

EFFECT OF DROPLET SIZE AND SPACING
ON CONTROL OF WEEDS WITH 2,4-D

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Abstract. The development of commercial spraying equipment capable of producing droplets with a very limited range of sizes has made the concept of controlled droplet application possible. Experiments were conducted to examine the effect of droplet size and droplet spacing on the efficacy of 2,4-D iso octyl ester in kerosene on variegated thistle (*Silybum marianum*), boneseed (*Chrysanthemoides monilifera*) and Paterson's curse (*Echium plantagineum*). Droplet spacing was varied by changing application volume and droplet size.

Plants were grown from seed in the glasshouse and returned to the glasshouse after spraying with a variable speed rotary atomizer. Herbicide solutions of varying concentration were prepared so that the effect of droplet size and spacing could be examined at constant dose rate.

Boneseed was more readily controlled by 2,4-D applied in droplets with diameters of 212 and 302 μm than in droplets with diameters of 172 and 461 μm . Large droplets at high herbicide concentration caused severe local damage to the leaves. Herbicide efficacy increased as droplet spacing increased to 15 droplets cm^{-2} and then remained essentially constant up to complete cover. Application of 2,4-D at 10% appeared to be more effective than other concentrations which ranged from 2.5% to 40%.

Variegated thistle did not respond to changes in droplets size from 172 to 461 μm . However, a droplet spacing of at least 10 droplets cm^{-2} produced better kills than less dense deposits. Generally, however, the response of variegated thistle to droplet spacing was minimal, which could be expected in view of the translocation of 2,4-D.

Paterson's curse showed little response to droplet size range 172 to 461 μm , although smaller droplets tended to produce more favourable results. Droplet spacing was not examined on this plant.

The results of this experiment showed that small differences in kill could be measured with changing droplet sizes and spacing. However, much larger changes were measured by changing dose rate.