



Strategies to Control Weevils in Grain Storage Facilities

Weevils in grain storage facilities can be a difficult pest to control. There are many species, such as the rice weevil (*Sitophilus oryzae*), maize weevil (*Sitophilus zeamais*), and the granary weevil (*Sitophilus granarius*). These weevils are easily identified from other grain insects by their long proboscis or snout. Their mouthparts are at the end of the snout. The female chews a hole in a kernel of grain and deposits an egg inside the kernel. She then seals the egg inside the grain where the juvenile will go through its entire life cycle and emerge as an adult. Go to <http://ento.psu.edu/extension/factsheets/weevils-on-stored-grain>* for details on the insect's biology.

Because of the way weevils transform from egg to adult and isolate themselves inside the grain kernel, they can be difficult to control. However, an effective way to control them is with an insecticide that kills the adults on contact such as Centynal™ Insecticide.

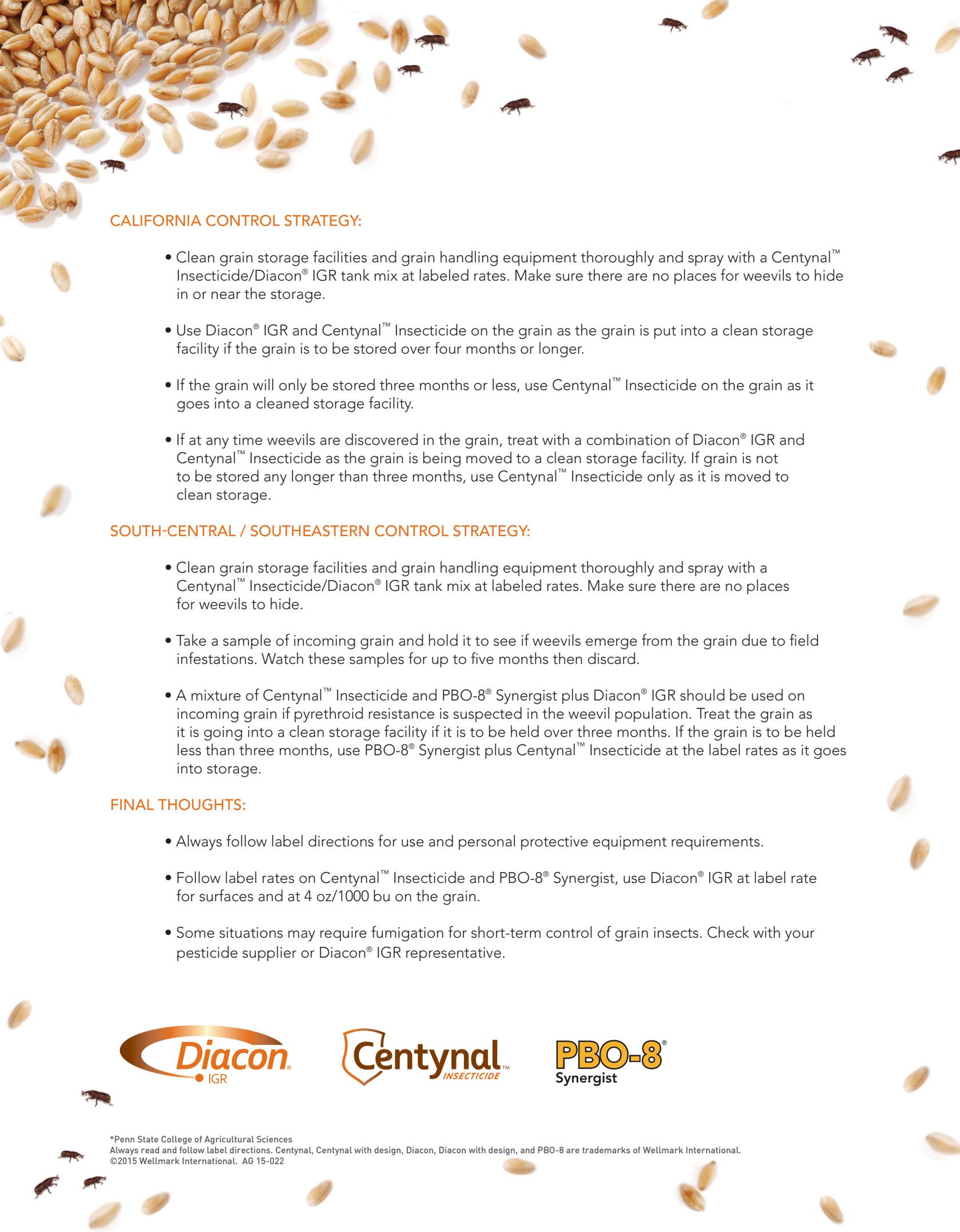
There are at least three situations where the control of the weevil requires a different approach to effectively control these insects:

- The first of which might be found in the **PACIFIC NORTHWEST**, where the insects are not common, but have been introduced into a few grain handling facilities. They are finding places to hide out (harborage) in the facility or nearby, and infesting new grain while in storage.
- The second situation which you might find in **CALIFORNIA** is where the insect is common, but is not dispersed widely in the environment, and not causing field infestations. In this situation, there does not seem to be resistance to pyrethroid chemistry.
- A third situation might be seen in the **SOUTH-CENTRAL** and **SOUTHEASTERN** parts of the US, where weevils are in the field and in the grain facilities. Some of the insect populations may have developed resistance to pyrethroid chemistry. Field infestations can occur as well as insects moving to the grain after it is in storage.

Centynal™ Insecticide has been evaluated in the laboratory and in university trials, and shown to be an effective tool in weevil management. In pyrethroid resistant populations, the addition of PBO-8® Synergist has improved the performance and control that Centynal™ Insecticide offers. Centynal™ Insecticide is effective for approximately 90 days. The addition of Diacon® IGR may be added in cases where long-term storage is needed. Diacon® IGR provides protection for other invading stored product pests. If weevils are seen during monitoring after about 90 days, then fumigation or turning the grain and retreating with Centynal™ Insecticide will be necessary.

PACIFIC NORTHWEST CONTROL STRATEGY:

- Clean grain storage facilities and grain handling equipment thoroughly and treat with a Centynal™ Insecticide/Diacon® IGR tank mix at labeled rates. Make sure there are no places for weevils to hide.
- Check all incoming loads for insects; especially if coming from suspected sources of weevils. Hold a sample of suspected weevil infested grain in a jar so you can observe it for a few months.
- Treat all incoming grain that might be stored more than a few months with Diacon® IGR.
- If weevils begin to show up in storage, turn the grain and treat it with Centynal™ Insecticide or fumigate. If the grain will be stored in ground piles, consider treating the grain with Centynal™ Insecticide at the label rate and Diacon® IGR at 4 oz/1000 bu from the beginning, especially if weevils are suspected with the incoming grain.

The background of the entire page is a white surface scattered with golden-brown grains and several small, dark brown weevils. The grains are most concentrated in the top-left corner, with a few weevils scattered throughout the upper half of the page.

CALIFORNIA CONTROL STRATEGY:

- Clean grain storage facilities and grain handling equipment thoroughly and spray with a Centynal™ Insecticide/Diacon® IGR tank mix at labeled rates. Make sure there are no places for weevils to hide in or near the storage.
- Use Diacon® IGR and Centynal™ Insecticide on the grain as the grain is put into a clean storage facility if the grain is to be stored over four months or longer.
- If the grain will only be stored three months or less, use Centynal™ Insecticide on the grain as it goes into a cleaned storage facility.
- If at any time weevils are discovered in the grain, treat with a combination of Diacon® IGR and Centynal™ Insecticide as the grain is being moved to a clean storage facility. If grain is not to be stored any longer than three months, use Centynal™ Insecticide only as it is moved to clean storage.

SOUTH-CENTRAL / SOUTHEASTERN CONTROL STRATEGY:

- Clean grain storage facilities and grain handling equipment thoroughly and spray with a Centynal™ Insecticide/Diacon® IGR tank mix at labeled rates. Make sure there are no places for weevils to hide.
- Take a sample of incoming grain and hold it to see if weevils emerge from the grain due to field infestations. Watch these samples for up to five months then discard.
- A mixture of Centynal™ Insecticide and PBO-8® Synergist plus Diacon® IGR should be used on incoming grain if pyrethroid resistance is suspected in the weevil population. Treat the grain as it is going into a clean storage facility if it is to be held over three months. If the grain is to be held less than three months, use PBO-8® Synergist plus Centynal™ Insecticide at the label rates as it goes into storage.

FINAL THOUGHTS:

- Always follow label directions for use and personal protective equipment requirements.
- Follow label rates on Centynal™ Insecticide and PBO-8® Synergist, use Diacon® IGR at label rate for surfaces and at 4 oz/1000 bu on the grain.
- Some situations may require fumigation for short-term control of grain insects. Check with your pesticide supplier or Diacon® IGR representative.

