WASHINGTON STATE UNIVERSITY
TRI-CITIES

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Subject: Aldicarb: Benefits Information

The following information is provided to you from the Western Integrated Pest Management Center's PNW Workgroup (comprised of Alaska, Idaho, Montana, Oregon, Utah, and Washington) regarding your May 25 request for aldicarb benefits information. In your request you asked for input on aldicarb use on the following crops: bananas (proposed import tolerance); citrus, other (includes kumquats, limes, tangelos, and tangerines); grapefruit; lemons; oranges; pecans; potatoes; sweet potatoes; yams; beans/peas, dry; beans/peas, green; sorghum; alfalfa; peanuts; soybeans; sunflower; cotton; sugarbeets; sugarcane; coffee (imported); and tobacco. Please note that of the PNW-related crops for which you requested information, there are no tolerances for dry peas, succulent peas, succulent beans, alfalfa, and sunflower; therefore, aldicarb use on these crops is not addressed in this response. Note that aldicarb is not registered for use in Alaska and is not used in agricultural production in Utah. Our response addresses the following six questions for aldicarb use on dry beans, potatoes, and sugarbeets in Idaho, Montana, Oregon, and Washington:

1) In what regions (state/county, etc.) of the U.S. is aldicarb use occurring?
2) What is the percent crop treated in the states where aldicarb is used?
3) What are the pests that aldicarb is critical for controlling?
4) What are the details of typical usage patterns (e.g., number of applications per season, use rate per application, acres treated, and time of application in the season?)
5) What worker activities typically occur when aldicarb is applied?
6) What alternatives, if any, are available to replace aldicarb?

Dry Beans
There is currently very little if any aldicarb use on dry beans grown in the PNW.

Potatoes
It is my understanding that the Washington State Potato Commission is responding separately on this issue; therefore, the information below focuses on aldicarb use in potato production in Idaho, Montana, and Oregon.

1) In what regions (state/county, etc.) of the U.S. is aldicarb use occurring? Aldicarb is not used extensively in Montana seed potato production. It is, however, used in potato production in both Idaho and Oregon. Potatoes are grown on 330,000 acres in Idaho with production occurring along the Snake River. Two-thirds of Idaho's potatoes are grown in the eastern part

of the state with the remainder of the production occurring in southern and southwestern Idaho. In Oregon potatoes are grown on 37,000 acres with production occurring in Klamath (7,000 acres) and Malhuer (5,000 acres) counties, the Willamette Valley (1,000 acres), Central Oregon (1,500 acres), and the Blue Mountains (23,000 acres).

2) What is the percent crop treated in the states where aldicarb is used? It is estimated that aldicarb is used on 8% of Idaho's potato acreage. In Oregon in Klamath County, Central Oregon, and the Willamette Valley either no aldicarb is used or it is used sporadically. Aldicarb, however, is used annually in potato production in Malhuer County and in the Blue Mountain growing region. Overall it is estimated that 10% of Oregon's potato acreage is treated with aldicarb.

3) What are the pests that aldicarb is critical for controlling? Aldicarb is used primarily for the control of nematodes. According to the August 2002 *Pest Management Strategic Plan for Pacific Northwest Potato Production*, "Nematodes are one of the limiting factors for potato production in the Pacific Northwest. Nematode infestation results in yield decline and reduction in quality, thereby contributing to economic loss to the industry." The three main nematodes controlled by aldicarb are stubby-root nematode, root-lesion nematode, and root-knot nematode. Root-lesion nematode is associated with verticillium wilt while stubby-root nematode vectors tobacco rattle virus, the causal agent of corky ring spot disease. Root-knot nematodes are also problematic for exporters from our region, as Mexico prohibits the importation of fresh potatoes containing these nematodes. Aldicarb also provides season-long control for Colorado potato beetle and green peach aphid, both important potato insect pests.

4) What are the details of typical usage patterns (e.g., number of applications per season, use rate per application, acres treated, and time of application in the season?) In both Idaho and Oregon all applications of aldicarb are made using closed handling or "lock and load" technology. Aldicarb is applied only once per season but may be applied either at planting or at pre-plant markout. The application rate in either case is 20 lbs. product per acre.

5) What worker activities typically occur when aldicarb is applied? Both planting and row marking are done by machine and because closed handling technology is used, there is little aldicarb exposure during these applications. Planting Applications: Potatoes are mechanically planted. During this operation the planter opens a furrow and aldicarb is applied in the furrow along with the potato seed piece. The planter immediately closes the furrow covering both the seed piece and the aldicarb. Aldicarb is contained in a closed hopper on the planter. A tube, connected to the hopper, delivers the aldicarb to within a couple of inches of the soil surface. Pre-Plant Markout Applications: This method of aldicarb application is used in the production of certain varieties of potatoes or in certain growing regions where the 150-day aldicarb PHI is problematic. Here growers will prepare fields for planting, establishing the location of the planting rows. As part of marking these rows, the planting furrow is opened, aldicarb is applied, and the furrow is closed much in the same manner as is done at planting. Later the planter reopens the treated furrow, deposits the potato seed piece and then again closes the furrow.

6) What alternatives, if any, are available to replace aldicarb? There are two primary alternatives to the use of aldicarb for nematode control in PNW potato production. Growers can choose to fumigate fields (a more expensive alternative) with dichloropropene (Telone) or metam-sodium (Vapam). Alternatively, growers may also choose to treat nematodes by making an in-furrow application of carbofuran (Furadan) and following this with three foliar applications of oxamyl

(Vydate). If potato soils are only infested with root-lesion nematodes growers can use long rotations and avoid treating for nematodes. For soils infested with either stubby-root nematode (estimated to be 5% of Idaho's potato acreage) or root-knot nematode (estimated to be 25% of Idaho's potato acreage), growers must treat for nematodes.

Sugarbeets

Note that in the December 2004 *Pest Management Strategic Plan for Western U.S. Sugarbeet Production* maintaining the registration for aldicarb use on sugarbeets is listed as a regulatory priority for the industry.

The following information was provided from a Bayer Crop Science survey conducted by John Gallian, University of Idaho's Extension Sugarbeet Specialist, and representatives of the Amalgamated Sugar Company.

1) In what regions (state/county, etc.) of the U.S. is aldicarb use occurring? In the PNW sugarbeets are grown in Malhuer and Union counties in eastern Oregon and in Benton County in Washington. In Idaho, sugarbeets are grown along the Snake River Plain, including the Magic Valley (Blaine, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties), the Treasure Valley (Ada, Canyon, Elmore, Owyhee, Payette, and Washington counties), and the Upper Snake River Valley (Bingham and Power counties). Counties in Montana with sugarbeet production include Big Horn, Carbon, Custer, Dawson, Prairie, Richland, Roosevent, Rosebud, Sheridan, Stillwater, Treasure, and Yellowstone.

2) What is the percent crop treated in the states where aldicarb is used? In 2005 a total of 185,000 acres of sugarbeets were produced in Idaho, Montana, Oregon, and Washington. Of this acreage 75% received at least one application of aldicarb as follows: 27,450 acres (15%) received one aldicarb application at planting; 99,750 acres (54%) received one post-emergence aldicarb application; and 11,500 acres (6%) received two aldicarb applications, one at planting and one post-emergence.

3) What are the pests that aldicarb is critical for controlling? Aldicarb is used for the control of nematodes and sugarbeet root maggot, as well as leafminers, leafhoppers, flea beetles, wireworms, aphids, and cutworms.

4) What are the details of typical usage patterns (e.g., number of applications per season, use rate per application, acres treated, and time of application in the season?)

    - For aldicarb applications made at planting the average application rate is 12 lbs. of product per acre and the maximum application rate is 20 lbs. of product per acre. In the PNW region sugarbeets are planted throughout April and May.
    - For post-emergence aldicarb applications an average of 13 lbs. product per acre is used. If this is the only aldicarb application being made to the field, a maximum of 20 lbs. of product per acre may be applied. When aldicarb is applied post-emergence for sugarbeet root maggot control applications are typically made between mid-May and the first week of June. Post-emergence aldicarb applications for leafhopper control (and thus control of curly top virus) are made at first cultivation between May 1 and May 15.

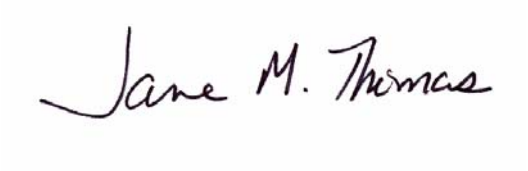
5) What worker activities typically occur when aldicarb is applied? Aldicarb applications made both at planting and post-emergence are mechanized operations with the product being applied

and then immediately covered by soil all in one operation resulting in very little opportunity for worker exposure. Planting Applications: Sugarbeets are planted by machine with the aldicarb contained in a closed hopper located on the planter behind the tractor. During the planting operation aldicarb is deposited through a tube that discharges the product one or two inches above the soil. As part of the planting process the seed and the aldicarb are placed in a furrow and are immediately covered over with soil. Post-Emergence Applications: When aldicarb is applied post-emergence a similar operation occurs. Cut-away disks on the cultivator create a furrow alongside the beet plants. As in planting operations aldicarb is deposited into the furrow and another set of disks fills the furrow covering the aldicarb. All aldicarb used in the PNW is the gypsum formulation so there is no dust associated with this material. The closed system or "lock and load" technology and the application techniques results in negligible exposure during application.

6) What alternatives, if any, are available to replace aldicarb? The alternative treatment for sugarbeet root maggot is terbufos (Counter). Growers in the PNW find this chemical to be less efficacious and more phytotoxic than aldicarb and have noted yield reductions associated with this use. The alternatives for nematode control are either very long rotations or fumigation with dichloropropene (Telone). If growers want to fumigate they first must wait until soil temperatures have warmed and then, following fumigation, must wait an additional period (a minimum of a week but often more depending upon fumigant labeling and the application rate used) before they can plant. These factors combine to delay planting, which is not optimal for sugarbeet production. In general fumigation is more expensive and is viewed as potentially more hazardous than the use of aldicarb.

I hope you find this information useful. I am also attaching a contact list for your use should you have further questions.

Sincerely,



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Contact List: Aldicarb Benefits Information

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bean, dry	Boob	Ed	Hush & Hush Fertilizer Co.	Fieldman	(509) 728-5555	boobsrus@compwrx.com	Washington
bean, dry	Metzger	Ron	Kelly Bean Co		(208) 436-3611	rmetzger@pmt.org	Idaho
bean, dry	Larsen	Lou	Columbia Bean	Fieldman	(509) 750-1944	lou@columbiabean.com	Washington
beet, sugar	Gallian	John	University of Idaho	Extension Sugarbeet Specialist	(208) 736-3633	jgallian@uidaho.edu	Idaho
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