

Correct Spraying Methods Cut Cost of 2,4-D Results

By **KEITH C. BARRONS**

Agronomist, The Dow Chemical Company

The over-all cost of spraying golf course turf with 2,4-D for the control of weeds may be appreciably lowered this year by applying the chemical in a minimum amount of water. Such a conclusion is indicated on the basis of experiments undertaken last year at Walnut Hills CC near Lansing, Mich. In cooperation with Don Halstead, Walnut Hills greenkeeper, The Dow Chemical Co. field research staff conducted tests in which 2 lbs. of a 2,4-D composition containing 70 per cent actual 2,4-D were applied per acre.

While the amount of chemical used per unit area was kept constant, the volume of water used to apply it included 25, 50 and 100 gals. per acre on adjacent plots. On the fairway, 2 lbs. of the 70 per cent 2,4-D composition per acre dissolved in 25 gals. of water gave as good results as the same amount of chemical applied in larger volumes. When applied on the rough, 50 gals. per acre, likewise containing 2 lbs., gave slightly better results than 25 gals. Even so, the degree of dandelion and plantain kill obtained with the 25 gals. volume was classified as good. Apparently the denser vegetation on the rough requires a somewhat greater volume in order to get complete coverage, particularly of the smaller weeds that may be partially protected from the spray by taller growth.

With less suitable equipment than used

in these tests, one might find it difficult to evenly distribute 25 gals. per acre, but 50 gals. per acre appears to be a practical objective for golf course spraying. Many greenkeepers will find that with small orifice nozzles and greater speed of the rig, 25 gals. will work satisfactorily on the fairway. Compared with 150 to 200 gals. per acre as used by many greenkeepers during 1946, these lower volumes may be applied at a considerably lower cost. Employing a spray rig mounted on a pick-up truck, speeds up to 10 miles an hour were used successfully in the above tests. Lower volume, of course, also means less time involved in filling the tank and less water to pump. Furthermore, spraying can be done with a smaller tank.

Distributes Spray

The important thing to remember is that with 2,4-D sprays it is not necessary to cover weed leaves with a continuous spray film. A few droplets distributed over each leaf seem to do the job, provided of course that they contain enough 2,4-D. The 50 gals. per acre volume is sufficient to get such a distribution of the spray.

In the Walnut Hills tests fan-type nozzles were used with 14 in. spacing. The boom was usually set at 15 in. above the ground and this arrangement gave a 50 per cent overlap of the fans. This double coverage seems highly desirable, judging



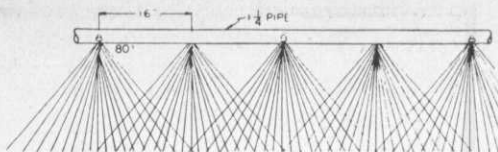
This 20-nozzle boom mounted on the front of a tractor with spray tank towed, makes an efficient rig for 2,4-D application. Flat fan spray and minimum of fog in application. Boom wings are hinged for ease in keeping 2,4-D away from areas where material should not be applied.

from the results obtained. Most people who have compared the conventional cone-type with the fan-type nozzle prefer the latter. Good results may be obtained with either, but at a given orifice size there seems to be less uncontrolled spray mist arising from the fan sprays.

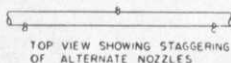
Fan nozzles may be operated at pressures as low as 40 lbs. and there appears to be little need for exceeding 125 lbs. As pressures increase, the problem of a fine spray mist increases. Uncontrolled mist can cause injury to those kinds of shrubs, trees, flowers and crops that are especially sensitive to 2,4-D, not only on the course but on neighboring property. One should use suitable equipment and give consideration to wind velocity and direction in order to avoid trouble.

From the standpoint of weed kill, 2,4-D may be applied over a long season. Generally speaking, plants should be in an active state of vegetative growth to be killed effectively by 2,4-D. Golf course maintenance men frequently ask when one should spray in relation to time of mowing. Experiments on fairways have failed to indicate any objections to spraying as little as one day after or 2 days before cutting. A workable rule is to spray about half way between mowings. Even with a 4-day mowing schedule on fairways, this should give sufficient time for leaf growth before spraying and translocation of the 2,4-D or its effect into the crown and roots before the leaves are cut off.

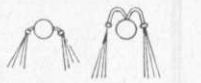
How much 2,4-D should be used per acre? Experiments over a 2-year period at Walnut Hills indicate that from 1½ to 2 pounds of 2,4-D per acre is a satisfactory amount. This is based on actual 2,4-D content. Thus, 2 pounds of a 70 per cent composition as used in the tests would contain just under 1½ pounds of actual 2,4-D. Possibly less can be used with good results when turf is actively growing and



FRONT VIEW OF SECTION OF SPRAY BOOM SHOWING ARRANGEMENT OF FAN NOZZLES TO GET DOUBLE COVERAGE



TOP VIEW SHOWING STAGGERING OF ALTERNATE NOZZLES



END VIEW SHOWING METHODS OF CONNECTING NOZZLES

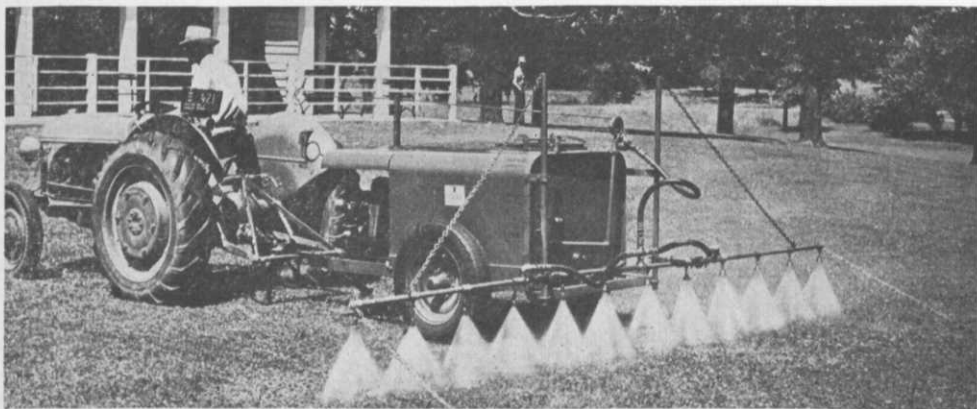


FAN NOZZLE SHOWING MACHINED GROOVE WITH ORIFICE ACCURATELY CENTERED.

Details of nozzle arrangement. 50% overlap of fans, as shown, is desirable. Nozzles may be connected by elbows or by U-shaped ¼-inch pipes. Pipes are attached to boom by couplings welded over holes drilled at proper spacing. 16-in. spacing of nozzles is often used. At this spacing the boom should be carried about 18 in. above top of foliage when nozzles with an 80 degree fan are employed. Most fan nozzles are 80 degrees.

continuing warm weather with ample soil moisture is anticipated. Reducing the amount of liquid employed for application rather than the amount of chemical is suggested as the safer way to lower costs. After all, it is the 2,4-D and not the water that does the killing.

Dandelion, buckhorn and broad-leaved plantain, the 3 most common turf weeds throughout much of the country, are among the many weeds killed by 2,4-D. Occasionally, more regrowth occurs than one anticipates. In some cases, plants will show the typical first response and then many of them will recover. Fortunately, this is the exception rather than the rule, and in most instances more than 90 per cent of these 3 weed species are killed.



This 12-nozzle boom, mounted behind a tractor-drawn spray tank, provides a flat fan spray with a minimum of fog. Wings fold up for ease in transporting. Boom available in limited quantities this year.

Lack of proper coverage, insufficient amounts of 2,4-D, slow growth due to dry weather and rainfall immediately following application seem to be the most probable reasons for these less favorable results.

Greenkeepers should not give up on any difficult-to-kill weed species until they have tried repeat applications after new growth appears. It is also worthwhile to try an ester composition of 2,4-D on such plants. This formulation is now available for use in controlling stubborn weed species.

When used according to directions, established bluegrass and many other species used on fairways and rough are not injured by 2,4-D. Bent grass as used on greens has been injured in some instances, and therefore this type of grass usually should be given only a spot treatment with a hand sprayer.

White clover is in a class by itself so far as weeds go, being a desirable constituent on most home lawns but a weed to many greenkeepers. Single average applications of 2,4-D do not ordinarily kill white clover. The plant suffers a severe setback but usually recovers to such an extent that a reduction in the population is hardly noticeable a year later. At Walnut Hills, it was observed that spraying just before its blooming season reduced clover flowering to a minimum during the 1946

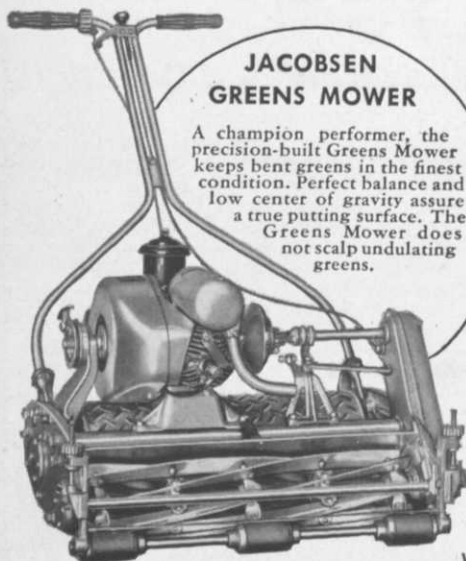
season. The ester formulations of 2,4-D have more effect on white clover than the salt formulations.

Sprayer Cleaning Important

None of the various 2,4-D compositions are corrosive, and if the spray rig is being used for weed spraying alone or for applying fungicides to greens, a simple wash with cold water is all that is necessary in cleansing the sprayer. Small amounts of 2,4-D remaining in a sprayer will cause a bad reaction on certain highly sensitive plants such as roses and tomatoes if the sprayer is used later for an insecticide or fungicide. Washing with water or even soap suds is not always sufficient, especially if one of the ester compositions of 2,4-D is used. The U. S. Department of Agriculture reports that household ammonia is a satisfactory material for eliminating 2,4-D from a sprayer.

MICHIGAN PGA MEETS—Annual spring meeting of Michigan PGA brought together pros and amateur officials at Detroit Leland hotel, April 14. Showing of a new golf film produced by the Michigan pros' educational and promotional committee was a feature of the evening. With PGA and the USGA Women's National in the Detroit district this year the pros and amateurs had plenty of planning to discuss at the session.

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