

## Onion Production, Maggot Control, and Cyromazine

**Cyromazine (Trigard®) is currently undergoing re-evaluation at EPA/OPP. The Preliminary Risk Assessment conducted by the Environmental Fate & Effects Division of OPP indicates a high risk to birds from onion seed treatment with cyromazine. BEAD needs assistance to better characterize the use of cyromazine in commercial bulb onion production.**

**From the Old Crop Profiles: cyromazine is used on onion seed to control onion maggots and/or seed corn maggots. Is this still correct?**

*Cyromazine is not widely used as a seed treatment for onion seed planted in the western US.*

**1. Since this is a seed treatment, what percentage of commercial onion growers (or how many acres) is planting seed? How many growers (or acres) plant seedlings?**

*At least 90% of US dry bulb storage onion acreage is seeded. In Washington State in 2013, 20,500 acres were seeded and only approximately 500 acres transplanted. In California, nearly all dehydrator onions are seeded.*

**2. Are there data to indicate how many acres are using cyromazine seed treatment and how many acres are using the alternative treatments each year?**

*The California Pesticide Use Report for 2011 contains 12 records (see attached) of onion seed treatment with cyromazine (Trigard OMC) for a total of 474.3 lbs active ingredient. It is not known if the seed treated in California was planted in California or the western states. In addition, if seed planted in California were treated out-of-state it would not appear in the database.*

*Regarding cyromazine seed treatment on onions, David Belles from Syngenta Crop Protection stated, "It is treated on onion for export to Canada because we don't have Regard labeled in Canada. There may still be a small amount used in the USA. Probably in the northeast."*

*Insecticide seed treatments are becoming more common in Idaho and Oregon with growers using clothianidin plus imidacloprid (Sepresto) or thiamethoxam plus spinosad (FarMoreF1500). In Washington an estimated 65% of growers use chlorpyrifos (Lorsban) at planting, 30% use seed treatment with either Sepresto or FarMoreF1500, and 5% do not use insecticides for onion and seed corn maggot.*

**3. Would cyromazine onion treatments be used on seeds being grown for onion sets, or to produce onion seedlings for those who plant seedlings instead of seed?**

*Extension specialists in several western states thought this may be a possibility but had not heard of specific instances. The potential acreage would be small.*

4. Would cyromazine ever be used to treat seeds that are used for onion seed production? (If so, where does this occur? How many acres?)

*Unknown but probably very limited.*

5. What states and growing areas have maggots at levels that require insecticide applications?

*Midwest and northeast states with higher organic matter soils have historically experienced greater problems with maggots on onions than the western states. However, treatment for onion and seed corn maggots is increasing in the west. Currently nearly all onions in Washington are treated for maggots. In California, maggots are more common in the Tulalake production area than the rest of the state. The other western states did not provide specific information.*

6. What other options (chemical, cultural, etc.) are used to control these maggots?

*Chemical: Other options for chemical control of onion maggots include chlorpyrifos, diazinon, thiamethoxam, spinosad, cypermethrin, zeta-cypermethrin, permethrin, and lambda-cyhalothrin. Efficacy ratings vary from poor to good.*

*Crop rotation: Rotating onions with non-susceptible crops such as cereals can reduce onion maggot populations due both to the rotation crop's lack of susceptibility and to the cultural practices used to produce those crops. However, high levels of decomposing plant material can increase populations of seed corn maggot.*

*Delayed planting: Planting onions as late as possible will reduce the attractiveness of the onion plant to ovipositing flies and reduce the duration that the crop is exposed to ovipositing flies. Planting cannot be delayed too late in the spring because this could reduce the period the onion plant can invest in bulbing, which is necessary for producing large onion bulbs.*

*Cull and crop residue management: Cull onions can also be a source of maggots and should be well removed from production fields. Onion crop residues should be chopped and incorporated into the soil as soon as possible after harvest so as not to attract flies preparing to lay eggs.*

*Field site selection: Maggots do not travel far from fields in which the pupae overwinter, so growers consider the distance when selecting fields for planting onions. Rotating to fields farther from previous onion plantings (at least 0.5 mile) can lessen the likelihood of maggot infestation.*

7. Is cyromazine onion seed treatment used in rotation with other chemistries? If so, please specify what state extension agents recommend their onion producers to do.

*Most do not recommend. A cyromazine onion seed treatment recommendation can be found at [http://wiki.bugwood.org/HPIPM:Onion\\_Maggot](http://wiki.bugwood.org/HPIPM:Onion_Maggot)*

8. Are there other factors that make cyromazine a useful chemical in onion production?

*Cyromazine is used for leaf miner control in Colorado and California and may be used in other states. In 2011, 77.7 lbs active ingredient cyromazine (Trigard) was applied to onion foliage in California (see attached). Most applications were by ground rig.*

Responses compiled from information provided by the following (alphabetic by state):

David Belles, Syngenta Crop Protection, Arizona  
Pesticide Use Report, Department Of Pesticide Regulation, State of California  
Robert Ehn, California Garlic and Onion Research Advisory Board  
Rob Wilson, University of California Intermountain Research and Extension Center  
Howard Schwartz, Colorado State University  
Mike Thornton, University of Idaho  
Diane Alston, Utah State University  
Doug Walsh, Washington State University  
Tim Waters, Washington State University

YEAR	DATE	COUNTY	SITE_NAME	PRODUCT_NAME	POUNDS_PRODUCT		POUNDS_CHEMICAL		AMOUNT_TREATED	UNIT_TREATED	UNIT	AERIAL_GROUND
					_APPLIED	CHEMICAL_NAME	_APPLIED	TREATED				
2011	15-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	4.3394	CYROMAZINE	3.25455	26.1		A	G	
2011	24-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	0.4988	CYROMAZINE	0.3741	3		A	G	
2011	22-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	3.33	CYROMAZINE	2.4975	20		A	A	
2011	24-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	5.16	CYROMAZINE	3.87	31		A	A	
2011	24-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	1.6125	CYROMAZINE	1.209375	9.7		A	G	
2011	12-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	1.945	CYROMAZINE	1.45875	11.7		A	G	
2011	12-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	4.2563	CYROMAZINE	3.192225	25.6		A	G	
2011	5-Aug-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	2.5106	CYROMAZINE	1.88295	15.1		A	G	
2011	17-Jul-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD	2.2113	CYROMAZINE	1.658475	13.3		A	G	
2011	1-Nov-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	1.505	CYROMAZINE	1.12875	10.2		K		
2011	1-Dec-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	15.896	CYROMAZINE	11.922	237.47		A		
2011	1-Jan-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	86.439	CYROMAZINE	64.82925	1373.54		P		
2011	1-Mar-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	138.642	CYROMAZINE	103.9815	2068.11		P		
2011	1-Feb-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	254.094	CYROMAZINE	190.5705	3735.28		P		
2011	1-Nov-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	1.505	CYROMAZINE	1.12875	22.49		P		
2011	1-Apr-11	MONTEREY	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	10.899	CYROMAZINE	8.17425	162.83		P		
2011	3-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.13	CYROMAZINE	0.8475	6.8		A	G	
2011	17-Jun-11	MONTEREY	ONIONS (GREEN)	TRIGARD	0.9975	CYROMAZINE	0.748125	6		A	G	
2011	21-Jun-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.13	CYROMAZINE	0.8475	6.8		A	G	
2011	24-Jun-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.15	CYROMAZINE	0.8625	6.9		A	G	
2011	5-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.15	CYROMAZINE	0.8625	6.9		A	G	
2011	15-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.41	CYROMAZINE	1.0575	8.5		A	A	
2011	26-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1469	CYROMAZINE	0.860175	6.9		A	G	
2011	15-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.15	CYROMAZINE	0.8625	6.9		A	G	
2011	5-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.15	CYROMAZINE	0.8625	6.9		A	G	
2011	25-Jun-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1469	CYROMAZINE	0.860175	6.9		A	G	
2011	30-Jul-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1638	CYROMAZINE	0.87285	7		A	G	
2011	19-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1638	CYROMAZINE	0.87285	7		A	G	
2011	16-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	0.83	CYROMAZINE	0.6225	5		A	A	
2011	10-Jun-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1	CYROMAZINE	0.75	6		A	G	
2011	16-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.16	CYROMAZINE	0.87	7		A	A	
2011	15-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1638	CYROMAZINE	0.87285	7		A	G	
2011	8-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1469	CYROMAZINE	0.860175	6.9		A	G	
2011	5-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1469	CYROMAZINE	0.860175	6.9		A	G	
2011	20-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.3963	CYROMAZINE	1.047225	8.4		A	G	
2011	19-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1469	CYROMAZINE	0.860175	6.9		A	G	
2011	11-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.16	CYROMAZINE	0.87	7		A	A	
2011	12-Aug-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.1638	CYROMAZINE	0.87285	7		A	G	
2011	12-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.405	CYROMAZINE	1.05375	8.45		A	G	
2011	15-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.4	CYROMAZINE	1.05	8.45		A	A	
2011	23-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.4	CYROMAZINE	1.05	8.45		A	A	
2011	12-Sep-11	MONTEREY	ONIONS (GREEN)	TRIGARD	1.405	CYROMAZINE	1.05375	8.45		A	G	
2011	1-Sep-11	VENTURA	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	0.29	CYROMAZINE	0.2175	4.41		P		
2011	1-Feb-11	VENTURA	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	64.04	CYROMAZINE	48.03	970.24		P		
2011	1-Jan-11	VENTURA	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	56.82	CYROMAZINE	42.615	860.9		P		
2011	1-Dec-11	VENTURA	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	1.2413	CYROMAZINE	0.930975	300.93		P		
2011	1-Apr-11	VENTURA	ONION (DRY, SPANISH, WHITE, YELLOW, RED, ETC.)	TRIGARD OMC	1.0913	CYROMAZINE	0.818475	16.54		A	G	
2011	18-Jan-11	VENTURA	ONIONS (GREEN)	TRIGARD	3.61	CYROMAZINE	2.7075	21.7		A	G	
2011	30-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	3.87	CYROMAZINE	2.9025	23.31		A	G	
2011	22-Oct-11	VENTURA	ONIONS (GREEN)	TRIGARD	4.67	CYROMAZINE	3.5025	28.1		A	G	
2011	29-Jul-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.805	CYROMAZINE	1.35375	10.86		A	G	
2011	16-Jul-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.33	CYROMAZINE	0.9975	8		A	G	
2011	24-Sep-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.829	CYROMAZINE	1.37175	11		A	G	
2011	3-Jun-11	VENTURA	ONIONS (GREEN)	TRIGARD	0.49	CYROMAZINE	0.3675	3		A	G	
2011	29-Jul-11	VENTURA	ONIONS (GREEN)	TRIGARD	2.12	CYROMAZINE	1.59	12.8		A	G	
2011	28-Mar-11	VENTURA	ONIONS (GREEN)	TRIGARD	4.11	CYROMAZINE	3.0825	24.72		A	G	
2011	24-Sep-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.496	CYROMAZINE	1.122	9		A	G	
2011	9-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.79	CYROMAZINE	1.3425	10.8		A	G	
2011	4-Oct-11	VENTURA	ONIONS (GREEN)	TRIGARD	2.01	CYROMAZINE	1.5075	12.1		A	G	
2011	7-Feb-11	VENTURA	ONIONS (GREEN)	TRIGARD	3.68	CYROMAZINE	2.76	22.11		A	G	
2011	9-Sep-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.97	CYROMAZINE	1.4775	11.9		A	G	
2011	28-Sep-11	VENTURA	ONIONS (GREEN)	TRIGARD	0.831	CYROMAZINE	0.62325	5		A	G	
2011	20-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.38	CYROMAZINE	1.035	8.31		A	G	
2011	12-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.67	CYROMAZINE	1.2525	10.08		A	G	
2011	22-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	0.82	CYROMAZINE	0.615	4.94		A	G	
2011	18-Aug-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.8	CYROMAZINE	1.35	10.86		A	G	
2011	4-Jun-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.895	CYROMAZINE	1.42125	11.4		A	G	
2011	8-Jul-11	VENTURA	ONIONS (GREEN)	TRIGARD	2.06	CYROMAZINE	1.545	12.4		A	G	
2011	15-Jul-11	VENTURA	ONIONS (GREEN)	TRIGARD	1.72	CYROMAZINE	1.29	10.4		A	G	