Abstract

Tick populations on Long Island are a problem for its residents because they carry diseases, such as Lyme (Borrelia burgdorferi). Fire Island and Shelter Island have both used 4-poster systems to decrease the tick populations. Fourteen 4-poster devices have been set-up at Brookhaven National Laboratory during spring 2013. The “4-poster” device feeds deer corn and uses this attractant to apply pesticide to a deer’s neck, head, and ears via rollers. This study examines the current tick population, habitat ticks prefer, and white-tailed deer usage of “4-posters.” The “4-poster” systems were monitored using wildlife cameras and corn and permethrin usage. Tick surveys were conducted and 4-poster devices were located in ten areas, with a total of four controls. These ticks carry various diseases including Lyme (Borrelia burgdorferi), Babesiosis (Babesia microti), Erlichiosis, and others [1].

The “4-poster” program that took place at Shelter and Fire Island were the first tests of “4-poster” in the area. These areas were carefully monitored for three years and the NYDEC allowed the use of the “4-poster” system on Long Island after this study [2]. In an attempt to decrease the population of ticks, BLN has set up twenty-four “4-poster” devices around the entire site during spring 2013 (Figure 1). The 4-poster works by attracting deer to it with a bait source of corn (Figure 2). The feeding tray is accessed by white-tailed deer by striking its head down along a slanted wall. This forces the deer to lift its neck, head, and ears against the rollers on each end. These rollers contain a pesticide, permethrin. The permethrin stays on the deer’s neck, head, and ears for an extended period [3].

This study looks at the effectiveness of the first summer’s deployment of the 4-poster devices. The number of deer using the device is calculated, and the first year tick surveys are completed. The tick population will also be compared between open grass and forested areas.

Introduction

Brookhaven National Laboratory (BNL) is 5,265 acres composed of mainly forested areas and open fields. It also has an abundance of white-tailed deer present on site. These areas have been fragmented due to building and recreational area development, along with the construction of a solar farm. Tick populations on Long Island have caused problems for residents for years. These ticks carry various diseases including Lyme (Borrelia burgdorferi), Babesiosis (Babesia microti), Erlichiosis, and others [1].

The “4-poster” program is a method of using BNL in the area. These areas were carefully monitored for three years and the NYDEC allowed the use of the “4-poster” system on Long Island after this study [2]. In an attempt to decrease the population of ticks, BLN has set up twenty-four “4-poster” devices around the entire site during spring 2013 (Figure 1). The 4-poster works by attracting deer to it with a bait source of corn (Figure 2). The feeding tray is accessed by white-tailed deer by striking its head down along a slanted wall. This forces the deer to lift its neck, head, and ears against the rollers on each end. These rollers contain a pesticide, permethrin. The permethrin stays on the deer’s neck, head, and ears for an extended period [3].

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Table 2. Displays tick abundance at the 14 “4-posters” and 2 control sites

| Sample | BL Male | BL Female | LS Male | LS Female | Nymph | Larval | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 |
|--------|---------|-----------|---------|-----------|--------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 Male | 0.010 | 0.017 | 0.030 | 0.030 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 |
| 15 Female | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Nymph | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Larval | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Discussion

With extended deployment of the “4-posters”, more deer use them each month on average (Figure 6). Supplemental feeding can bring deer closer together than during normal grazing and is discouraged and even banned in some states due to the possibility of transmitting diseases [4]. The disease of main concern is chronic wasting disease, but this danger can be mitigated through careful observation. No significant difference were found between forested and grass field tick surveys, but it is possible more data will reveal different results. Tick surveys were completed as the baseline in a three year longitudinal study. They will be used for comparison in later years.

References