Sent via email to: TreatedSeeds@cdpr.ca.gov

February 11, 2022

Ms. Jennifer Teerlink
CA Department of Pesticide Regulation
1001 I Street, P.O. Box 4015
Sacramento, California 95812-4015

Re: Comments Regarding Treated Seeds

Dear Ms. Teerlink:

I am the Executive Director of the California Specialty Crops Council. The California Specialty Crops Council (CSCC), a 501(c) 5 non-profit organization, is a trusted source of field-based information spanning horticultural crop production, pest management, food safety and stewardship activities in fruit, root, vegetable, and vine crops (fresh, dried, and processed). Combined, CSCC growers generate $5.0 billion annually on approximately 513,000 acres of California farmland. Our members include:
CA Cherry Board, CA Prune Board, CA Fresh Carrot Advisory Board, CA Garlic and Onion Research Advisory Board, CA Leafy Greens Research Program, CA Melon Research Board, CA Pear Advisory Board, CA Pepper Commission, and the California State Beekeepers Association.

The CSCC is committed to transparent scientific and technical exchange, responsible agricultural practices and effective public policy solutions developed through partnerships with the scientific community, policymakers, and other stakeholders in agriculture.

I would like to comment regarding treated seeds and provide answers to the questions posed by the Department on November 15, 2021.

- What California crops are typically grown from pesticide-treated seeds? Treated seeds are used on a large number of crops in California including alfalfa, beans, corn, sugar beets, sunflower, spinach, broccoli, cucurbits, cotton, and onions. It should be remembered that treated seeds serve as a critical component of IPM programs as they can reduce non-target exposure and reduce environmental impact and may decrease the need for supplemental foliar applications.

  Is there anyindustry tracking of what portion of those crops rely on pesticide-treated seeds?

  There is tracking of crops relying on treated seed. Bayer and Syngenta are the most active. But we don't have any details for this.

- Is there any tracking of how much (e.g., acres treated, pounds applied) total pesticide-treated seed is planted in California?

Most vegetable seeds get treated in California. As an example, onion seed is sent to a seed treater and they apply both insecticides and fungicides to the same seed. Rates are based on the federal label. We believe that the seed treaters report their seed treated volume, but not sure who to. Maybe the American Seed Trade Association or the California Seed Association.

- What kind of insect or other pest pressures do seeds face?

Seed treatments have replaced a number of at planting pesticide applications, such as chlorpyrifos. The utility of seed treatments is that it allows for early season protection for germinating and emerging plants. Our onion members use Supresto (clothianidin + imidacloprid) and FarMore FI500 (spinosad + thiamethoxam) on onions in the Tulelake region. These are the primary seed treatments for onion seed and are beneficial for control of Onion Maggot and Seedcorn Maggot. Per the Pest Management Strategic Plan for Dry Bulb Storage Onions in the United States (sections attached), the seedcorn maggot feeds on both the seeds and the emerging seedlings of onions. Both species feed on the roots or leaves of the developing onion plant. Larval feeding reduces plant vigor and often results in plant death; plant stand can be reduced substantially if the onions are not protected at planting. Larval feeding also can increase rot when the bulbs are in storage. Also, feeding by onion maggot larvae has been implicated in spreading bacteria that cause bacterial soft rot. Again, these are early season pests/diseases that can wipe out large sections of crops as seeds germinate and put out first leaves. Our leafy greens members report spinach is often coated with Thiram for damping off issues. Broccoli may be coated with NipsIT (Clothianidin) for protection against the Bagrada bug.

- For crops that use pesticide-treated seeds, are these primarily imported, treated in California at a treatment facility or seed retailer, or treated on site?

Basically, on-site treatment of seeds is a thing of the past. Gone are the days when a batch of treatment was mixed up at the planting site. The onion seeds are treated in Salinas by Incotec. Also, Germains, Seed Dynamics and Syngenta Seed are all in the Salinas area.

- Is there any industry tracking or documentation that details how much pesticide treated seed is imported into California for use in California?

There may be some corn and cotton treated seed brought into California, but most all the vegetable seeds are treated in California.

- How much seed treatment product does the seed retain versus how much is lost in the treatment process? What information is available on the mass of pesticide on the seed at the time of planting?

Seeds are dosed at the recommended rate/acre of pesticide that would/could be applied legally alone. Most seeds get 0.5 mg to 1.25 mg per seed, depended on size of the seed. With the new systems for seed coating, dust is no longer an issue, and no pesticide is lost.

- The peer-review literature heavily focuses on environmental impacts from neonicotinoid-treated seeds. Is there information focused on other active ingredients utilized in pesticide-treated seeds?

Corn, cotton and soybean seeds have been treated with insecticides and fungicides long before the neonicotinoids became available. Chemicals include Abamectin, mefenoxam, (Apron) thiram, Rally, biologicals like Rhizobium, several organic pesticides and some fertilizers.

- Is there any information on the relative environmental impact of pesticide-treated seeds versus other application methods?

We believe there is data, but not sure who has it. Possibly the American Seed Trade Association (ASTA), which has seed treatment guides for farmers and applicators on their website, www.seed-treatment-guide.com. Data also shows seed treatments significantly reduces the amount of pesticides used through conventional delivery methods. If the seed and emerging seedling are protected, then this gives the plant early protection and develops a healthy plant that will need less subsequent sprays for diseases and insects that would impact plant health.

We trust CDPR will finalize their re-registration findings based on sound science and field data, and will think through IPM, seed treatments and resistance management requirements as the Department moves forward on its re-registration of these important crop care materials, especially regarding use on California onions, and leafy greens. The specialty crops growers we represent are supportive of the seed treatments. Seed treatments allows plants to get off to an early start, and these plants will need less subsequent sprays that would impact plant health.

Please let us know if we can answer any questions.

Respectfully submitted,

Gary W. Van Sickle

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Attachment: Excerpts from the Dry Bulb Storage Onions Pest Management Strategic Plan

Pest Management Strategic Plan
for

Dry Bulb Storage Onions

in

the United States

Lead Author

Dr. Howard Schwartz
Department of Plant
Pathology Colorado State
University

Approved by an Industry Review on
December 12, 2012

Las Cruces, NM

Contact Agency:
Western Integrated Pest Management Center
http://www.wripmc.org

This project was originally sponsored by the Western Integrated Pest Management Center , which is funded by the United States Department of Agriculture,

National Institute of Food and Agriculture.

Note: This document was revised in 2013 from the 2004 PMSP for Dry Bulb Storage Onions in Western States and the 2005 PMSP for the Michigan Onion industry to represent input-ji om and strategy of the U.S. Onion industry for 2013 - 2022.

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Pre-Plant

In most of the onion-growing regions of Colorado, Idaho, Oregon, Utah, and Washington, field preparation for establishment of an onion planting begins the fall prior to planting; in some areas, field preparation begins in early spring of the planting year. For example, in western Oregon, field preparation is more commonly done in the spring because of fall and winter rains. In New Mexico, onions are sown in both spring and fall, and field preparations occur just before planting. Planting in all other northern regions generally occurs in March and April.

Prior to planting, growers have their soil analyzed to identify available soil nutrients. Based on results of the soil tests, major and minor plant nutrients are usually applied to the soil prior to planting. Nitrogen fertilizer is typically applied as a side dressing or through the sprinkler or drip irrigation system after planting. A soil test to determine occurrence and population of plant parasitic nematodes is taken prior to planting; fields with significant levels of nematodes are avoided or treated pre-plant with a soil fumigant. Cover crops are planted in the fall or early spring by many growers to reduce crop injury, especially those farming sandy soils in windy areas. Growers generally avoid planting a cover crop that is a known host for nematodes; however, cereal grains, which can be a host for some nematodes, are often used as a cover crop because of their ability to prevent soil erosion and protect young onion seedlings from sand blasting. Careful timing is essential to kill the cover crop with herbicides or tillage to avoid suppressing onion growth. Planting into the cover crop residue in the spring provides wind erosion protection. Onions have foliage that is sparse, slow to develop, and competes poorly with weeds or a cover crop.

In preparation for planting, the soil is worked to produce a smooth surface. If the soil is to be fumigated, it is often done at this time (or in the previous fall) for control of nematodes, soil- dwelling insects, soil-borne diseases, and weeds. Beds are then created for planting.

Field activities that may occur during **Pre-plant** (Appendix 1):
Planting cover crop
Soil tillage
Cover crop removal (herbicide or tillage)
Soil sampling for nutrients or nematodes
Scouting for weeds and insects
Bed preparation and shaping
Soil fumigation
Fertilizing
Pre-plant herbicide application

Insects and Mites (Appendix 3)

Many different types of insect pests can be found in the soil prior to planting, depending on the previous crop and the history of the field. Armyworms and cutworms are often present at this crop stage but control measures are not usually initiated at this time.

Farming practices prior to planting can impact the control of maggots and other soil-dwelling insects. Because maggot pupae and other insects overwinter in the soil, operations that disturb their habitat can reduce their populations. Field operations that can be beneficial include crop rotation, plowing, incorporation of previous onion crop residues, and destruction of cull piles.

When economically feasible, maintaining a fallow season for onion fields will also reduce the survival of soil-borne insects that have a limited ability to seek out new hosts.

Crop rotation is a practice commonly used to mitigate soil insects such as maggots, symphyla, or wireworms that can damage onions. Continual production of onions in the same field year after year will result in the establishment of resident populations of onion insect pests (and will build up populations of stem and bulb nematodes). Rotating onions with non-susceptible crops such as cereals can reduce some insect populations due both to the rotation crop's lack of susceptibility and to the cultural practices used to produce those crops.

Onion Maggot *(Delia antiqua)* and Seedcorn Maggot *(Delia platura)*

Onion maggot and seedcom maggot larvae are nearly identical, but can be morphologically differentiated by structures on the posterior end. The seed com maggot larva is generally smaller than the cream colored onion maggot larva; and is white to whitish yellow, cylindrical, and tapered with the smaller end in front. Both species feed on the roots or leaves of the developing onion plant. Larval feeding reduces plant vigor and often results in plant death; plant stand can be reduced substantially if the onions are not protected at planting. Larval feeding also can increase rot when bulbs are in storage. Feeding by onion maggot larvae has been implicated in spreading bacteria that cause bacterial soft rot.

Pupae of these insects overwinter in the soil, and adults (flies) emerge in the spring. The onion maggot has three generations per season, whereas the seedcom maggot has at least three generations. First-generation larvae are the most damaging to the crop compared with subsequent generations because their damage often results in seedling death. A single larva can destroy up to 30 seedlings and can move between adjacent plants. Onion maggot and seedcorn maggot are most problematic in muck fields and other fields that have high organic content, such as those coming out of pasture or where manure was applied the previous year.

Chemical Control.

None

Cultural Control.

Crop rotation: Rotating onions with non-susceptible crops such as cereals can reduce maggot populations due both to the rotation crop's lack of susceptibility and to the cultural practices used to produce those crops.

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.

Wireworms *(Limonius* spp.)

Wireworms are the soil-dwelling larvae of click beetles. The adults are slender, tan to nearly black and about three-eighths of an inch long. The larvae are hard, segmented, three-eighths to half an inch long, and dark yellow or brown. They can be found in the soil prior to planting, especially if the field has been rotated recently out of pasture or non-row crops.

Wireworms are found in most onion production areas but Washington growers report limited wireworm damage.

Chemical Control.

Pre-plant soil fumigation may be practiced to control wireworms and other insects that are found in the soil prior to planting. Soil fumigation is accomplished with such Restricted Use Products as dichloropropene(Telone II), dichloropropene+ chloropicrin(Telone C-17 or Telone C-35)).

Diazinon can be used as a pre-plant broadcast application but has not proven to be effective. None of the registered and labeled biocontrol tools is effective for wireworms.

Cultural Control.

Crop rotation: Rotating onions with non-susceptible crops such as cereals can reduce wireworm populations due both to the rotation crop's lack of susceptibility and to the cultural practices used to produce those crops.

Biological Control.

None known.

Bulb Mites *(Rhizoglyphus* spp.)

Bulb mites are shiny, creamy white, bulbous shaped, and less than a sixteenth of an inch long. The mites overwinter in decaying vegetation of weeds or a previously planted vegetable crop that remains in the soil. Injury to the base of onion plants may occur from germination to early vegetative growth, resulting in death of seedlings (pre- or post-emergence). Symptoms closely mimic those associated with damping off. Most damage results from incidental fungal and bacterial rots that develop around points of injury produced by bulb mite feeding.

Chemical Control.

Pre-plant soil fumigation can be used to control insect and mite pests that are found in the soil prior to planting. Soil fumigation is accomplished with such Restricted Use Products as dichloropropene (Telone II), dichloropropene+ chloropicrin (Telone C-17 or Telone C-35), and sodium methyldithiocarbamate (Vapam).

Cultural Control.

Crop rotation: Growers discourage bulb mite build-up by avoiding successive allium crops.

Cull and crop residue management: Bulb mite populations can be reduced by allowing crop residues to fully decompose fully prior to planting onions. Fallowing to allow complete decomposition of organic matter reduces field populations of the bulb mite but is seldom

feasible economically.

Biological Control.
None known.

Critical Needs for Management of Insects in Onions: Pre-Plant

RESEARCH

- Identify the impacts of 1PM and cultural practices on bulb mites.
- Determine the effects of green manure crops on insect pests found in the soil prior to planting.
- Develop a prediction model for potential for maggot damage.

REGULATORY

- Registration of alternative products such as fipronil and cyfluthrin + tebupirimphos (Aztec) for control of wireworms and maggots.

EDUCATION

- Invite EPA to visit onion fields in the western states to observe production practices and pest problems.

Diseases (Appendix 2)

Many different fungal pathogens reside in the soil or in decaying organic matter in the soil. Control of these pathogens prior to planting can eliminate the need for control measures later in the growing season and subsequently help increase plant vigor and improve quality and yield of the onion crop.

Black Mold *(Aspergillus niger)*

This fungal pathogen overwinters in cull piles, crop debris, and soil. It can be transmitted via infested seed. Damage from black mold affects the bulb. Infected bulbs have a black discoloration at the neck, on the outer scales, and between the scales. Advanced stages of the disease can cause the onion bulb to shrivel.

Chemical Control.

Pre-plant soil fumigation can help reduce the severity of black mold; however, the pathogen can easily re-contaminate treated soil by fungal spore movement from other sites. Soil fumigation is accomplished with such products as chloropicrin, dichloropropene+ chloropicrin (Telone C-17 or Telone C-35), and sodium methyldithiocarbamate(Vapam).

Cultural Control.

Eliminate cull piles and onion debris from the field.

Crop rotation: Rotate out of *Allium* crops for at least three years.

Assay seed lots and select lots with low *Aspergillus* levels. Seed treatment with fungicides such as boscalid + pyraclostrobin (Coronet) can reduce seed infection levels and seed transmission.

Planting through Emergence (up to and including flag leaf stage)

Most dry bulb onions are direct seeded with precision planters; planting occurs primarily from early March through April. A small percentage of the crop is seeded in the fall. Some onion seed is coated with fungicides to combat soil-borne diseases such as smut and damping-off.

The soil should be moist at planting and irrigated once the onion seedlings have emerged. Growers in some areas irrigate after planting to assist with germination and to help with seedling emergence (irrigation prevents the soil from crusting and thus aids in emergence). Transplanted onions require irrigation immediately after planting. Emergence is the point at which the flag leaf (thin, curved, cotyledonal leaf) has emerged from the soil. It can take from IO to 30 days after seeding before a seedling emerges and a flag leaf is present.

Field activities that may occur during Planting through Emergence (Appendix 1): Scouting for weeds and insects

Fertilizing

Planting (seeds or transplants)
Irrigation

Pre-emergence herbicide application
Breaking soil crust to allow for
emergence

Insects and Mites (Appendix 3)

Bulb mites, wireworms, armyworms, and cutworms can be present at planting through emergence but are not treated at this time. Thrips usually are not present at this stage, but a systemic insecticide applied at planting may suppress thrips on young plants early in the season.

Onion Maggot *(Delia antiqua)* and Seedcorn Maggot *(Delia platura)*

The pupa of these insects overwinter in the soil and can be very problematic in fields with high organic matter. Feeding by onion maggot larvae reduces plant vigor and can increase incidence of rot when bulbs are in storage. The seedcorn maggot feeds on both the seeds and the emerging seedlings of onions. Plant stands can be reduced if populations are high.

Chemical Control.

Insecticides applied at planting as either seed treatments or in-furrow drenches/other at-plant applications are the most effective means of managing onion maggot and seedcorn maggot infestations in seeded onions. Seed treatments include cyromazine (Trigard 75WP), clothianidin + imidacloprid (Sepresto) and spinosad + thiamethoxam (FarMore FI500).

Sepresto and FarMore FI500 also include fungicides and are marketed as insecticide and fungicide packages for early-season insect and disease control. Trigard may not be as effective against seedcorn maggot as onion maggot.

Diazinon and Lorsban are applied to the soil at the same time onion seeds are planted. In the Great Lakes region, there is widespread resistance in onion maggot populations to Lorsban. Growers in this region typically use a combination of Trigard-treated seed and an at-plant application of Lorsban. For transplanted onions, only Lorsban may be applied over the top after transplanting. Other products that are more effective than Lorsban for protecting transplanted onions are needed.

Editorial Note: Lorsban (chlorpyrifos) has been removed from label in late Summer 2021.

Cultural Control.

Cultivation: Plowing and cultivation in preparation for establishment of onion seedbeds can reduce maggot populations at the time of planting, especially if soils have warmed up prior to planting.

Cull and crop residue management: Cull onions and onion crop residues can be a source of maggots that can infest the newly planted onion crop. Cull piles should be well removed from production fields and crop residues should be well chopped and incorporated at planting time.

Biological Control.

None known.

Bulb Mites *(Rhizoglyphus* spp.) Described in Pre-Plant section

Chemical Control.

Pre-plant soil fumigation can be used to control insect and mite pests that are found in the soil prior to planting. Soil fumigation is accomplished with such Restricted Use Products as dichloropropene (Telone II), dichloropropene+ chloropicrin (Telone C-17 or Telone C-35), and sodium methyldithiocarbamate (Vapam).

Cultural Control.

Crop rotation: Growers discourage bulb mite build-up by avoiding successive allium crops. Cull and crop residue management: Bulb mite populations can be reduced by allowing crop residues to fully decompose prior to planting onions. Fallowing to allow complete decomposition of organic matter reduces field populations of the bulb mite but is seldom feasible economically.

Biological Control.

None known.

Critical Needs for Management of lnsects in Onions: Planting through Emergence

RESEARCH

- Research chemical, cultural, and biological controls for onion and seedcorn maggot.
- Identify insecticides (applied at planting or to seed) that might be efficacious for onion thrips and western flower thrips, which become problematic later in the season.

REGULATORY

- None.

EDUCATION

- Educate regulators on the need for a speedy registration process.

  Invite EPA to visit onion fields in the western states to observe production practices and pest problems.