

Converting Ag Aircraft for Mosquito Control

A Guide to Assist Aerial Applicators in Retrofitting Aircraft to Spray DIBROM & TRUMPET



 **AMVAC**



An increasing number of mosquito abatement districts, local governments, homes associations and public health departments are taking steps to manage mosquito populations in their communities, reducing the nuisance and health threats to humans and livestock. As a result, licensed professional aerial applicators are being contracted to apply mosquito-control products on a regular basis during the mosquito season.

This brochure provides general guidelines for converting equipment on most agricultural aircraft for the ultra low volume (ULV) application of DIBROM[®] Concentrate and TRUMPET[®] EC.

This information is critical because of the unique characteristics of the DIBROM / TRUMPET formulations and the large differences in how mosquito-control applications are made when compared to traditional agricultural pesticide applications.

Applicators must be aware that mosquito-control applications are made at much faster speeds and higher altitudes than typical agricultural applications.

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Product Information

Naled, the active ingredient in DIBROM Concentrate and TRUMPET EC, has been used in the United States and many countries around the world for more than 40 years to control adult mosquitoes. Both formulations are labeled for aerial application. However, due to the corrosive nature of the DIBROM and TRUMPET formulations, specialized equipment is required for handling, storage and application.

The correct retrofitting or converting of existing aircraft spray systems used for agricultural pesticide application is critical to the safe and effective application of DIBROM Concentrate and/or TRUMPET EC as part of a successful adult mosquito-control program.

DIBROM is applied undiluted at a rate of 0.5 to 1.0 fluid ounce of product per acre; TRUMPET is applied at 0.6 to 1.2 fluid ounces of product per acre. Both products can be applied over all areas where mosquitoes are found, including residential, recreational and agricultural areas, tidal marshes, swamps, woodlands, livestock feedlots and pastures. There are no aquatic setback restrictions for DIBROM Concentrate or TRUMPET EC.

The Importance of Spray Droplet Size

The effectiveness of DIBROM / TRUMPET in controlling adult mosquito populations is



dependent on the size and uniformity of the spray droplets, height of the aircraft, weather and swath width created by the spray system. Research shows that small droplets stay airborne longer and increase the probability of contact with adult mosquitoes, resulting in a higher level of control.

Conversely, overly large particles are ineffective in controlling mosquitoes because they fall to the ground too quickly and may pose a risk to non-target organisms. The optimum droplet size for DIBROM / TRUMPET applications made by air is between 10 and 70 microns for most of the droplets created. The size of the aircraft, boom width, air speed and nozzle configuration and type will determine the swath width of the applications.

Therefore, the converting or retrofitting of an ag aircraft should be done in a manner that achieves proper spray droplet size and distribution for most effective adult mosquito control.

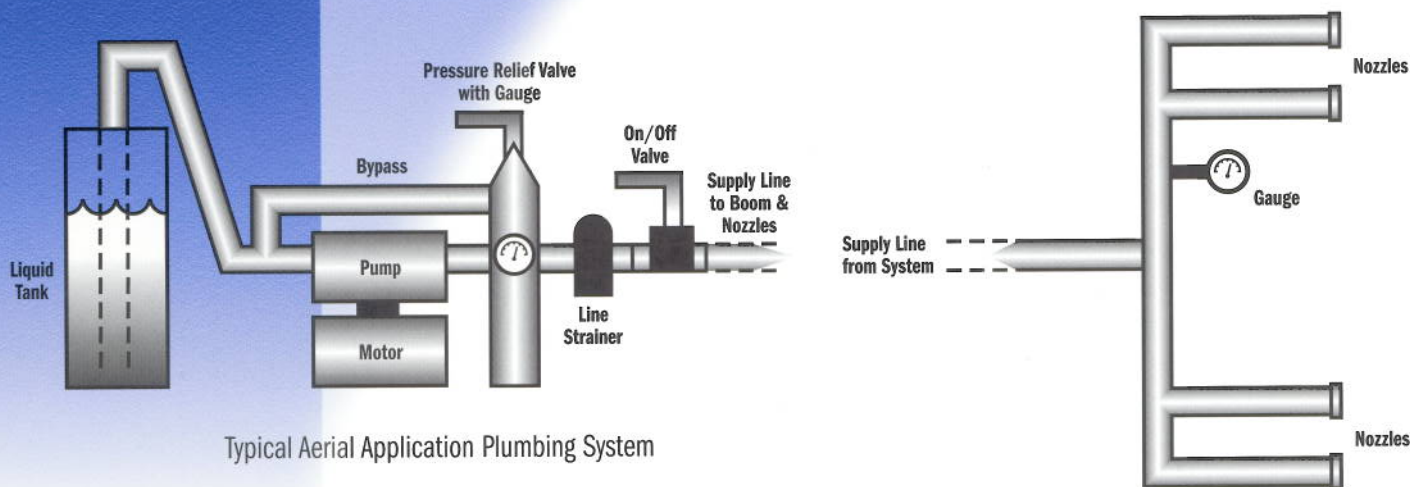
Spray System Conversion & Setup

Because of the corrosive nature of naled, all equipment used in the application of DIBROM or TRUMPET should be constructed of corrosion-resistant materials such as stainless steel, bronze, brass, fiberglass, polypropylene or rigid PVC. The use of Teflon® or Viton® seals is recommended for all valves, meters, pumps and motors.

For many aerial applicators, using a completely separate tank, pump, hose, nozzle and boom system with appropriate dry-breaks and valves, is a way to more quickly and conveniently convert the aircraft for mosquito-control operations. This reduces downtime for flushing and rinsing of tanks and lines between normal ag operations and mosquito-control applications.



Micronair system setup for mosquito control



Typical Aerial Application Plumbing System

Typical Boom & Nozzle Setup

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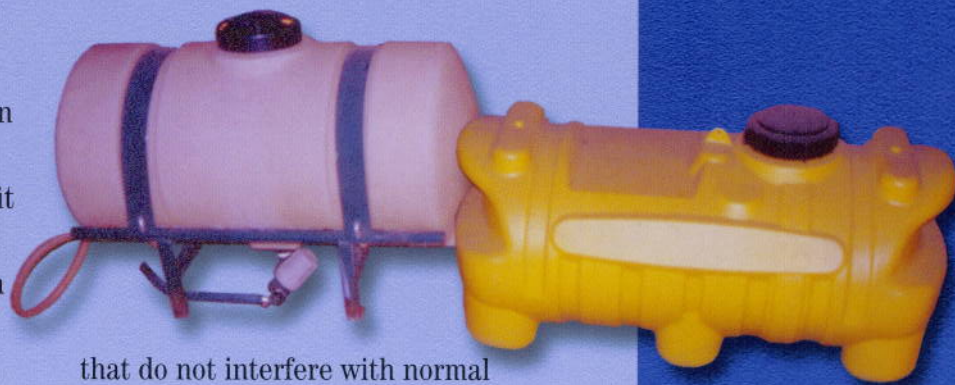
Application Equipment Requirements

Individual components of the application system should be selected based on the use of naled-resistant materials and to fit the size and type of the existing aircraft and spray system. **Careful consideration must be given to the size and type of ag aircraft because the density of DIBROM/TRUMPET is greater than water.** Following are comments about specific components used to convert or retrofit existing systems:

Tank – Polypropylene and naled-resistant fiberglass tanks are suitable. Tank size should be based on the weight (amount) of DIBROM/TRUMPET to be applied per load, size and model of the aircraft, and size of the area to be treated. Because the products are applied undiluted at ULV rates of 0.5 to 1.2 ounces per acre, depending on formulation, a smaller or partially full tank may be used. Many pilots and mosquito-control districts find the smaller payloads advantageous due to less ferry time.

Applicators can utilize their existing liquid tank if it meets the above requirements, or insert or mount a separate smaller tank specifically for holding DIBROM/TRUMPET. A separate tank may also eliminate the risk of contamination of other pesticide loads that follow mosquito-control operations.

The supplemental tank can be mounted inside the existing tank or in other areas



that do not interfere with normal operations.

A third option is to utilize a self-contained spray pod system that allows mosquito-control spray equipment to be completely separate from regular agricultural application operations. Most self-contained spray pods consist of the chemical tank, rotary atomizer and monitoring/control system, and are easy to mount with a minimum of modification to most aircraft. There are no external hoses, booms or other equipment to install.

Pump System – Stainless steel gear pumps have performed well with naled formulations. The Oberdorfer stainless steel pump, equipped with Teflon seals, is a corrosion-resistant and dependable pump that is available in a range of sizes to handle flow rates associated with aerial ULV applications. When using a diaphragm pump, a Santoprene[®] diaphragm is recommended. Avoid the use of soft materials such as mild steel or galvanized steel, and in the case of DIBROM Concentrate, do not contaminate the application system, transfer system or storage facilities with water.

IMPORTANT: Careful maintenance, flushing and cleaning of all pumps and meters is critical due to the nature of naled and for proper long-term operation of the system.

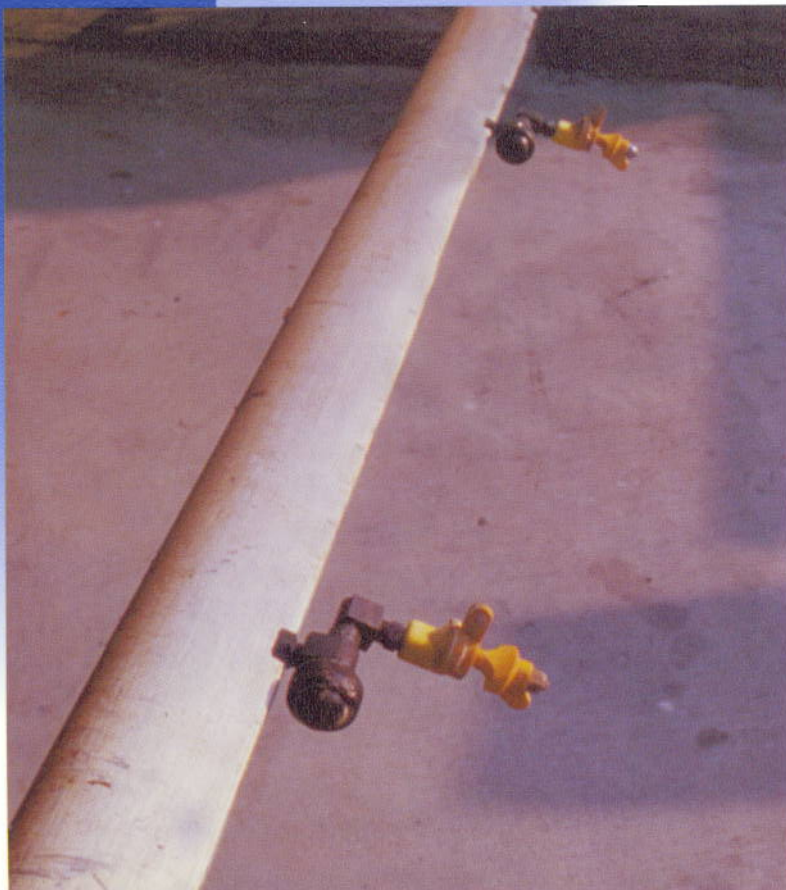
Boom – Polypropylene or stainless steel supply lines can be attached to the existing boom or other support, or a separate stainless steel boom setup can be installed for quick mounting and removal. Since the boom is subject to a great deal of force, construction should be suitable to prevent leaks or failure.



Nozzle Setup

Nozzles – Aircraft flying in excess of 100 mph and without an atomizer should use appropriate nozzles constructed of stainless steel or brass that will produce droplets between 10 and 70 microns. Generally, four to six nozzles should be used, depending on boom length, and positioned at 45 to 90 degrees into the wind. The positioning results in the maximum wind shear action across the face of the nozzle and helps create the optimum spray particle size. High pump pressures in the 50 to 70 psi range are required to achieve maximum atomization and the greatest percentage of small droplets.

Rotary Atomizer – For aircraft flying under 100 mph, the use of mechanically assisted or specially vaned rotary atomizing nozzles are required to distribute particles in the 20-40 micron range for ULV applications. For aircraft flying over 100 mph,



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traditional wind-driven vaned rotary nozzles work well. Micronair Corporation supplies several sizes of atomizing nozzles, depending on the size of the aircraft, type of application, flow rate and droplet size requirements.

Rotary atomizers are driven by either the airflow past the aircraft and through the fan blades or by electric or hydraulic motors. They are fitted with electromagnetic brakes to prevent rotation and pesticide application outside the target area when spraying. Like traditional nozzles, rotary atomizers can be mounted to either the stationary or supplemental spray boom on the aircraft. For most fixed-winged aircraft, one rotary atomizer is mounted on each side of the fuselage (25 feet between units) and face to the rear of the aircraft.

Supply Lines – Polypropylene or stainless steel tubing is recommended for use as hoses for moving product from the tank to the nozzles.



Micronair Rotary Atomizer

Product Handling Information

Loading – DIBROM / TRUMPET should be passed through a filter as it is being loaded into the aircraft. A 100-mesh stainless steel or polypropylene screen can be used. In California, a closed loading system is required for both products.

Flushing / System Maintenance – After applications of DIBROM Concentrate, “Jet A” aircraft fuel, Aromatic 150, Aromatic 200 or Aromatic 200ND can be used for effective flushing of the system. Do not use isopropyl or methyl alcohol due to their flammability. Once the system is flushed of remaining product, it can be refilled with a coat of light oil to eliminate condensation.

After applications of TRUMPET EC, water can be used to thoroughly flush the entire system, as well as for rinsing off the aircraft. Many pilots have added on-board flush tanks to flush the systems following the last pass while still over the treated area. Once on the ground, the system can be blown dry with compressed air to eliminate condensation.

IMPORTANT: Mosquito-control applications must be made when wind speeds are less than 10 mph and when thermal inversions are not likely.

Information contained in this guide is accurate at the time of printing.
Please refer to the product label or contact the equipment manufacturer
for specific information.

For additional mosquito-control information, refer to the
American Mosquito Control Association Web site at www.mosquito.org.

To contact AMVAC Customer Service, please call:

888-462-6822

Or visit our Web site at:

www.amvac-chemical.com



AMVAC Chemical Corporation

4100 E. Washington Blvd.

Los Angeles, CA 90023

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