RAATs brochures explain both aerial and ATV application strategies.

Takes bran bait well. Pest of forage and crops. Peak hatch range: May 15 – June 15. Female body length:

Grasshopper Life Cycle
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How to evaluate grasshopper density

Reason: It is important to accurately estimate grasshopper pop-

ulation density during the peak of hatching. AFA is used to determine the

Number of grasshoppers per square yard's worth of grasshoppers

on an area.

Egg-pod and loose eggs of

(REDLEGGED GRASSHOPPER)

Third and fourth instars are usually 1½ to 2½ inches long and have

fifths instars are usually more than 1½ inches long.

1. Hatching usually occurs mid-May to late June. A few species hatch in the summer and overwinter as nymphs.

2. Grasshoppers have to shed their hard exoskeleton to grow bigger through each nymphal phase (instar) to adulthood. They often hang upside down on grass stems to molt. It takes five to seven days to complete an instar.

3. Most species have few nymphal instars.

4. The last molt results in an adult with functional wings that allow low, soaring flights. Some species have two to five or more instars and adults, and also help keep grasshopper densities in check.

How to use ATVAAs

1. Apply carbaryl at 3/4 lb/a or carbaryl at 1 lb/a. Aim for a final spray swath width of 15 feet. Apply during the active growth stage of your plant.

2. Many insecticides such as diazinon (a broad-spectrum insecticide) are effective for controlling grasshoppers at a low rate, but many are not effective at high rates. Carbaryl is a broad-spectrum insecticide that is effective against a wide range of grasshopper species. It is effective against grasshoppers regardless of the agent and swath width. In some cases, costs can be reduced from levels recommended by the label, and untreated swaths are alternated with treated swaths. RAATs work with a narrow spray pattern and a high volume of water, which helps to disperse the insecticide over a large area. This method normally will result in 80 to 95% control, which is effectively increases the amount of seedbroke used by more than 10%.

3. Some species of grasshoppers have relatively low volume and fine spray, so several acres can be treated with a single pass. Many species of grasshoppers will be killed at this concentration. Use a spacing plan that allows for adequate coverage.

4. When grasshopper populations are low, a lower rate of insecticide can be used. This will help keep grasshopper densities in check.

5. The choice of a treatment option depends on the size of the population, the type of vegetation, and the location of the crop.

Steps to Estimate Grasshopper Density

1. A few grasshoppers may be present in a square-foot survey hoop to consistently estimate the area of the ground.

2. Sweep the square-foot survey hoop at least 3 times from the center outward.

3. Count the number of grasshoppers in the square-foot survey hoop that jump, and use a biconvex estimate. The total number of grasshoppers per square yard for that area is estimated using the following formula:

4. Step 1: Identify the number of grasshoppers per square yard in the treated area.

5. Step 2: Use the following formula to estimate the number of grasshoppers per square yard for the entire area:

6. Step 3: Add the number of grasshoppers per square yard to the number of grasshoppers per square yard for the untreated area to estimate the total number of grasshoppers per square yard for the entire area.

How to use RAATs

1. RAATs are applied to native and non-native grasses. The Grasshopper Life Cycle is divided into seven nymphal instars. The insecticide used is carbaryl. Carbaryl is applied to grasses in a single pass with a boomless nozzle that can produce a 12 to 20-foot spray swath. The nozzle is fine-tuned to provide a spray pattern that is narrow enough to reduce drift and maximize coverage. The boomer can be used for high-volume, low-volume, or in between. The nozzle is fine-tuned to provide a spray pattern that is narrow enough to reduce drift and maximize coverage. The boomer can be used for high-volume, low-volume, or in between.

2. RAATs can be used to control grasshoppers in a variety of environments, including agricultural, rangeland, and urban areas. The insecticide used is carbaryl. Carbaryl is applied to grasses in a single pass with a boomless nozzle that can produce a 12 to 20-foot spray swath. The nozzle is fine-tuned to provide a spray pattern that is narrow enough to reduce drift and maximize coverage. The boomer can be used for high-volume, low-volume, or in between.

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