

## Fire Ant Bait Broadcast Application Guide

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### GROUND APPLICATION OF BAIT FORMULATED FIRE ANT PRODUCTS

Broadcast application of bait-formulated insecticides is the most cost-effective means of controlling the red imported fire ant, *Solenopsis invicta* Buren, on large areas.

Conventionally formulated fire ant bait products contain processed corn grits coated with soybean oil, which is attractive foraging ants when fresh. Ants carry the bait or lick off the soybean oil and transport it back to the colony where it is fed to the remaining colony members. The active ingredient is dissolved in the oil. Hydramethylnon (AMDRO®, SIEGE®), when applied at a rate of 1 to 1 ½ pounds per acre, provides its maximum control 3 to 6 weeks after application. Fenoxycarb bait products (Logic®, Award®) work slower than hydramethylnon baits. Abamectin bait (Ascend®) is intermediate in speed of activity.

Each fire ant insecticide bait product will be accompanied with its directions for proper use. These label directions should be followed closely to avoid problems to the user or the environment. As an example, AMDRO® is labeled for use on lawns, golf courses, non-food bearing ornamentals, sod farms, pastures, range grass, and non-cropland areas [NOTE: AMDRO® is not labeled for use in home gardens or similar areas where food crops are grown]. Treatments should be made when ants are actively foraging for food, usually when temperatures are between 65 and 95 degrees Fahrenheit. The bait should not be applied to wet ground or if rain is expected. Wetting the bait will cause it to become soggy and unattractive to ants. AMDRO® can be applied either to individual mounds (5 tablespoons/mound) or broadcast at the rate of 1 to 1.5 pounds per acre. For larger areas, broadcasting the bait is more economical and less labor intensive than

individual mound treatments. Hand seeders and chest spreaders are ideal for medium sized areas. Large areas may require a Herd GT77-A1 seeder/spreader or aerial application.

Herd GT77 Seeders for Application of Fire Ant Bait Conventionally-formulated insecticide bait products (e.g., AMDRO<sup>®</sup>, SIEGE<sup>®</sup>, Logic<sup>®</sup>, Award<sup>®</sup>, Ascend<sup>®</sup>) marketed to treat populations of the red imported fire ant are applied at a rate of 1 to 1 ½ pounds of product per acre. The only applicators currently available for applying these materials to large areas using ground equipment are the Herd GT Seeders. These seeders are electrically driven using power from a standard 12-volt battery, and they can be mounted on nearly any vehicle (to be specified when ordering).

Three models of Herd GT Seeders are sold:

- 1) GT77 has an adjustable opening at the bottom of the hopper that allows for calibration of product flow;
- 2) GT77A has a fixed plate developed to apply AMDRO<sup>®</sup> or SIEGE<sup>®</sup> (hydramethylnon) bait products; and,
- 3) GT77L has a fixed plate developed to apply Logic<sup>®</sup> or Award<sup>®</sup> (fenoxycarb) bait products. For the GT77A & L models, application rate is affected only by the speed driven during treatment.

Depending on the model selected and the type of mounting selected, prices range from \$271 to \$308 per unit. They are shipped directly from the factory via UPS. Information about these applicators can be found on the Web Site, <http://www.herdseeder.com/fire-ants1.html>.

David E. Herd, President of the Herd Seeder Company, Inc., has asked that those interested in purchasing applicators contact the manufacturer directly at:

Herd Seeder Co., Inc.  
P.O. Box 448  
Logansport, Indiana 46947-0448  
Phone: 219.753.6311  
Fax: 219.722.4106  
E-mail: [info@herdseeder.com](mailto:info@herdseeder.com)

### **AERIAL SPREADER EQUIPMENT/MODIFICATIONS**

Aerial application of a bait product through granular spreaders requires some simple spreader modifications to apply the product uniformly and at the proper rate. Modifications are required for several reasons: 1) the product will bridge in the hopper if not agitated; 2) due to the friable nature of and bait products, crushing the product onto metal surfaces will cause the material to cake; and 3) the low use rate requires uniform flow to be maintained through the hopper.

Transland high volume and slim line spreaders have been successfully used to apply AMDRO<sup>®</sup>. Transland Swathmaster or spreaders of similar design should NOT BE USED due to their potential to crush bait particles and cause caking of AMDRO<sup>®</sup>.

Two modification systems which have been tested and proven to accurately apply AMDRO<sup>®</sup> by air at required rates are described on the following pages.

### **MODIFICATION SYSTEM 1**

(Source: USDA-APHIS-PPQ Aircraft and Equipment Operations, Mission, Texas)

This system has been utilized on a Cessna 188 Ag-Truck.

**Ram Air Induction Tube:** A 1-1/2 inch diameter tube is attached to the outside of the hopper sub tank and extends outboard where it is mounted to the lower wing surface (Figure 1). The end of the tube requires a 45 to orient the tube into undisturbed air. Attachment to the hopper sub tank will require a 1 1/2-inch hole on the side of the sub tank to allow the insertion of the extended Air Agitation Tube.

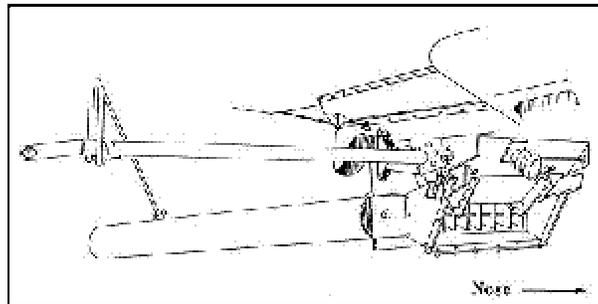


Figure 1. Ram air induction system

**Air Agitation Tube:** Extending from the ram air induction tube on the inside of the hopper is the air agitation tube, which contains a double row of 1/4-inch holes, covered with 50-mesh screen. (See Figure 2) Holes are drilled only on the topside of the tube and are oriented 45 degrees from vertical. The end of the tube is easily attached to the spray valve attachment point. The air agitation tube should be placed approximately 1 inch above the gate opening.

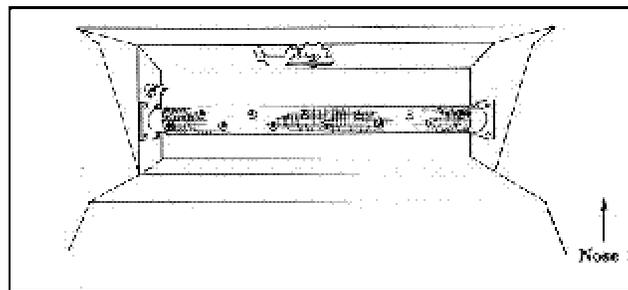


Figure 2. Air tube mounted at base of hopper

**Hopper Vent Tube Air Flow Regulator:** In order to adjust the flow of product precisely without altering the gate opening, which is set at 1/4 inch, a metal sleeve is used to adjust airflow into the hopper. (See Figure 3) This sleeve is constructed of sheet metal with an

adjustment nut to move the sleeve up or down the hopper vent tube to alter airflow. Duct tape may also be used to provide similar results.

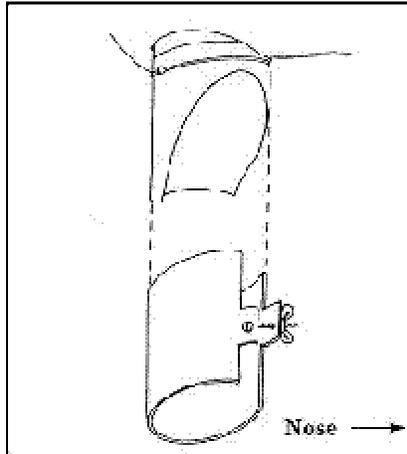


Figure 3. Hopper vent tube air flow regulator

## MODIFICATION SYSTEM 2

(Source: Don Graves, Custom Ram Air Induction Tube: Applicator, Navasota, Texas)

The following modification system been utilized on a Cessna Ag Wagon

Ram Air Induction Tube: A 1-inch diameter PVC tube 16 inches in length with a 45-degree elbow (See Figure 4) is installed through the spray pump inlet into the wind stream (See Figure 5). The end of the tube should be clamped to the spray pump mount to secure it.

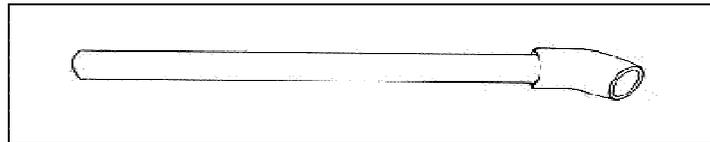


Figure 4. Ram induction tube

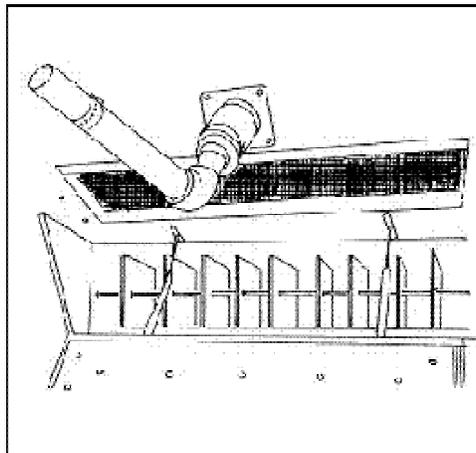


Figure 5. Ram air induction tube mounting

**Air Agitation Assembly:** This assembly consists of 1-inch PVC pipe, 1-inch "T" connector, and two 1-inch caps. Quarter-inch holes are drilled one inch apart and positioned to blow air down onto the bottom of the hopper gate.

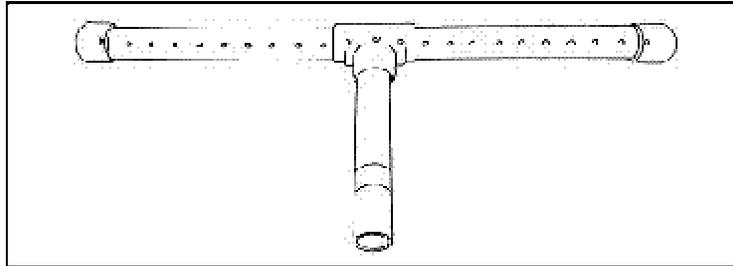


Figure 6. Air agitation assembly

**Adapter:** A 1/2-x 1 1/4-inch PVC bushing, housing a short piece of 1 1/4-inch PVC pipe (See Figure 7) slit on the sides is used to attach the ram air induction tube to the air agitation assembly through the spray pump inlet.

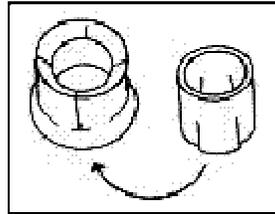


Figure 7. Adapter

**Gate Seal Plate:** A 1/8-inch metal or stainless steel plate should be cut to fit securely in the bottom of the hopper to close off the gate opening. Three 1/2-inch holes are drilled along the bottom edge (See Figure 8) to allow product to flow when the gate is opened. The air agitation assembly should be positioned 1/2 to 1 inch above the gate seal plate. Product flow is controlled by altering the size of the holes in the gate seal plate.

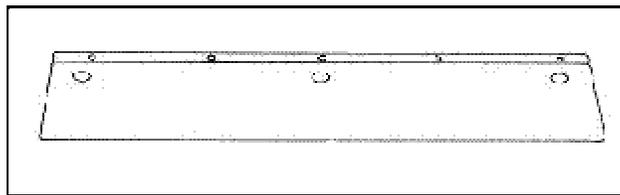
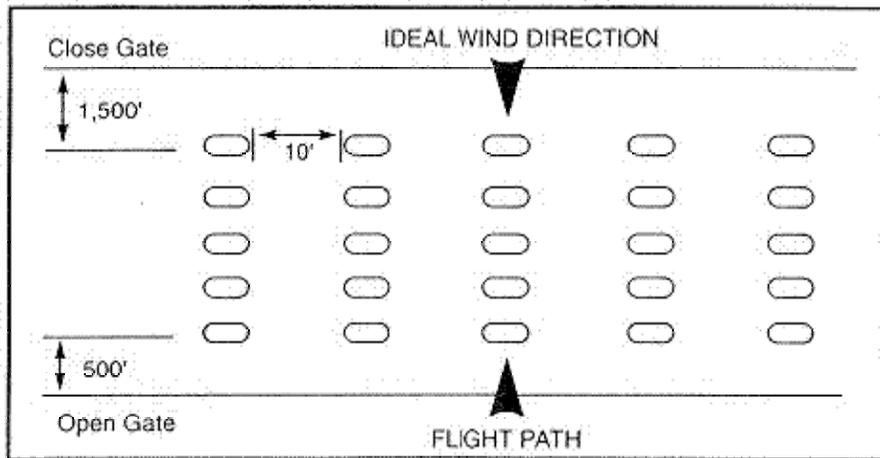


Figure 8. Gate seal plate

### SWATH CHECKS

Ideally, the application swath width should be checked under minimal or no wind conditions. If wind is present, the aircraft should fly directly into the wind to reduce the possibility of an altered swath width. Flying crosswind for swath checks will cause the bait to drift and result in a wider than normal swath.

To properly evaluate swath width, checks should be performed in an open area away from trees and other obstructions. Collection pans measuring 12 inches by 12 inches should be placed in a straight line 10 feet apart, oriented perpendicular to the line of flight. Enough pans should be placed to provide a collection area twice the expected swath width, in case the pilot does not fly directly over center or there is drift of bait due to wind.



Swath width evaluation

The widest effective swath is achieved by flying at an altitude equal to the wingspan. Flying lower will reduce swath width, while flying higher will not appreciably increase swath width.

A minimum 100 pounds of test material should be placed in the hopper for swath checks. The aircraft should be in level flight at the proper operating speed and altitude at least 1,000 feet before reaching the collection pans. Five hundred feet before reaching the collection pans, the gate should be opened and left open until 1,500 feet past the pans. It is also suggested that after closing the gate the aircraft remain in the same flight path for 10 seconds. Turning too soon or abruptly pulling up may distort the deposit pattern.

The overall swath width is determined by inspecting all collection pans for presence of at least one bait particle, and measuring the distance between the extreme pans containing bait. The effective or working swath width is considered to be 90% of the overall swath width.

### CALIBRATION

Once the swath width has been determined and the aircraft ground speed has been set, the number of acres covered per minute should be determined using Table 1.

The next step is to place a minimum of 100 pounds of product in the spreader hopper. Set the gate opening to 1/4-inch (a 1/4-inch drill bit can be used as a gauge) and perform a one minute calibration run at the set flying speed and altitude. It is best during calibration

runs to fly crosswind if wind is present. Flying upwind will reduce rate, flying downwind will increase rate.

After the one-minute calibration run, empty product remaining in the hopper and weigh it to determine the amount of product used. The amount used should be within 10% of the required amount.

**Table 1. TO DETERMINE THE NUMBER OF ACRES TREATED PER MINUTE**

ACRES PER MINUTE									
Flying Speed	Working Swath Width (ft.)								
(mph)	50'	55'	60'	65'	70'	75'	80'	90'	100'
75	7.58	8.33	9.09	9.85	10.61	11.36	12.12	13.64	15.15
80	8.08	8.89	9.70	10.51	11.31	12.12	12.93	14.54	16.16
85	8.59	9.44	10.30	11.16	12.02	12.88	13.74	15.45	17.17
90	9.09	10.00	10.91	11.82	12.73	13.64	14.55	16.36	18.18
95	9.60	10.56	11.52	12.47	13.43	14.39	15.35	17.27	19.19
100	10.10	11.11	12.12	13.13	14.14	15.15	16.16	18.18	20.20
110	11.11	12.22	13.33	14.44	15.56	16.67	17.78	20.00	22.22
120	12.12	13.33	14.55	15.76	16.97	18.18	19.39	21.82	24.24
130	13.13	14.44	15.76	17.07	18.38	19.70	21.01	23.64	26.26
140	14.14	15.56	16.97	18.38	19.80	21.21	22.63	25.45	28.28
150	15.15	16.67	18.18	19.70	21.21	22.73	24.24	27.27	30.30

Example: If the swath width was 65 feet and the flying speed was 110 mph, then 14.44 acres would be covered per one minute of application time. At a one-pound-per-acre rate (AMDFRO is applied at 1 or 1.5 pounds per acre), 14.44 pounds of product should be dispensed in a one minute calibration flight.

## ADJUSTMENTS / TROUBLESHOOTING

*Excessive Flow Rate.* If the flow rate per minute exceeds the desired rate with the recommended gate opening:

With **System 1**, reduce the amount of airflow into the hopper vent tube. This will reduce the hopper's internal pressure and ultimately reduce bait flow.

With **System 2**, the holes on the gate seal plate should be reduced, either by using tape or by replacing the gate seal plate with one that has smaller holes.

*Low Flow Rate.* If the flow rate per minute is below the desired rate:

With **System 1**, open the gate assembly 1/2 to 1 turn at the gate stop, or increase the amount of air flow into the hopper vent tube if airflow has been reduced.

With **System 2**, increasing the size of the three holes on the gate seal plate will be required.

*Product Flow.* If flow of product in the hopper appears to be a problem, the hopper may not have been dry prior to loading the bait product, causing bait particles to adhere to the hopper walls and gate area. The hopper can be easily dried by flying the aircraft with the gate open for several minutes.

*Air Agitation.* To ensure that good air agitation of the bait is taking place in the hopper, a visual inspection through the hopper sight glass can be made. Inspection should be made when the amount of product in the hopper is low, displaying strong blowing or fluffing of the product in the hopper.

### **SAFETY**

Before initiating a fire ant control program with a bait-formulated fire ant insecticide, it is essential to READ THE LABEL CAREFULLY.

Bait products, like AMDRO<sup>®</sup>, should be kept dry during storage in enclosed buildings, trailers, vans, etc. to eliminate the risk of the bait becoming wet and unusable. It is also suggested that baits be stored in a cool location. Storage of ant bait products for long periods of time in a hot location may cause the bait to become rancid, and reduce its attractiveness to the ants.

Empty bags or containers can be discarded at a sanitary landfill or incinerator.