Study 51

Applied 11/85
Sampled 5/86

PROTOCOL FOR THE DEVELOPMENT OF A PLAN TO PROTECT GROUND WATER FROM AGRICULTURAL USE OF PESTICIDES; V. EFFECT OF WINTER RAINS ON PESTICIDE MOVEMENT THROUGH SOILS

I. Background

The movement of pesticides through soils occurs as a result of the application of water. In California, winter months are wet so that natural rain events are the major input of water to agricultural systems in winter. In contrast, summer months are dry so irrigation water is the major input in summer. Rain events are probabilistic in their occurrence and, therefore, they are an uncontrolled source of water to soils. Irrigation systems represent a more controlled situation and the amount of water added can be metered in accordance with vegetation requirements.

The relative importance of each process in the movement of pesticides through soils is not known. This study specifically focuses on the effect of the winter rain component on the movement of pesticides through soils.

II. Study Design

The experiment will be conducted at the Fresno facility. Prior to application of the test pesticide to a 30x30 foot plot, one background core to 35 feet will be taken. Standard sampling, storage, and splitting techniques will be followed. Soil texture, organic matter content, moisture content and pesticide concentration will be conducted on each 6-inch core sample. Simazine and diazinon will be added to the plots in early November at a rate of 4 lbs active ingredient per acre. The pesticides will be broadcast over the plot. Soil cores will again be taken around mid-March after the bulk of winter rains has fallen. Four cores will be taken in each plot, one to 20 feet and three to 10 feet.

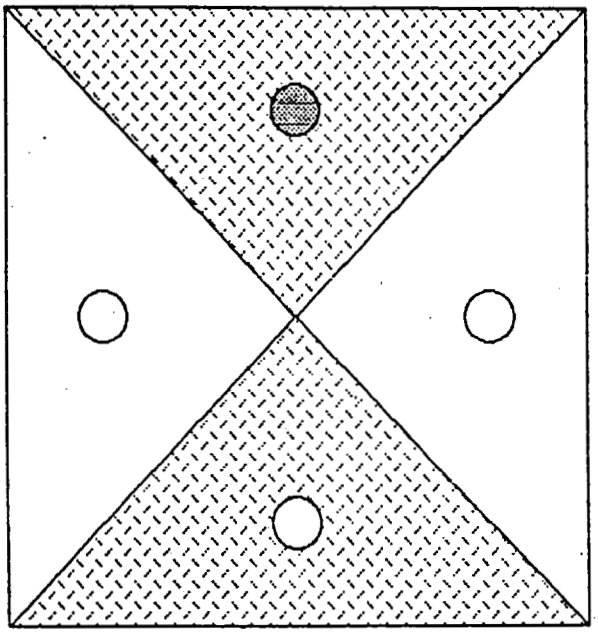
In addition, potassium bromide will be added to each plot at a rate of 150 lbs/acre. This high rate of application may have some affect on transport of pesticide through the soil. Therefore, the plot will be divided into quadrants and potassium bromide added to 2 of the 4 quadrants (Figure 1). One soil core will be taken from each quadrant with the 20-foot core taken from a quadrant where the combination of postassium bromide and pesticide had been applied.

III. Budget

Sixty-three six-inch cores will be generated from the background coring. Every third core sample will be chemically analyzed for both simazine and diazinon for a total of 42 analyses. The coring in the spring will generate 90 samples per pesticide. At a cost of approximately $100 per sample, the total cost of chemical analyses will be around $25,000.

Personnel expenditures	$ 5,000
Operating expenses	28,000
Total	33,000

Figure 1. Schematic of plot configuration and treatment application.



Only pesticide added to quadrant

Pesticide and KBr added to quadrant

Soil coring to 10 foot depth

Soil coring to 20 foot depthp