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INSECT, PLANT DISEASE, & WEED SCIENCE NEWS [No. 87-7] [May 1, 1987]

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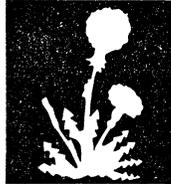
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**INSECT
PLANT DISEASE
WEED SCIENCE****NEWS**

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87-7

May 1, 1987

In This Issue:

-HERBICIDE APPLICATION

Weed control with herbicides depends on the uniform application of dependable herbicides. A sprayer is needed which will allow for both uniform application and correct droplet size at desired spray volumes. The sprayer should be of sufficient capacity to handle the acreage involved.

AGITATION

Agitation of most spray solutions is necessary. Any separation will vary the spray concentration. For a simple orifice jet agitator, a flow of 6 gallons per minute for every 100 gallons of tank capacity is usually adequate.

SPRAY BOOMS

The use of gauge wheels helps maintain the proper distance between the spray nozzle and the target especially on uneven ground, going across terraces, etc. A spray boom where the height and angle of the spray nozzles can be changed is also desirable. The supply lines to and on the spray boom must be of adequate size for even distribution. It is best to have the supply line coming to the center of the spray boom section and distribute from that point rather than coming in on the end of the spray boom and running the chance of less pressure at the far end. Many sprayers, now, are being designed with wet booms and are fitted with assemblies that protrude 1/3 to 1/2 way into the boom which take the spray solution out of the middle of the boom. PVC Schedule 80 makes an excellent wet boom if supported adequately. The wet boom, which takes the spray solution from the middle, will help keep materials like sand and rust in the bottom of the spray boom which can be flushed out of the end of the spray boom when it is cleaned. This requires valves or plugs on the end of the spray boom. Shutoff controls are needed that allow use of 1/3 to 1/2 of the spray boom when necessary.

NOZZLES

Nozzles help determine the uniformity of application. They also affect the droplet distribution and influence drift potential. Select nozzles that give adequate coverage at desired application rate, speed, and pressure for a given herbicide. For most situations, flat fan nozzles are preferred. Contact herbicides, such as paraquat, need smaller droplet sizes for good performance as compared to preemergence herbicides. Stainless steel nozzle tips will last longer than brass or nylon and generally produce a more uniform pattern. Hardened stainless steel tips have the longest life. Nylon nozzles with stainless steel inserts offer an alternative to solid stainless steel and reduce cost. It is desirable to use nozzles with large angle tips, (110 degrees) with booms that are 30" or less in height. With



booms 36-48" high, use 80° tips and with 48-52" high booms use 73° tips. The nozzle spacing should provide for 100% overlap at the target height. Target height is the distance from the boom to the top of weeds, stubble, etc. Tilting the nozzles back up to 30° from vertical increases the area covered by the nozzles, but can increase drift potential especially with high boom heights. Usually, it is desirable to use the smallest nozzle possible to limit the amount of spray volume needed. But the smaller the nozzle opening, the greater the chance of plugging. Nozzle spacing of 30 inches allows use of larger orifice openings, thus reducing the chances of plugging tips. Wind and sprayer speed affect the spray pattern more as gallonage is reduced.

For floaters and other large sprayers with boom height of 36 inches or more, quality spray patterns have been achieved with 30 gallons of spray solution per acre applied at 10 mph with nozzles spaced at 30 inches. Pressure should be 30 to 40 psi when contact herbicides are used with 20 gpa or more.

For sprayers with lower booms and those that create less turbulence, such as Spray Coupes, lower gallonage and higher speeds are usually possible.

For tractor mounted sprayers and pull type sprayers operated at less than 7 mph, the lowest rate of spray solution recommended by the herbicide manufacturer for ground application is usually satisfactory if correct nozzle size, pressure, 100% overlap, and low boom height are maintained. The use of low pressure or extended range nozzles may be satisfactory with small flat fan nozzles. We have double sprayed 10 gallons per acre (5 gallons each pass) at 17 psi with low pressure nozzles spaced at 30 inches traveling 6.4 mph with excellent results. Large orifice low pressure nozzles or extended range nozzles, may need to have the pressure increased to 30 psi when used with contact herbicides to give the droplet size needed.

THE USE OF STRAINERS AND SCREENS

The sprayer should be equipped with several strainers and screens. The more strainers and screens used, the better the chance of keeping the nozzles from plugging. Be sure the appropriate size nozzle screen is used.

PUMPS

Centrifugal or turbine pumps are best suited for applying wettable powder and 4L formulation of herbicides, such as atrazine. Centrifugal pumps should run between 3000 to 4500 rpm so a gear which allows you to increase rpm's is necessary if the pump is to be operated by the power take-off. Turbine pumps generally operate at 1100 rpm and can be mounted directly to the power take-off shaft. Centrifugal and turbine pumps can also be run by a hydraulic motor which is usually simpler and more convenient. An external oil bypass kit may be needed to reduce heat buildup in tractors with open center hydraulic systems and oil flows of 18 to 24 gpa. Check your operator's manual for installation instructions. Pumps need to be able to supply the volume required by the nozzles, the volume required by the tank agitators plus an additional capacity of 10 to 20%.

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