



Department of Public Works
100 Stone Quarry Drive
Durham, NH 03824

Public Right-Of-Way Vegetation Management

Standard Operating Procedure

Durham Public Works Mission Statement:

We strive to enhance the quality of our resident's lives. We will work in partnership with residents, community organizations, and other Town departments. We will exercise sound financial and performance principles in the management of our Town's infrastructure. We will act with pride, vision, and accountability, and we will react in readiness. We will listen....and respond.

Approved:

06/16/23

06/16/23

Richard Reine
Director of Public Works

Date

Samuel Hewitt
Assistant Director of Public Works

Date

Table of Contents

Introduction

- 1) Objective.....3
- 2) Procedure.....3
- 3) Level of Service.....3
- 4) Command.....3
- 5) Execution.....3
- 6) Adoption.....4

General Vegetation Management Procedures

- 1) Personnel.....5
- 2) Equipment Inspection.....5
- 3) Spray Equipment Calibration.....6
- 4) Treatment Methods.....6
- 5) Chemical Treatment Procedure.....8
- 6) Labeling of Equipment and Vehicles.....12
- 7) Pesticide Storage.....13
- 8) Public Notification.....15
- 9) Pesticide Licensing Requirements.....16
- 10) Pesticide Permitting Requirements.....22
- 11) Record Keeping and Documentation.....24
- 12) Frequently Asked Questions.....25
- 13) Disclaimer.....28
- 14) References.....28
- 15) Appendix.....29

Introduction

Objective

The Durham Public Works Department believes in providing safe, efficient, and cost-effective vegetation and invasive species management measures within Durham's public right-of-ways for the ecological, economic, and social benefit of the Town's residents, stakeholders, and general public. The Durham Public Works Department is responsible for vegetation control within the public rights-of-way on 61 miles of roadway, 16 miles of sidewalk, dozens of Town-owned parks and lands, and municipal facilities.

Procedure

The objective will be achieved by the implementation and execution of the procedures and tasks outlined in this Standard Operating Procedure. Due to the many variables that are inherent in vegetation and invasive species management, targeted areas may require different levels of effort and/or emphasis on any number of application types, which together will determine the overall strategy for each occurrence. It is important to note that some species may require multiple treatments over several months to completely remediate.

Level of Service

The Durham Public Works Department will make every effort possible to provide vegetation and invasive species management on an annual basis. It should be noted that the Town employs two licensed pesticide applicators, who in addition to facilitating this program are responsible for the continual maintenance of all Town municipal facilities, parks, and public lands.

Command

Direction of vegetation and invasive species management activities for the Durham Public Works Department is vested with the Director of Public Works and his/her designee.

Execution

The policy outlined within this document is intended to serve as the Standard Operating Procedure for public right-of-way vegetation management for the Durham Public Works

Department. One or more of the following, which may delay or prevent the implementation of this policy, may affect all or any part of this policy:

- Equipment breakdown
- Pesticide availability
- Inclement weather conditions
- Protected lands
- Emergencies
- Personnel illness
- Permit restrictions

Adoption

The Town of Durham Public Works Department has adopted this Public Right-Of-Way Vegetation Management, Standard Operating Procedure effective July 2022. Residents and other interested parties are encouraged to familiarize themselves with the content as it describes the methods and procedures the Durham Public Works Department will deploy for the control of various types of vegetation and invasive species.

General Vegetation Management Procedures

Personnel

The Durham Public Works Department will utilize personnel from its Facilities and Grounds Division for pesticide application and from its Highway Division for vegetation management activities that do not require chemical application methods.

Equipment Inspection

The Durham Public Works Department will utilize all Department assets as needed for vegetation management, including but not limited to:

- 6- 26,000 GVW trucks
- 2- One-ton dump trucks
- 1- Volvo Excavator with mulching head
- 1- Maclean Sidewalk Machine with mulching head
- 12 - Chainsaws
- 2 - Motor-powered pole saws
- 1 - 12-gallon pump sprayer
- 2 - Backpack pump sprayers

An annual New Hampshire state inspection of the 26,000 GVW and one-ton dump trucks is performed by the Fleet Services Division in September. Interior and exterior safety equipment is checked for proper operation. Engine components including exhaust, fuel, transmission, battery, and coolant systems are inspected. The undercarriage of every vehicle, including shocks, coil springs, axles, steering components, and frame will be inspected for excess damage. All deficiencies will be corrected before a state inspection sticker is issued. A similar inspection will be performed on the heavy equipment.

The Highway Division will perform routine and emergency maintenance activities on all small engine equipment, including but not limited to; chain sharpening and tensioning, re-fueling and oiling, spark plug cleaning/replacement, carburetor cleaning/replacement, air filter cleaning/replacement.

Spray Equipment Calibration

Proper sprayer calibration is one of the most important components in an integrated pest management program. The Facilities and Grounds Division is responsible for backpack sprayer

calibration using either the 1/128 or Actual Area Sprayed methods depending on the application. Proper calibration of boom sprayer equipment ensures spray applications are effective, efficient, and economical. Most importantly, calibration ensures that the applicator is not over-applying or under-applying a pesticide. Poor spray coverage is the primary cause of reduced spray product performance.

The applicator will calibrate their spraying equipment for the following reasons:

- 1) To determine the precise rate of material applied per acre.
- 2) To ensure each nozzle tip is operating at the manufacturer's specification.
- 3) To compensate for equipment changes and environmental conditions.

The concept of the 1/128th method is based on the time it takes to spray 128th of an acre with a single nozzle on a backpack sprayer and hand pump sprayer. The time requirement is then used to collect fluid ounces from a single nozzle and the result is converted to gallons per acre. The concept of the Actual Area Sprayed method is based on the time it takes to spray a given area with the backpack sprayer. The time requirement of the given area is then used to collect spray from the backpack sprayer. Applicators will follow the calibration worksheets for each method developed by the University of New Hampshire's Cooperative Extension which can be found in Appendix A. This data will be collected and stored through the ArcGIS Survey 123 application.

Treatment Methods

The Durham Public Works Department will draft a Vegetation Control Plan of targeted areas for the upcoming season during the winter preceding each growing season. Targeted areas will include roadways, sidewalks, public facilities, and public lands. The type of species contained within each area will be identified along with the suggested treatment method and timeline for treatment/removal. The Durham Public Works Department will primarily use mechanical or chemical treatment depending on the species and its surrounding environment. For large-scale mechanical public right-of-way trimming which will impact multi-modal transportation patterns, public notices will be issued in advance. These notices will be compiled by the Assistant Public Works Director and distributed through the Friday Updates listserv and Town of Durham social media pages. An ISA Certified Arborist will perform an ISA Tree Risk Assessment for trees which potentially require removal. If the Risk Assessment indicates that removal is the

best course of action, the Durham Public Works Department will consult with the individual property owner(s) where the tree(s) is(are) located.

Each targeted area will be evaluated by Durham Public Works staff. Depending on the species and growth density, the Durham Public Works Department will elect to use one of the following treatment methods:

- a) *Mechanical*: Mechanical treatment will primarily be used on woody brush + trees.
 - 1) *Mowing/Cutting*: Using an excavator with mulching head, chainsaws, or hand pruning equipment. Japanese Knotweed will not be mowed under any circumstance. Cutting alone using hand pruning equipment will not eliminate Japanese Knotweed. Cutting in combination with herbicide treatment or smothering is recommended.
 - 2) *Hand Pulling + Digging*: Most effective on young growth. This method can be very time consuming and is not typically recommended. This treatment alone will not eliminate Japanese Knotweed and will in most cases further stimulate growth and cause the plant to expand in coverage.
 - 3) *Smothering*: Used as an alternative to herbicides for Japanese Knotweed removal. Follow the instructions below:
 - Cut the plant close to the ground during the first week of June.
 - Pile the stems on a tarpaulin to dry.
 - Cover the cut stems by spreading a thick layer of mulch, grass clippings, or other material over them.
 - Cover the entire mulched area with 7-mil or thicker black plastic. If more than one tarp or sheet of plastic is used, ensure that an overlap of 2 feet is maintained to prevent sunlight from penetrating.
 - Weight the plastic and seal the edges with rocks, sticks, soil, sand, or mulch, etc. Patch any holes which develop.
 - After 5 years, the covering material can be removed, and the area planted. It is important to note that if the treated area falls within

the jurisdiction of Comprehensive Shoreland Protection Act, approved plants must be used.

- b) *Chemical*: Chemical control can be very effective in managing noxious weeds and invasive species. This treatment technique requires a licensed pesticide applicator and cannot be applied outside of the public right-of-way by the Durham Public Works Department. It is important to note that this method does not guarantee complete remediation of the targeted species with a single treatment and will require follow-up treatments for 3-5 years.

Chemical Treatment Procedure

If it is determined that a species requires chemical treatment, the Durham Public Works Department will adhere to the procedures below:

- 1) Pesticide applications will be performed by a licensed applicator.
- 2) **Calibration** – Each piece of spraying equipment will be properly calibrated a minimum of once annually by its applicator. Applicators will adhere to the general rules below for calibration and use their best judgement on which method to utilize:
 - a) Always consult the pesticide manufacturer's label for requirements on personal protective equipment. It may be required to wear gloves, safety glasses, and boots during a calibration. An apron may be required to avoid splashing during tank mixing.
 - b) Use only the type and size of nozzle listed on the pesticide manufacture's label during the calibration process to maintain consistency during spraying.
 - c) If the nozzle attached has been previously used, make sure that it is properly cleaned and unclogged to allow correct product flow. When cleaning the nozzle, used compressed or canned air. **Do not blow through the nozzle with your mouth.** If the nozzle needs further cleaning, use the recommended brushes and cleaners.
 - d) The most effective tool to determine a consistent application is pacing. For example, determine a cadence for slower, consistent speeds and one for a more up-tempo pace as the product may require. Controlling pace will help create consistent and effective control of spraying that leads to greater efficiency.

- e) Most manufacturers recommended an optimal spray height of 20" or 30".
 - f) Do not wave the spray wand during a ground application as this will create an uneven application pattern. Spray holding the wand steady either in front of or beside you to provide the best coverage in a broadcast setting.
 - g) A back and forth or up and down pattern will work best with a controlled pace when applying product in a more vertical setting such as on shrubs.
- 3) **Mixing Requirements** – The pesticide will be shipped in concentrate form, requiring mixing with water to dilute before application. For this Standard Operating Procedure, applicators will follow the product label instructions for the Rodeo, FiNALSAN, Finale herbicides:

Rodeo:

- a) Use only clean, stainless steel, fiberglass, plastic, or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store, or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers, or spray tanks.
- b) Fill the mixing or spray tank with the required amount of clean water.
- c) Add the specified amount of Rodeo (e) and nonionic surfactant (LI 700) near the end of the filling process and mix well. Using Rodeo without a surfactant will significantly reduce its performance.
- d) During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, avoid the use of mechanical agitators, terminate by-pass, and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.
- e) Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Concentration (Percent)	Amount of this Product for Desired Volume:		
	1 Gallon	25 Gallons	100 Gallons
0.5	2/3 fl oz	1 pt	2 qt
0.75	1 fl oz	1 ½ pt	3 qt
1	1 1/3 fl oz	1 qt	1 gal

1.5	2 fl oz	1 ½ qt	1 ½ gal
2	2 2/3 fl oz	2 qt	2 gal
3.75	5 fl oz	3 ¾ qt	3 ¾ gal
5	6 ½ fl oz	1 ¼ qt	5 gal
10	13 fl oz	2 ½ gal	10 gal

- f) Do not mix and load within 400 feet of a gravel packed public well or 250 feet within a non-gravel packed well. Additionally, mixing and loading will not occur within 75 feet of surface waters or within 75 feet of private water wells.

FiNALSAN:

- a) Use only clean, stainless steel, fiberglass, plastic, or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store, or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers, or spray tanks.
- b) Fill the mixing or spray tank with the required amount of clean water.
- c) For the control of perennial or more established weeds, mix one part FiNALSAN with 5 parts water (26 oz. in 1 gallon water).
- d) For the control of annual weeds and small, easy-to-kill weeds, mix one part FiNALSAN with 9 parts water (26 oz. in 1 gallon water).
- e) Shake well before using.
- f) Do not mix and load within 400 feet of a gravel packed public well or 250 feet within a non-gravel packed well. Additionally, mixing and loading will not occur within 75 feet of surface waters or within 75 feet of private water wells.

Finale:

- a) Use only clean, stainless steel, fiberglass, plastic, or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store, or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers, or spray tanks.
- b) Fill the mixing or spray tank with the required amount of clean water.
- c) Add the specified amount of Rodeo (e) and nonionic surfactant (LI 700) near the end of the filling process and mix well. Using Rodeo without a surfactant will significantly reduce its performance.

- d) During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, avoid the use of mechanical agitators, terminate by-pass, and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.
- e) If the spray mixture is allowed to settle for any period of time, thorough agitation is required to resuspend the mixture before spraying is resumed. Maintain constant agitation while spraying.
- f) Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Concentration (Percent)	Amount of this Product for Desired Volume:				
	1 Gallon	10 Gallon	25 Gallon	50 Gallon	100 Gallon
0.4	0.5 fl oz	5 fl oz	12.8 fl oz	0.8 fl oz	0.4 gals
0.6	0.75 fl oz	7.7 fl oz	19.2 fl oz	1.2 qts	0.6 gals
0.8	1.0 fl oz	10.25 fl oz	25.6 fl oz	1.6 qts	0.8 gals
1.0	1.25 fl oz	12.8 fl oz	32 fl oz	2 qts	1 gal
1.25	1.6 fl oz	16 fl oz	40 fl oz	2.5 qts	1.25 gals
2.5	3.2 fl oz	32 fl oz	80 fl oz	5 qts	2.5 gals

- g) Do not mix and load within 400 feet of a gravel packed public well or 250 feet within a non-gravel packed well. Additionally, mixing and loading will not occur within 75 feet of surface waters or within 75 feet of private water wells.

4) **Spray Drift Management:** The applicator is responsible for avoiding spray drift when treating the targeted species. When making scheduling decisions, the Supervisory Applicator and Assistant Public Works Director will consider how the interaction of spray equipment and local weather conditions may affect the application on that specific day. Applicators will adhere to the requirements below to avoid off-target drift:

Rodeo:

- a) Do not apply Rodeo when wind speeds are lower than 2 mph due to variable wind direction and high inversion potential.
- b) When applying Rodeo in an environment with a low relative humidity, calibrate the spray equipment to produce larger droplets to compensate for evaporation.

- c) Do not apply Rodeo when there is an atmospheric temperature inversion as reduced vertical air mixing will result in suspended pesticide droplets to remain in a concentrated cloud. This cloud will move unpredictably due to light variable winds which are common during temperature inversions.
- d) Apply Rodeo in the direction the wind is going to avoid the potential for drift to adjacent sensitive areas (e.g. on a NW wind, spray SE).

****The closest automated surface observing station is located at the Pease International Airport. Sensible weather data is reported hourly and can be found here: <https://w1.weather.gov/data/obhistory/KPSM.html>***

Radiosondes collect atmospheric temperature data at both the Gray, ME and Norton, MA National Weather Service Offices daily at 08:00 and 20:00 Eastern Time and is available here:

https://vortex.plymouth.edu/mapwall/upperair/raob_conus.html

ICAO identifiers KGYX and KBOX are for Gray, ME and Norton, MA respectively.

FiNALSAN:

- a) Do not apply FiNALSAN in a manner that will contact workers or other person, either directly or through drift.

Finale:

- a) Apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or vegetative canopy, unless necessitated by application equipment.
- b) Applicators are required to select nozzles that deliver a medium to coarse spray droplet size (ASABE S572.1).
- c) Apply large droplets.
- d) Do not apply Finale when wind speeds exceed 10 miles per hour at the application site.
- e) Do not apply Finale during temperature inversions.

****The closest automated surface observing station is located at the Pease International Airport. Sensible weather data is reported hourly and can be found here: <https://w1.weather.gov/data/obhistory/KPSM.html>***

Radiosondes collect atmospheric temperature data at both the Gray, ME and Norton, MA National Weather Service Offices daily at 08:00 and 20:00 Eastern

Time and is available here:

https://vortex.plymouth.edu/mapwall/upperair/raob_conus.html

ICAO identifiers KGYX and KBOX are for Gray, ME and Norton, MA respectively.

- 5) **Pesticide Application** – Review the specimen labels for the personal protective equipment required for application.

Rodeo

Rodeo will be applied at a 1.5% spray concentration as specified in the Town of Durham's Permit. This concentration is effective in areas where there is a low density of undesirable trees or brush. Flat fan nozzles will be used to allow the product to mist over the foliage of the targeted vegetation. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage. Applicators will follow the instructions on the Rodeo specimen label for situational uses:

- a) **Annual Weeds:** Apply 24 fluid ounces of Rodeo per acre if weeds are less than 6 inches in height or runner length. If weeds are more than 6 inches tall or when weeds are growing under stressed conditions, use 1.25 to 3 quarts per acre. Use the higher concentration for weeds that are over 24 inches tall or on tough to control species. For best results, cover the top one-half of the plant. Spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.
- b) **Perennial Weeds:** Perennial weeds are best treated after they reach the reproductive stage of growth. Non-flowering plants are best treated when they reach a mature stage of growth. When spraying, ensure a thorough coverage of the targeted species. Use a 1.5 percent solution on harder to control perennials including Bermuda grass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle. Use a 4 to 7 percent solution of this product in low volume directed spray applications.
- c) **Woody Brush + Trees:** Apply Rodeo after full leaf expansion unless otherwise directed. Use the higher labeled rate for larger plants and/or dense areas of

growth. For best results, spray during the late summer or fall. Spray coverage should be uniform with at least 50 percent of the foliage contacted. Allow seven or more days before tillage, mowing, or removal. Repeat treatments may be necessary to control plant regeneration.

d) **Aquatic Species:** Rodeo may be applied to *emerged* plants in all bodies of fresh and brackish water that may be flowing, nonflowing, or transient following the instructions below:

- 1) Rodeo will not be applied to plants that are completely submerged or have most of their foliage under water.
- 2) A watershed permit is required to apply Rodeo to public waters.
- 3) Durham Public Works will not perform aquatic applications within a ½ mile of potable water intakes.
- 4) For treatments in dry ditches or after a drawdown of water, wait 1 day to apply treatment and allow 7 or more days before the reintroduction of water.
- 5) For moving bodies of water, applications will be made when the water is moving upstream to prevent the concentration of Rodeo.
- 6) With bankside applications, do not overlap more than 1 foot into open water.

e) **Japanese Knotweed:**

- 1) *Individual Stem Treatment:* Rodeo can be applied to control Japanese Knotweed using individual stem treatment. Using a pointed tool, make a hole through both sides of the stem about 6 inches above the ground, just below a node. Using a hand-held injection device, inject 5 mL of undiluted product directly into each hole of the stem. Treat each stem of the plant.
- 2) *Foliar Spray:* Cut the aboveground portion of the plant in early June. Once the stalks regenerate to 5 feet, apply a minimum 2.5 percent uniform spray concentration to the plant. Additional treatments may be necessary.

FiNALSAN

FiNALSAN will be applied at a rate of 26 oz/gal as specified in the Town of Durham's Permit. Applicators will follow the instructions on the FiNALSAN specimen label for situational uses:

- a) **Annual Weeds:** Apply the mixed solution at 75-200 gallons/acre. Spray weed thoroughly, using a course nozzle setting to reduce drift. Thorough coverage is extremely important. For spot treatment of individual weeds, apply the mixed solution to the center of the plant to the point of runoff. Repeat treatment every two to three weeks to control new weeds growing from seed and re-growth from bi-annual and perennial weeds. The best results are obtained with young, actively growing weeds, less than five inches high.

Finale

Finale will be applied at a rate of 3.2oz/gal as specified in the Town of Durham's Permit. Applicators will follow the instructions on the Finale specimen label for situational uses:

- b) **Industrial Landscaping:** Finale may be used for trimming and edging industrial landscapes and landscaped highway medians, interchanges, embankments, and buffer areas when perennial plants are established. When spraying in areas adjacent to desirable plants, use a shield made of cardboard, plywood, or sheet metal to help prevent spray from contacting foliage of desirable plants.
- c) **Perennial + Annual Weeds:** For postemergence control of emerged weeds listed in the following tables, apply Finale at the rates for broadcast or spot applications based on the weed size and growth stage as defined on the specimen label.
- d) **Woody Brush + Trees:** Apply Finale as a broadcast or spot spray application for control of herbaceous and woody weed species. Make foliar applications in the Spring, Summer, and early Fall when undesirable vegetation is actively growing. Mid-to-late Fall applications to vegetation that is slowing growth may not provide consistent control.

Labeling of Equipment and Vehicles

The Durham Public Works Department is not required to label its vehicles used for transporting applicators to the project site(s) but will adhere to the requirements of NHCAR Pes 504.01 for the labeling of service containers which contain an herbicide:

- 1) Service containers shall bear abbreviated labeling, affixed to the container, which shall include:
 - a) Product name;
 - b) Signal word of original concentrate;
 - c) Common name and percentage of active ingredients;
 - d) Name, address, and telephone number of pesticide application firm; and
 - e) Notation as to whether the material is dilute or concentrate.

Pesticide Storage

The Durham Public Works Department will store their pesticides on the first floor of the barn at the Wagon Hill Farm in accordance with the requirements of NHCAR Pes 803.01:

- 1) Pesticides shall be stored in accordance with the precautionary storage instructions contained in the product label(s);
- 2) Pesticide containers shall have legible labeling indicating the contents of the containers, pursuant to NHCAR Pes 502.02 and Pes 504.01;
- 3) Pesticides and pesticide containers that have not been triple rinsed shall be stored in a separate room and in such a manner as to prevent contamination to food, feed, seed, livestock remedies, drugs, plants, and other products or materials from the volatilization of pesticides, the leakage or breakage of pesticide containers, or other causes;
- 4) Pesticide storage rooms shall be protected and locked in such a manner that they are not readily accessible to children and the general public;
- 5) The floor surface of the pesticide storage room shall be smooth and impervious, facilitating the complete recovery of spills. Floor surfaces may include, but are not

limited to, sealed concrete and plastic. Earthen floors shall be prohibited for pesticide storage rooms;

- 6) The pesticide storage room shall be identified by legible signage clearly indicating that pesticides are in storage, as follows:
 - a) Sign(s) shall include the word “Warning”, “Danger”, or “Pesticides” followed by wording that indicates pesticides are in storage; and
 - b) Lettering of the words “Warning”, “Danger”, or “Pesticides” shall be a minimum of one and ½ inches in height;
- 7) Pesticide storage room shall be vented to the outdoors;
- 8) Pesticides shall be stored in a dry place and in accordance with the temperature requirements on the label;
- 9) Pesticides shall be stored in tightly sealed containment free from leakage, corrosion, breaks, or tears. Containers used for pesticide storage and handling shall be of materials and construction compatible with the pesticide stored and the conditions of storage and maintained in a manner as to minimize the possibility of a spill. Defective containers, if not fully repaired, shall be destroyed or disposed of in accordance with NHCAR Pes 801.04;
- 10) In conjunction with pesticide storage, ambulance and fire department phone numbers or the 911 number shall be displayed at a central location where all persons have access;
- 11) The local fire department shall be notified that pesticides are in storage;
- 12) Notification to the fire department shall include the following:
 - a) The general location of the storage room; and
 - b) General precautions as described on the labels of the pesticides in storage concerning the water solubility, the significance to methods of combating a fire and the possibility of reacting with fire suppression chemicals;
- 13) Pesticide storage rooms shall have sufficient lighting to allow the observation of containers and their labeling;
- 14) Storage of pesticides in bulk shall be in compliance with bulk storage rules under NHCAR Pes 804;

- 15) Cabinets, storage bins, lockers, or similar type storage facilities shall be considered a storage room provided that:
 - a) If the single or aggregate area exceeds 15 cubic feet or 25,920 cubic inches, the facility shall be vented according to NHCAR Pes 803.01(g); and
 - b) The storage facility complies with NHCAR Pes 803.01(a)-(f), (h), (j), (k) - (r);
- 16) Floor drains not used in conjunction with catch basins shall be prohibited in pesticide storage rooms;
- 17) Pesticide storage room floors may be equipped with a catch basin as defined in Pes 802.02, provided that:
 - a) There are no pipes attached; and
 - b) It is constructed for complete recovery of a spill;
- 18) Areas used for storage of pesticides shall be maintained in a clean condition; and
- 19) At a minimum, spills and leaks shall be cleaned up within a one hour period of becoming aware of a spill, leak or discharge.

Public Notification

The Durham Public Works Department will adhere to the New Hampshire Code of Administrative Rules (NHCAR) Chapter Pes 505.06 for the notification of spraying in rights-of-way. These chapter stipulates that the following types of herbicide applications do not require notification:

- 1) By the cut surface treatment where herbicides are applied directly to the cut surface of the stump after vegetation is cut, provided that:
 - a) The herbicide shall be applied before the end of the workday during which the vegetation has been cut or if application is impossible due to rain, during the next work day, following such weather event; and
 - b) The pesticides are applied according to label recommendations;
- 2) To control poison ivy;
- 3) For the control of invasive species listed within Agr 3802.01 NH Prohibited Invasive Species, New Hampshire restricted invasive species as described within RSA 430:53 IV,

Common Reed (*Phragmites australis*, formerly *P. communis*), or Purple Loosestrife (*Lythrum salicaria*);

- 4) In conjunction with landscape plantings on roadside rights-of-way; and
- 5) Pesticide use not related to the purpose of maintaining the rights-of-way.

Most species and applications performed by Durham Public Works will not require public notification. However, messages regarding treatment activities and schedules will be generated by the Assistant Public Works Director or Public Works Director and distributed through the “Friday Updates” listserv service and Town social media pages.

Pesticide Licensing Requirements

Obtaining A License

The New Hampshire Department of Agriculture, Markets, and Food requires that anyone who wishes to apply pesticides on a property of another must be licensed as a Commercial Applicator. For the purpose of this Standard Operating Procedure, a Category B license is required as defined by NHCAR Pes 302.01, “Right-of-way and commercial brush control: shall include commercial applicators using or supervising the use of pesticides for the control of weeds, brush and other vegetative pests in industrial and non-crop sites, and in the maintenance of public roads, electric powerlines, pipelines, railways, waterways, airports, boundary markers and other right-of-way areas including any non-crop area which might require weed and brush control.”

NHCAR Pes 304.01 states that those who wish to “apply for commercial applicator registration shall demonstrate by examination a practical knowledge of the principles and practices associated with pest control and the safe use of pesticides.” Further, Pes 304.02 includes:

- a) There shall be two types of examinations, written and oral.
- b) There shall be separate written examinations for each fundamental area of study as follows:

- 1) A general examination, which shall test knowledge of fundamental core principles, including subject areas such as labeling and labeling comprehension, safety, environmental consequences of use and misuse, etc.
- 2) A regulations examination, which shall test knowledge of applicable state and federal laws and rules that govern the conduct of pesticide activities in New Hampshire, in particular the Federal Insecticide, Fungicide, and Rodenticide Act, regulations under RSA 430:28-50 and the administrative rules written under those regulations, NHCAR Pes 100-1100; and
- 3) A category examination, either operational or supervisory, for each category of certification, which shall test knowledge specific to the category in accordance with the applicable standards of competency under NHCAR Pes 304.10 plus those subject areas listed under NHCAR Pes 304.09(b)(4)-(7).

It is required that the Department have one licensed applicator who also maintains a Supervisory Level Certificate. NHCAR Pes 303.01 states that to be eligible to apply for a supervisory registration certificate, as defined in NHCAR Pes 101.35, the applicant shall satisfy one or more of the following requirements:

- 1) The applicant shall have:
 - a) Been registered at the operational level for 3 years;
 - b) Been actively working in the field for 3 years under the supervision of a person registered at the supervisory level; or
 - c) Held a supervisory registration certificate-general use, as defined in NHCAR Pes 101.36, for 3 years, with the exception that an F2 supervisory registration certificate-general use pursuant to NHCAR Pes 101.36 shall not qualify for eligibility under this provision;
- 2) The applicant shall be a graduate of a recognized college or university at which he or she majored in entomology, plant pathology, forestry, fruit, berry, and vegetable growing, or in other fields requiring training in biological principles, including the use and application of pesticides, and:
 - a) Shall have been registered at the operational level for at least one growing season or shall have been actively working under a person registered at the supervisory level

- or under the direction of a person professionally qualified or above such level a level, for this period of time; or
- b) Shall have held a supervisory registration certificate-general use, as defined in NHCAR Pes 101.36, for at least one growing season, with the exception that an F2 supervisory registration certificate-general use pursuant to NHCAR Pes 101.36 shall not qualify for eligibility under this provision;
- 3) The applicant shall be a graduate of a 2-year school of agriculture or a technical institute majoring in the fields noted in NHCAR Pes 303.01(a)(2) and:
- a) Have been registered at the operational level for at least one year or actively working for at least one growing season under the supervision of a person registered at the supervisory level or under the direction of a person professionally qualified at or above such a level; or
 - b) Have held a supervisory registration certificate-general use, as defined in NHCAR Pes 101.36, for at least one growing season, with the exception that an F2 supervisory registration certificate-general use pursuant to NHCAR Pes 101.36 shall not qualify for eligibility under this provision; or
- 4) The applicant shall have had at least one year of practical experience as described under NHCAR Pes 303.01(a)(2)a. and b. or NHCAR Pes 303.01(b)(2), plus the equivalent of 2 additional growing seasons of experience that shall consist of any of the following:
- a) Practical experience as described under NHCAR Pes 303.01(a)(2)a. and b., NHCAR Pes 303.01(b)(2), or both;
 - b) Educational experience pertaining to the use of pesticides, which may include courses associated with the fields of study listed in NHCAR Pes 303.01(a)(2) or other forms of education as specified under NHCAR Pes 303.01(b)(1), where one year of educational experience is equivalent to one year; or
 - c) Any combination of such practical experience and educational experience totaling the equivalent of 2 growing seasons.

If it is determined that a specific species with a right-of-way requires the use of that require the use of pesticides, the Durham Public Works Department will utilize a licensed applicator.

Currently, the Department has two team members which hold the Category B designation, one of whom additionally holds the supervisory registration certificate.

License Renewal and Continuing Education

The Durham Public Works Department will follow the requirements of NHCAR Pes 400 for commercial applicator license renewals as defined by NHCAR Pes 401.01:

- 1) Any person holding a current license, permit or certificate may renew such license, permit or certificate for the next year without taking another examination provided the following is submitted to the division:
 - a) Application form with the information required by RSA 430:34;
 - b) Proof of financial responsibility pursuant to NHCAR Pes 302.03;
 - c) Report of pesticides used for the preceding year required by NHCAR Pes 901.02 or NHCAR Pes 901.03; and
 - d) Registration fee established by RSA 430:33.
- 2) An examination shall be required for any additional categories or classifications requested by the applicant but not held by the applicant the previous year.
- 3) Every fifth year of renewal, holders of commercial applicator or commercial applicator not for hire registrations or licenses, and holders of private applicator restricted use permits shall provide proof of compliance with the recertification requirements set forth in NHCAR Pes 402.01 and NHCAR Pes 402.02.
- 4) If a license, permit or certificate is not renewed by June 1 of each year then such licensee, permittee or certificate holder shall be required to take another exam pursuant to NHCAR Pes 302.02 and NHCAR Pes 305.04.

NHCAR Pes 402.01 describes the continuing education requirement for commercial applicators.

In summary:

- 1) Commercial applicators shall recertify pursuant to NHCAR Pes 402.01(o) by either attending seminars which have been approved by the division and which shall be known as "division of pesticide control approved seminars" or by retaking the examinations as provided under NHCAR Pes 304, during the last year of their recertification cycle.

- 2) The University of New Hampshire cooperative extension, industry groups, pesticide manufacturers, and others may hold recertification seminars for commercial applicators.
- 3) Seminars, held either in-state or out-of-state, shall provide educational opportunities on any or all the following subjects;
 - a) New application methods;
 - b) New pest control methods in their category of registration;
 - c) New developments in equipment;
 - d) New laws and rules;
 - e) Precautionary techniques used in the safeguard of the environment; and
 - f) Any other information related to new technology pertaining to pesticide application.
- 4) Commercial applicators shall recertify by:
 - a) Retaking the exams as provided under NHCAR Pes 304; or
 - b) Obtaining credits by attending division of pesticide control approved seminars as follows:
 - 1) Credits are calculated in accordance with NHCAR Pes 402.01(i);
 - 2) Credits are obtained during the 5-year period ending December 31 of the applicant's fifth year of certification;
 - 3) The applicant has renewed his or her certification annually during said 5-year period; and
- 4) The applicant has accrued at least 12 credits per category in which he or she is certified, except those persons certified in 5 or more categories shall not be required to obtain more than 48 credits during this period.
- 5) Applicators may attend recertification sessions during any year of the five-year period as described in NHCAR Pes 402.01(o).
- 6) Applicators who add categories shall obtain all needed recertification credit in new categories by the end of the fifth year of the current recertification cycle.
- 7) In lieu of attending these seminars, persons may retake the examinations as provided under NHCAR Pes 304 during the fifth year of every consecutive five-year period from date of original issuance of registration. A passing grade, as stated under NHCAR Pes 304.08, shall be required prior to renewal of the license.

8) The division shall deny credit for a recertification session if the application for recertification credits does not meet the deadline set forth in (d) above, the session does not fulfill the requirements upon which the original approval was based, or if the attendee was not present for the total seminar.

9) Pursuant to NHCAR Pes 402.01(a), recertification seminars approved by state lead agencies for pesticide regulation of states other than New Hampshire shall be considered to be approved by the division and, therefore, to be “division of pesticide control approved seminars.”

10) Pursuant to (t) above, the division shall accept certificates of attendance as verification of attendance of such seminars by the person whose name appears on said certificates as the attendee provided that the certificate:

- a) Is produced by the state lead agency for pesticide regulation, or by cooperative extension;
- b) Bears identification of the state lead agency or cooperative extension; and
- c) Contains the following:
 - 1) Name of attendee or applicator;
 - 2) Name of seminar;
 - 3) Date of seminar;
 - 4) Number of credits approved; and
 - 5) Signature of attendee or applicator.

Continuing Requirements

The Durham Public Works Department will abide by the ongoing requirements of NHCAR Pes 403 as they pertain to licensing:

- 1) Supervisory Level Certificate of Registration: At least one employee at the supervisory or managerial level of each business entity applying pesticides commercially shall hold a supervisory level certificate of registration. If more than one supervisory office or district exists in the state for any one business entity, then at least one member of each such district shall hold a supervisory level certificate of registration.

- 2) Certification of Crew Members: At least one member of each crew shall be registered at either the operational or supervisory level and be present whenever and wherever a commercial application of pesticides is made in this state.
- 3) Periodic Inspections: By accepting registration certificates, licenses, permits, certification and other documents, the bearer shall agree to and understand that periodic inspections of pesticide application for enforcement purposes shall be made pursuant to RSA 430:42 and 430:43.

Additionally, The Durham Public Works Department will host an annual refresher course during the winter season for its field workers to review Best Management Practices for invasive species removal. This will include how to identify them and record their location using the ArcGIS Quick Capture application. This course will be provided in person or virtually by the Invasive Species Coordinator at the New Hampshire Department of Agriculture, Markets, and Food.

Pesticide Permitting Requirements

The Durham Public Works Department will not apply pesticides without being in possession of a special permit issued by the New Hampshire Department of Agriculture, Markets, and Food's Pesticide Control Division. Permit requirements are outlined in NHCAR Pes 505.05:

- 1) Application for approval for treatment of rights-of-way and woodland areas shall be made on form Special Permit Application – Right-of-Way / Woodland Areas provided by the division.
- 2) Applications shall be submitted:
 - a) At least 120 days prior to the date of proposed treatment; or
 - b) At least 60 days prior to the date of proposed treatment in situations where:
 - 1) The treatment will not be made during the months of June 15 through September 30; or
 - 2) The type of application pursuant to NHCAR Pes 505.06(b) is not subject to the notification requirements of NHCAR Pes 505.06.

- 3) Applications for the control of invasive species as listed within Agr 3802.01 NH P3802.01 NH Prohibited Invasive Species, New Hampshire restricted invasive species as described within RSA 430:53 IV, Common Reed (*Phragmites australis*, formerly *P. communis*), or Purple Loosestrife (*Lythrum salicaria*), shall be exempt from (b) above.
- 4) Applicants seeking approval of treatments to rights-of-way shall provide the following information and accompanying documentation:
 - a) Designation of area to be treated;
 - b) Name and address of contractor employed to apply pesticides;
 - c) Labels for products to be utilized;
 - d) The current U.S. Geological Survey map of a scale of no less than 1:24000 or 1:25000 if metric, if available, or maps of an appropriate scale and scope to allow decision-making delineating:
 - 1) The spray area;
 - 2) Surrounding areas;
 - 3) The following sensitive areas:
 - a) Public wells within 400 feet of the proposed treatment area used for drinking or domestic purposes;
 - b) Surface waters or their tributaries used for public water supply;
 - c) Other surface waters;
 - d) Pasture land; and
 - e) Watersheds of public water supplies;
 - 4) Method of notification to be utilized pursuant to Pes 505.06;
 - 5) A copy of the notification request coupon pursuant to Pes 505.06(f)(5)g. used in the notification process; and
 - 6) Detailed information as to method of application, description of property, schedule of treatment, and reason or need for treatment.
- 5) Information submitted in support of proposed treatment shall be complete and accurately represent the facts, and any falsification of information shall result in denial, or revocation after opportunity for a hearing, of the special permit.

- 6) The division shall act upon the permit application in accordance with RSA 541-A:29, where decisions to grant or deny a permit are based upon the criteria specified in NHCAR Pes 603.02(a)(1)-(7) and (9).
- 7) In the event of a public health emergency, application for a special permit shall be in accordance with NHCAR Pes 505.05(a), (d)(1)-(4) and (7), (e), and (h).
- 8) In the event of a public health emergency the division shall act upon a special permit application in accordance with NHCAR Pes 505.05(f), and:
 - a) Prioritize the order of review such that those applications that are perceived to have the greatest impact on human health shall be processed first; and
 - b) Transmit the permit, if granted, to the applicant by fastest practicable means such as facsimile, electronic mail, or U.S. mail.

Record Keeping and Documentation

The Durham Public Works Department will comply the rules outlined in NHCAR Pes 901.02:

- 1) All applications of pesticides by registrants or permittees shall be recorded simply and accurately with records being maintained at the firm, branch office, or subsidiary for pesticide applications performed by personnel working from such firm, branch office or subsidiary as registered under NHCAR Pes 307.
- 2) Registrants and permittees shall keep and maintain these records for a period of at least 2 years whether or not there is a renewal of certification.
- 3) The following facts regarding each pesticide application shall be included in records maintained by both commercial and private applicators:
 - a) Crop treated, site of treatment, address, and town;
 - b) Pesticide and formulation employed;
 - c) Dosage applied;
 - d) Method of application;
 - e) Date or dates of application;
 - f) Target organisms; and
 - g) The registrants or permittees of the division who participated.
- 4) The records specified in (a) above shall be made available to the division to verify compliance with this section.

Additionally, The Durham Public Works Department will comply with annual reporting requirements as defined by NHCAR Pes 901.04:

- 1) In addition to NHCAR Pes 901.02, all records pertaining to the application of pesticides, as required under RSA 430:33 I, II, shall be made available to the division on an annual basis, for the period ending October 31, on or before December 1.
- 2) Applicators and permittees shall report annually the following regarding pesticide use:
 - a) Name of applicator and firm;
 - b) The year for which the report covers;
 - c) Location of the site of application;
 - d) The list of licenses or permittees whose use is included in the report;
 - e) Trade name of pesticide;
 - f) Amount of active ingredient in the concentrate;
 - g) EPA pesticide registration number;
 - h) Major crop or site treated;
 - i) Number of acres treated with each pesticide reported; and
 - j) Total amount of concentrated pesticide used.

Durham Public Works pesticide applicators will complete entries for the pre-application checklist and daily use record using Survey123. This data will be stored digitally and made available upon request. Examples of an unpopulated survey can be found in Appendix B.

Frequently Asked Questions

1) What is the best treatment for Japanese Knotweed within public right-of-ways?

As indicated above in the section labeled "Treatment Methods", Japanese Knotweed can be controlled mechanically or chemically. Japanese Knotweed Best Management Practices outlined by the New Hampshire Department of Agriculture, Markets & Food indicate that chemical measures are most effective for managing the spread of the plant. Aside from chemical treatment, mechanical measures such as smothering have also proven beneficial.

2) How are Japanese Knotweed stems disposed of?

In most cases, the Durham Public Works Department will allow the Japanese Knotweed stems to decompose on-site. This will minimize the risk of spreading the plant as seeds can be lost during transportation. For plants which are located near wetlands or surface waters, the Durham Public Works Department will lay the stems on plastic or a tarpaulin until they are fully dried to prevent the stems from rooting in the moist soil. The plastic or tarpaulin will be removed once the stems are dry, and the stems will be left in place to decompose. If the stems are in a manicured area, the Durham Public Works Department will allow the stems to dry completely before transporting them in a covered dump truck to the Transfer Station for burning.

3) When applying a pesticide, how will the operator prevent damaging nearby vegetation?

When applying pesticides, the Durham Public Works Department will follow Best Management Practices to ensure that the target is the only noxious weed / invasive species that receives treatment. The herbicide, Rodeo, will be used and mixed with LI-700 for noxious weed and Japanese Knotweed control. LI-700 is soy-oil derived product with a non-ionic penetrating surfactant to reduce off-target spray drift. When applying this combination, Durham Public Works will follow the guidance for spray drift management on Rodeo's specimen label. Additional information can be found in the section of this Standard Operating Procedure labeled "Process and Procedures".

4) How will waterways be protected when applying pesticides in their vicinity?

As mentioned previously, The Durham Public Works Department will use the herbicide, Rodeo, mixed with LI-700 for noxious weed and invasive species control. The Rodeo product was chosen for its effectiveness in controlling annual and perennial noxious weeds and invasive species which grow in and around aquatic sites and wetlands. NHCAR Pes 502 lists the setbacks in feet within which pesticides may not be applied without a special permit and include:

- 1) Gravel Packed Public Wells – 400¹
- 2) Non-Gravel Packed Wells – 250¹
- 3) Public Water Supply Surface Waters (within watershed out to 5 miles) – 250¹
- 4) Public Waters Under Shoreland Protection Act* - 50¹
- 5) Non-Public Waters⁴ – 25²

6) Beyond 25 Feet – Not in a manner that will result in presence of pesticide within 25 feet of the REFERENCE LINE³.

1 Exceptions to these distances may be requested through a SPECIAL PERMIT.

2 EXCEPTION under Pes 1001.002 (a) for indoor treatment (b) outdoor termite control & (c) other outdoor applications under SPECIAL PERMIT.

3 REFERENCE LINE (Pes 101.28) – For natural fresh water bodies the natural mean high water level (DES) or the high water mark; for artificially impounded fresh water bodies, the elevation of the top of the impoundment; for coastal waters, highest observable high tide; for rivers, ordinary high water mark.

4 SURFACE WATER (Pes 101.37) – “means streams, brooks, creeks, rivers, lakes, ponds, wetlands and tidal waters within the jurisdiction of the state, including all streams, lakes or ponds bordering on the state, marshes, watercourses and other bodies of water, natural or artificial.”

Public rights-of-way with the Town of Durham fall within these buffers in many locations. For this reason, Durham Public Works operates under a Watershed Special Permit for applying pesticides issued by the New Hampshire Department of Agriculture, Markets & Food Division of Pesticide Control. This permit allows the Department to use Rodeo within the setbacks listed above. Applicators will adhere to the guidance listed on the Rodeo specimen label for application to protect the waterway in the vicinity of the target.

5) How will you treat an invasive species which crosses the right-of-way onto private property?

Those who wish to apply pesticides on a commercial basis, on the property of another, must be licensed as a commercial applicator. The Durham Public Works Department has two team members which hold the Commercial Not-For-Hire designation. A Commercial Applicator Not-For-Hire is a commercial applicator who applies pesticides to one specific location as part of their employment with a particular entity. In the case of Durham Public Works, applicators can apply pesticides on Town of Durham property and under no circumstances can they apply pesticides for clients on a not-for-hire, for-hire or contract basis.

If it is determined that an invasive species or noxious weed may extend beyond the public right-of-way, Durham Public Works will consult with the property owner. Boundary markers will be located to designate the public right-of-way vs. private property. Treatment will be applied to those species within the public right-of-way only. Durham Public Works will encourage the property owner to consult with the New Hampshire Department of Agriculture, Markets & Food Division of Pesticide Control to strategize treatment for the species on their property.

7) Will I receive a notification if noxious weeds or an invasive species will be chemically treated in front of my home?

The Durham Public Works Department will issue notices through the Friday Updates listserv for larger scale chemical treatment applications of noxious weeds. If there is a large cluster of an invasive species, such as Japanese Knotweed that will require multiple steps for remediation, the Durham Public Works Department will consult with the individual property owner abutting the right-of-way.

8) I have decorative plantings and trees in front of my house. Will these be damaged by the roadside cutting equipment?

The Durham Public Works Department does not permit and is not responsible for existing decorative landscaping planted within the public right-of-way. Saplings and young trees will be cut back to avoid overgrowth, reduced sightlines, and damage to public infrastructure. Mature trees will require an ISA Tree Risk Assessment performed by an ISA Certified Arborist before significant pruning or removal occurs.

Disclaimer

To the extent any previous rule, regulation, policy, or past practice, written or unwritten, is in conflict with the provisions of this policy, such is hereby withdrawn, voided and all personnel should conduct themselves in conformity with this policy.

References

Cygan, D. (2018). *Preventing the Spread of Japanese Knotweed*. Best Management Practices. Retrieved June 30, 2022 from <https://www.agriculture.nh.gov/publications-forms/documents/japanese-knotweed-bmps.pdf>

Hamilton, G. (2016, February 8). *Greenhouse Sprayer Calibration and spray calculation worksheet*. Extension. Retrieved June 30, 2022, from <https://extension.unh.edu/resource/greenhouse-sprayer-calibration-and-spray-calculation-worksheet>

Laws and rules. Laws and Rules | NH Department of Agriculture, Markets and Food. (n.d.). Retrieved June 30, 2022, from <https://www.agriculture.nh.gov/laws-rules/index.htm>

Rodeo Herbicide. Rodeo Herbicide | Herbicide – Land Management. (n.d.). Retrieved June 30, 2022, from <https://www.corteva.us/products-and-solutions/land-management/rodeo.html>

Appendix

A.



Backpack Sprayer Calibration Worksheet 1/128 Method

1/128 Method Calibration

The concept of the 128th method is based on the time it takes to spray 128th of an acre with a single nozzle on a backpack sprayer and hand pumped sprayer. That time requirement is then used to collect fluid ounces from a single nozzle. Since there are 128 fluid ounces in a gallon, the simple conversion or result is in gallons per acre (GPA).

Retain the following information for your records:

Date _____

Ag Firm _____ Operator _____ Phone _____

Address _____ Town _____ State ____ Zip code _____

Backpack Sprayer Identification: _____

Backpack Sprayer _____ Brand _____ Tank Size _____

Sprayer Tip Type _____ Sprayer Tip Size _____

Control Flow Value Regulator Type and Pressure Rating _____

Step 1: Determine application pressure and timing.

Mark off an area that is 340 square feet (18.5 feet by 18.5 feet). Mark out established boundaries. Measure the time in seconds it takes to uniformly spray the 340 square feet. Walk at a comfortable, steady speed and maintain consistent pressure while spraying. Operate the backpack sprayer with half tank of water at the desired pressure.

Seconds to spray the 18.5 feet by 18.5 feet area:

First Trial: _____ Second Trial: _____ Third Trial: _____

Total time (sum of the 3 trials): _____ Seconds

Average time needed to spray 340 square feet area (18.5 feet by 18.5 feet) =

_____ fluid ounces divided by 3 trials = _____ average number of seconds to given spray area

Step 2: Measure nozzle output.

Using a stopwatch and measuring cup marked in fluid ounces, collect water from the nozzle for the time (in seconds) it took to spray the predetermined area.

Collect water output for _____ seconds (Calculated in Step1)

Amount collected:

1) _____ fluid ounces 2) _____ fluid ounces 3) _____ fluid ounces

Total output from the nozzle (sum of the 3 collections): _____ fluid ounces

Fluid ounces for average nozzle output =

_____ fluid ounces divided by 3 collections = _____ fluid ounces for average nozzle output

Average nozzle output: _____ fluid ounces is equal to _____ Gallon per Acre (GPA)

The sprayer is calibrated to deliver _____ gallons per acre.

To convert to gallons per 1000 square feet

Gallons per 1000 square feet = _____ GPA divided by 43.46 (*number of 1000 sq. ft. in acre*)

Gallons per 1000 square feet = _____

To convert to fluid ounce per 1000 square feet

Fluid Ounce per 1000 square feet = _____ Gallons per 1000 square feet times 128 fl. oz. per gallon

Fluid Ounce per 1000 square feet = _____

George Hamilton, Extension Field Specialist

February 8, 2016

UNH Cooperative Extension programs and policies are consistent with pertinent Federal and State laws and regulations
On nondiscrimination regarding race, color, national origin, sex, gender orientation, age, disability or veteran's status.
College of Life Sciences and Agriculture; County Governments; and U.S. Department of Agriculture.



Backpack Sprayer Calibration Worksheet

Actual Area Sprayed Method

Retain the following information for your records: Date _____

Ag Firm _____ Operator _____ Phone _____

Address _____ Town _____ State ____ Zip code _____

Sprayer Identification

Backpack Sprayer _____

Spray Nozzle _____ Tip Size _____

Control Flow Valve Type and/or Pressure _____

Actual Area Sprayed Method Calibration

The concept of the actual area sprayed method is based on the time it takes to spray given area with the backpack sprayer. That time requirement the given area is then used to collect spray from the backpack sprayer.

Step 1: Determine application pressure and timing.

Mark off an area along with marking out established boundaries and record measurements of the area. Measure the time in seconds it takes to uniformly spray the given area. Walk at a comfortable, steady speed and maintain consistent pressure while spraying. Operate the backpack sprayer with half tank of water at the desired pressure.

Total: _____ seconds to spray the _____ feet by _____ feet area.

Step 2: Measure nozzle output.

Using a stopwatch and measuring cup marked in fluid ounces, collect water from the nozzle for the time (in seconds) it took to spray the given area.

Collect water output for _____ seconds.

Amount collected:

- 1) _____ fluid ounces 2) _____ fluid ounces 3) _____ fluid ounces

Total output from the nozzle (sum of the 3 collections): _____ fluid ounces

Fluid ounces for average nozzle output =

_____ fluid ounces divided by 3 collections = _____ fluid ounces for average nozzle output

Average nozzle output: _____ fluid ounces

Gallons for average nozzle output = _____ fluid ounces divided by 128 fluid ounces = _____ gallons

Step 3: Calculate number of square feet in given area.

Given Area: _____ feet by _____ feet area.

Calculate number of square feet: _____ feet times _____ feet = _____ square feet in given area.

Step 4: Rate per Acre.

$$\frac{\text{Gallon per Acre} = (\quad) \text{ Gallons (given area)}}{\text{Acre} \quad (\quad) \text{ Square Feet (given area)}} = \frac{\text{(X) Gallons per}}{43,560 \text{ Square Feet per Acre}}$$

$$\frac{\text{Gallon per Acre} = (\quad) \text{ Gallons (given area) times 43,560 Square Feet per}}{\text{Acre} \quad (\quad) \text{ Square Feet (given area)}}$$

$$\text{Gallon per Acre} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ Gallon per Acre}$$

Step 4: Rate per 1,000 Square Feet in Gallons.

$$\frac{\text{Gallon per 1,000 square feet} = (\quad) \text{ Gallons (given area)}}{\frac{\text{Foot}}{\text{Foot}} \quad (\quad) \text{ Square Feet (given area)}} = \frac{\text{(X) Gallons per 1,000 Square}}{1,000 \text{ Square}}$$

$$\text{Gallon per 1,000 Square Feet} = \frac{(\quad) \text{ Gallons (given area) times 1,000 Square Feet per Acre}}{(\quad) \text{ Square Feet (given area)}}$$

$$\text{Gallon per 1,000 Square Feet} = \frac{(\quad)}{(\quad)} = \underline{\hspace{2cm}} \text{ Gallons 1,000 Square Feet}$$

Step 4: Rate per 1,000 Square Feet in Fluid Ounces.

Fluid Ounce per 1,000 Square Feet = _____ Gallons per 1,000 Sq. Ft. times 128 Fluid Ounces per Gallon

Fluid Ounce per 1,000 Square Feet = _____ Fluid Ounces

B.

Pesticide / Fertilizer Applicator Preparation Checklist

Applicator Name (Printed): _____ Date: _____

Applicator Signature: _____

ITEM	YES	NO	COMMENTS	RESOLVED
Have required and up to date Certification or Licensure?			Certificate or Licensure #: Date:	
Proper PPE per product label and SDS shall be followed?				
Closed steel toed Boots and socks shall be worn?				
Long sleeve shirt and long pants shall be worn?				
Reflective shirts or vest- if working near traffic shall be worn?				
Equipment drain lines shall be closed as required?				
Filters shall be confirmed are in place and clear?				
Equipment shall always be checked for leaks?				
All tank applicators shall be properly labeled per chemical specifications?				
All chemicals mixed for the job shall be used as required?				
Empty Chemical containers shall be triple rinsed, crushed or hole punched?				
End of Use Containers shall always be properly labeled?				
Chemical Spraying Records Form shall always be completed?				



NH PESTICIDE APPLICATOR DAILY USE RECORDS

Company Name _____

Applicator(s) _____

Date	Address & Town	Site & Crop	Pesticide & Formulation	Application Method	Treated Dosage	Target Pest(s)

- These records must be maintained for 2 years whether or not certification is renewed
- Administrative Rule reference for daily record keeping may be viewed on reverse side