

Pesticide Information Request Response

Arid Southwest IPM Network

March 7, 2007

Active Ingredients:

Methomyl (Lannate) and Thiodicarb

Crops/Target sites:

Sweet corn (especially in FL) and head lettuce (especially in CA). EPA is also interested in other sections of the country where these crops are grown and these active ingredients are used.

Extent of Response:

Responses represented here are limited to AZ and Imperial County CA, and are segregated by state.

Data Sources:

Arizona: The Pesticide Use Reporting (PUR) database provided data for product use from 2001 to 2005. In addition, data from an annual head lettuce crop insect losses survey conducted by John Palumbo were consulted. Dr. Palumbo provided responses for product use in head lettuce in Arizona. Eric Natwick collected information and provided responses for Imperial County, CA.

General Comments:

Lannate (methomyl) is extremely important to the AZ/CA Lettuce industries (see the attached letter below that Dr. John Palumbo wrote to EPA on behalf of DuPont in August 2006).

ARIZONA RESPONSE

Thiodicarb Use:

Thiodicarb is not an important product in head lettuce or sweet corn in AZ. The PUR data reported only 4 applications of thiodicarb statewide in head lettuce from 2001 to 2005, and none for any type of corn. (Field corn and sweet corn cannot be distinguished in the PUR data.) This was never applied in combination with methomyl. Bayer doesn't even promote the product. Even before the newer Lep materials I never heard mention of Larvin and Lannate being mixed (for one, that would be cost-prohibitive). Based on the Lettuce Insect Losses (LIL) data Larvin was not used in Lettuce from 2004-2006.

Methomyl Use:

Sweet corn

Very little sweet corn is grown in AZ. Larvin would not be applied and Lannate would be used sparingly (1-2 apps). Pyrethroids are primary products used.

Head Lettuce

Lannate (metholmlyl) is a very commonly used and important insect control product in AZ lettuce. It is generally applied in combination with other insecticides (only 2% of lettuce applications from 2001-2005 were not mixtures). Lannate is extremely important to the AZ/CA

Lettuce industries (see the attached letter below that John Palumbo wrote to EPA on behalf of DuPont in Aug 2006).

Arizona Response to Specific Questions for Methomyl on Head Lettuce:

1a. What are the typical use rates?

Based on PUR data, the mean use rate of methomyl on head lettuce in Arizona varied from 0.71 ai/acre in 2001 down to 0.66 in 2005 with a 5-year mean of 0.68 (+/- 0.13). Ai / acre ranged from 0.072 to 2.52 with a median of 0.68. According to John Palumbo's experience in research plots and anecdotal conversations with PCAs, *rates range between 0.5-0.75 lb product / acre* – depending on pest pressure and pest (thrips vs. armyworm). Efficacy is consistent within this range also.

1b. What are the typical number of applications per crop?

Based on data from the annual Lettuce Insect Losses survey, the avg. no. of Lannate applications in fall lettuce averaged 1.6 and 2.3 in 2005 and 2006, respectively; the average number of treated acres was 47.3 and 54.1%, respectively. The primary targets were Lepidopteran pests, flea beetle and trash bugs; thrips were a secondary target. In spring lettuce, the number of applications ranged from 1.7 to 1.9, and the average number of treated acres ranged from 38.7 to 67.4 in 2005 and 2006, respectively. Primary targets were thrips and alate aphids, secondary targets were trash bugs.

1c. What is the timing of the applications?

Lannate use is most important during the fall crop at stand establishment (to control armyworms and flea beetle), typically in mid-September (see letter below), there are also some minor uses mid-season (pre-heading) for thrips and corn earworm, and then again some use pre-harvest (14 d) for broad spectrum knockdown (contaminants-trash bugs). In spring lettuce, the use would probably be highest from thinning to early heading, primarily used to control thrips (rotated with spinosad) and alate aphids, typically in mid-March when thrips and aphids are probably the most difficult to control.

2a. Would these two chemicals be applied to the same crop during the same growing season?

No. No PCA I know would be willing to spend that much money – you would be looking at a \$40-50/acre cost, not including application costs (add another \$10).

IMPERIAL COUNTY, CALIFORNIA RESPONSE

Response to Specific Questions: Sweet Corn

1a. What are the typical use rates?

Sweet Corn

Thiodicarb is not used in sweet corn.

Methomyl is used in sweet corn at 0.45 lbs ai/acres.

Head Lettuce

Thiodicarb was reportedly applied to about 5% of the acreage in 2005. However, this is decreasing each year as the dealers are no longer interested in carrying Larvin on their inventory according to the Bayer sales rep and one of the dealers Eric Natwick spoke to. The use rate for thiodicarb is 0.75 lb ai/acre.

Methomyl is typically used at 0.9 lb ai/acre.

1b. What are the typical number of applications per crop?

Sweet Corn

Thiodicarb is not used on sweet corn.

For Methomyl, 4 to 5 applications are typical.

Head Lettuce

If used on head lettuce, 1 to 2 applications of thiodicarb is typical.

For head lettuce, 2 applications of methomyl are typical.

1c. What is the timing of the applications?

Sweet corn

Thiodicarb is not used on sweet corn.

Methomyl on sweet corn is applied just prior to and during silking for armyworm and corn earworm control.

Head Lettuce

Thiodicarb is applied to head lettuce anytime from stand establishment through heading, but I don't believe we will see this use in the future.

Methomyl is applied on head lettuce during stand establishment for beet armyworm, flea beetles, crickets, and other seedling pests and during head maturation for thrips.

2a. Would these two chemicals be applied to the same crop during the same growing season?

No.

Yuma Agricultural Center

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Aug 18, 2006

Ms. Kelly Sherman
Case Review Manager
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Ms. Sherman,

It is my understanding that the USEPA is in the process of making an important regulatory decision on future uses of Lannate insecticide in vegetable crops. As a vegetable entomologist in a highly-intensive vegetable production region (Yuma, AZ and Imperial county, CA), I can honestly say that Lannate is very important to the industry and plays a major role in our integrated pest management programs. I would like to provide my perspective on why the present uses of these compounds should be retained.

First and foremost, Lannate is one of the few insecticides in our IPM arsenal that provides short residual, broad spectrum activity against a number of important pests of leafy vegetables. As little as 10 years ago, it was the primary product used against beet armyworm, cabbage looper, corn earworm and diamondback moth in lettuce and cole crops, applied as many as 10 times on a single crop. Since the registration of newer selective products such as Success, Intrepid, and Avaunt, its use has decreased to as few 2-3 times per season. However, these Lannate applications are more important than ever because they provide growers with an effective tool to control not only lepidopterous larvae, but other secondary pests important at stand establishment such as flea beetles, crickets and earwigs that the newer products won't. Similarly with the recent resurgence of silverleaf whitley on desert crops, growers have relied on Lannate early in the growing season to assist in adult knockdown of migrating adult populations. This type of use will become even more critical if the Q-biotype becomes established. Because Lannate has a short residual in the field, it is also used effectively against all these pests as part of our resistance management guidelines as a rotational partner with the newer selective products during the season. Finally, it has been a savior to growers the past few years in controlling pests such as false chinch bugs and leafhoppers that contaminate crops approaching harvest, which again are not controlled by the newer selective products.

Perhaps more importantly though for Arizona and California growers is the central role that Lannate plays in western flower thrips management in leafy vegetables. Thrips have quickly become one of our most important pests of all lettuce types, spinach and celery. Prior to 1997 thrips were only a minor pest found occasionally on head lettuce in the late spring. However, it is no surprise that with the registration and increased usage of the newer selective compounds (ie, Success, Intrepid and Avaunt for lepidopterous larvae, neonicotinoids and insect growth regulators for aphids and whiteflies) that thrips have emerged as a serious economic pest of leafy vegetables throughout the production season. Fortunately, Lannate gives growers an alternative that can consistently control adult and immature thrips, and is considered the industry standard. In essence, Lannate is the key component of our thrips resistant management program where combinations with pyrethroids or dimethoate, are used in rotation with combinations of Success, acephate, and endosulfan (all of which are less effective and generally require more frequent usage).

In conclusion, the availability of Lannate is one of the central reasons why our present vegetable IPM programs have been so successful in the past few years. It is my opinion that the removal or restriction of Lannate uses in leafy vegetables would be detrimental to Arizona and California vegetable cropping systems. Not only would resistance management programs for Lepidopterous pests and thrips be in jeopardy with the loss of Lannate, but in order too prevent economic losses growers would likely resort to using less effective compounds such a pyrethroids, acephate and endosulfan at much higher frequencies. Finally, I don't foresee any future registrations of new alternative chemistries that would replace Lannate's role in the management of key pests such as flea beetle, crickets, and most importantly, western flower thrips in leafy vegetables.

If you have any questions or would like to discuss this matter in more detail, please don't hesitate to contact me.

Sincerely,

John C. Palumbo, Ph.D.
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Table 9. Insecticide usage on fall and spring head lettuce in the 2004-2005 and 2005-2006 growing seasons

IRAC MOA Group	Product	Fall Head Lettuce				Spring Head Lettuce			
		2004-2005		2005-2006		2004-2005		2005-2006	
		Treated acres (%)	No. times applied (No./ac)	Treated acres (%)	No. times applied (No./ac)	Treated acres (%)	No. times applied (No./ac)	Treated acres (%)	No. times applied (No./ac)
1A	Lannate	47.3	2.3	54.1	1.6	38.7	1.9	67.4	1.7
1A	Larvin	0.0	0	0.0	0	0.0	0	0.0	0
1B	Diazinon - foliar	2.1	1	4.2	1.2	1.4	1	5.1	1.2
1B	Diazinon-chemigation	40.1	1	42.0	1	19.6	1	37.5	1
1B	Dimethoate	4.6	1	6.0	1.3	42.3	1.5	19.8	1.3
1B	Metasystox -R	0.0	0	0.3	1	3.0	1	0.0	0
1B	Orthene (acephate)	9.4	1	8.9	1	24.9	1.2	16.4	1.1
2A	Endosulfan	21.0	1.1	18.6	1.2	38.2	1.3	37.7	1.4
3	Pyrethroids- foliar	96.7	3.5	99.8	3.3	92.6	3.3	96.1	2.9
3	Pyrethroids-chemigation	50.1	1	56.9	1	34.4	1	43.7	1
4A	Admire	65.9	1	80.1	1	63.0	1	79.6	1
4A	Provado	0.0	0	1.8	1	24.1	1.4	7.2	1
4A	Assail	n/a	n/a	4.7	1	n/a	n/a	33.9	1.3
5	Success	94.7	2.8	97.6	2.6	88.4	2.2	89.2	2
5	Entrust	0.0	0	0.4	2	0.0	0	0.0	0
6	Proclaim	13.7	1.2	36.8	1	2.6	1	12.9	1
6	Agriemek	0.0	0	0.0	0	0.0	0	0.0	0
9B	Fulfill	8.6	1	1.0	1	20.0	1.1	13.9	1.1
11B	Bt (i.e. Dipel/Javelin)	2.3	1	0.4	1	2.2	1	0.8	1
18A	Intrepid	59.7	1.4	61.1	1.2	41.0	1.2	56.7	1.2
18B	Azadirachtin / Neem	0.0	0	0.0	0	0.0	0	0.0	0
22	Avaunt	18.9	1.2	27.6	1.1	4.2	1	14.5	1
23	Oberon	n/a	n/a	1.4	1	n/a	n/a	3.9	1

This is part of the University of Arizona College of Agriculture 2006 Vegetable Report, index at: <http://cals.arizona.edu/pubs/crops/az1419/>