

Pesticide Application Equipment

In order for pesticides to do their jobs, it is critical for pesticide applicators to make sure pesticides reach the target pests in the most effective and efficient way. In past exams we have talked about nozzle technology, and how selecting the proper nozzle for a boom sprayer allows the applicator to get more of the product to the target pest. In this exam we will take a step back and look at when to properly use the many different types of application equipment. Each piece of equipment has strengths and weaknesses and as an applicator you need to be aware of these to effectively control the pest and make informed decisions when buying equipment.

Boom Sprayers:

The vast majority of pesticides applied on Nova Scotia farms are applied by tractor mounted or pull behind sprayers. Boom sprayers are the most common type, but can vary greatly in form and design. Boom sprayers are designed to distribute an even amount of spray volume over a fixed boom width. They work most effectively when they are applying blanket treatments over low growing crops. The downward pressure of the spray volume allows it to penetrate the canopy. Modifications of nozzles and nozzle formations can allow for different applications depending on the target pest. These sprayers can be attached to a tractor's three point hitch, be pulled on a trailer or be on a self propelled spraying unit.

The major considerations with a boom sprayer are the boom length, the spray volume capacity (tank size) and the pump (what is the pressure range). To a certain extent, the size of the tractor that will run the sprayer will determine what sprayer specifications you should get. Beyond PTO and pulling capacity of the tractor, type of crop and field type can greatly impact the type of boom sprayer. Small fields and undulating land can limit practical boom length. Most applicators would like a wider boom length to decrease the number of passes over a field. However, it is critical boom height stays fairly consistent when applying any product. Over the last several years there have been great advances in auto levelers and new designs that allow booms to stay fairly level in moderately hilly fields. Keep in mind, some of these advancements may be cost prohibitive for smaller growers.

Forced air boom sprayers work very similarly to a regular boom sprayer, except air is forced downward with the spray pattern and drives the product into the crop canopy. This technology can greatly reduce spray drift and can improve coverage, especially when the pest target is in the crop canopy (ie. mites). Electrostatic sprayers force charged spray particles into the canopy. These positively charged particles are drawn to the negatively charged leaf surfaces. This sprayer is designed to get more product to the target and in theory less product is lost.

Airblast Sprayers:

Airblast sprayers are generally used in orchards, vineyards and other perennial crops. The purpose of these sprayers is to distribute the desired spray volume through a three dimensional canopy. These sprayers force spray volume in a vertical pattern and often produce small spray droplets. The small spray droplets allow for good canopy penetration and effective pest control, especially in orchards. Keep in mind these sprayers are prone to spray drift due to the droplet size and the height at which the spray volume is discharged from the sprayer.

These sprayers use nozzles, similar to boom sprayers, to create spray droplets. The difference is the sprayer forces air to deposit spray volume into the desired target in a vertical pattern. In wild blueberries, these sprayers are often used to spray fungicides or insecticides on cropping fields in order to reduce the number of passes across a field. Some larger airblast sprayers can have an effective spray width of 80+ ft. There are boom sprayers that have an 80 ft boom width, but these sprayers are not as practical in smaller fields and can be cost restrictive even for moderate size growers.

Backpack Sprayers:

Backpack sprayers are often an under-utilized pest management tool. Backpack or handheld sprayers allow the pesticide applicator to treat small pest outbreaks in a much more focused way. Spot weed control is the most common use for the backpack sprayer. However, with different nozzle configurations and backpack booms, vegetable growers can treat row crops for diseases and insects. This can be especially effective when multiple species are being grown in a field. It allows for site specific application in small areas.

With any pesticide application device it is important to follow proper safety procedures to minimize pesticide exposure. A backpack sprayer is no different; as the applicator is much closer to the product than they would be in a tractor.

Motorized backpack forced air sprayers can also be used to apply different pesticides in special situations. This equipment uses a motorized blower and either a pump or gravity feed to distribute a mist. This is ideal for fungicides and insecticides in small perennial fruit fields.

Weed Wipers:

Weed wipers can come in many forms, but all of them aim to wipe herbicides onto the target weed. Generally, these devices are best used with broad spectrum, non-selective herbicides like glyphosate. Due to the nature of the application, the device targets weeds that are taller than the crop. In essence, it allows for selective weed control with a non-selective herbicide.

Weed wipers come in varying widths and styles. As with boom sprayers, how level your fields are can help determine your optimal width. These devices are simple, inexpensive and can allow for a diversified weed control program. They are used in vegetables, berries and some field cropping and pasture situations.

Hand held “hockey stick” style weed wipers allow for spot treatment of weeds in low density weed situations. This apparatus is simply a hollow tube shaped like a hockey stick, with an adsorbent material on the blade.

Other Pesticide Application Devices:

In some livestock facilities or greenhouses, some pesticides are to be applied by a fogger. In these controlled environments, this equipment emits very small spray droplets that creep into the areas where the pests are hiding. This equipment should be used with extreme caution and is often used when the spaces are empty of livestock or crops.

Dusters were once popular application devices for powder formulated insecticides. This piece of equipment blows powder out of a hopper with a motorized fan. The small dust particles allowed

for excellent coverage of the plant material and allowed for effective pest control. However, wind conditions had to be very low and applicator exposure risk is very high.

Soil fumigation is still done for many crops. The procedure involves preparing the soil and injecting the fumigant into the soil. The broad spectrum fumigant will reduce most insect, disease and some weed pressure, depending on the product used. Great care has to be used to avoid movement of product off site and to minimize applicator exposure.

Granular applicators are used in several perennial crops. These applicators are often modified fertilizer applicators or motorized forced air backpack sprayers. Granular pesticides generally have less active ingredient per unit weight, compared to other formulations, to allow for easier distribution. The aim of the equipment used is to distribute the granules evenly over the target treatment area. Calibration of granule applicators, like all pesticide application equipment, is critical.

Operation:

Whatever devices are used on your farm, it is critical to understand how it functions and how to maintain it. No matter how good a piece of equipment is, if it is being used improperly or isn't being maintained well, it will invariably lead to decreased pest control, wasted input costs and lost revenue. Always consult the manufacturer for proper operation and maintenance of pesticide application equipment.

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