THE EVOLUTION OF RAILROAD WEED SPRAY EQUIPMENT

Ralph H. Bogle, Jr.
President
The R. H. Bogle Company
Alexandria, Virginia

The problems of weed eradication on American railroads have existed since the inception of the steam engine. Labor costs in the early days permitted hand methods, i.e., the pulling of weeds and grasses by hand. This method, although used to a very restricted degree, prevails today. As costs of wages increased from a possible ten cents per hour in 1910, it was soon learned that some other methods must be found to alleviate the weed problem.

As early as the turn of the century, the application of raw steam was found to be a method of control. By releasing a valve within the cab of the engine, the fireman could apply steam from the boiler, through a pipe leading to a perforated pipe of approximately four inch diameter, mounted below the floor of the cab. Such an application was limited, for the most part, to areas within yards that were troublesome to yard personnel. This method of control was soon found to be of an extremely temporary nature and insufficient to maintain control over extensive railroad systems.

Another approach to the problem was devised early after 1900. This method was the use of fire to control vegetation. Labor forces actually set fires along the right-of-way, having to stand close by to prevent spread of flames to properties outside the right-of-way fences. As the years passed, mechanical equipment was constructed to move over the rails, dispensing forced flames against weeds and grasses. The first machines were oil burners, some of which are still used. Later developments utilized propane burners, with directed, forced flames of varying sizes. Whereas all weed burners are on-track equipment, some are self-propelled and some are moved by regular work trains. Unfortunately, weed burning was found to lack the answer to good control as only the aerial parts of the plants were burned, leaving the root systems intact. In addition, ashes from the burned vegetation were absorbed thus producing fertilization of the soil. The act of burning was discovered to be costly as additional personnel were necessary to contain the fires set and too few acres could be burned per day.

Chemical weed control on railroads began just before the turn of the century, on a limited bases. Equipment consisted only of a tank car of highly dilute, chemical weed killer, the tank car being equipped with a four inch, perforated pipe mounted beneath the running board at the rear of the car. A pipe led from the step valve underneath the center of the car to the four inch pipe, the chemical moving by gravity to the dispensing pipe. As the dilution of the chemical was, of a necessity, high because of the size of the perforations in the pipe and the speed of the train pulling the car, the number of miles and/or acres that could be treated, was extremely small.

In 1913, the writer's father developed the first spray equipment for railroad use. The sprayer consisted of a railroad flat car upon which was mounted a small manifold of seven valves, each valve controlling the amount of chemical passing through one of seven pipes mounted in the vertical at the end of the flat car. At the end of the pipe was placed a solid cone, brass nozzle with an orifice of approximately 5/8 inches. The dilute chemical was stored in a tank car directly to the rear of the flat car and was connected from the underside of the tank to the manifold on the flat car. Air from the compressor mounted on the railroad engine, used for braking of trains, was directed into the tank car which forced the chemical through the pipe and the nozzles. A pressure gauge was mounted on the manifold to indicate the operating pressure on the pipe line. In addition a whistle was also mounted on the car for safety sake, this arrangement was the original spray system in its entirety.

Dilution of chemical, utilizing the spray system and because of the use of nozzles, was drastically reduced from approximately 1 : 19 to a dilution of common use today of 1 : 3. The new dilution of chemicals reduced the time required to mix a carload of dilution. The spray method increased the number of miles and acres that could be treated in a day's time.

Since 1913, many new innovations have been added to this primitive sprayer. Immediately following World War II, the flat car was dispensed with, a box car-type car was initiated in which to mount permanent equipment. Gasoline pumps were installed to replace the use of air from the engine compressors. Pipe sizes were increased to carry larger volumes of material. Side booms were added to the cars in order to treat passing track and yard tracks in addition to treatment of the track upon which the sprayer was operating. To the list of indicators within the car itself has been added meters to record volumes per mile, odometer, speedometer, levelometers wind indicators, etc. All materials are passed through strainers before entering the pumps. And, because of the necessity of alternating between types of solutions while spraying track, an air-actuated multiport valve has been added in the system.

Just prior to 1950, chemical brush control was added to railroad maintenance methods. Early models of railroad brush spraying used Bean guns, mounted in series, and fastened to the floor of the spray car. It was soon learned that additional height was required to see the brush to be sprayed and to adequately cover the vegetation. The gun turrets were eventually mounted on a brush control deck on the roof of the spray car.

To extend the spray of brush killing chemicals to right-of-way lines, additional pressure was required which necessitated increasing pipe sizes, heavier-duty pumps, and new improved nozzles capable of adjustment to change spray patterns. Fire nozzles were inaugerated, designed to produce a solid stream of fogging, as was required. Today, operating at 150 - 200 p.s.i. railroad spray equipments are capable of treating brush for a distance of 100 feet each side of track, simultaneously, for a total of 500 or more acres per day. At this rate of application, 50,000 or more gallons of dilute chemical can be applied daily.

Our company is justly proud of the fact that the spray-type equipment for railroad weed control was developed by one of our employees. Not being satisfied with the early design, we have consistently worked to improve our equipment and can boast a fleet of spray cars, modern in design and capable of applying weed and/or brush control chemicals in the most efficient manner and with the least delays for maintenance. The future will bring additional changes in design, for more efficient operation. It always has.