLUBLE NUTRIENTS

Where the use of nutrients causes potential ground water problems, nitrates and other soluble nutrients are normally the nutrients that limits the amount of animal waste and fertilizer that may safely be applied. Nitrate overloading on some soils can impair ground water quality.

The method of determining the nutrient hazard to ground water is based on a Leaching Index (LI).

Leaching Index

A Leaching Index map for each soil hydrologic group has been developed in Florida. By using the LI maps the Leaching Index can be determined. Since all soils in Florida pose a nitrate leaching hazard, determining LI index values is not necessary. For informational purposes the LI guidelines are explained below:

Rating	Criteria
LOW	A leaching index below 2 indicates low potential of leaching soluble nutrients below the root zone.
MEDIUM	A leaching index between 2 and 10 inches indicates a medium potential of leaching soluble nutrients below the root zone.
High	A leaching index larger than 10 indicates a high potential of leaching soluble nutrients below the root zone.

Soils with a rating of Medium or High are considered to pose the same potential nitrate leaching hazard. Since all soils in the area served by this field office have a MEDIUM to HIGH LI value, no differences in interpretations exist based on soil type.

PESTICIDE AND NUTRIENT MANAGEMENT

Introduction

A soil link between each of the pesticide and nutrient concerns listed above and each soil survey map unit has been made and is available in Section II-ii-A of this FOTG. The soil link is based on the soil and site characteristics explained above.

There are 4 possible field conditions which are derived from the dominant soil in a field. They are as follows:

Where Soileach is Low and Soilrun is Low use Pesticide and Nutrient Management Jobsheet Number 1.

Where Soileach is Medium or High and Soilrun is Low use Pesticide and Nutrient Management Jobsheet Number 2.

Where Soileach is Medium or High and Soilrun is Medium or High use Pesticide and Nutrient Management Jobsheet Sheet Number 3.

Where Soileach is Low and Soilrun is Medium or High use Pesticide and Nutrient Management Jobsheet number 4.

Documentation for Determining Soileach and Soilrun for Pesticide and Nutrient Management

On the following page is a copy of the form which is used to determine and document Pesticide and Nutrient Management Job Sheet selection.

U.S. DEPARTMENT OF AGRICULTURE
FL-CPA-14
Soil Conservation Service

PESTICIDE AND NUTRIENT MANAGEMENT JOB SHEET NUMBER 1
(Soileach = low; Soilrun = low; Leaching Index = med. or high)

Tract Number _____ Field Number(s)_____

PESTICIDE MANAGEMENT

Soils in these field(s) have a low potential for pesticide leaching to the groundwater and a low potential for pesticide runoff from the field(s) to surface water.

The Florida Pest Control Guide contains a listing of pesticides suitable for each type of pest and is available from the Cooperative Extension Service. Read and follow pesticide labels.

NUTRIENT MANAGEMENT

Soils in these field(s) have a medium or high potential for nitrogen leaching to the groundwater and a low potential for phosphorous runoff from the field(s) to surface water.

A soil test will be used as a guide to determine plant nutrient needs. In addition, a listing of nitrogen and phosphorous requirements by crop type is available from the Cooperative Extension Service. Nutrients shall be added at the rate needed by the crop grown, or according to the producers goals, whichever is lower.

U.S. DEPARTMENT OF AGRICULTURE
FL-CPA-15
Soil Conservation Service

PESTICIDE AND NUTRIENT MANAGEMENT JOB SHEET NUMBER 2
(Soileach = med. or high; Soilrun = low; Leaching Index = med. or high)

Tract Number _____ Field Number(s)_____

PESTICIDE MANAGEMENT

Soils in these field(s) have a medium or high potential for pesticide leaching to the groundwater and a low potential for pesticide runoff from the field(s) to surface water.

The Florida Pest Control Guide contains a listing of pesticides suitable for each type of pest and is available from the Cooperative Extension Service (CES). This list also contains Relative Leaching Potential Index (RLPI) values. While any approved pesticide listed in the guide can be used, the applicator should consider for use pesticides with a larger RLPI value and larger Health Advisory Level (HAL or HALEQ) value.

Special emphasis should be placed on the above criteria where the field is in close proximity to sinkholes or karst formations.

The local CES office can assist you with proper pesticide selection using the above and other pest control criteria.

Read and follow pesticide labels, it is the law.

NUTRIENT MANAGEMENT

Soils in these field(s) have a medium or high potential for nitrogen leaching to the groundwater and a low potential for phosphorous runoff from the field(s) to surface water.

A soil test will be used as a guide to determine plant nutrient needs. In addition, a listing of nitrogen and phosphorous requirements by crop type is available from the Cooperative Extension Service. Nutrients shall be added at the rate needed by the crop grown, or according to the producers goals, whichever is lower.

U.S. DEPARTMENT OF AGRICULTURE
FL-CPA-16
Soil Conservation Service

PESTICIDE AND NUTRIENT MANAGEMENT JOB SHEET NUMBER 3
(Soilleach = med. or high; Soilrun = med. or high; Leaching Index = medium or high)

WATER QUANTITY AND QUALITY

Tract Number _____ Field Number(s)_____

PESTICIDE MANAGEMENT

Soils in these field(s) have a medium or high potential for pesticide leaching to the groundwater and a medium or high potential for pesticide runoff from the field(s) to surface water.

The Florida Pest Control Guide contains a listing of pesticides suitable for each type of pest and is available from the Cooperative Extension Service (CES). This list also contains Relative Leaching Potential Index (RLPI) and Relative Runoff Potential Index (RRPI) values. While any approved pesticide listed in the guide can be used, the applicator should consider for use pesticides with a high RLPI value, a larger Health Advisory Level (HAL or HALEQ) value, and a larger Aquatic Toxicity value.

Special emphasis should be placed on the above criteria where the field is in close proximity to a surface water body, sinkhole formations, or in deep sandy soils.

The local CES office can assist you with proper pesticide selection using the above and other pest control criteria.

Read and follow pesticide labels, it is the law.

NUTRIENT MANAGEMENT

Soils in these field(s) have a medium or high potential for nitrogen leaching to the groundwater and a medium or high potential for phosphorous runoff from the field(s) to surface water.

A soil test will be used as a guide to determine plant nutrient needs. In addition, a listing of nitrogen and phosphorous requirements by crop type is available from the Cooperative Extension Service. Nutrients shall be added at the rate needed by the crop grown, or according to the producers goals, whichever is lower.

U.S. DEPARTMENT OF AGRICULTURE
FL-CPA-17
Soil Conservation Service

PESTICIDE AND NUTRIENT MANAGEMENT JOB SHEET NUMBER 4
(Soileach = low; Soilrun = med. or high; Leaching Index = med. or high)

WATER QUANTITY AND QUALITY

Tract Number _____ Field Number(s)_____

PESTICIDE MANAGEMENT

Soils in these field(s) have a low potential for pesticide leaching to the groundwater and a medium or high potential for pesticide runoff from the field(s) to surface water.

The Florida Pest Control Guide contains a listing of pesticides suitable for each type of pest and is available from the Cooperative Extension Service (CES). This list also contains Relative Runoff Potential Index (RRPI) values. While any approved pesticide listed in the guide can be used, the applicator should consider for use pesticides with a larger RRPI value and a larger Aquatic Toxicity value.

Special emphasis should be placed on the above criteria where the field is in close proximity to a surface water body.

The local CES office can assist you with proper pesticide selection based on these and other pest control criteria.

Read and follow pesticide labels, it is the law.

NUTRIENT MANAGEMENT

Soils in these field(s) have a medium or high potential for nitrogen leaching to the groundwater and a medium or high potential for phosphorous runoff from the field(s) to surface water.

A soil test will be used as a guide to determine plant nutrient needs. In addition, a listing of nitrogen and phosphorous requirements by crop type is available from the Cooperative Extension Service. Nutrients shall be added at the rate needed by the crop grown, or according to the producers goals, whichever is lower.

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