

Lawn Care Metering Systems

Roger Funk

Vice-president, Research and Development
The Davey Tree Expert Co., Kent, OH

At the present time, most liquid lawn care companies provide a programmed service to home owners rather than individualizing the service to the specific needs of each lawn. Each morning materials are selected and premixed in the spray tank and the same basic mixture is sprayed on each lawn. Since most lawns in a given area have similar cultural requirements, a basic chemical program can provide satisfactory results at a price most home owners can afford.

Special services not included in the basic program such as disease or grub control can be provided by applying materials from auxiliary tanks or spreaders. In addition, service representatives are often employed to expand service capabilities. However, the increase in time and labor required to provide these services necessitates an additional expense to lawn care customers.

ADVANTAGES OF METERING

Metering pesticides directly into the spray line eliminates premixing and allows the applicator to select and apply the proper pesticides for each lawn without increasing application time. The cost, then, for this customized service should be comparable to that of programmed services. In addition to reducing the cost of a custom lawn service, metering reduces the handling and use of pesticides which would improve personnel and environmental safety. Injecting pesticides directly into the spray line would also minimize chemical breakdown due to alkaline tank mixes and eliminate the possibility of pesticide sludge accumulations in tanks and filters. This would increase the effectiveness of certain pesticides and solve the problem of pesticide waste disposal.

PARAMETERS FOR METERING

In order to be practical in a lawn care operation, chemical metering systems must be simple to operate and maintain. Complicated equipment that is difficult to understand or repair will distract applicators from their major objective - servicing lawns. The resultant decrease in productivity and increased potential for misapplication will cancel out any advantages of metering.

Metering systems must be accurate in low volume metering since the recommended rate for lawn care pesticides can be as low as 0.75 ounces per 1000 square feet of turfgrass. Although pesticide concentrates can be diluted with water to increase the volume being metered, some chemicals may be hydrolyzed, particularly in alkaline water. In addition, the preparation of a stock solution increases the handling of the pesticide and requires a larger holding tank on the spray unit.

A convenient method of determining if the pesticide is being metered properly is also important. Regardless of the dependability of the metering system, leaks, clogging and equipment failures do occur.

METERING SYSTEMS

Chemical metering pumps generally operate by one of two principles - proportioning or injection. The type of metering system which is most adaptable to a lawn care spray operation will depend upon the materials used and whether or not a variable flow rate is an essential option of the spray technique.

A proportioner is powered by the flow of water through a spray line and responds to changes in flow rate; i.e., if the flow rate increases or decreases, the proportioner maintains the same amount of chemical being metered into a gallon of water. The most common proportioners incorporate an in-line water wheel or expandable bladder which, unfortunately, cannot meter wetttable powders. Also, proportioners may not operate properly with wetttable powders in the tank mix since this mixture powers the proportioner and may clog or cause excessive wear on parts.

An injector is usually powered by electricity or pressure (compressed air, CO₂, etc.) and meters chemicals at a fixed rate. Since injectors are not powered by the water in the spray line, they, unfortunately, do not respond to changes in flow rate. They are, however, unaffected by wetttable powders in the spray mixture, and certain types of injectors may be capable of injecting insoluble materials.

Metering pesticides will significantly improve lawn care operations and help allay growing concerns about the overuse of pesticides in the urban environment.

Research personnel at Davey Lawnscape have been testing pesticide metering systems for the past two years, including operational units in the field during the 1981 season. As continuing research improves the performance of the metering units, we plan to convert our entire fleet to proportioners by 1984.