Cures

Coalition for Urban/Rural Environmental Stewardship

www.curesworks.org

Orchard Management Practices for Protecting Water

- CURES: Non-profit organization: agricultural, urban projects
- Promote stewardship, Best Management Practices (BMPs)
- Parry Klassen, Executive Director
- **www.curesworks.org**

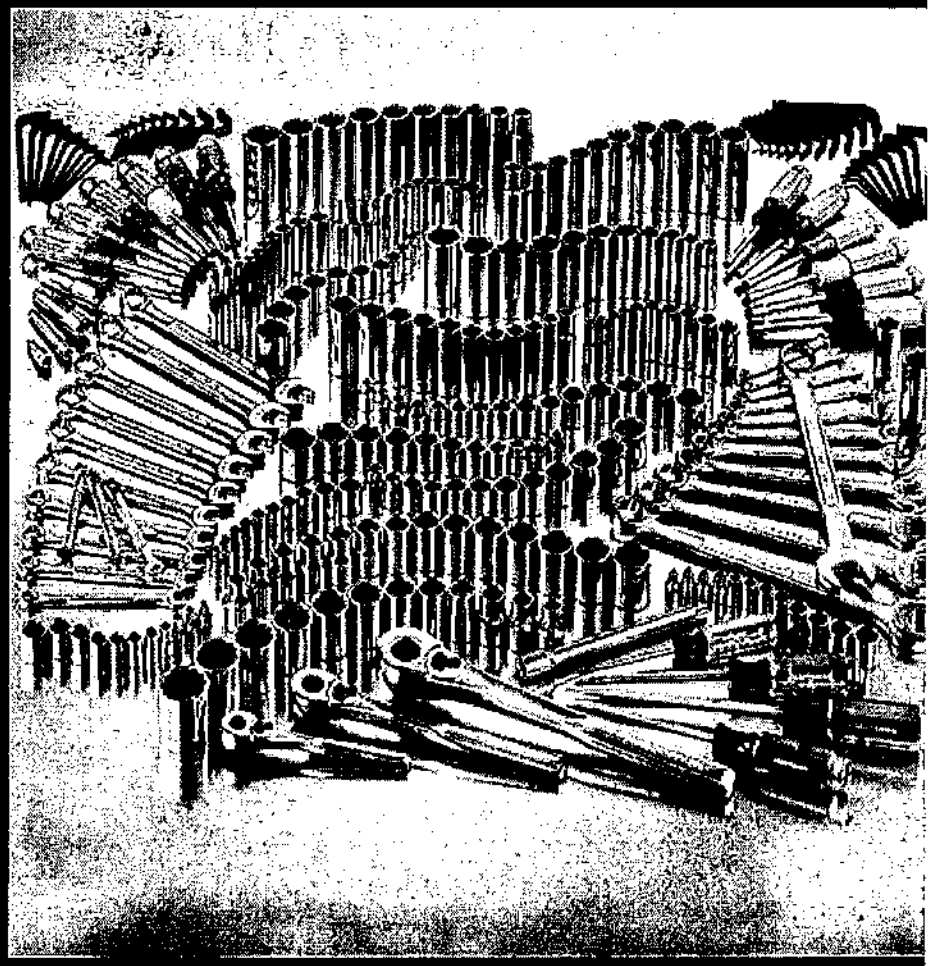
Scrutiny of Agricultural Runoff
(Farm inputs and sediment)

- Pesticides
  - Organochlorines, carbamates, organophosphates, pyrethroids, herbicides
- Nutrients
  - Organic nitrogen, phosphate, potassium
- Metals
  - Cadmium, copper, lead, nickel, zinc, selenium, arsenic, boron
- Pathogens, Ambients
  - *E Coli*, Flow, Temperature, pH, EC, Turbidity, Dissolved Oxygen, Total Organic Carbon

Approaches for BMPs
The Toolbox / Menu

Pesticides

- Application BMPs
  - Spray drift management
  - Lower label rates
  - Mix and load properly
  - Calibrate equipment
  - New sprayer technology
- Farm Site BMPs
  - Buffer zones to sensitive sites
  - Grassed drainage waterways
  - Vegetative filter strips
  - Drainage management



Pesticide Application BMPs

Managing Drift from Ground Applications

- Most drift comes from outside rows near sensitive areas

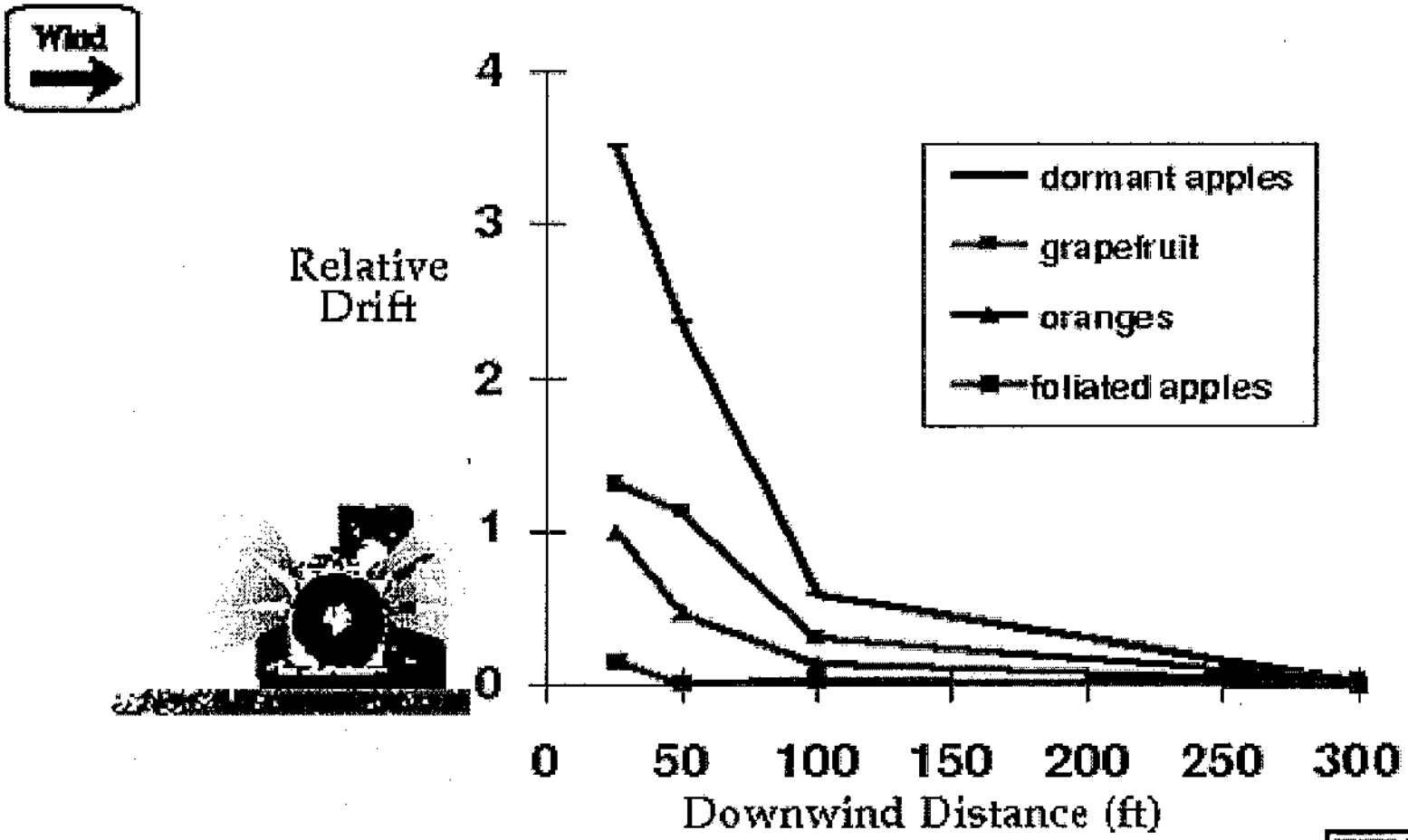
- **Watch wind speed direction**
- **Leave adequate buffer zone**
- **Use larger droplet nozzles where possible**

Aerial Application Drift Management:
Pilot needs to know drain / waterway locations

Application BMPs

- Managing Drift From Airblast Sprayers
  - Most drift comes from first and last passes through the orchard
- Don't spray inside of rows 1, 2 and last 2
- Spray outside - inward on perimeter rows, slow down to improve coverage.

How foliage density affects ground deposition

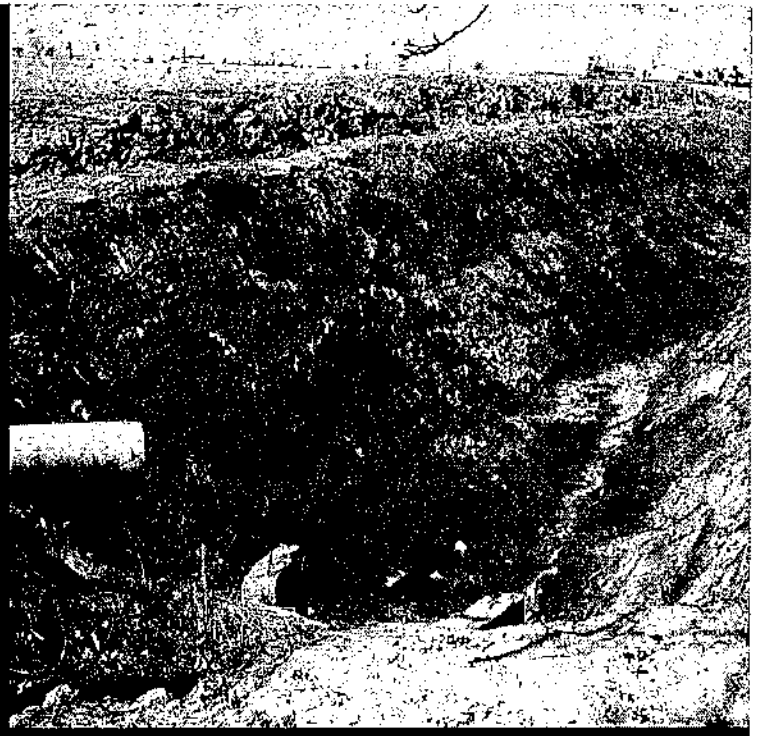


SPRAY DRIFT TASK FORCE

Farm Site BMPs

Sediment Basins

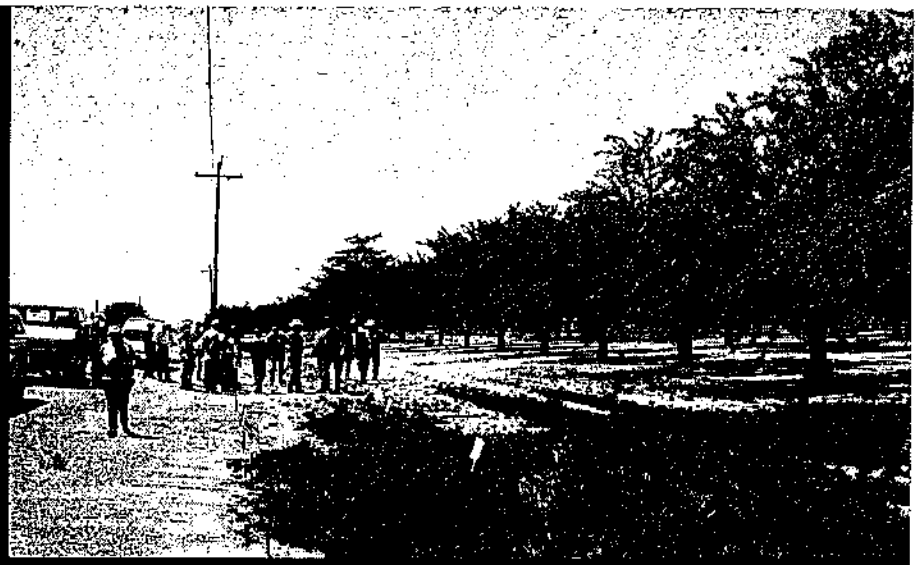
- Basins for water & sediment run-off
- Requires modification of drainage system to protect surface water



Cover Crop Effectiveness Study
Overall Results

- Ground cover and soil type affected the loads of diazinon and esfenvalerate in runoff
  - Orchard with planted cover had far less water runoff than orchard with bare ground.
  - Vegetation reduced the concentration of esfenvalerate in runoff.

Study Results



- Planted cover crop
  - 3x less runoff than the disked plot
  - ~2x less than the bare ground plot.
- Planted cover crop
  - ~3x less diazinon total load than the disked plot
  - 2x less than the bare ground plot
  - 2.5x less esfenvalerate than the disked plot or the bare ground plot

Field Perimeter "Filter Strips"

- Strips or areas of herbaceous vegetation situated between field and …
  - ***Environmentally Sensitive areas (steams, rivers, wetlands, riparian areas, etc.)***
  - Other cropland
  - grazing land
  - forestland
  - disturbed land

Biggest benefit to orchard/vineyard growers:

Storm Runoff

- Filter strips reduce winter storm runoff from fields
  - Reduce erosion
  - Improve water penetration into soil

- Filter strips slow runoff velocity, capturing sediment

Ideal Locations

-- Lower edges (down-gradient edge) of orchards or crop fields where runoff occurs
-- Above conservation practices, such as ponds, drainageways, and terraces

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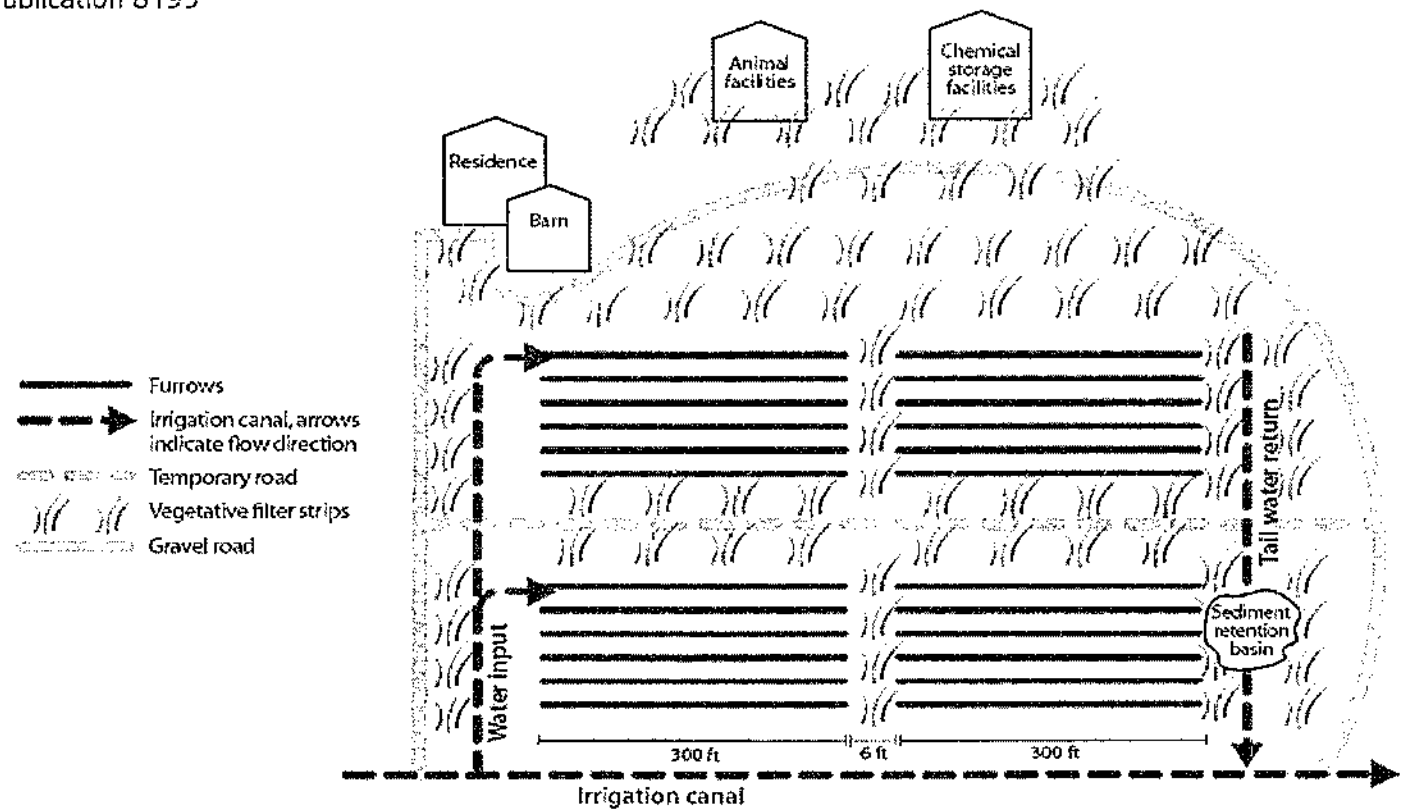
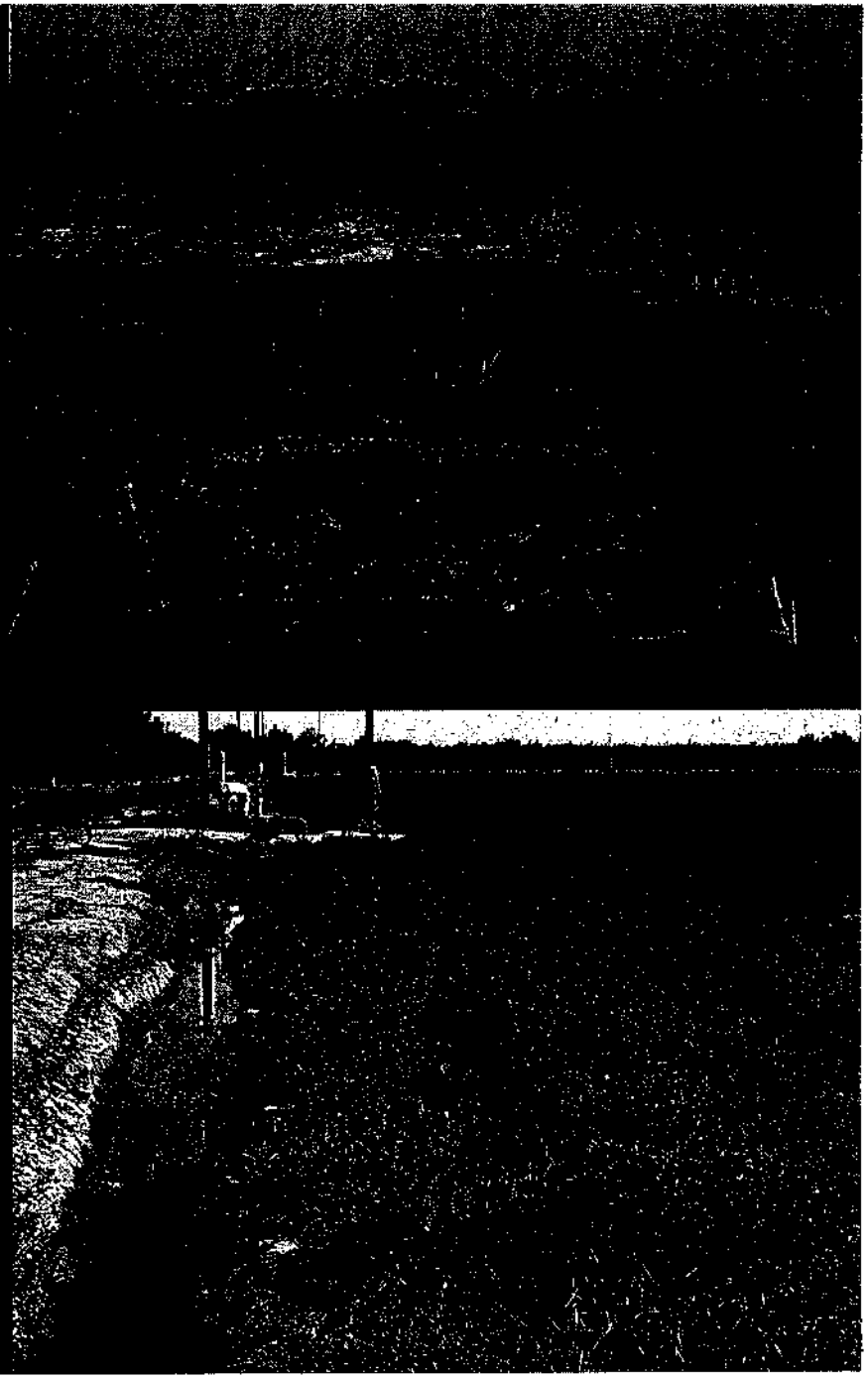


Figure 1. Farm plan indicating potential locations for vegetative filter strips.

Farm Site BMPs

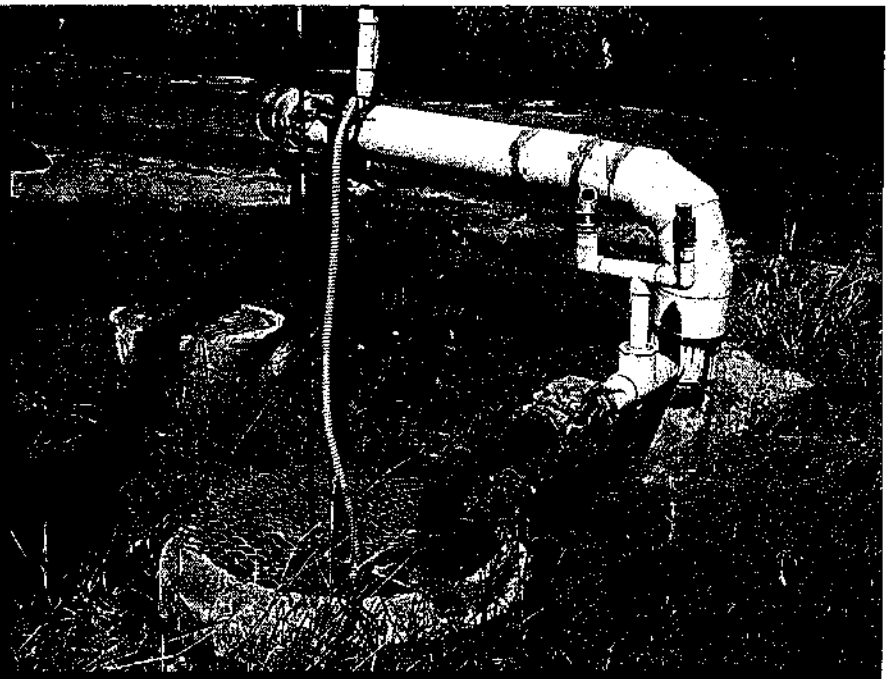
Tailwater Return Systems

- Recirculate drain water back into irrigation system
- "Cadillac" system but costly



Tailwater Return Systems

- Can operate with low horsepower pumps
- In salty areas, can cause build up of salts
- Water savings

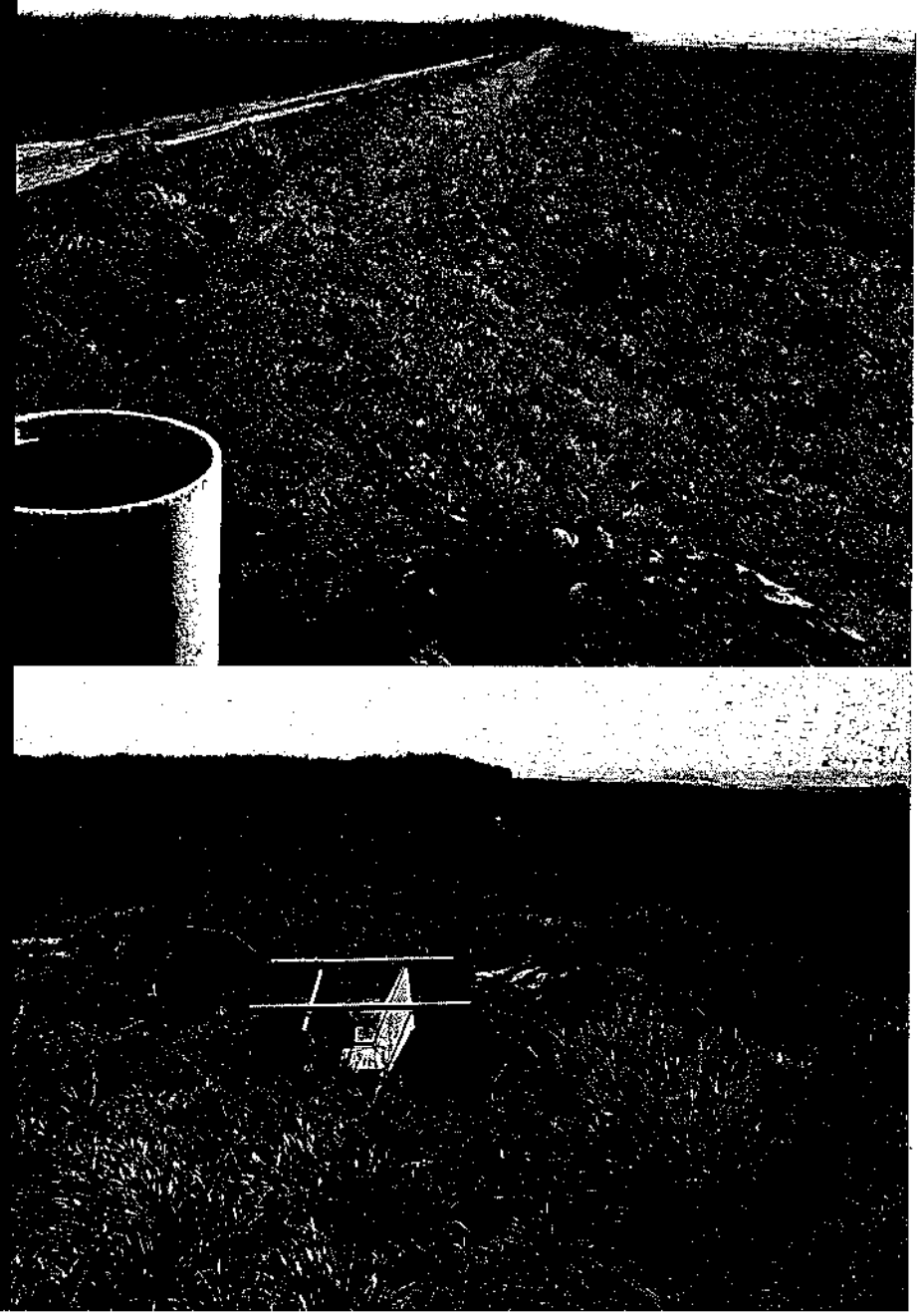


Potential BMPs
Vegetative Ditches

Allow grass in drainage ditches

-- Circulate drain water through vegetated ditches or field areas

West Stanislaus County
-- BMP effectiveness research
-- Alfalfa



Cost of not succeeding

- Potential for individuals to be required to file Report of Waste Discharge with Water Board
  - Water Board dictates Waste Discharge Requirements
  - On farm testing of discharges to ensure compliance
  - Coalition spending +$40,000 per site annually for sampling, reporting

Let's don't go there!

Enormous Task At Hand

1. **Identify and promote practices that reduce farm runoff in rivers**
   - Orchard runoff from dormant sprays
     - Almonds, Peaches, Plums/Prunes
   - Irrigation runoff carrying pesticides/nutrients
     - Row, field crops (alfalfa, tomatoes, cotton)
     - Orchards
   - Promote adoption by growers /PCAs

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"Education For Environmental Responsibility"