



April 27, 2006

Ref: 2006-9-1

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Office of Pesticide Programs
Special Review and Reregistration Division
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Subject: Metaldehyde Use Information

The following information is provided to you from the Western Integrated Pest Management Center regarding your request for information on the use of metaldehyde. On April 11, your request for information was forwarded to the IPM centers by Wilfred Burr of USDA's Office of Pest Management Policy. In your request you asked about use on agricultural crops, homeowner uses, and use on public lands. This response provides input from the Pacific Northwest (PNW) states of Alaska, Idaho, Montana, Oregon, Utah, and Washington. The main focus of this response concerns metaldehyde use on agricultural crops; however, the IPM Center contacts for Alaska provided input on the importance of homeowner uses as well.

Grass Seed

Metaldehyde is a very important chemical in grass seed production in western Oregon. It is estimated that 185,000 of Oregon's 490,000 acres of grass seed are treated with metaldehyde each year.

All metaldehyde used on grass seed is pelletized bait (it holds up better than liquid in wet growing conditions). Nearly all metaldehyde is applied by ground equipment with an average application rate of 10 to 15 pounds of pellets per acre. Typically one or two metaldehyde applications are made in the fall and in some cases one or two more applications might also be made in the spring.

Almost all newly planted grass seed crops are treated for slugs and between 35 to 50% of established fields are also treated. While slugs can damage both new and established grass seed crops, slug damage to seedling grasses can be severe. Without effective control, whole areas of newly planted fields can be destroyed. As low-till and no-till practices in grass seed production increase and soil disruption decreases, gray garden slug populations have increased. Growers may end up making a total of four applications of metaldehyde to protect newly planted fields from slug damage.

The main grass seed crops affected by slugs are perennial ryegrass, annual ryegrass, and tall fescue. A more detailed breakdown of estimated metaldehyde usage is:

- Annual Ryegrass: 125,400 acres total with 50% or 62,700 acres treated with an average of 1.5 applications per season.
- Perennial Ryegrass: 192,950 acres total. Of this, 128,650 acres are established and 20% of that or 25,730 is treated twice a season. About 33% of the acreage is newly seeded (64,300 acres) and 100% of this is treated with an average of 2.5 applications per season.
- Tall Fescue: 145,330 acres total. Of this, 113,330 acres are established and are not treated. The remaining 32,000 acres are newly planted and 100% of those receive an average of 2.5 applications per season.

One alternative to metaldehyde is iron phosphate (Sluggo) but it is only being used on about 5% of the treated acres of grass seed. The iron phosphate products do not appear to hold up as well as metaldehyde in the wet conditions common to western Oregon. Growers have also shown reluctance to use iron phosphate because they still view it as an unproven product and because of the price difference: metaldehyde costs about \$1.25 per pound while iron phosphate costs \$1.55 per pound.

An alternative to metaldehyde for slug control is the carbamate methiocarb (Mesurol); however, this chemical, besides being a Restricted Use Pesticide, is not labeled for use on grass seed crops in Oregon.

Ornamentals

Metaldehyde use in ornamentals is very important in the PNW. While it is used by landscape contractors, the critical use is in commercial ornamentals production in Oregon, particularly in container-grown, but also occasionally in field-grown ornamentals. In fact, metaldehyde use in Oregon nurseries has been mandated in several cases by the Oregon Department of Agriculture (ODA) to clean up quarantine pests (brown garden snail).

The alternatives to metaldehyde in ornamentals are again iron phosphate (Sluggo) and the carbamate methiocarb (Mesurol). Methiocarb is not an effective control for slugs and the iron phosphate products don't draw slugs out of nursery containers as the metaldehyde does. There has been some use of copper barriers for slug control but slugs can dig under these barriers and increasing the width enough to make them effective would be prohibitively expensive.

Most of the metaldehyde used is the pelletized bait; however, it was reported that there is some use of liquid formulations in Washington in areas of dense plantings. No metaldehyde is applied aerially. Typically in a nursery setting there are two primary periods of metaldehyde use and multiple applications are made in each period. Metaldehyde is applied in the spring as weather is warming up and again in the fall as it begins to cool. Because of the amount of irrigation that takes place in nursery settings, repeated metaldehyde applications are necessary. Although the primary metaldehyde use periods are in the spring and fall it is not uncommon for it to also be used throughout the growing season.

Metaldehyde use is viewed as important because it prevents slug damage which make plants unmarketable and for snail control because both Oregon and Washington have been identified as regulated areas for brown garden snail quarantine.

Berries

With the wet weather common in the PNW berry-growing regions, slugs are a perennial problem, feeding on both leaves and fruit. While metaldehyde is primarily used for slug control in PNW berries, snails also occasionally require control. For most of the berry crops discussed below, metaldehyde is applied at 10 pounds of pellets per acre. Some growers are obtaining good slug control by making metaldehyde applications to newly planted fields at higher rates and then in subsequent years, as the slug population decreases, making applications at lower rates. A typical scenario for this type of use would be to apply five pounds of a 4% metaldehyde product to newly planted fields and then to gradually reduce applications to two pounds per acre. No aerial metaldehyde applications are made to PNW berry crops.

Iron phosphate is not widely used in berries for the same reasons presented above under the discussion for grass seed. Plus, growers in Washington have tried using iron phosphate for slug control in berry crops but report that the slugs ignored this bait.

Strawberries – While metaldehyde is used on nearly all the berry crops, it is most widely used on strawberries. Because these grow low to the ground, slugs feed on plants and fruit and can also get into boxes of harvested fruit that have been placed in flats stacked in fields during harvest. It is estimated that 85% or more of Oregon and Washington strawberry acreage is treated with metaldehyde bait. Metaldehyde is applied between the rows of strawberry plants either once or twice per season in the spring and may be applied again at harvest.

Blueberries – Metaldehyde is applied to between 10% and 30% of blueberry acreage and is particularly important in blueberries that are not trellised. Metaldehyde applications are made close to harvest because fruit-laden branches hang down and where they touch the ground, slugs are able to move into the fruit. In blueberries, typically only one metaldehyde application is made per season.

Black Raspberries – Metaldehyde use in black raspberries is similar to that in blueberries. It is applied once per season close to harvest. Here again, branches laden with fruit can touch the ground and slugs then can access fruit.

Blackberries/Raspberries – Slug treatment is not as common in blackberries and raspberries as it is in other berry crops. Although the fruit of blackberries and raspberries is well away from the soil, slugs have been known to climb up the canes. Extension personnel estimate that 5 to 10% of Oregon's blackberry/raspberry acreage is treated with metaldehyde, while it is estimated that in Washington 40 to 50% of the acreage is treated. Where it is used, typically one application is made between fruit set and harvest.

Clover Seed

There are four primary types of clover grown for seed in western Oregon: crimson, red, arrowleaf, and white. (Note: Most ladino clover seed, a type of white clover, is grown in California.) In 2005 in Oregon 12,750 acres of red clover seed were produced which accounts for approximately 50% of the U.S. production; 5,500 acres of crimson (90% of U.S. production); 6,100 white clover (excluding ladino) accounting for 100% of U.S. production; and 1,020 acres of arrowleaf (also 100% of U.S. production). Be aware that acreages vary from year to year and good working estimates for crimson and red clover seed crops are 8,000 acres a year.

Crop production practices among clover seed crops vary greatly. Crimson and arrowleaf clover grown for seed are fall-planted while plantings for red clover seed crops are evenly divided between spring and fall. Both red and white clover seed crops are perennials, while the crimson and arrowleaf are annuals. Neither crimson clover seed nor arrowleaf clover seed crops are ever grazed. Red clover is sometimes cut for silage but is most often simply flailed. White clover seed crops are grazed.

Metaldehyde use varies but is important in almost all clover seed grown in Oregon. In some cases the entire field is treated with metaldehyde applications and follow-up applications are limited to field borders, in other cases the field borders alone are treated with metaldehyde, and in other cases the entire field might receive multiple metaldehyde applications. In general up to three applications might be made to a field while field borders might receive up to four treatments.

A small portion of Oregon's spring-planted red clover seed is planted as a cover crop with either wheat or oats. In this case, metaldehyde is not used.

Crop experts do not agree on the potential loss from slug damage should metaldehyde not be available. One expert estimates losses from slug damage in the range of 2 to 6%. Another expert believes that this estimate is too low. One grower described a 100% loss scenario. Because of slug damage this grower ended up replanting two newly-planted clover seed fields this past winter, even after making three bait applications. Per the *Pest Management Strategic Plan for Western U.S. Alfalfa and Clover Seed Production*, metaldehyde baits are the only products currently available for slug control in clover seed. Crop experts do agree that retaining metaldehyde use on clover seed crops is critical.

Vegetable Seed Crops

Vegetable seeds are grown on 4,000 to 5,000 acres in western Oregon and on 3,500 to 5,000 acres each year in western Washington. Vegetable seed growers rely on metaldehyde baits for slug control for many of the vegetable seed crops. In western Oregon these crops include Austrian winter pea seed, brassica seed crops, table beet seed, sugarbeet seed, and spinach seed. In western Washington metaldehyde is important primarily in the brassica seed crops but it is also used in table beet seed. For all of these seed crops the primary pest being targeted is the gray garden slug. I am providing what information I was able to gather for the specific seed crops that at this time appear to be unsupported through reregistration.

Sugarbeet Seed – There are two producers of sugarbeet seed in western Oregon and between them they produce 100% of the U.S. sugarbeet seed. Sugarbeet seed crops are planted in rotation with other crops and typically follow grass seed. Throughout the time that a grass seed crop is growing slug eggs build up in the soil. In any given year something less than 50% of the sugarbeet seed acreage is treated with metaldehyde. The average use is two or three applications per season. Slug infestations are more of a problem in fields planted with transplants and transplanting accounts for only 10 to 20% sugarbeet seed production. Transplants are planted in the spring when conditions are cool and wet. Fields that are direct seeded are planted in the fall.

Table Beet Seed – Metaldehyde is used in Washington table beet seed production. Metaldehyde is not used every year, but it is important and it is used when conditions warrant. Specific use information was not available at this time but can be pursued if needed.

Austrian Winter Pea Seed – No specific use details were available

Brassica and Leafy Vegetables

Metaldehyde is reported to be used in cabbage, lettuce, celery, and rhubarb production in the PNW. As you are no doubt aware IR-4 trials are underway in the PNW for metaldehyde use on celery and rhubarb. For these trials metaldehyde is being used at the full labeled use rate and for the maximum allowable number of applications per season.

Homeowner Use

Metaldehyde is no doubt a very important home garden chemical throughout the wetter areas of the PNW. Because actual use information is not available, I had initially not planned to provide any homeowner information in this response; however, Western IPM Center contacts in Alaska felt strongly that this use be addressed. They provided the following information:

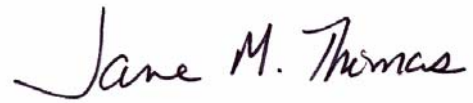
Southeast Alaska has as large a slug problem as western Oregon and western Washington. Most homeowners use metaldehyde for slug control where pets aren't present. Iron phosphate (Sluggo) is also commonly used; however, the efficacy is not comparable to metaldehyde. Metaldehyde is the most effective product on the market for slug control and its use is very important to homeowners.

Gardening in Alaska is more important than in other areas of the U.S. While gardening in most areas of the U.S. can be viewed as a hobby, produce from home gardens and game from hunting and fishing provide subsistence food supplies for many Alaskan households. It is estimated that 50% of Alaska's home gardeners have slug problems, that 30% use some type of slug control regularly, and that metaldehyde is the leading chemical of choice for home garden slug control.

Unsupported Uses

It is my understanding that the following uses reported above for metaldehyde are not being supported through reregistration: clover seed, table beet seed, sugarbeet seed, Austrian winter pea seed, and homeowner uses. These uses of metaldehyde are important in the PNW and we are asking that metaldehyde be reregistered for these uses as well. Should you need additional information please contact me or any of the individuals on the attached contact list.

Sincerely,

A handwritten signature in black ink that reads "Jane M. Thomas". The signature is written in a cursive style with a large initial 'J' and a long, sweeping underline.

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Metaldehyde Contact List

Crop:	Last Name:	First Name:	Organization:	Title:	Work Ph:	Email:	Responsible State:
blackberry	DeFrancesco	Joe	Oregon State University	Senior Faculty Research Assistant	(541) 737-0718	defrancj@hort.oregonstate.edu	Oregon
blueberry	Cieslar	Brian	Whatcom Farmers Co-Op	Agronomist	(360) 354-2418	BrianC@wfcoop.com	Washington
blueberry	DeFrancesco	Joe	Oregon State University	Senior Faculty Research Assistant	(541) 737-0718	defrancj@hort.oregonstate.edu	Oregon
clover seed	Aldrich-Markham	Susan	Oregon State University	Extension Agronomist (Yamhill Co)	(503) 434-8917	susan.aldrich-markham@oregonstate.edu	Oregon
clover seed	Anderson	Dave	Western Biochemical Consulting	Consultant	(503) 982-2712	dandersonwbc@qwest.net	Oregon
clover seed	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
clover seed	Leffel	John	JL Agricultural Consulting	Consultant	(503) 648-2742	johnleffel@msn.com	Oregon
clover seed	McCulley	John	Oregon Clover Seed Commission	Administrator	(503) 370-7019	assoc@wvi.com	Oregon
general project info.	Boyle	Dean	Cenex Supply & Marketing		(541) 475-2222		Oregon
general project info.	Burton	Del	UAP Northwest	Manager Pasco Sales and Distribution Center	(509) 545-1865		Washington
general project info.	Samoil	Ken	IR-4	Study Director	(732) 932-9575 ext. 614	samoil@aesop.rutgers.edu	
general project info.	Sherwood	Ken	Alaska Mill & Feed		(907) 279-4519		Alaska
general project info.	Stafford	Mike	UAP Northwest	Regional Manager	(208) 454-0475	mike.stafford@ua.com	Idaho
grass seed	Aldrich-Markham	Susan	Oregon State University	Extension Agronomist	(503) 434-8917	susan.aldrich-markham@oregonstate.edu	Oregon
grass seed	Burr	Ron	Ag Research, Inc.	Consultant	(503) 769-3416		Oregon
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grass seed	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
grass seed	Gingrich	Gale	Oregon State University	Field Crop Extension Agent	(503) 373-3756	Gale.Gingrich@oregonstate.edu	Oregon
grass seed	Kugler	John	Washington State University	Area Extension Educator	(509) 754-2011 ext. 413	kugler@wsu.edu	Washington
grass seed	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264 ext. 25	bob.mcreynolds@oregonstate.edu	Oregon
grass seed	Mellbye	Mark	Oregon State University		(541) 967-3871	mark.mellbye@oregonstate.edu	Oregon
grass seed	Young	William	Oregon State University	Extension Seed Production Spececialist	(541) 737-5859	william.c.young@oregonstate.edu	Oregon
homeowner	Jahns	Tom	University of Alaska Fairbanks	Pesticide Coordinator	(907) 262-5824 ext. 303	fftrj@uaf.edu	Alaska
homeowner	Stafford	Mike	UAP Northwest	Regional Manager	(208) 454-0475	mike.stafford@ua.com	Idaho
ornamental	Brown	Pat	Wilbur-Ellis	Sales Representative	(801) 381-3093	pbrownd@wecon.com	Utah
ornamental	Hedberg	Jan	Oregon Department of Agriculture	Lead Horticulturist	(503) 986-4644	jhedberg@oda.state.or.us	Oregon
ornamental	Lyon	Tom	Wilbur-Ellis	Crop Advisor	(208) 459-1631	tlyon@wecon.com	Idaho
ornamental	Nuthak	Craig	Wilbur-Ellis	Sales Representative	(208) 731-1868	cnuthak@wecon.com	
ornamental	Poncelet	Janet	UAP Northwest	Territory Manager	(503) 663-0164	janet.poncelet@uap.com	Oregon
ornamental	Porter	Franki	Wilbur-Ellis	Sales Representative	(800) 275-6920	fporter@wecon.com	Washington
ornamental	Rosetta	Robin	Oregon State University	Extension Horticulturist	(503) 678-1264 ext.33	robin.rosetta@oregonstate.edu	Oregon
pea seed	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
raspberry	Cieslar	Brian	Whatcom Farmers Co-Op	Agronomist	(360) 354-2418	BrianC@wfcoop.com	Washington
raspberry	DeFrancesco	Joe	Oregon State University	Senior Faculty Research Assistant	(541) 737-0718	defrancj@hort.oregonstate.edu	Oregon
rhubarb	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264 ext. 25	bob.mcreynolds@oregonstate.edu	Oregon

Metaldehyde Contact List

Crop:	Last Name:	First Name:	Organization:	Title:	Work Ph:	Email:	Responsible State:
strawberry	Cieslar	Brian	Whatcom Farmers Co-Op	Agronomist	(360) 354-2418	BrianC@wfcoop.com	Washington
strawberry	DeFrancesco	Joe	Oregon State University	Senior Faculty Research Assistant	(541) 737-0718	defrancj@hort.oregonstate.edu	Oregon
strawberry	Porter	Franki	Wilbur-Ellis	Sales Representative	(800) 275-6920	fporter@wecon.com	Washington
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sugarbeet seed	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
sugarbeet seed	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264 ext. 25	bob.mcreynolds@oregonstate.edu	Oregon
sugarbeet seed	Wood	Jim	West Coast Beet Seed	Fieldman	(503) 393-4600	jimw@wcbeet.com	Oregon
table beet seed	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
table beet seed	Lyons	Milo	Alf Christiansen	Production Manager	(360) 419-3021	milo_lyons@alfseed.com	Washington
vegetable crops	Drost	Dan	Utah State University	Vegetable Specialist	(435) 797-2258	dand@ext.usu.edu	Utah
vegetable crops	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264 ext. 25	bob.mcreynolds@oregonstate.edu	Oregon
vegetable crops	Porter	Franki	Wilbur-Ellis	Sales Representative	(800) 275-6920	fporter@wecon.com	Washington
vegetable seed crops	Fisher	Glenn	Oregon State University	Entomology Extension Specialist	(541) 737-5502	fisherg@science.oregonstate.edu	Oregon
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vegetable seed crops	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264 ext. 25	bob.mcreynolds@oregonstate.edu	Oregon
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	Deer	Howard	Utah State University		(435) 797-1602	howardd@ext.usu.edu	Utah
	Hirnyck	Ronda	University of Idaho		(208) 364-4046	rhirnyck@uidaho.edu	Idaho
	Jahns	Tom	University of Alaska Fairbanks		(907) 262-5824	fftrj@uaf.edu	Alaska
	Jenkins	Jeff	Oregon State University		(541) 737-5993	jenkinsj@ace.orst.edu	Oregon