What Works Where?

- What’s New at VBC
  - Label Changes
  - Strain Specificity
- Product Review

Matching the solution to the situation

Find the right formulations to match your application needs.
Valent BioSciences Larvicides

- Biorational Larvicides
  - Made from Naturally Occurring substances
    - Bacteria
  - A copy of a Naturally Occurring substance
    - Growth Regulator
MetaLarv S-PT

- Methoprene based pellet
- Residual Material
  - Up to 42 Days Residual Control
- Pretreat
  - Up to 28 days preflood
- Dry Down, Reflood (wet - dry)
  - Up to 3+ dry down reflood events
MetaLarv S-PT: Juvenile Hormone Analogue
JUVENILE HORMONE (JH) LEVEL INTENSITY

NORMAL IMMATURE MOSQUITO DEVELOPMENT

1\textsuperscript{st} INSTAR → 2\textsuperscript{nd} INSTAR → 3\textsuperscript{rd} INSTAR → 4\textsuperscript{th} INSTAR → PUPAE → ADULT

INTERRUPTED DEVELOPMENT AFTER APPLICATION OF METALARV\textsuperscript{TM} S-PT

1\textsuperscript{st} INSTAR → 2\textsuperscript{nd} INSTAR → 3\textsuperscript{rd} INSTAR → 4\textsuperscript{th} INSTAR → PUPAE → NO ADULT EMERGES

MetaLarv\textsuperscript{TM} S-PT impact
MetaLarv S-PT

- Monitor Efficacy
  - Collect pupae
  - Monitor for emergence
MetaLarv S-PT

- S-PT = Spherical Pellet
- Small size – increased point sources
  - 2.5lb/acre = 3.5 pellets/ft²
- Ballistic
  - Great swath
- Non Abrasive
- Not dusty
- Triple action
VectoBac

The science of specificity™
VectoBac

- VectoBac - Bti
  
  *Bacillus thuringiensis Subsp. isrealensis*
  Serotype H-14 Strain AM65-52,
  Fermentation Solids, Spores and
  Insecticidal toxins

![Image of Bacillus thuringiensis Subsp. isrealensis](image)
VectoBac Mode of Action
VectoBac

- Effective against all Species of Mosquitoes, black flies, and non biting midges
- Used for resistance management
- Single brood control
  Exception WDG in Containers
VectoBac Formulations

- **Aqueous**
  - VectoBac 12AS
  - VectoBac WDG

- **Granular**
  - VectoBac G
  - VectoBac GS
  - VectoBac GR
VectoBac GR: New Formulation

**FOR ORGANIC PRODUCTION**

**ACTIVE INGREDIENT:** Bacillus thuringiensis, subsp. israelensis, strain AM 66-62, formulation soluble and susceptible... 2.80%
**OTHER INGREDIENTS**... 97.20%
**TOTAL**... 100.00%

**Potency:** 300 International Toxic Units (ITU) per mg (equivalent to 0.001 billion potency: 1 IU per pound)

The percent active ingredient does not indicate product performance and potency measurements are not Federally standardized.

**EPA Reg. No.:** 73689-096
**EPA Est. No.:** 53525-16-001
**List No.:** 05110

**INDEX:**
1.0 First Aid
2.0 Precautionary Statements
3.0 Hazards to Humans (and Domestic Animals)
4.0 Application Directions
5.0 Storage and Disposal
6.0 Notice to User

**KEEP OUT OF REACH OF CHILDREN**

**FIRST AID:**

1. If in eyes: open eyes, rinse with plenty of water for 15 minutes. If sufficient water is not available, use saline or sterile water. Do not rub eyes. If eye irritation persists, call a physician.

2. If in skin: wash with soap and water or other suitable cleansers. Bathe with soap and water after handling. Wear proper protective clothing when handling.

3. If in inhalation: move to fresh air. If not breathing, give artificial respiration. Do not give mouth-to-mouth resuscitation unless trained.

4. If swallowed: do not induce vomiting. Give 1-2 teaspoons of vegetable or olive oil. Give nothing by mouth if choking or aspiration is suspected. Call a physician.

**HOT LINE NUMBER:** 1-800-528-7771

**SUGGESTED RANGE RATES:**

- **Ground Application:** 1.0 to 2.5 lbs. / acre
- **Misting:** 0.25 to 0.5 lbs. / acre

**ENVIRONMENTAL HAZARDS:**

1.0 Do not contaminate water when cleaning equipment or disposing of equipment washwater. Do not apply directly to livestock, pets, or wildlife.

2.0 Do not contaminate any area other than the target (mosquito) species.

**APPLICATION DIRECTIONS:**

- **Mosquito Habitat:**
  - **Suggested Range Rats:**
    - 2.5 - 10 lbs. / acre
    - 0.25 - 0.5 lbs. / acre

**Storage and Disposal:**

- Store in a dry, cool place. Do not store near food or feed products. Keep out of the reach of children and pets.

- Do not contaminate water when cleaning equipment or disposing of equipment washwater. Do not apply directly to livestock, pets, or wildlife.

- Do not contaminate any area other than the target (mosquito) species.
VectoBac GR

- High Density Granule
  - Increased penetration
  - Increased swath
  - Less wind movement
  - Increased hopper capacity
- Increased point source
  - 10 x granules
- Synthetic granule
  - No equipment damage
- NOP / WHOPES
VectoBac WDG: Innovative Use

- OMRI
- Certified WHOPES
  - World Health Organization Pesticide Evaluation Scheme
- Container species
  - Often very cryptic
  - *Aedes albopictus*
  - *Aedes aegypti*
  - *Aedes serriensis*
- Residual in Containers
 VectoBac WDG: Unique Application

- Direct Applications
  - Calibrated Scoop
- Misting
  - Ground applications
    - Backpack
  - Wide Area Sprays
    - Truck mounted
    - Aerial
VectoLex

The power of residual efficacy™
 VectoLex

- VectoLex - Bs
  Bacillus sphaericus Serotype H5a5b, strain 2362Fermentation Solids, Spores and Insecticidal toxins
VectoLex Mode of Action

- Similar to Bti
- Recycling
VectoLex: Standing Water Mosquitoes

- Effective against *culex* and other species
  - Not effective against
    - Container species
    - Salt water mosquitoes
VectoLex Formulations

- Aqueous
  - VectoLex WDG

- Granular
  - VectoLex FG
  - Formerly CG

- Placement
  - VectoLex WSP
VectoMax

Combining our strengths™
 VectoMax Bio Fusion

- BioFusion
- Based on a unique combination VectoMax – Fusion of VectoBac and VectoLex
- Not just a Mix
  - Mixes toxins suspended separately
  - May or may not get both while feeding
VectoMax Formulations

- VectoMax FG
  - Formerly CG

- VectoMax WSP
VectoMax FG

- Granular formulations
  - 10/14 mesh corncob granules
- Broadcast application 5-20 lbs../acre
VectoMax WSP

- Water Soluble Pouch
- Treats up to 50 sq. ft.
- Residual
  - Closed System 55 – 75 days
  - Open system 3 – 4 weeks
VectoMax

- VectoMax
  - Active 30 - 55 Days
  - Effective against all species
    - Initial control similar to VectoBac
    - Residual similar to VectoLex

- Bonus!
  - Quick kill
    - Fast acting, long lasting
  - Controls all mosquito species
  - Residual activity against several mosquito species
  - Effective in all environments
  - NOP on the label
Matching Product to Operational Objectives

- Single Brood Control
  - Aedes Residual
- Culex Residual
- Mixed Brood Residual
- Multiple Flood
- Pre-flood

Products:
- VectoBac®
- Teknar®
- VectoMax®
- VectoLex®
- MetaLarv®
Thank you so much!

http://publichealth.valentbiosciences.com/
MetaLarv® S-PT Evaluation Marin-Sonoma MVCD
MetaLarv® S-PT Evaluation Marin-Sonoma MVCD

- Two acres of flooded salt marsh were treated at 3.25 lbs./acre on the Hamilton Military Base on May 9, 2012.

- Four floodings were monitored including the initial flood.

- Pupae were collected and isolated to monitor emergence from up to five sites within the treatment block.

- Results:
  - Initial flood – 76 pupae collected; zero emerged; 100% EI
  - Second flood – 52 pupae collected 33 days after treatment; one emerged; 98% EI
  - Third flood – 3 pupae collected 48 days after treatment; zero emerged; 100% EI
  - Fourth flood – 28 pupae collected 92 days after treatment; 3 emerged; 89% EI
MetaLarv® S-PT Evaluation Marin-Sonoma MVCD

Percent Emergence Inhibition of *Aedes dorsalis* following application of MetaLarv S-PT to a Tidal Marsh at 3.25 lbs/acre

<table>
<thead>
<tr>
<th>Days After Treatment</th>
<th>%EI</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>100%</td>
</tr>
<tr>
<td>33</td>
<td>98%</td>
</tr>
<tr>
<td>48</td>
<td>100%</td>
</tr>
<tr>
<td>92</td>
<td>89%</td>
</tr>
</tbody>
</table>
EI of *Aedes vexans* after 20 and 41 days pre-flood application (5 lbs/acre) to flood/dry-down/re-flood microcosms in Washington
EI of *Ochlerotatus dorsalis* after 14-day pre-flood application (10 lbs/acre) to flood/dry-down/re-flood microcosms in Washington
VectoBac Granules

- **VectoBac G**
  - 5 pounds / acre 3.4 granules / sq. ft.
  - 10 pounds / acre 6.8 granules / sq. ft.

- **VectoBac GS**
  - 5 pounds / acre 25 granules / sq. ft.
  - 10 pounds / acre 50 granules / sq. ft.

- **VectoBac GR (new)**
  - Newest Granule
  - 5 pounds/acre 38 granules/sq. ft.
  - 10 pounds/acre 77 granules/sq. ft.
VectoBac WDG

- **Wide Area Application**
  - **Key Factors**
    - Convection
    - Temperature
    - Wind up to 15mph
      - Prefer no less than 3
    - Height of release
      - Spray nozzles pointed directly up
    - Droplet spectrum
      - 20-120 microns
        - 2-3 hours for drops to settle
 VectoLex

- Unique Residual Process
VectoLex WDG

- Aqueous residual
Application Considerations

Even a the best product is only as good as the application!
Before you Begin

- Read
- Apply according to label rates
  - Larval numbers
  - Water conditions
  - Environmental Considerations
What to Use?

- What kind of mosquito
- Stage of development
- Habitat characteristics
Susceptibility by Stage of Development

- **First Instar**
- **Second Instar**
- **Third Instar**
- **Early Fourth Instar**
- **Late Fourth Instar**

- **Bti AM65-52 & SA3A**
- **Bs 2362 s-ABTS-1743**
- **Bti/Bs in BioFuse Combination**
- **S-methoprene**
Susceptibility of Target Species in California

*Culex spp*  *Culiseta spp*  *Floodwater Aedes spp.*  *Anopheles spp.*  *Container Aedes spp.*

- **Bti AM65-52 & SA3A**
- **Bti/Bs in BioFuse Combination**
- **Bs 2362 s-ABTS-1743**
- **S-methoprene**

*NB: Local Ae. nigromaculis populations in Central Valley exhibit s-methoprene tolerance*
Habitat Characteristics

- Thick Vegetation?
- Dirty Water
- Pre Flood – Dry Down Reflood?
- Standing Water with High Flow?
Just so you know!

- Label on VectoLex CG and VectoMax CG are changing to FG
  - VectoLex FG
  - VectoMax FG
    - International designation for fine grain
- WHOPES
- Strain will be specified on label
Just like people, no two bacterial strains are identical. Minor genetic differences can affect insecticidal activity and safety profile.
Valent BioSciences Corporation recognizes there are differences between strains

Bti strain effects on % suspension (technical powders)