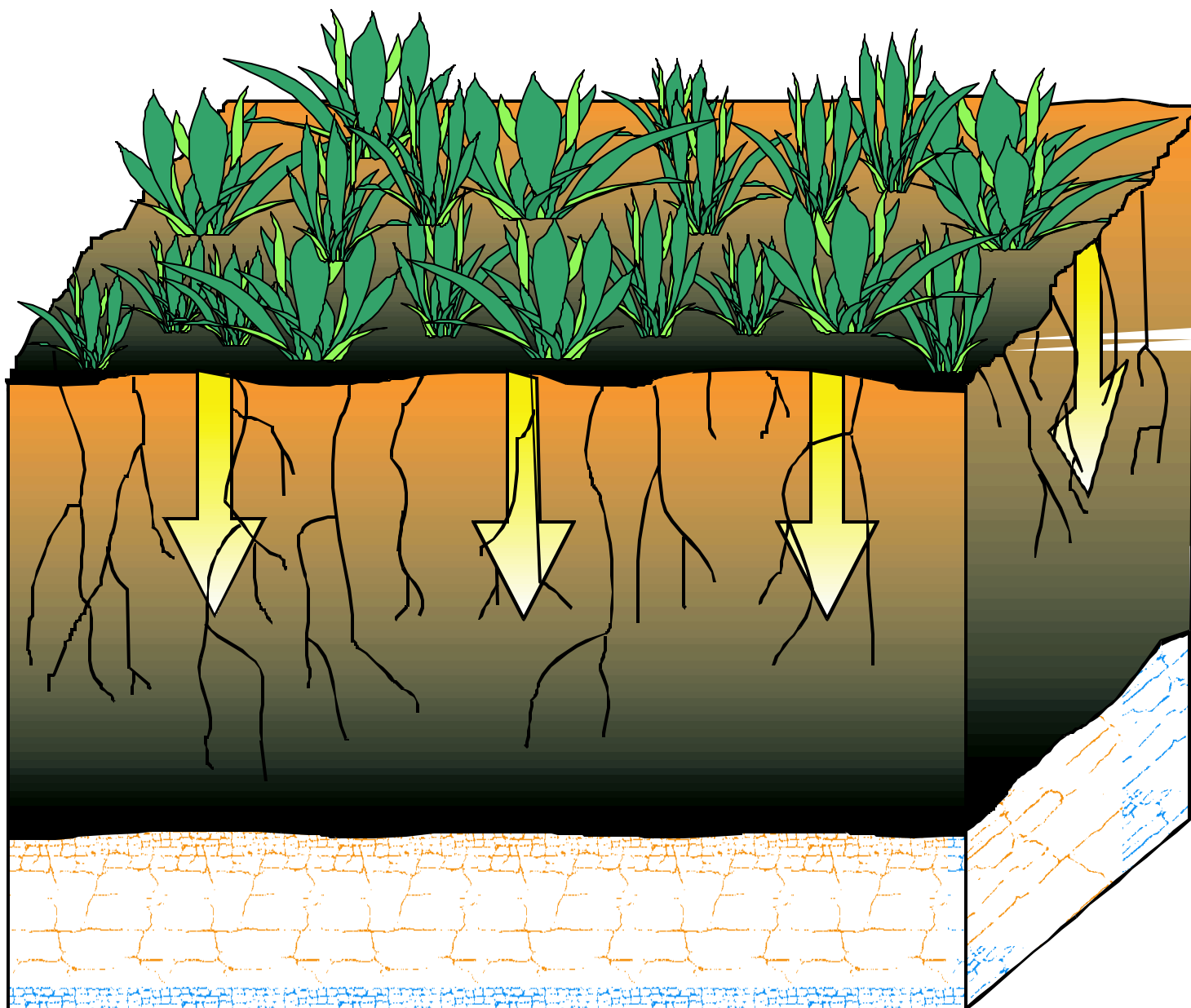


# SOIL, WATER AND LAND USE:

## *I. Understanding Pesticide Interaction*

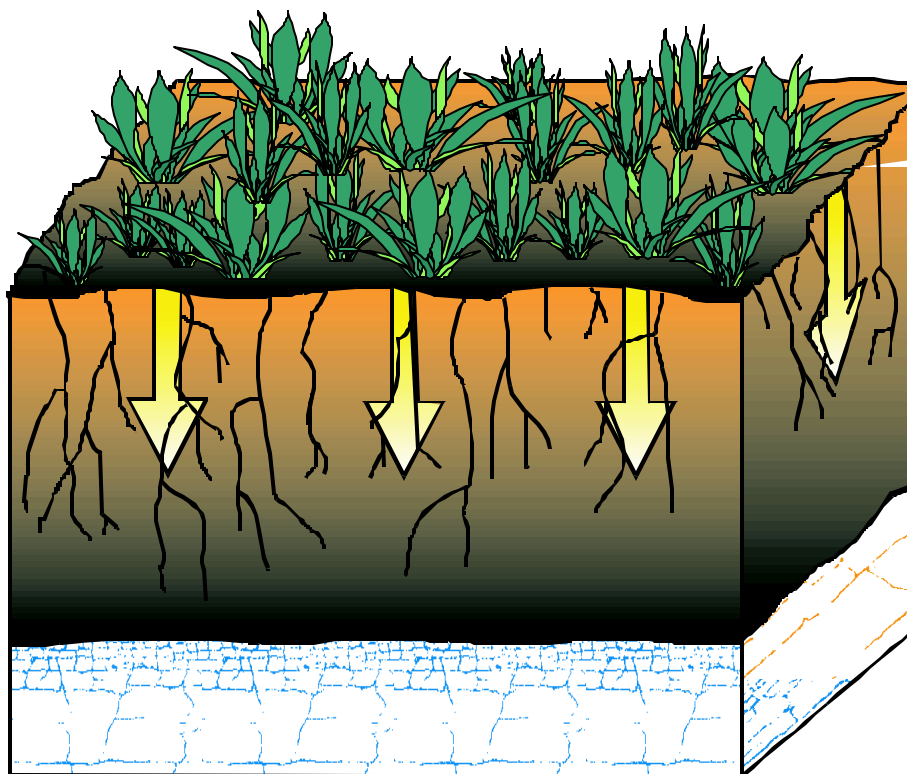


**A Soil and Water Education Kit**



# SOIL, WATER AND LAND USE:

## *I. Understanding Pesticide Interaction*



### A Soil and Water Education Project Kit For Ages 15-18

Produced jointly by the Soil and Water Science Department and the 4-H Youth Development Program, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences. University of Florida, Revised March 1997; reviewed June 2002.



## ***PREFACE***

Through a combination of discovery, discussion and background information, the aim of this project is to increase the understanding of soil properties and their effects on pesticide behavior and movement. It is hoped that once participants realize the interrelationship between individual actions and environmental effects, more responsible and informed decisions will be made.

The learning activities in this project are designed to use simple, inexpensive materials. They lend themselves to group work and participant-led conclusions to support the given background material. They follow the belief that learning should be a combination of discovery and gaining from those who are more knowledgeable.

The project culminates in the use of the Chemical Movement in Soils-Youth Version (CMIS) program which illustrates the influence of soil properties, chemical properties, rooting depth, precipitation and evapotranspiration upon the movement and persistence of organic chemicals (pesticides) in well drained soils. Participants are then encouraged to investigate and choose pesticides for a given soil which will have the minimum adverse impact on water quality.

This curriculum package is designed for the use with high school students. Background knowledge varies with the age and experience of the youth involved. Therefore, sections of this project may be considered optional if the participants have a previous understanding of the concepts presented.

Leaders are encouraged to select learning activities that are most suitable for the participants. Leaders may want to follow the experiential approach in which the group first conducts and discusses the activities and then uses the background text to verify the findings or leaders may choose to read the text with the youth beforehand and use the activities to clarify or reinforce the information presented.

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## ***LESSON PROFILES***

A brief description of the five lessons in this project.

### ***Lesson 1: Water Quality***

The importance of ground water as a resource and the need for maintaining water quality is introduced along with a review of water movement through the hydrologic cycle. Activities explore both water quality and selected processes of the hydrologic cycle (evapotranspiration and ground water storage and movement).

### ***Lesson 2: Soil Properties***

Soil formation, texture and chemical properties are discussed, providing information which will be helpful in understanding water and chemical movement in later lessons. Activities allow hands-on experience with soil texture and the opportunity to experiment with soil properties.

### ***Lesson 3: Soil Interaction with Water***

This lesson continuous with principles learned in Lesson 2 and expands upon them to demonstrate how soil has the ability to hold, supply and transmit water. Youth will determine how soil texture affects infiltration rates and experiment with water flow and its role in drainage and runoff.

### ***Lesson 4: Pesticide Interaction with Soil, Water and Plants***

Pesticide uses, advantages and disadvantages are explored along with means by which pesticides are lost or removed from an application site. Lesson 4 looks at soil properties, water and pesticide properties to determine whether pesticides will likely enter into ground or surface water. Participants will be introduced to the CMIS computer program in preparation for Lesson 5.

### ***Lesson 5: Practical Applications***

Having learned how weather conditions, soil and pesticide properties affect pesticide movement, participants will directly apply this knowledge to practical situations using the CMIS program. They will then investigate and choose pesticides for given situations which will have the least threat to water quality thereby avoiding possible water contamination.