
Malathion Use on Citrus in California

Date: April 24, 2006

To: [Kari Mavian](#), [Tom Moriarty](#), ccqc1946@pacbell.net, [Rick Melnicoe](#), [Teung Chin](#)

From: [Beth Grafton-Cardwell](#)
Kearney Agricultural Center

Subject: Malathion Reregistration Update

[Attachment](#)

Kari:

I have attached a summary statement as to the reasons why .75 lb ai/acre malathion is an unacceptable change to the label for citrus pests. The primary reason is that rates below 7.5 lb ai/acre do not control scale insect pests. Thus the label change would render the insecticide useless for several key pests of citrus (cottony cushion scale, black scale, citricola scale). Alternative insecticides are available, but they are primarily organophosphates and carbamates and they have their own issues. The increase of the REI to 5 days would limit use of the product at harvest time, however growers could manage the pests with this limitation. Citrus growers do not need multiple applications of malathion and so if a reduction is needed, I would change the label to once per season.

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From: Kari E. Mavian [mailto:KEM.US@cheminova.com]
Sent: Monday, April 24, 2006 12:59 PM
To: Grafton-Cardwell, Beth; ccqc1946@pacbell.net
Subject: Malathion Reregistration Update

Hi Wally and Beth,

I am writing this time concerning the reregistration of malathion. As you may be aware, the Environmental Protection Agency (EPA) is currently reviewing the use patterns for malathion as part of the compound's reregistration process. The EPA is now inviting comments from stakeholders with regard to some changes they have proposed for emulsifiable concentrate (EC), wettable powder (WP) and dust formulations of malathion.

We are writing to ask if you would once again assist in this review procedure. We have attached a copy of the most recent request for information issued by the EPA. EPA especially needs to know if the application rates, number of applications, and REI's are appropriate, and if not, the specific reasons why. Unfortunately the EPA has requested that input is received this week, so fairly urgent action is needed.

You will note that we have highlighted certain cells in the attached spreadsheets. These cells represent what we feel are significant changes from current labeled use patterns and require particular scrutiny. If any of these changes severely limit the commercial viability of malathion on citrus, the EPA needs to be informed.

We recommend that you send your comments to the following three people:

Cheminova contact:

Paul Whatling

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1620 Eye Street NW, Suite 615
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(202) 463-1491

EPA contact:

Tom Moriarty

Chemical Review Manager
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We once again appreciate your assistance. Please let me know if you have any questions.

Best regards,

Kari

Kari E. Mavian

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Summary of Malathion uses in California citrus
Beth Grafton-Cardwell
April 25, 2006

While Malathion is used for miscellaneous insect pests (katydids, whiteflies, aphids) at fairly low use rates (1-2 lb AI/acre), it fills an important need for soft scale insects in certain situations. The use rates for these species (cottony cushion scale, citricola scale, and black scale) are 1-2 pts per 100 gallons and treatments for these pests are applied in 500-750 gpa. At these water volumes, the rate needed for scale insects is 5-15 lbs AI/acre (UC IPM citrus guidelines <http://www.ipm.ucdavis.edu/PMG/r107301611.html>). Rates lower than 5 lb/acre will not effectively control the scale species listed in Table 1 and efficacy is better with 7.5-10 lb/acre.

The alternative insecticides for these scale insects have a longer REI and PHI (methidathion), have more serious worker safety issues (methidathion), or are less effective against scales (carbaryl). The higher label rate should be retained for control of soft scales.

Table 2 shows that during 1997, when malathion was used for pesticide-resistant California red scale, there were frequent applications of 7-15 lbs AI. Since that time, pyriproxyfen has become the primary red scale control material, and the number of applications of 7-15 lbs per acre of malathion has declined. During 1998 and 1999, there were outbreaks of cottony cushion scale due to disruption of the natural enemies by pyriproxyfen. These outbreaks were controlled by malathion, thus malathion use for scales remained high during this period. Since 1999, the number of uses of 7-15 lbs AI/acre malathion have been quite low. However, one never knows when a scale pest upset will occur again and it is critical to maintain a label rate of malathion that will effectively kill scale insects.

Reasons for maintaining registration of higher rates of malathion:

- 1) Malathion use has declined, but that is because it is used less frequently for California red scale because of the registration of Esteem(pyriproxyfen) and Applaud (buprofezin) in 1998 (peak use of malathion in 1994-97 due to red scale resistance and multiple applications of OPs). It is still critically needed for secondary pests such as cottony cushion scale, black scale, and citricola scale.
- 2) Insect growth regulators, pyrethroids, and neonicotinoids are replacing OPs and carbamates for many citrus pests. However they do not control soft scales very well.
- 3) The alternative chemicals for soft scales are Supracide, which has a much longer REI and PHI and carbaryl, which is less effective than malathion for soft scale control. Assail is moderately effective against citricola scale. Lorsban is not very effective against cottony cushion scale.
- 4) Malathion has a relatively short (1 day) REI and (7 day) PHI and international MRLs are established. Growers need the flexibility of having a few insecticides that have short REIs so that they can make rapid pest control decisions without severely delaying harvest.

Table 1. Summary of Malathion uses and alternatives for soft scales.

Malathion 8, REI 1 d, PHI 7 d, MRLs established

Pest	Rate form/acre	Water volume gpa	Rate AI/acre	Typical rate/acre	Typical timing	Low risk Worker Activities	Medium risk worker activities	Effective alternatives (REI)	Alternative REI	Alternative PHI	International MRL
Cottony cushion scale	1-2 pts/100 gal (1-2 lb/100 gal)	750-1500	7.5-15 lb	7.5 lb	May-July	Irrigation, scouting,	harvesting	methidathion Carbaryl	30 d 12 h	14 or 60 d 5 d	Yes Yes
Citricola scale	1-2 pts/100 gal (1-2 lb/100 gal)	500-1000	5-10 lb	5 lb	Aug-Nov	Irrigation, scouting,	harvesting	chlorpyrifos Assail	5 d 12 h	21-35 d 7 d	Yes, varies No
Black scale	1-2 pts/100 gal (1-2 lb/100 gal)	750-1500	7.5-15 lb	7.5 lb	Aug-Sep	Irrigation, scouting,	harvesting	chlorpyrifos methidathion Carbaryl	5 d 30 d 12 h	21-35 d 14 or 60d 5 d	Yes, variable Yes

Table 2 Number of applications of malathion in California citrus by lbs ai/acre for 1994-2004.

Rate (Lbs AI/Acre)	Number of Applications of Malathion in California Citrus										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<1	883	206	70	21	20	119	476	150	189	918	334
1 - 2	9	9	15	11	6	28	10	20	14	3	8
2 - 3	11	3	2	16	8	12	5	13	5	2	5
3 - 4	2	0	0	9	7	2	4	5	3	5	6
4 - 5	3	2	1	11	5	12	2	9	1	6	0
5 - 6	2	1	0	8	6	4	4	2	3	0	2
6 - 7	0	2	4	32	5	3	5	3	1	5	1
7 - 8	7	4	6	22	14	28	12	10	11	12	18
8 - 9	2	14	91	45	11	31	2	10	8	12	6
9 - 10	1	1	3	49	10	36	1	5	7	18	0
10 - 11	0	6	5	18	24	39	1	10	6	1	1
11 - 12	18	2	5	13	22	31	4	6	7	3	0
12 - 13	3	2	1	140	22	26	0	11	4	2	3
13 - 14	5	1	0	11	11	10	0	1	1	0	0
14 - 15	3	1	3	5	3	7	1	1	0	0	0
>15	7	33	71	114	19	44	4	7	4	5	0

Table 3. Number of acres treated with malathion in California citrus by lbs ai/acre for 1994-2004.

Sum of Acres Treated with Malathion in California Citrus

Lbs ai/acre	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<1	6604.5	1104.4	512.5	431.6	692.8	2128.7	10189.0	4343.5	5205.8	15540.4	9082.0
1 - 2	127.3	89.5	79.3	169.3	179.0	694.7	103.0	472.8	387.8	57.0	88.3
2 - 3	213.3	8.8	17.0	182.0	155.0	380.0	55.0	139.5	97.0	21.0	21.5
3 - 4	20.0	0.0	0.0	255.0	284.5	31.0	57.0	451.0	76.0	20.5	83.9
4 - 5	260.0	88.0	64.0	246.0	32.3	111.2	6.0	168.0	14.0	28.0	0.0
5 - 6	80.5	15.0	0.0	100.0	91.0	44.0	22.0	26.0	33.0	0.0	25.0
6 - 7	0.0	5.3	48.3	416.0	141.0	84.5	26.0	55.0	2.5	93.0	20.0
7 - 8	121.8	97.0	145.0	296.0	216.0	684.0	151.0	606.0	133.0	132.2	728.0
8 - 9	30.0	225.9	2428.7	868.0	191.0	1160.3	78.0	163.0	183.6	206.0	107.0
9 - 10	10.0	40.0	42.0	745.0	152.0	1247.4	6.0	159.5	206.0	419.0	0.0
10 - 11	0.0	49.0	31.0	227.0	709.4	1081.4	8.0	233.0	222.0	80.0	9.0
11 - 12	560.7	45.5	65.5	320.0	675.5	632.0	281.0	153.0	78.0	390.0	0.0
12 - 13	32.7	121.0	9.0	3862.0	239.0	481.5	0.0	304.0	58.0	15.0	160.0
13 - 14	49.0	20.0	0.0	182.0	240.5	196.0	0.0	23.0	5.0	0.0	0.0
14 - 15	50.0	20.0	91.1	34.0	69.0	87.0	6.0	10.0	0.0	0.0	0.0
>15	49.0	596.9	2012.6	2430.0	336.0	844.8	72.0	141.5	231.0	54.7	0.0