

EARLY SPRING TREATMENTS USING NATULAR™ G30 (2020 UPDATE)

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ABSTRACT

With the goal of reducing early season mammal biting mosquito species such as *Ochlerotatus abserratus* and *Ochlerotatus excrucians*, the Central Massachusetts Mosquito Control Project once again evaluated the Natular™ G30 formulation of spinosad. Created from fermented *Saccharopolyspora spinosa*, spinosad can be a viable alternative to *Bacillus thuringiensis israelensis* and other traditionally used products. The Natular™ G30 formulation of spinosad is a slow release design, allowing itself to be utilized as a pre-hatch treatment. This is the sixth evaluation of Natular™ G30 by CMMCP, and again indicated that Natular™ G30 can be used successfully pre-hatch. This method can be used to control several mosquito species that develop early in the season such as *Ochlerotatus abserratus* and *Ochlerotatus excrucians*.

BACKGROUND

Ochlerotatus abserratus and *Ochlerotatus excrucians* represent two of the first mosquito species to emerge each season, having developed in scattered woodland “snow” pools. These species are both persistent mammal biters and may harbor Jamestown Canyon virus (Andreadis 2005). *Oc. abserratus* and *Oc. excrucians* are univoltine species, as they produce a single generation each year. The eggs produced by adult females during the season remain inactive until the following spring. Although a potential vector of Jamestown Canyon virus, *Oc. abserratus* and *Oc. excrucians* are not considered important factors in the transmission cycle of West Nile virus and Eastern Equine Encephalitis. Along with *Oc. abserratus* and *Oc. excrucians*, *Ochlerotatus canadensis* may also develop in these woodland pools. The significant difference between these three species is that *Oc. canadensis* may

produce multiple generations a year, in addition to being a potential vector of both West Nile virus and Eastern Equine Encephalitis (Andreadis 2005).

To reduce these “spring brood” species of mosquitoes CMMCP had used methoxychlor, an organochlorine, by applying the dust formulation to the frozen larval habitats. Treating these locations pre-hatch, allowed for an expanded larvicide window outside the traditional spring season. The winter applications significantly reduced the number of adult *Oc. abserratus*, *Oc. excrucians*, and *Oc. canadensis* mosquitoes that would later emerge, and as a result lower the number of service requests from the residents of CMMCP member communities. During this time period, methoxychlor was used not only against mosquitoes but many other pest control insects. It was also used against insects in the agricultural, horticultural and veterinary fields (Extension Toxicology Network 1996). Since

CMMCP discontinued using methoxychlor in the 1980s, it has not found a suitable alternative.

The majority of current mosquito larvicide options involve strains of *Bacillus thuringiensis israelensis* and/or *Bacillus sphaericus*, insect growth regulators, or surfactant oils, but the development of spinosad based products adds another alternative. Created from the fermentation of the soil bacteria *Saccharopolyspora spinosa*, spinosad has been shown to control developing mosquito larvae. Natular™ G30 is a currently available, slow release, commercial formulation of spinosad. Another benefit of Natular™ G30 is that the Environmental Protection Agency has identified it (spinosad) as a “Reduced Risk” pesticide (CMMCP 2020). Clarke Mosquito Control Products, Inc., the manufacturer of Natular™ G30, has formulated the granules to provide larval control for up to 30 days, as implied by the product name. CMMCP sought to determine if this product could be applied before the traditional larvicide season, and provide proper control of immature mosquito larvae. If successful, Natular™ G30 would allow for an increased amount of targeted *Oc. abserratus*, *Oc. excrucians*, and *Oc. canadensis* larviciding, reducing the number of adulticide service requests from residents in the CMMCP service area.

MATERIALS & METHODS

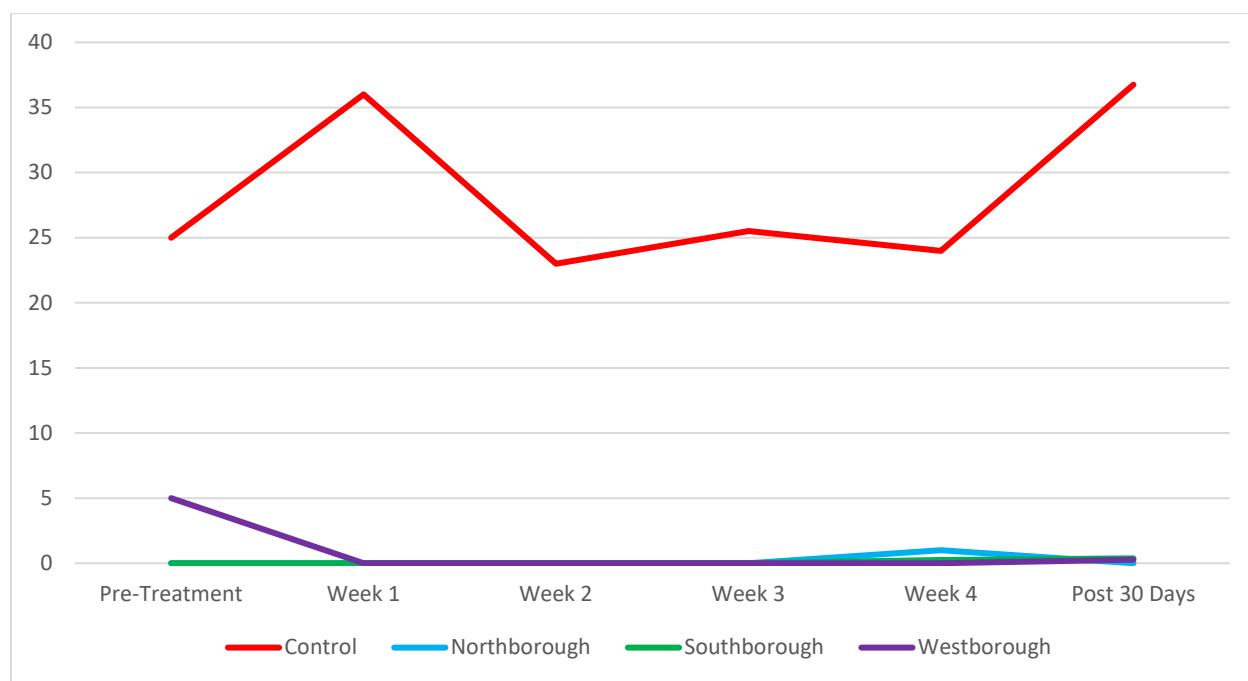
Three CMMCP communities were involved in this evaluation of Natular™ G30, Northborough, Southborough and Westborough. All of these towns were included in previous Natular™ G30 trials. Twenty sites were used to monitor Natular™ G30 efficacy. Site selection

was based on historical larvae data from CMMCP field inspections, although many of the locations were involved in the Natular™ G30 field trials of previous seasons. In order to ensure consistent surveillance during the trials, recoverable dip stations (RDS) were first created at every site, both treated and untreated. Four RDS per site were flagged and at these specific points are where larval densities and general observations took place throughout the course of the project. The Natular™ G30 applications at the treatment sites took place in early to mid-March, immediately following initial pretreatment larval observations, at a rate of 10lbs/acre. Larval surveillance was attempted twice a week, with several additional observations taking place beyond the proposed control range of 30 days. Following the conclusion of field surveillance, the data was compiled and evaluated to measure the level of larval control at treatment sites, as well as what natural fluctuations transpired at the untreated control sites.

2020 RESULTS

Following field observations, the data was clustered by town and treatment status, allowing the efficacy of the Natular™ G30 treatments to be determined. Compared to the control (untreated) sites, all of the treated sites remained relatively free of mosquito larvae for duration of the treatment window. The suppressed levels of larvae continued to be observed beyond 30 days post-treatment. These treatment site observations were in direct contrast to the control (untreated) sites, which experienced consistent levels of mosquito larvae and advancing larval stage for the majority of the project timeframe.

Figure 1: Larval Averages during Natular™ G30 Evaluation



DISCUSSION

Natular™ G30 once again showed viability as a pre-hatch option for early season mosquito species. All treatment sites experienced consistently depressed levels of mosquito larvae, primarily in mammal biting species such as *Ochlerotatus abserratus* and *Ochlerotatus excrucians*. At the same time, untreated sites experienced relatively consistent levels of mosquito larvae, with advancing development stages towards adult emergence. This sixth evaluation of Natular™ G30 reinforced the potential of this product as a viable pre-hatch option against spring mosquito larvae in woodland pools. It is anticipated that CMMCP will begin integrating Natular™ G30 into the spring larvicide program for the 2021 season. As a pre-hatch alternative to traditional

bacterial larvicides, the use of Natular™ G30 will expand the larvicide season for CMMCP field technicians, reducing adult mosquitoes and the need for adulticide operations.

ACKNOWLEDGEMENTS

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REFERENCES

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