PROTOCOL TO QUANTIFY THE DISSIPATION OF BENTAZON IN COMMERCIAL RICE FIELDS

I. OBJECTIVES

1. To determine the dissipation rate of bentazon in water of rice fields located in the Sacramento Valley.
2. To examine the fate of bentazon in water, soil and vegetation through a mass balance assessment.

II. PERSONNEL

Personnel from the Environmental Hazards Assessment Program (EHAP) of the California Department of Food and Agriculture (CDFA) will be conducting this study. Field operations and chemical analysis will be supervised by Roger Sava and Randy Segawa. Protocol development, data analysis and report write-up will be supervised by Lisa Ross.

All questions concerning this study should be directed to Mary Brown at (916) 324-8916, ATSS 454-8916.

III. STUDY DESIGN

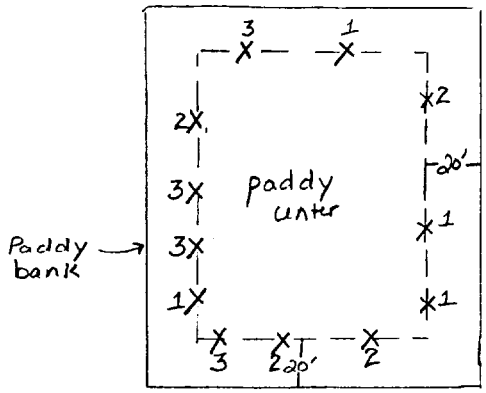
Bentazon will be aerially applied in liquid form at the label rate of 1 lb ai/acre. Prior to application the rice fields will be drained in accordance with label specifications. Twenty four hours after application the fields will be reflooded to an approximate depth of 4 inches. Field reflooding may take 3 to 5 days.

Field Sites

Personnel from BASF (the manufacturer of bentazon) have agreed to assist EHAP in locating three rice fields for study in different regions of the Sacramento Valley. Field criteria include: (1) fields should be close to the source of irrigation water to eliminate potential influx of bentazon into test fields through recycled water; (2) about 4 to 7 pads per test field; (3) fields should be roughly the same size (about 90 acres) and (4) fields should be laser leveled. Cooperating growers must be willing to: (1) not add irrigation water for the first two or three days after the reflood height is established and (2) allow EHAP personnel to walk through selected pads and collect water, soil and vegetation samples.

Field Sampling

Three pads from each field will be selected, the inlet and outlet pads and one in between to facilitate testing for a gradient in bentazon concentration across the field. Within each pad, 3 composite samples of soil and vegetation and/or water will be collected for chemical analysis. Each composite sample will consist of four subsamples collected randomly. All sampling sites will be located 20 feet from the paddy bank to avoid edge effects. Figure 1 gives an example of the field set-up using the above sampling scheme.



Each composite sample (1, 2 and 3) consists of four subsamples randomly located around the pad. The X indicates subsample location, the numbers indicate which composite sample it has been randomly assigned to.

Figure 1.

Water samples will be collected from all three fields in accordance with the following schedule: -1, 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 16 and 32 days after application. It will not be possible to sample all pads on days 1, 2, 3, and 4 since it may take up to 5 days to reflood a given field. However, water sampling can be done with a hand pump when water reaches a depth of half an inch in a given pad. An additional water sampling period will be added just prior to field drainage for harvesting which usually occurs sometime in early September. Samples will be composited and replicated as specified above.

Soil and vegetation samples will be collected in two of the three rice fields on the following schedule: -1, 0, 2, 4, 8, 16 and 32 days after application. Samples will be composited and replicated as specified above.

On the day of application, the application efficiency will be measured using absorbent kimbies (cut into one square foot sections) mounted on cardboard. The kimbies will be collected after application and brought back to the laboratory for bentazon analysis. There will be a total of nine replicates in each field, with three randomly located in each of the three pads selected for study. Kimbies should be placed in the pad, 25 feet from the paddy bank.

The volume of water entering all fields will be recorded to facilitate mass balance calculations. During the growing period, water will be held on all fields until they are drained for harvest sometime in late August or early September. Once drainage begins, the volume of water leaving the fields will be recorded using the depth of water on field and field area as an estimate. Drain water samples will also be collected for chemical analysis. During this final drain period, on two separate days, a set of replicate samples (two per day) will be collected from each field (4 total per field).

Chemical analysis will be performed by Enseco-Cal Laboratories in West Sacramento. Ten percent of the samples collected by EHAP will be split with BASF as part of a quality control program.

IV. ESTIMATED NUMBER OF SAMPLES FOR CHEMICAL ANALYSIS

Sample Type	# of Samples
Application Efficiency	27
Water	378
Drain Water	12
Soil	126
Vegetation	126
TOTAL	669

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