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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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UNDATED

PC Codes: D249502, D249503
Case No: 046754

MEMORANDUM:

SUBJECT: Study Site Selection for Isoxaflutole Ground Water Studies

TO: Daniel Kenny, PM Team Reviewer
Registration Division (7505C)

FROM: David Wells, Hydrologist
Environmental Fate and Effects Division (7507C)

Thru: Betsy Grim, Acting Chief
Environmental Risk Branch II (7507C)

Summary: Rhone-Poulenc will be conducting a number of additional field studies in support of registration for the new corn herbicide isoxaflutole (Balance). The company recently submitted information for six potential study sites for conducting the small-scale prospective ground water studies. Review of the information found concerns with several of the sites, however we were able to agree upon two sites for next year. The first study will be conducted in the **Spillville Loam in Sioux County, Iowa** and the second in the **Cozad Loam in Merrick County, Nebraska**. Monitoring protocols are expected to be submitted within the month and the studies are scheduled to begin next spring.

Rhone-Poulenc has submitted information for preliminary site selection for two small-scale prospective ground water studies to be conducted using the herbicide isoxaflutole, also known as "Balance."

The six soil types and locations proposed were:

- I. Cylinder Silty Clay Loam
south of Doon,
Sioux County, Iowa
- II. Spillville Loam
south of Doon
Sioux County, Iowa
- III. Wadena Loam
east of Rock Valley
Sioux County, Iowa



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- IV. Cozad Loam
near Central City
Merrick County, Nebraska
- V. Coupee Silt Loam
Laporte County, Indiana
- VI. Elston Loam
Laporte County, Indiana

Generally, the six proposed sites have many gross characteristics in common such as shallow ground water, no prior use of the test compound, "uniform" soils (based on large scale soil mapping), no impeding layers, no tile drains, and no nearby potable wells. Below is a summary and discussion of these sites, generally, it focuses on characteristics that vary between sites or are of concern, and not those that are common to the sites.

Cylinder, Iowa

- Water depth 10.5 feet
- "Off labeled" soil
- Acreage small, field surrounded by steeper fields
- Distance to surface water body about 1/4 mile
- Area down hill often floods but rarely reaches this soil
- Visual confirmation of slope, field was cropped so it couldn't be measured.
- Difficult access, may be restricted in winter
- Cores found abundant gravel in lower depths, large gravel near water table
- Center pivot irrigation
- Buried electric cable across the site may have disrupted the soil horizons and could be a hazard for installation of monitoring equipment.

Spillville, Iowa

- Water depth 11-13 feet
- Labeled soil
- Large field
- Distance to surface water body (small stream) 80-120 feet
- Slope appears <2% but not measured
- Soils "more uniform" than Cylinder soil, soils "lighter with depth"
- Cores found small to large gravel in sand at depth but "less than Cylinder"
- Center pivot irrigation

Wadena, Iowa

Water depth 21-22 feet
"Off Labeled" soil
No nearby surface water bodies
Large readily accessible field
Cores found moderate-light coarse gravel in deeper sandy soils, coring slow
Center pivot irrigation
Field is rented, so need cooperative agreements with both owner and grower

Cozad Loam, Nebraska

Water table approx. 6 feet
Labeled soil
Distance to surface water body (creek) about ½ mile
Site about 20 acres, easy access
Cores found sandy soils prior to water table with no gravel
Center pivot irrigation, has "precision tuning capability"

Coupee Silt Loam, Indiana

Water table 21 feet
"Off Labeled" soil
No ponds or streams noted
Cores found gravely coarse sand w/shale & gravel at depth -
"not a solid layer"
Center pivot irrigation
Soil cracks when extremely dry

Elston Loam, Indiana

Water Depth 14 feet
Surface/subsurface layers black w/ high OM (2-6%), highly acidic horizons
No ponds or streams noted
Some areas slopes > 2%
Cores found gravelly sandy clay loam & gravelly coarse sandy loam 72-78"
Coring was difficult
No irrigation present

The soils at the Elston site have a high organic matter content (2-6%), with some highly acidic horizons, and gravelly layers at depth. Coring was reported to be difficult due to "significant quantities" of shale and gravel. In addition, parts of the area has slopes over 2%.

The Cylinder site is a small field surrounded by steeper fields. A river about 1/4 mile away often floods adjacent down slope areas. Cores found abundant gravel in lower depths and larger gravel near water table. Access may be difficult access and may be restricted in winter. Also a buried electric cable across the site may have disrupted the soil horizons and could be a hazard for installation of monitoring equipment.

The Coupee Silt Loam site contains layers of gravely coarse sand with pieces of shale and gravel at depth however it was "not a solid layer" and coring was reported to be difficult. The water table was significantly deeper at this site at approximately 21 feet. The most serious concern for this site was that the soil cracks when extremely dry, which could lead to preferential flow.

The Wadena site is a large readily accessible field. Cores found moderate to light coarse gravel in deeper sandy soils and coring was slow. The water table is also deeper at this site, approximately 21-22 feet. R.P concluded that installation of monitoring equipment would be more difficult because of the larger gravel and deeper water table. The field is rented, so would need to be a cooperative agreements with both owner and grower.

The Cozad Loam site is about 20 acres in size with easy access. The cores found sandy soils prior to water table with no gravel. R.P. expressed concern that the ground water is very shallow at this site, 5-6 feet. The center pivot irrigation is reported to have "precision tuning capability"

The Spillville site is a large field with a small stream 80-120 feet away. The soils are reported to be "more uniform" than Cylinder soil, and get "lighter with depth." Cores found small to large gravel in sand at depth but "less than the Cylinder" site.

Additional information provided by Rhone-Poulenc indicated that the organic matter content of the soils was 1-3% at the Cozad, Nebraska site, and 1-4% at the Coupee, Indiana site. As mentioned earlier, the Elston, Indiana site has 2-6% organic matter.

EFED has requested that the first two ground water studies for isoxaflutole be located on the most vulnerable labeled soils in the major corn growing regions. It should be noted that the six soils discussed here, represent a minority of corn acreage in the Midwest, each probably representing < 10,000 acres. Two additional small-scale prospective ground water studies are planned on more typical corn soils following these two studies.

The study sites proposed by Rhone-Poulenc have many of the individual characteristics needed for the small-scale prospective ground water studies however four of the six soils are within soil series that are "off labeled" for use of isoxaflutole. Specifically, use of isoxaflutole will not be allowed on the Wadena, Coupee, and Elston soil series. EFED is concerned about conducting the studies on these "off labeled" soils and the potential problems with interpreting the resulting data.

In a telephone conference on September 15, EFED and Rhone-Poulenc discussed the various characteristics of each of the proposed sites. EFED agrees that the Spillville soil in Iowa is the best of the six proposed sites however for the second study we prefer the Cozad site over the Elston site. At the completion of the conference call both parties agreed upon two sites, the **Spillville Loam in Sioux County, Iowa** and the **Cozad Loam in Merrick County, Nebraska**. Rhone-Poulenc will begin characterization of these two sites immediately.

David Wells, Hydrologist