City of Wyoming
Gypsy Moth Program
Drift Management Plan
2016

The City of Wyoming Gypsy Moth Suppression Program is designed to alleviate the damage and nuisance caused by massive numbers of gypsy moth larvae in areas of human population. To meet this goal, an aerial application of narrow spectrum pesticides is used.

The gypsy moth program utilizes a private consultant to determine treatment areas and to determine the appropriate time for treatment. In addition, an aerial contractor is used to apply the insecticide to suppress the number of gypsy moth caterpillars in designated treatment areas. The contractor carries out the pesticide portion of the spray in May to mid-June in collaboration with the consultant and City program manager. The City program has designed treatment operations to minimize off-target drift in this program. The following is a description of the operational details that have been in effect for previous treatment programs. The methods are described here to comply with the Department of Agriculture Pesticide and Plant Management Division's Regulation No. 637.

PROCEDURES

General

The City uses Integrated Pest Management (IPM) strategies in its approach to gypsy moth suppression to the largest extent possible. Insect population surveys determine where the insect will outbreak so only a minimum of area needs to be treated. This work eliminates large areas of forest from the spray in most years as very low numbers of gypsy moth and populations that are declining significantly are almost never a problem and, thus, are not sprayed.

The most specific generally available larval pesticide, *Bacillus thuringiensis kurstaki* (B.t.k) is used to suppress the gypsy moth while limiting the effects on non-target species. Low volume and small droplet size is also used to achieve good control with the smallest amount of material in the environment. Early intervention is also used to limit growing populations and prevent insect outbreak. Overall, these strategies minimize the use of more toxic chemicals while producing good suppression of gypsy moth life stages throughout the ups and downs of the gypsy moth cycle.

Spray Operations

The conditions under which the spray proceeds are monitored very closely. Wind speed is monitored continuously as it can be a major factor in off site drift. Winds over ten miles per hour are usually avoided particularly if they are gusty and unpredictable in direction and/or speed. Humidity influences the integrity of the droplet as it descends from the aircraft with lower humidity allowing the droplet to dry and become more susceptible to unacceptable drift. Air temperature is also a factor affecting drift with cooler uniform temperatures throughout the air column preferred.

During spray, wind speed is monitored continuously and watched especially close as the speed approaches ten to twelve miles per hour. Hand held gauges are helpful to measure the ground wind speed but technicians also watch the upper trees for gusty conditions and higher level winds that might influence spray. Gusty winds that break up the spray pattern and blow the material in an uneven fashion signal a stopping of the spray activity until favorable conditions return. A steady breeze, particularly with high humidity and cool temperatures, is entirely acceptable for B.t. spray as long as the material falls quickly and penetrates the forest canopy.

Relative humidity (RH) is tested often as conditions change throughout the spray day. The rate of change of this measurement is important as is the precise amount. A steady, although low, RH often allows the material to drop well into the canopy as long as the winds are not gusty and temperatures are not too high. Low RH coupled with other adverse factors means an end to the spray until conditions improve.

When spray weather conditions appear to begin to favor off target drift, the gypsy moth staff make multiple tests beneath the application aircraft. A clean automobile windshield with good backlight and a clean petri dish placed on a post can tell the observer much about the spray deposition. The time it takes from when the aircraft passes overhead to when the spray begins to hit the windshield determines if the spray is falling well or "hanging up" due to temperature inversions, rising air currents, and low humidity. The density and size of the droplets on the windshield and on the petri dish indicate if spray pattern is good and if the small droplets are still falling well. These ground tests of spray deposition continue until a determination can be made that the spray is no longer falling quickly and on target. The spray activity is then called off until more favorable conditions return.

The guidelines for calling off the aerial spray are based on many years of experience and testing under field application conditions. After every spray season, the consultant and contractor assess the field results in a number of the blocks. This data is then combined with the date and time of day when the

blocks were treated. This data is analyzed to see if there are any trends of diminished results because of deteriorating weather conditions that would favor drift or non penetration of the forest canopy. So far, the post spray analysis has shown no difference in efficacy to time of day sprayed. This strongly indicates that the weather guidelines are sufficiently conservative for spray placement and avoidance of off target drift.

In general, spraying is stopped when gusty winds break up the spray pattern and ground testing cannot get good spray deposition of fine droplets after two or three good tests. This testing must take into consideration the material of interest; neat B.t. has an intended droplet size much smaller than microencapsulated pheromone.

The City requires the contractor to utilize micronaire spray nozzles that are able to change droplet size. A larger droplet size will reduce the number of dried out droplets. Also, the increased size will cause the spray material to drop onto the target rather than "hang-up." Adjustments are sometimes made to compensate for field conditions.

Summary

The City, through its private consultant and contractor, monitors spray applications and weather conditions to identify developing conditions that could result in the off-target drift of spray material. Field reports from experienced observers indicate when desirable spray conditions begin to deteriorate and the program director works with the consultant and contractor to determine when the spray application should be stopped either for the day or until conditions improve.

This Drift Management Plan is in effect for the City of Wyoming Gypsy Moth Program continuously unless revised by a more recent version.

4/12/16
Date

Keith L. VandenBerg
Director