

# Georgia Mosquito Control Association 2014

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Calibration

# Oh Great! Another ULV Machine Presentation



# What is this calibration word every one keeps using

- By Definition : To check, adjust, or determine by comparison with a standard
- Calibration requirements are different for different types of mosquito control applications



**Conditions and Rates to use KONTROL 4 - 4 Undiluted for Mosquito Control**

PERMETHRIN/PBO LBS. A.I./ACRE	APPLICATION RATES/FLUID OUNCES TO USE PER MINUTE			
	5 mph	10 mph	15 mph	20 mph
0.007/0.007	8.1	16.2	24.4	32.5
0.0035/0.0035	4.0	8.1	12.2	16.2
0.00175/0.00175	2.0	4.1	6.1	8.2

**AERIAL APPLICATION INSTRUCTIONS**

The use of aircraft specially equipped and capable of applying ULTRA LOW VOLUMES of **KONTROL 4 - 4** may be necessary.

**DROPLET SIZE CALIBRATION FOR AERIAL APPLICATION EQUIPMENT:**

**Aerial Application made at  $\leq 200$  above ground elevation:** Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns ( $D_v 0.5 < 60 \mu m$ ) and that 90% of the spray is contained in droplets smaller than 100 microns ( $D_v 0.9 < 100 \mu m$ ). The effects of flight speed and, for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

**Aerial Application made at  $>200$  above ground elevation:** Spray equipment must be adjusted so that the volume median diameter produced is less than 70 microns ( $D_v 0.5 < 70 \mu m$ ) and that 90% of the spray is contained in droplets smaller than 145 microns ( $D_v 0.9 < 145 \mu m$ ). The effects of flight speed and, for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

Do not apply by fixed wing aircraft at a height less than 100 feet, or by helicopter at a height less than 75 feet unless specifically approved by the state or tribe based on public health needs.

Apply at a sufficient airspeed to deliver the appropriate amount of a.i./acre (from 0.00175 to 0.007 # a.i./acre) and to achieve the appropriate droplet range. Flight speed and nozzle orientation must be considered in determining droplet size. Apply when wind speed is greater than 1 mph.

The spray boom should be mounted on the aircraft as to minimize drift caused by wingtip or rotor vortices. The minimum practical boom length should be used and must not exceed 75% of the wing span or 90% rotor diameter.

in the treatment of cattle, horses, animal confinements, dogs, swine etc., poultry flocks and birds, cover any exposed drinking water, drinking fountains and animal feed before application. Do not contaminate non-approved sites with spray drift.

### GROUND-BASED APPLICATION INSTRUCTIONS (Non-Thermal Application)

**DROPLET SIZE CALIBRATION FOR GROUND-BASED APPLICATION EQUIPMENT:** Spray equipment must be adjusted so that the volume median diameter is less than 30 microns ( $Dv\ 0.5 < 30\ \mu m$ ) and that 90% of the spray is contained in droplets smaller than 48 microns ( $Dv\ 0.9 < 48\ \mu m$ ). Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

#### Suggested Dilution Rates to Achieve 0.00175# a.i. per Acre

			HAND HELD THERMAL FOGGERS 50 FT SWATH AT 2 MPH 0.00318# A.I. PER ACRE	
MACHINE OUTPUT GAL/HR	DILUTION RATIO WITH FOG OIL 5MPH	DILUTION RATIO WITH FOG OIL 10 MPH	MACHINE OUTPUT	DILUTION RATE
10 gal/hr	1 : 9.5	1 : 4.25	0.25 gal/hr	1 : 1.2
20 gal/hr	1 : 20	1 : 9.5	2.0 gal/hr	1 : 16.4
30 gal/hr	1 : 30	1 : 14.75	5.0 gal/hr	1 : 42.4
			8.0 gal/hr	1 : 68.4

### NON-THERMAL AEROSOL FOGGER APPLICATION

**KONTROL 4 – 4 ULV Non-Thermal Aerosol Fogger Application:** To control mosquitoes, midges and blackflies, apply **KONTROL 4 – 4** using any standard ULV ground applicator capable of producing a non-thermal aerosol spray. Apply the product at a flow rate of 4.1 to 16.2 ounces per minute at an average vehicle speed of 10 mph. If different vehicle speed is used, adjust the rate accordingly. These rates are equivalent to 0.00175 to 0.007 pounds of permethrin and the same amount of 0.00175 to 0.007 pounds of synergist piperonyl butoxide per acre. Vary flow rates accordingly to vegetation density and mosquito population. Use higher flow rates in heavy vegetation or when populations are high. An accurate flow control system must be used to ensure proper flow rate. **KONTROL 4 – 4** may also be applied by diluting with a suitable solvent such as mineral oil and applying so as not to exceed the maximum pounds of active ingredient per acre as shown in the first column of the ULV table shown below. That table represents some suggested application rates for ground ULV applications. If an alternative dilution rate is used, adjust the flow rate accordingly.



# MasterLine®

By Univar

## **Bifenthrin 7.9 Termiticide/Insecticide**

- Mixes Easily with Water
- Controls listed Insects and Mites on Trees, Shrubs, Flowering Plants, Non-Bearing Fruit and Nut Trees, and Flowers
- Controls Pests Indoors and Outdoors on Residential, Institutional, Public, Commercial, and Industrial Buildings, and Lawns, Ornamentals, Parks, Recreational Areas and Athletic Fields.
- For Use in Interiorscapes including Hotels, Shopping Malls, and Office Buildings
- For Use in Outdoor Plantscapes including Residential Dwellings, Parks, Institutional Buildings, Recreational Areas, Athletic Fields, and Home Lawns
- Prevents and Controls Termites in and around Structures and Constructions
- Prevents and Controls Ticks (including ticks that may transmit Lyme Disease and Rocky Mountain Spotted Fever
- For the Control of Deer ticks (Ixodes sp.)

When used as a Termiticide, Individuals/ Firms must be licensed by the State to apply termiticide products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the pest control regulatory agency of your State prior to use of this product.

**Active Ingredient:**

Bifenthrin\*

**By Wt.**

7.9%



**Mixing Directions:** For 0.02% suspension, mix 0.33 fluid oz. of Masterline Bifenthrin 7.9 Termiticide/Insecticide per gallon of water. For 0.06% suspension, mix 1 fluid oz. Masterline Bifenthrin 7.9 Termiticide/Insecticide per gallon of water (1 fluid oz. = 2 tablespoons). Do not use household utensils to measure Masterline Bifenthrin 7.9 Termiticide/Insecticide. Use the higher rates for heavy pest infestation, quicker knockdown or longer residual control. Retreatment may be necessary to achieve and/or maintain control during periods of high pest pressure. Repeat application only if there are signs of renewed insect activity. Repeat application limited to once per seven days.

**Perimeter Treatment:** Treat a band of soil and vegetation 6 to 10 feet wide around and next to the structure and the foundation of the structure to a height of 2 to 3 feet. Use 0.33 to 1.0 fluid oz. of Masterline Bifenthrin 7.9 Termiticide/Insecticide per 1,000 square feet in enough water to provide sufficient coverage (refer to **Perimeter Application Dilution Chart**).

**For Ant and Fire Ant Mounds use Masterline Bifenthrin 7.9 Termiticide/Insecticide 0.06% dilution as Drench Method:** Use 1-2 gallons of dilution for each mound area. Sprinkle the mound until wet and apply to a 4 foot diameter circle around the mound. For mounds larger than 12", use a higher volume. Applications should be made in cool weather, such as in early morning or late evening hours, not in the heat of the day.

**Mosquito Control:** To control mosquitoes around buildings, landscapes, and lawns, dilute 0.33 to 1.0 fl. oz. of Masterline Bifenthrin 7.9 Termiticide/Insecticide per gallon of water and apply at the rate of one gallon of dilution per 1,000 square feet as a general spray. Masterline Bifenthrin 7.9 Termiticide/Insecticide may be diluted at lower concentrations and applied at higher volumes to ensure the proper amount of product per area (refer to the **Ornamental or Perimeter Application Dilution Charts**).

**Calculating Dilution Rates:** The following steps should be taken to determine the appropriate dilution of Masterline Bifenthrin 7.9 Termiticide/Insecticide that is required to control specific pests:

- 1) Select an application rate in terms of fluid oz. of Masterline Bifenthrin 7.9 Termiticide/Insecticide.
- 2) Determine your application volume and amount of spray mix you want to prepare in the **Dilution Chart**.
- 3) Use the **Dilution Chart** to determine the appropriate volume of Masterline Bifenthrin 7.9 Termiticide/Insecticide that must be mixed in your desired volume of water.

# Barrier Spray Calibration





- Label rate
- Know n distance measurement ( 1,000 ft.)
- Practice with water !!!
- Remember The Label is the Law

1000 Ft. @ 3 min.= 1 gal of dilution @ 3min  
( 1 gal of water – 1 oz of bifin.)

# Adulticide Calibration



# Calibration of formulation pump is required to insure proper flow rate

- 1- Disconnect formulation line from nozzle and place tip of line in a container to collect the discharge
- 2- Start machine and allow to reach desired operating pressure
- 3- Move discharge line into measuring container, turn spray on for 1 min
- 4- At the end of 1 min measure the amount of chemical collected and pour back into formulation tank
- 5- Adjust pump setting if necessary and repeat process until desired flow rate is reached





# Calibration Of Droplets On ULV Equipment

- Two ways to adjust droplet sizes on ULV Machines
- Adjust the Flow Rate
- Adjust the RPM of the engine



Artichoke, globe  
Asparagus  
Avocado  
Broccoli  
Brussels Sprouts  
Cabbage  
Cauliflower

Corn, forage  
Corn, grain (field and pop)  
Corn, stover  
Corn, sweet kernel plus cob  
with husks removed  
Eggplant

Horseradish  
Leafy Vegetables (except Brassica)  
Lettuce, head  
Mushrooms  
Onion, dry bulb  
Peaches

Potato  
Soybeans  
Spinach  
Tomatoes  
Vegetable, cucurbits  
Walnuts

In the treatment of corrals, feedlots, animal confinements/houses, swine lots, poultry ranges and zoos, cover any exposed drinking water, drinking fountains and animal feed before application. Do not contaminate non-approved sites with spray drift.

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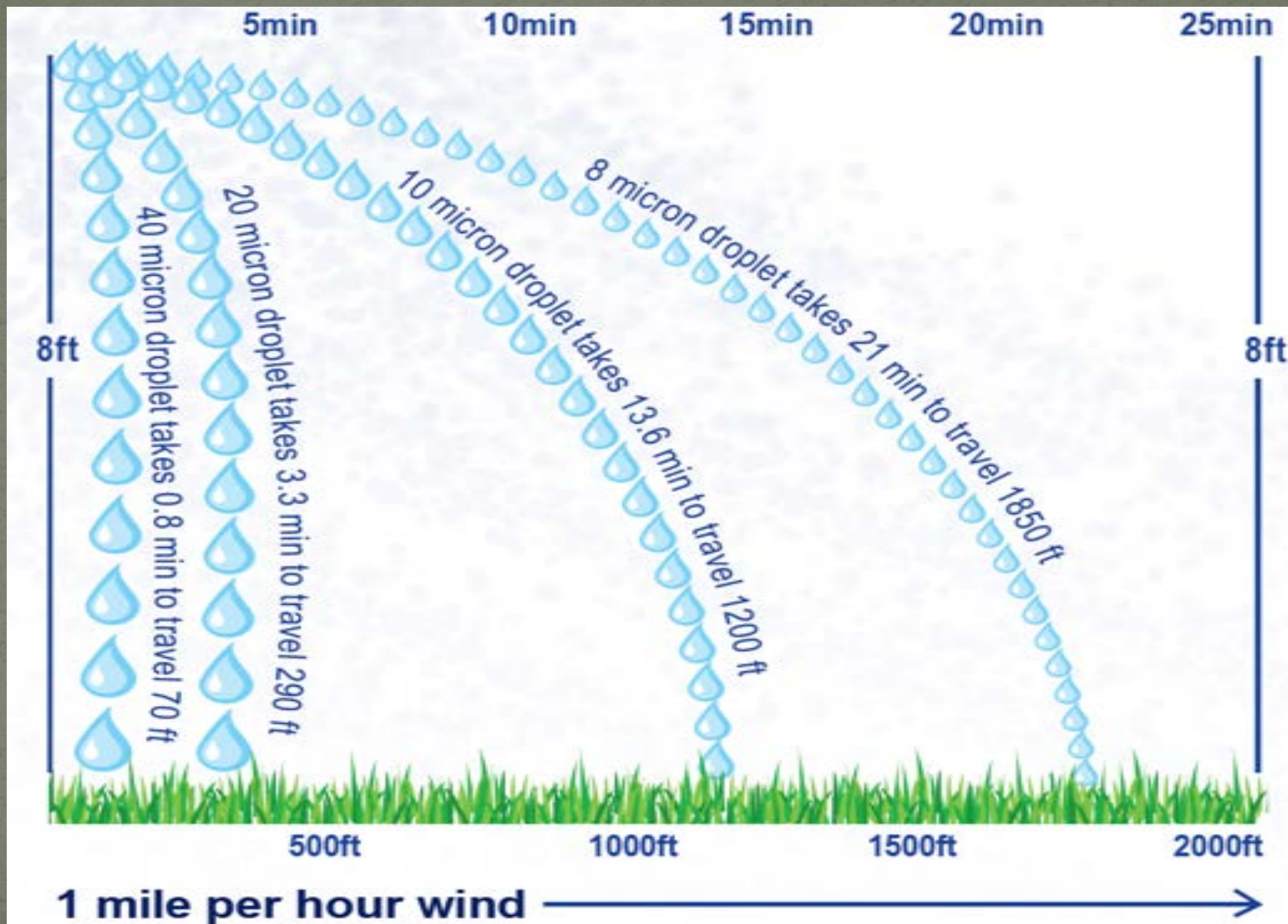
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# Measuring Droplet Size





Collected By: CONRAD  
Date/Time: Thu Sep 26 08:07:41 2013  
Test Number: 1  
Customer Name: VOLUSIA  
Sprayer Type: LONDON FOG 18-20  
Sprayer ID: 191203  
Product: KONTROL 30-30  
Product Temperature:  
Distance to nozzle: 8FT  
Comments:

RPM:  
Flow: 600ML  
Pressure:  
Weather: WSW  
Humidity: HIGH  
Wind Speed: 9MPH  
Ambient Temperature: 79F  
Formulation: 30-30  
Diluent: NA

Mass (Volume) Median Diameter: 17.74\*  
Sauter Mean Diameter: 9.71  
Volume Mean Diameter: 3.46  
Area Mean Diameter: 2.06  
Number Mean Diameter: 1.42  
D90: 28.64  
D10: 4.68  
Span: (D90 - D10)/MMD : 1.35

Number Median Diameter: 0.98  
NMD / MMD: 0.06  
Total Count: 1269  
Collection Time: 30  
Min (diameter): 1  
Max (diameter): 35  
Count > 32: 2  
Count > 48: 0

Diam.	Droplet Count	162	325	487	650
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Remember even though it's small if your applying adulticide then your equipment must be calibrated



# Know the difference

- ULV Adulticide- 3 fluid oz or less per acre  
(Requires droplet calibration)

Droplets average 17 vmd

- Barrier spraying ( fogging)- 1 oz per 1000 sq.ft  
(Does not require droplet calibration)

Droplets average 60-120 vmd



# Trouble Shooting

- #1 Air getting into lines...or FMI pump set incorrectly (pumping backwards, or set at ZERO so no fluid flows). We trouble shoot this by suggesting they pump fluid directly from a bucket to the nozzle through the pump...taking all the other "potential problems" out of place. (filter, pulse dampener, solenoid valve, tanks, etc.) Then we work backwards, connecting in the tank, then through the filter, then through the pulse dampener, then through the solenoid valve until a plug or air leak is located

Thank You