SPRAYER CALIBRATIONS

BY O. W. (RED) KROMER

The application rate of a sprayer is determined by:

1. Nozzle size
2. Fluid pressure to the boom
3. Rate of travel

For a new machine, it can be assumed the nozzles and guage are accurate. For a used machine with used nozzles, the first thing to check is the width of the spray fan from the nozzle to determine if it will give proper coverage. With the nozzle about 20 inches above the ground, the outer edge of the spray fan should hit the ground approximately below the adjacent nozzle. With a correctly designed nozzle, this will then give a uniform spray application. The next thing to check with used nozzles is the rate of discharge. Using water in the sprayer, catch the spray from one nozzle for one minutes. You can measure this with a gallon can or you can weigh it (water weighs 8.4 pounds per gallon) and compare this with figures on the nozzle table. If the rate is somewhat greater than the rate on the table it is possible the gauge may also be reading incorrectly. Use a new nozzle and test. If its discharge compares with the nozzle table, you know the gauge is probably O.K.

Used nozzles that discharge more than their rating can be used if the fan angle is satif-factory as mentioned above. However, you have to take into account the additional discharge in your application calculations. Nozzles with check valves have to be operated at a higher pressure to obtain their rated discharge. If the check valve closes at 5 pounds, then you have to set your system pressure 5 pounds higher than the chart pressure.

You are now ready to calibrate or checkout the complete machine. Fill the tank to the top with water - turn on the boom and spray over a distance of 40 rods (660 feet), previously measured distance, at the speed you intend to travel (4 M.P.H. if you used this speed in your calculation). Again fill the tank to the top, measuring the amount of gallons put in. This can be done with a 5 gallon bucket or an old water meter. Now you can calculate the rate of application in gallons per acre with the following formula.

$$\text{gallon per acre} = \frac{\text{gallons used in 40 rods} \times 66}{\text{boom spray width in feet}}$$

Boom spray swathe width is equal to the distance in feet between the end nozzles on the boom plus one nozzle spacing in feet. For example, a 13 nozzle boom with 20 inch nozzle spacing would have 12, 20 inch spaces between nozzles or $\frac{12 \times 20}{12}$ = 20 feet between the end nozzles on the boom. To this must be added the extra width of the spray pattern of the end nozzles or $\frac{20}{12}$ = 1.66 feet. The boom spray width therefore is 20 + 1.66 or 21.66 feet to be used in the above formula.

If the rate is higher than you want, you may decrease it by driving faster or using a smaller nozzle. Reducing the pressure would also reduce the application rate slightly but would also effect the fan angle which might be undesirable. Speed of travel has the greatest effect on application rate. For example, if you are applying 12.9 gallons per acre at 30 pounds pressure and 4 m.p.h., increasing your speed to 6 m.p.h. will apply 33 1/3% less or 8.599 gallons per acre. Conversely, if you want to increase the application rate you may drive slower or use a larger nozzle tip or both, if necessary.

Increasing the pressure will increase the application rate slightly. But also has the undesirable effect of producing smaller droplets in the vapor size range which do not hit the target but drift off and evaporate or cause damage to susceptible vegetation. As travel speed has the greatest effect on application rate it should be checked occasionally.

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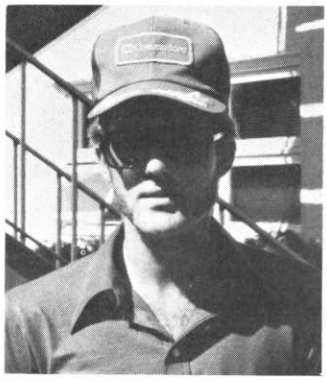
This can easily be done if the 40 rods (660 feet) distance is laid out in an area to be sprayed and permanent markers are put in flush with the ground so they will not affect mowing, etc. The operator can then time himself through this measured distance each time he sprays. By comparing this time with the time from the calibration calculations, he will know if he is on target for travel speed.

It is also advisable to occasionally measure the amount of chemical and water mixture used in this distance to find out if the application rate has changed due to nozzle wear or pressure changes. A chemical and water mixture may also have a different application rate than water so this should be checked after calibrating with water and before applying the mixture.



CONGRATULATIONS. CARLOS!

Carlos G. Stimson, superintendent of Brookings (S.D.) Country Club, Route 4, Lake Campbell, has been designated a Certified Golf Course Superintendent by the Golf Course Superintendents' Association of America.

Stimson, superintendent of the Brookings course since March 1975, received the honor at a May 10 new members party at the club. The award was presented by Green Chairman Bill Parriot.

Carlos and his wife, Jean, live at Route 4, Brookings. They have a nine month old son, Christopher.

In order to become certified, an applicant must be currently employed as a golf course superintendent with five years' experience and a Class A member of G.C.S.A.A. for two years. He also must pass a rigorous six hour examination testing his knowledge of the rules of golf, practical turf management, plant protectant chemicals, business administration, personnel management and the history, ethics, purpose and procedures of G.C.S.A.A. and his profession.

The certification program was instituted by G.C.S.A.A. in 1971 as a means of recognizing outstanding and progressive superintendents. More than 500 G.C.S.A.A. members are now entitled to use the letters "CGCS" after their names.