



NEXT GENERATION

# Natular<sup>®</sup> SC

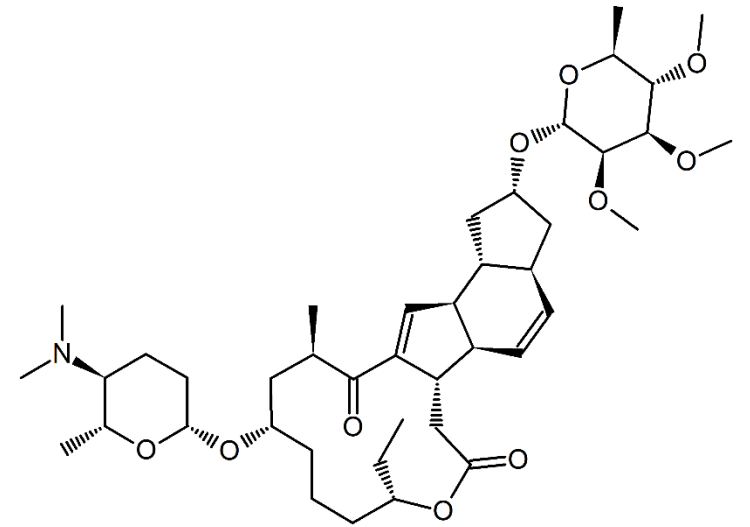
*An easier wide area larvicide*

# The Newest Addition to the Natular® Portfolio

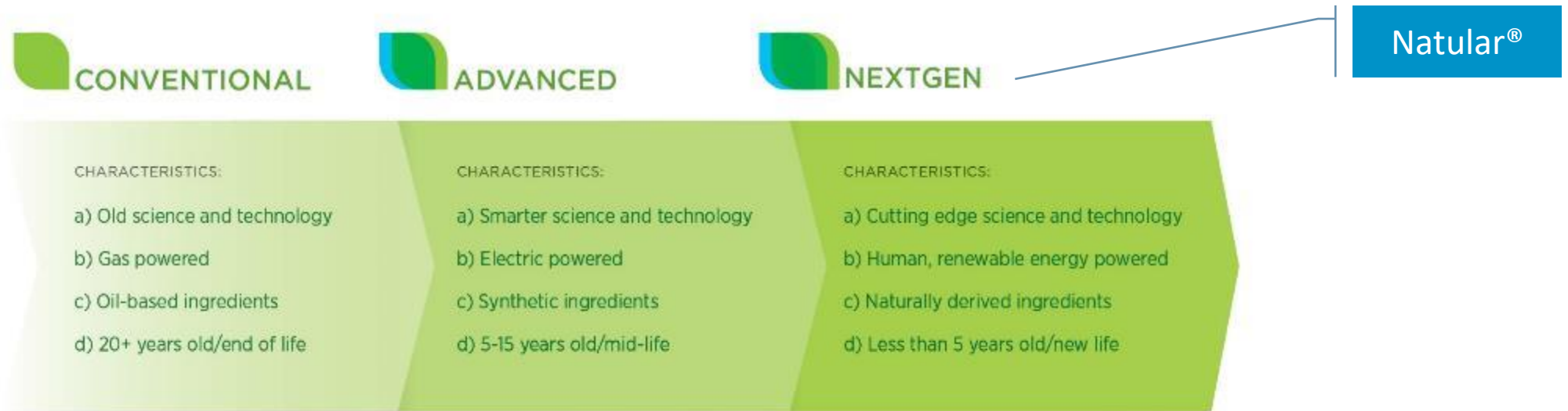


# About Spinosad

- A product of a naturally occurring soil bacterium
- **Unique mode of action**
- Unique class of chemistry – **IRAC Class 5**
- Controls **all four stages** of mosquito larvae
- Reviewed as the first **Reduced Risk** larvicide by the EPA
- Presidential **Green Chemistry** Challenge Award recipient
  - 1999: Dow AgroSciences (now Corteva), AI development
  - 2010: Clarke, Natular tablet technology



# Our EcoTier Guidelines for Product Development



Natular®

a) Design and Development, b) Power Source, c) Ingredients, d) Life Stage



NEXTGEN

# Natular SC Liquid Larvicide

The proven performance of **Spinosad**, plus exceptional **mixing, handling** and **application ease** for **wide-area** larvicide applications.



# Wide Area Larviciding Today



Complex mixing and loading



Air blast applications



Treatment area surface spotting



Wide Area Larviciding Made Easy

Natular SC is Easy to Handle,  
Mix, Apply, Clean and Store

# Product Highlights

- Suspension Concentrate, 22.5% Spinosad
- **Mixes readily** with water
- **No additional mixing or agitation equipment** required
- **Highly stable** suspension
- **Non-damaging** to application equipment and treated surfaces
- **Rinses easily** with plain water from treated surfaces
- **Easy to clean** and flush equipment
- **Low odor**



# Flexible and Versatile

- Flexible use patterns
  - **Wide area** / air blast equipment
  - **Ground** treatments
  - **Aerial** applications
  - **Spot** / localized
- Wide range of labeled use sites, including urban, commercial, residential, rural and agricultural\* areas



\* See label for full site list



# Optimized for Wide Area Applications



TeeJet or Micronair nozzles

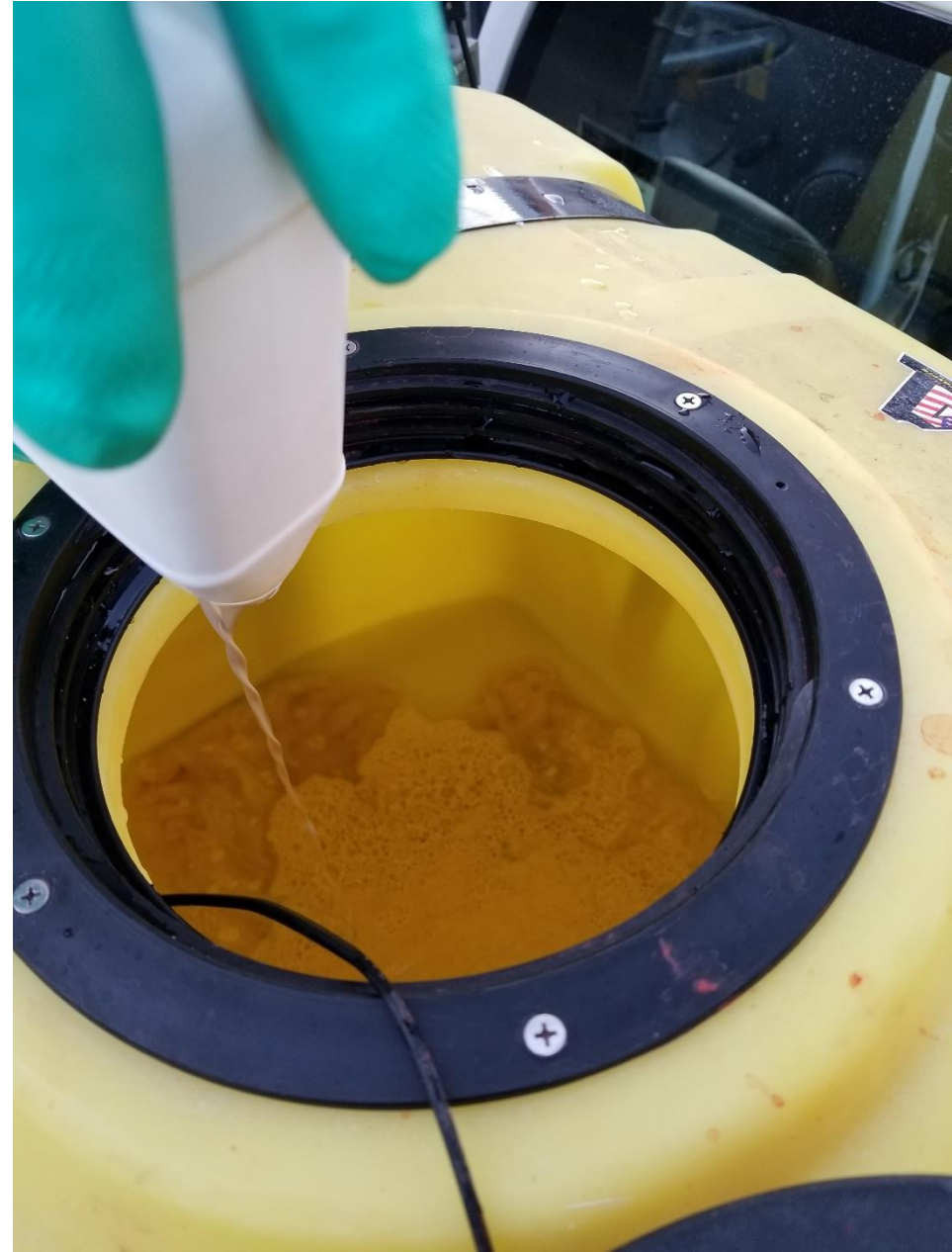


Buffalo Turbine or A1 Mister



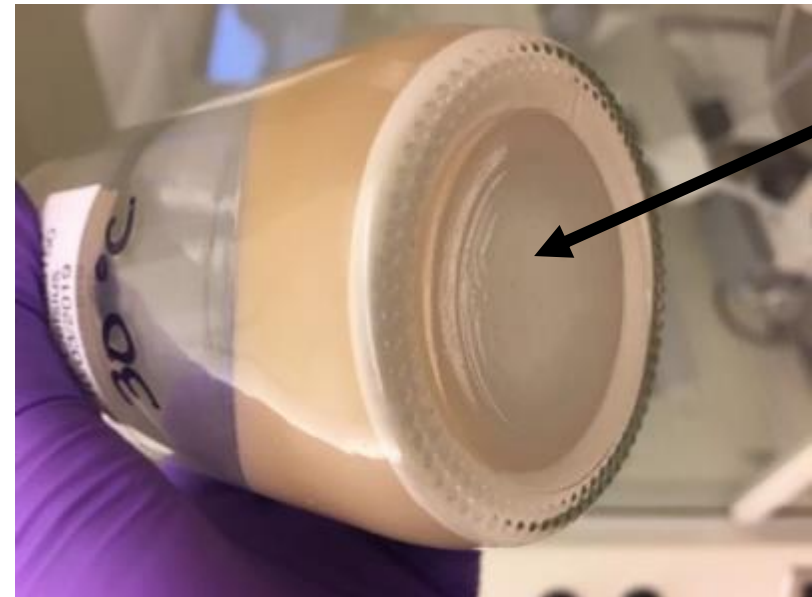
# Fast and Easy Mixing

1. Shake Natular SC Container
2. Fill spray tank with 1/2 required water
3. Turn on recirculation pump
4. Add Natular SC
5. Add remaining water



# Stability Lab Test

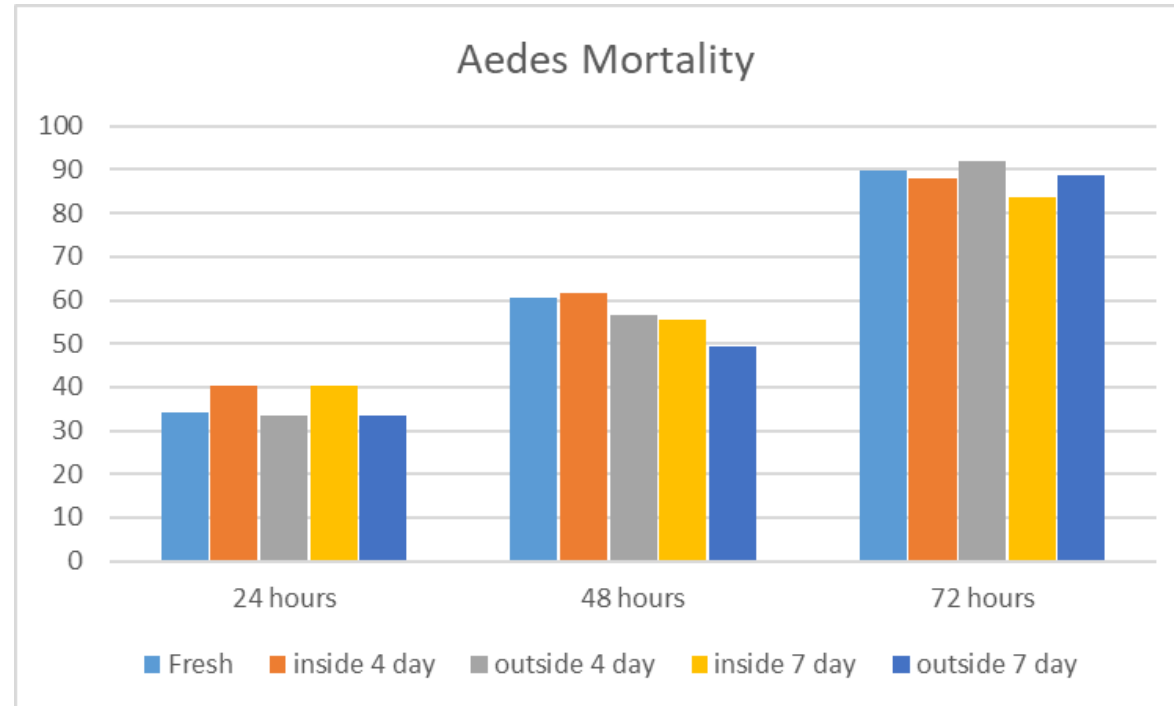
- Highly stable suspension with no efficacy loss after 7 days!
- Key findings:
  - SC will start to settle after one hour
  - SC will easily go back into suspension
  - SC will not lose efficacy: No difference in mortality observed 1 week after initial mix



# Flexibility Benefits of Stable Suspension

No loss of efficacy with mixed product after 1 week when mix is stored in **indoor or outdoor** conditions.

*Study conducted on Clarke colony Aedes, Culex and Anopheles mosquitoes. Efficacy on all species was similar to Aedes results, shown here.*



# Stability in the Field

After sitting for 24 hours in the spray tank, only **recirculation pump** and **normal driving** needed to re-suspend formulation prior to application

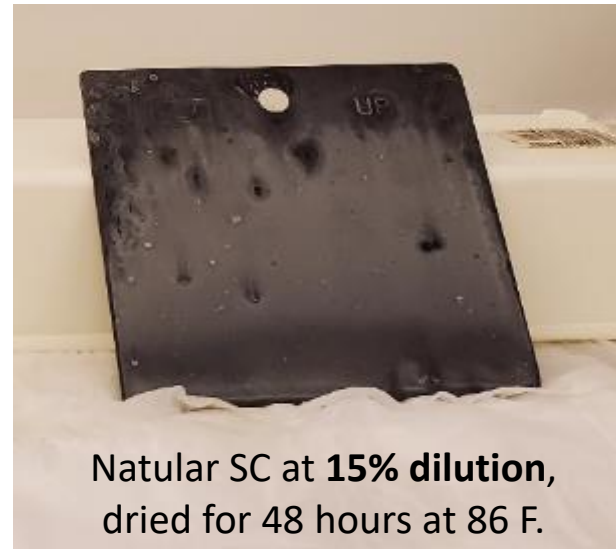


Natular SC in spray tank  
24hrs after initial mix



# Rinses off Easily

Lab tests on paint coupons using diluted Natular SC at a rate **3x higher than normal application rates** demonstrate that surface spotting may occur in the treatment zone but a **simple water rinse, without scrubbing** removes the residue.



# Easy Clean-Up & Maintenance

- Common sense recommendations:
  - Flush application equipment regularly with water
  - Check filter regularly for any material build up
  - Wash chemical tank down with water periodically



# Product Storage

- Highly concentrated formula
- Compact packaging requires minimal shelf space
- Available in one gallon jugs, 4 gallons per case
- Stable suspension

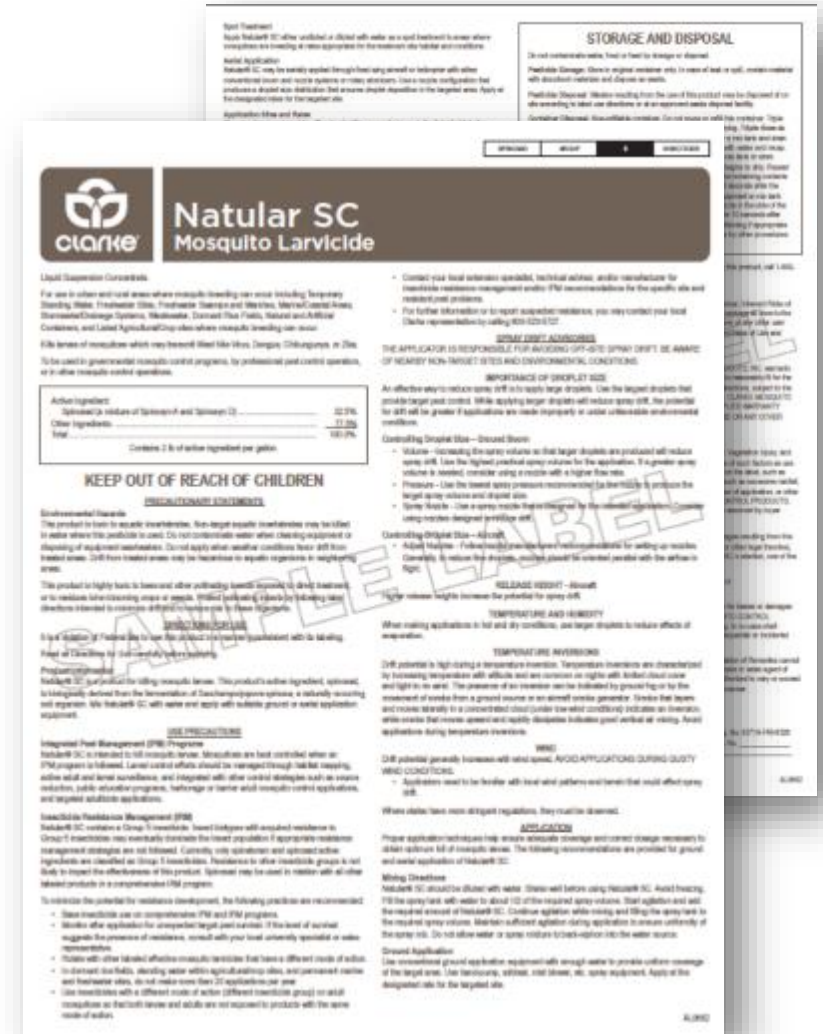


# Understanding the Product Label

# Natular SC Sample Label

You'll find similar precautionary statements as those on all other Natular product labels regarding direct exposure

Toxicity to aquatic invertebrates and bees



# Understanding Exposure, Hazard and Risk

Precautionary statements reflect inherent hazards:

- HAZARD = the inherent toxicity of an **active ingredient**, usually measured by an LD<sub>50</sub>
  - 11 µg/bee is the standard threshold the EPA uses for determining the bee hazard of an active ingredient, *regardless of use pattern or use rate*
- EXPOSURE = contact with the **active ingredient**
- RISK = Hazard (or Toxicity) X Exposure

Risk can be managed by reducing exposure!

# Managing Adverse Effect Risk

1. Manage exposure opportunities
  1. Start with understanding and following the label to limit exposure
  2. Follow pollinator stewardship best practices
2. Use RT25 study findings to inform operational protocols



In registering the product,  
the EPA has determined that when  
Spinosad is used at rates for  
public health mosquito control and  
according to the label,  
**risk to bees and aquatic  
invertebrates is mitigated.**

# Following the label

Label language regarding product application is designed to mitigate adverse effects on the environmental and beneficial insects:

- Application rate
- Dose / droplet densities
- Application method
- Application timing
- Weather conditions



# Responsible Stewardship Builds Trust

- Recommended Best Application Practices
  - Spray when pollinators are not active
    - Build an extra hour buffer around spray times to further reduce exposure risk
  - Use the lowest effective rate to minimize risks
    - Mosquito control application rates are exceptionally low
  - If possible, share plans for wide area larvicide applications through social media or website
    - Build on your public notification protocols for adult treatments
  - Expand your notification process to include advance treatment notifications to local hobbyists and bee keepers
    - Give them the option to cover their hives if they feel more comfortable doing so
  - Work with bee keepers and hobbyists to understand hive locations and proactively offer to turn off spray applications when in the area
    - Build goodwill and demonstrate responsible stewardship!



# Understanding EPA's RT25 Results

- **The RT25:** a laboratory test designed to determine the length of time over which field weathered foliar residues remain toxic to exposed honey bees
- EPA-reviewed results on Spinosad at a rate of 0.16 lb ai/acre, which is **nearly 5x the recommended application rate for Natular SC**, show foliar residues are non-toxic within 3 hours of an application:

Consider your treatment window

Spinosad	NAF-315 (23.5)	0.16 lb a.i./A	alfalfa	<	3	Honey bee ( <i>Apis mellifera</i> )
		0.16 lb a.i./A	alfalfa	<	3	Honey bee ( <i>Apis mellifera</i> )

Source: <https://www.epa.gov/pollinator-protection/residual-time-25-bee-mortality-rt25-data>

# Supplemental Clarke Research

- Clarke repeated the RT25 study with Natular SC using an application rate of 0.08 lb ai/acre (equivalent to 5.0 fl oz/acre), a **rate more than double the recommended public health use rate**, to give our Natular customers more confidence in their real world experience with this formulation

Natular SC	0.08 lb ai/acre (5.0 fl oz/acre)	alfalfa	<	0	Honey bee ( <i>Apis mellifera</i> )
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An RT25 of 0 (zero) means as soon as residues are dried (within about 10 minutes), Natular SC residues are not toxic to honey bees.

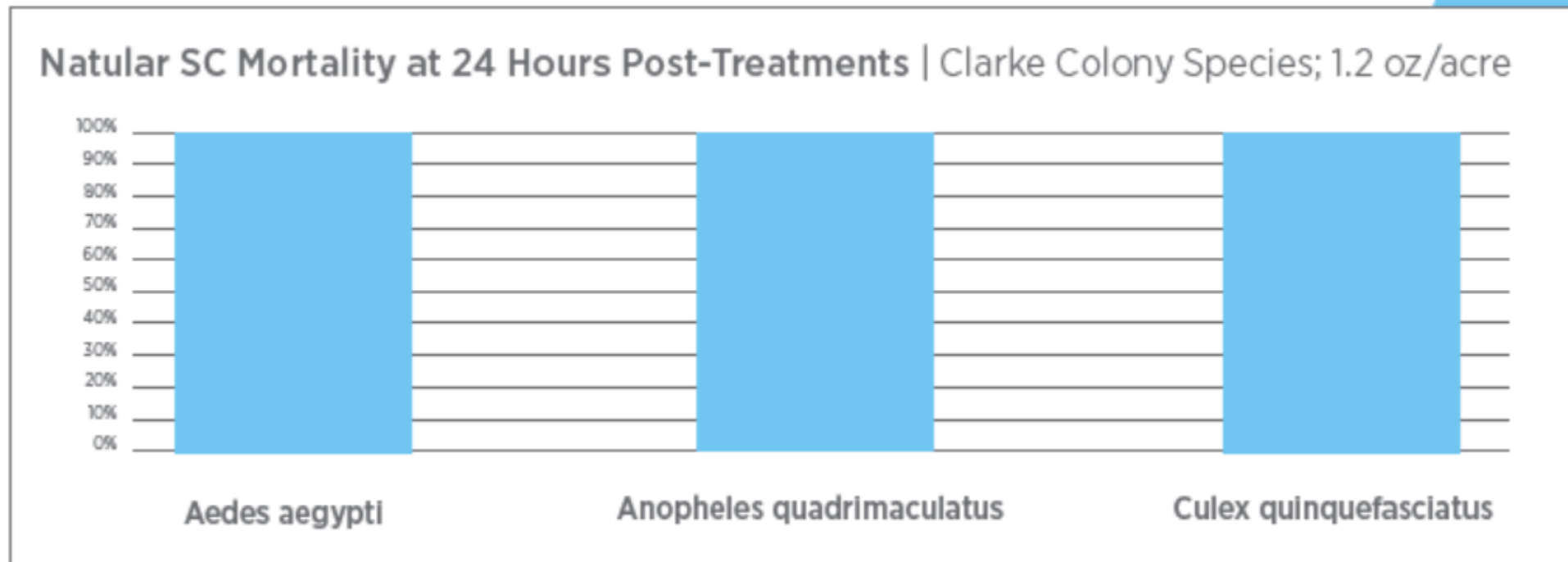
Consider your treatment window.



# Product Efficacy

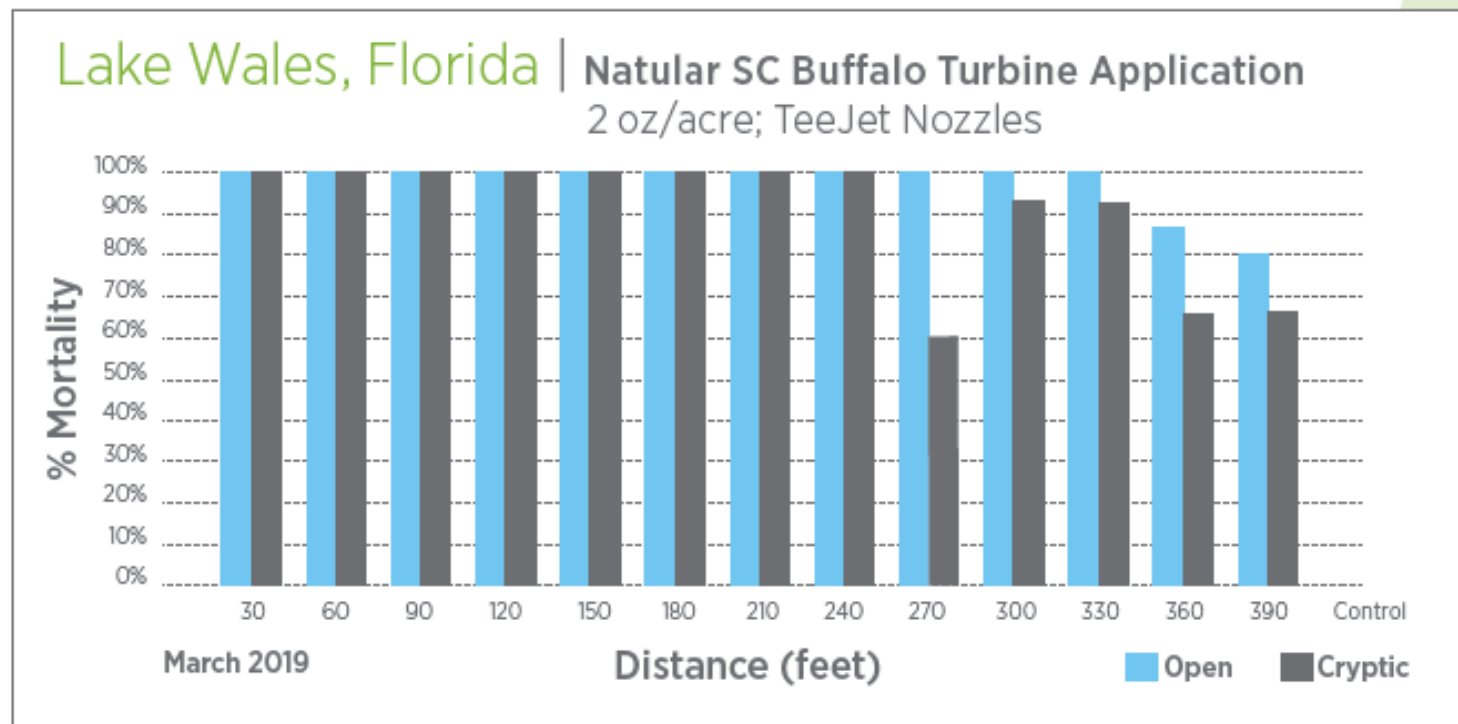
# Lab Efficacy Testing

Lab efficacy testing on Clarke colony mosquitoes demonstrates Natular SC controls larvae from three major species.



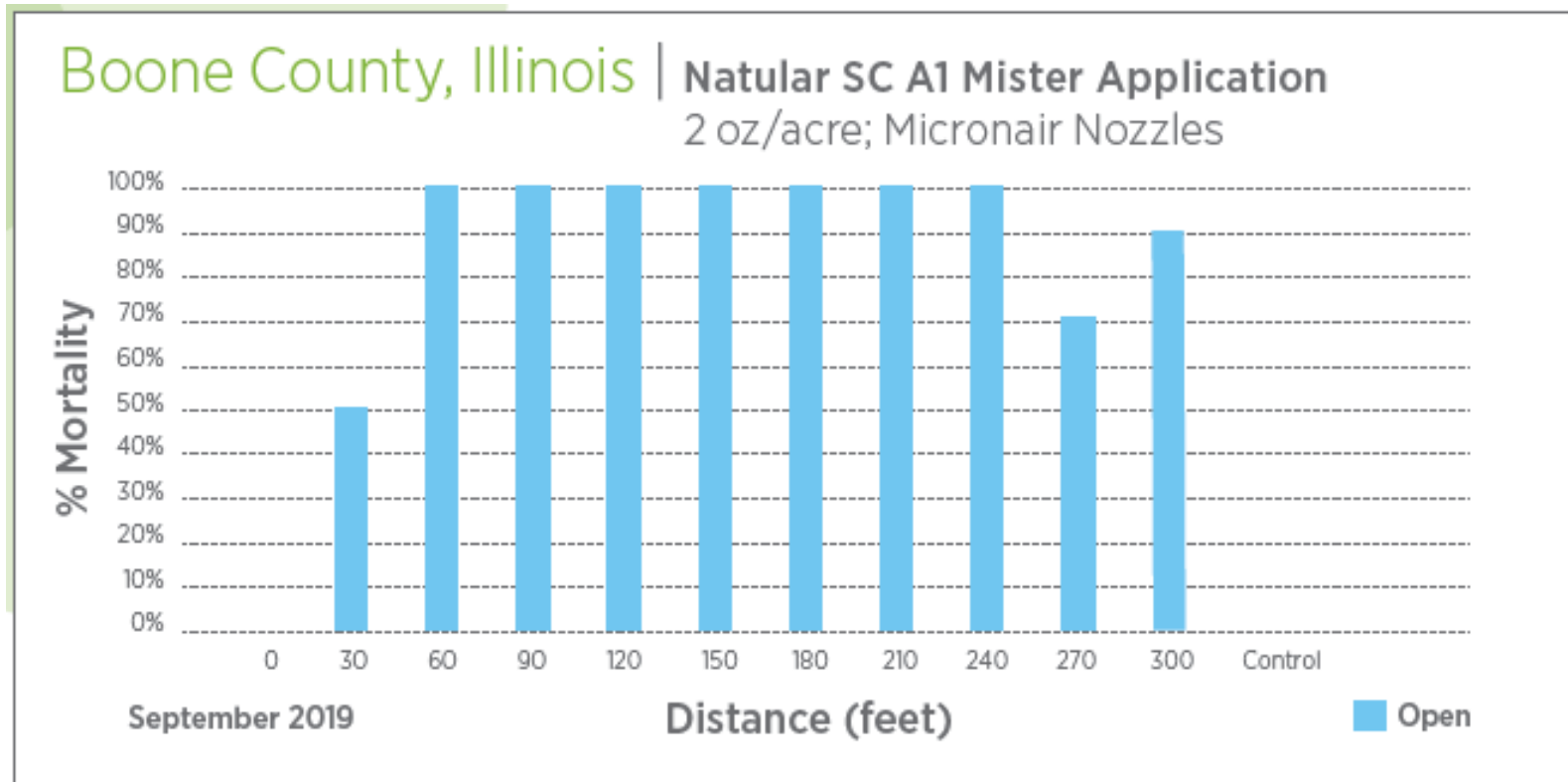
# Wide Area Field Performance

Field trial work in Lake Wales, FL demonstrates the effectiveness of Natular SC on colony *Aedes aegypti* when applied through a Buffalo Turbine outfitted with TeeJet<sup>®</sup> nozzles in open field and simulated cryptic habitats.



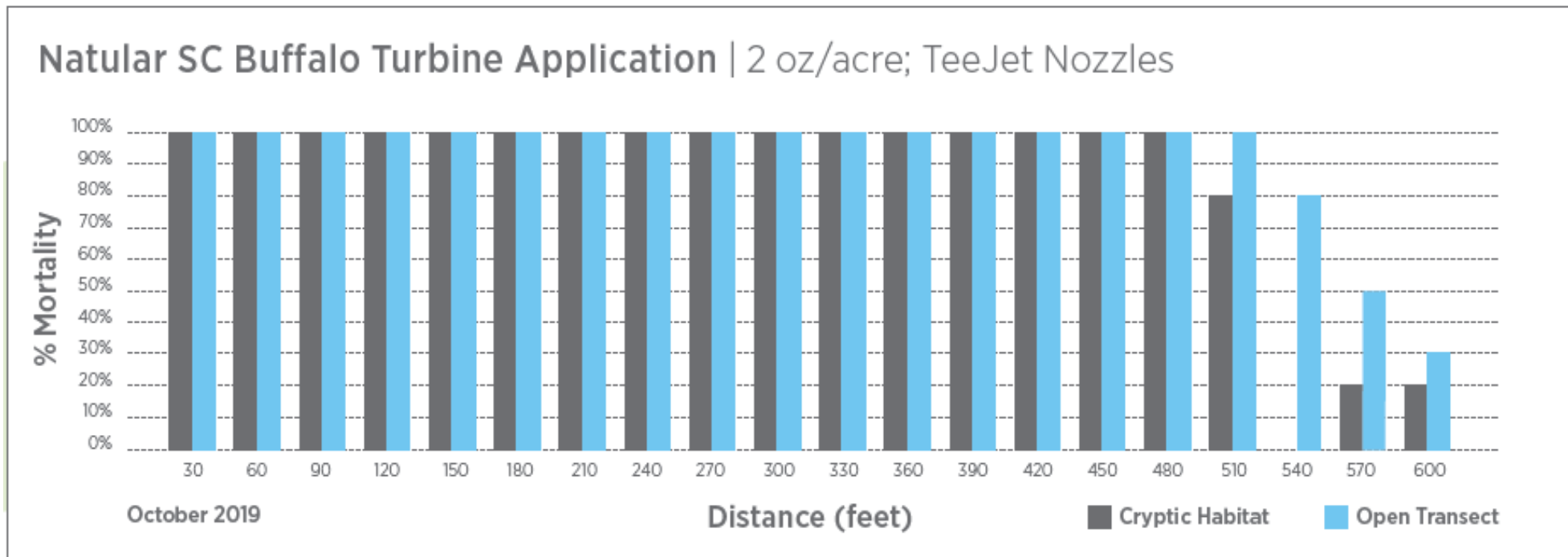
# Wide Area Field Performance, cont.

Field trial work in Boone County, IL demonstrates the effectiveness of Natular SC on colony *Aedes aegypti* when applied through an A1 Mister with Micronair nozzles.



# Operational Performance

The Cayman Islands Mosquito Control Unit used Natular SC for an extended operational trial in 2019. Applications were made through a Buffalo Turbine equipped with TeeJet<sup>®</sup> nozzles to control colony *Aedes aegypti* in residential and cryptic habitats on the island.



# Program Fit Assessment

Are you seeking:	Natular SC	Vectobac WDG
Easy product mixing with just water	Yes	No
No mixing/loading equipment required	Yes	No
Quick mixing process	Yes	No
Low-foaming product	Yes	No
Stable suspension	Yes	No
Non-damaging formulation	Yes	No
Easy clean-up	Yes	No
Low odor	Yes	No
Compact packaging	Yes	No
Application equipment and nozzle flexibility	Yes	Yes
Wide area, ground spot, or aerial labeling	Yes	Yes





# Thank you!

Contact your Clarke Sales Consultant for more information.  
Or call 800-323-5727 if you need  
your Consultant's contact information.