Clarke Outdoor Spraying Company, La Grange, Ill., is using a helicopter for golf course and tree spraying in the Chicago area. Clarke has found the demand for this type custom spraying good from February until freezing weather in the latter part of the year. Pilot for Clarke is Charles J. DuPont, a veteran pilot of some 20 years.

For Contract Applicators

Helicopter Is Versatile Tool

GOLF COURSES in metropolitan Chicago are becoming regular clients of Clarke Outdoor Spraying Company. With their helicopter, Clarke can spray the fairways on an 18-hole course in 1½ hours. Custom spray rates for the job are reasonable, especially when the savings in time on a revenue producing course are considered.

Charles J. DuPont, aviation manager and pilot for Clarke, says they have now established standard prices. Clarke was among the first, if not the first contract applicator, to spray golf courses on a commercial basis. Their price for spraying 18 fairways, is $100, and the same is true for greens. Cost of dry granular application is based on pounds applied per acre. These rates range from 65¢ to $2.35 per acre.

Helicopter application costs, according to DuPont, appear somewhat higher than the cost of using ground spray equipment. In the Chicago area, DuPont says, use of ground spray equipment will range between $60 and $70 for 18 fairways or a comparable number of greens. But this cost, he says, does not include the time of the superintendent, or other hidden costs such as down time for the course. Even though many courses are

Clarke uses Hughes 200 helicopter with fully articulated rotor. This model is small and compact and lends itself to close-in spray work. Pilot DuPont says that he normally flies about 5 feet above golf greens and fairways when spraying. Advantages of helicopter include labor saving, speed, and ability to spray when ground is soft.

Aerodynamic characteristics of the helicopter's rotor system creates what is referred to as "blade tip vortices." Because of the extreme turbulent air created, vortices are normally considered an undesirable area in which to introduce spray. Experience of pilot along with spray equipment thus become very important in even coverage. DuPont depends on vortex action to increase coverage in hard-to-cover tree tops and crotches.

closed on Mondays, superintendents find it difficult to spray both fairways and greens along with their regular maintenance in a single day.

Helicopter Saves Labor

Besides time, the key plus factors for the helicopter involve the climate and labor supply. Helicopters can spray when ground is too soft for ground equipment. Also, they do not tie up course help, except for fertilizer applications. In the latter case, 2 men are supplied by the course for help in loading. Another advantage of the helicopter is that which is so important in rights-of-way maintenance. It can easily cover inaccessible areas.

Clarke's spraying business includes larviciding, fogging, misting, inspection, and regular spraying. John Clarke, manager, purchased the helicopter primarily for use for mosquito spraying on areas impossible to reach with ground equipment. Spraying trees for control of Dutch elm disease followed. Since much of the tree work involved golf courses, spraying of fairways and greens was the next logical step. DuPont reports that Clarke last year gave several demonstrations for superintendents, a number of whom are now clients.

The helicopter can do a good job of spraying trees. Down wash from the rotor produces good coverage in the new growth areas of tree tops. Crotches are also well covered. Difficulty is in spraying trees along streets because of traffic and parked cars. DuPont says this is difficult but can be done with close cooperation of police and park departments. Where the trees are accessible, such as in parks or on golf courses, DuPont can cover 334 trees per actual hour of flying time.

DuPont points out, however, that ferrying time must be allotted in scheduling time between jobs and the normal wait for the service or nurse truck cuts down the number of spray hours per day. Clarke finds that 4½ hours spray time is normal on a good day. Scheduling is based on average weather conditions. John Clarke and DuPont checked meteorological data for the Chicago area for the three years prior to the '68 spraying season. Temperature, wind, and moisture were plotted. They then charted the expected average weather picture for this season as a base for setting up weekly work schedules. The helicopter cannot be used for spraying if wind is more than 15 knots (approximately 17¼ mph). For Dutch elm disease control on trees, the limit is 10 knots.

Season Begins in February

Spraying season for Clarke's helicopter business normally begins in late February. September through late October is almost dead time. Business then increases from late October until winter weather intervenes. Last season, DuPont reports that Clarke was able to spray until December 13.

Clarke's helicopter is a Hughes 200 with fully articulated rotor (3 blades). The 3-bladed rotor system is smoothest and most responsive in flight. This model is small and compact and a very practical type for spray work according to DuPont, a veteran pilot with 20 years of helicopter flying experience.

Operating cost including gas, oil, scheduled and unscheduled maintenance, and reserve for limited life item replacement amounts to about $22 per hour of flying time. A Hughes spray system is also used. This is a 36-foot boom equipped with 37 nozzles.

Such a unit has a broad application in the field of custom application. Fungiciding of fairways and greens had been well established. Cadminate, chlordane and ferrous sulphate were used in one application, DuPont reports. In another, actidione R. Z. was used in a standard mixture of 40 gallons of water per acre. Later, a reduced water mixture was also used with good results, important because it proved that the fungicide can be used safely with less than the normal quantity of water.

Fly control has proved to be very practical. Dibrom 14

used with a sugar water carrier has given successful abatement of adult flies for 1 week. Solution has been applied at rates of ½ gallon of water, ¼ pound of sugar, and 3 ounces of dibrom per acre. For shorter range kills, ultra-low volume applications of 1½ ounces per acre have been used successfully.

DuPont points out that not only may trees be sprayed for insect and disease control, but foliar applications of fertilizer are practical. Results to date have been excellent in controlling the elm bark beetle. Great advantage in this area is that a large volume of work can be done in a minimum of time.

Legal problems of using helicopters in metropolitan areas will vary. Federal regulations generally apply only if a helicopter is carrying passengers. Custom spray helicopters do not carry passengers, nor do they fly over congested areas since golf courses are generally in the open. Civil complaints because of noise, may arise. But DuPont believes these can be handled by education in the form of publicity. Club members who know the program can be a help.

Noise levels of helicopters can be expected to drop considerably during the next few years. Coming of the jet-turbine engine will help. Also, tail rotors such as the new model designed by Hughes which operates at a much reduced r.p.m. will help. Further advances in dispersing equipment can be expected and will greatly aid the custom applicator using helicopters. DuPont believes the time will come when a spray unit will be developed which can sense airspeed and regulate the rate of spray output to provide a constant flow per acre. Improvements are also needed in swath control, he says. This can prevent excessive dosage and give the custom applicator better control, and generally aid the industry.