

Silwet* 408

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Description

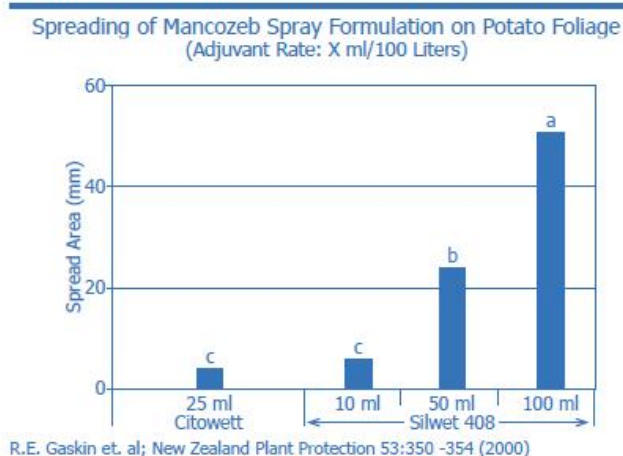
Silwet 408 spray adjuvant is a superspreading surfactant based on a trisiloxane ethoxylate. Silwet 408 spray adjuvant lowers the surface tension of spray solutions, beyond that which is achievable with conventional adjuvants.

Typically, Silwet 408 spray adjuvant (@ 0.1 wt %) gives an aqueous surface tension of <22 mN/m. On the other hand, an octylphenol ethoxylate containing 10 EO units (a commonly used nonionic surfactant) at 1.0 wt % gives a surface tension of only 30 mN/m.

The bottom line? Silwet 408 spray adjuvant helps lower the aqueous surface tension more effectively than conventional spray adjuvants.

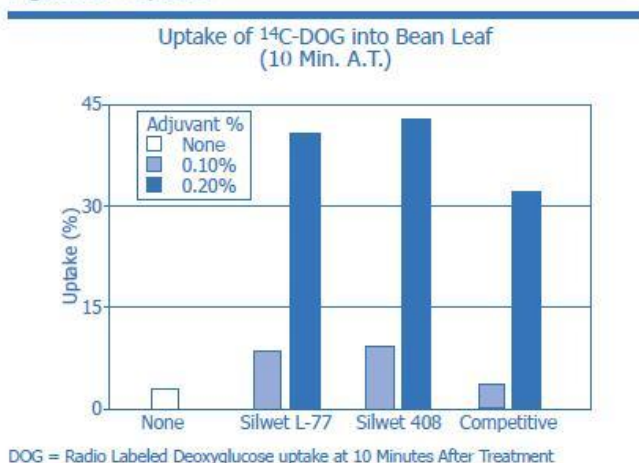
Because Silwet 408 spray adjuvant is a superspreading surfactant, the contact angle of spray solutions on leaf surfaces is reduced, leading to an increase in spray coverage (Figure 1).

Figure 1: Spreading



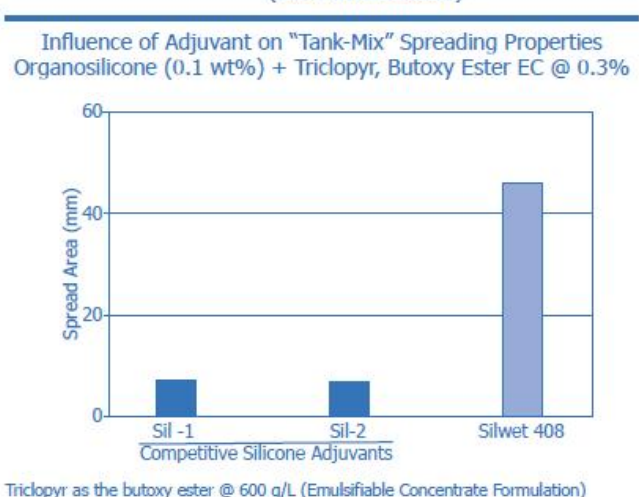
Additionally, under specific conditions, Silwet 408 spray adjuvant promotes rapid uptake of agrochemicals into plants via stomatal infiltration. Spray solutions taken into plants in this way become rainfast, thereby improving application reliability (Figure 2).

Figure 2: Uptake



Unlike other trisiloxane alkoxyates, which are negatively affected by oil based components (i.e. EC formulations, spray oils, etc.), Silwet 408 spray adjuvant provides enhanced spreading in many of these types of formulations relative to competitive organosilicone based adjuvants (Figure 3).

Figure 3: Spreading of Oil Based Agrochemicals (EC Formulation)



Silwet 408 spray adjuvant is nonionic in nature, making it useful with a broad range of agrochemical formulations.

Key Features and Benefits

- Superspreader for soluble liquid and emulsifiable concentrate formulations
- Promotes spray volume reduction
- Promotes rapid uptake of agrochemicals (rainfastness)
- Improves spray coverage
- Nonionic
- Meets requirements of EPA 40CFR§180.910

Typical Physical Properties

Property	Result
Surface Tension (0.1%, mN/m) ^(a)	21.5
Cloud Point (0.1 wt%), °C	<10
Viscosity (cSt @ 25°C)	35
CMC (Wt%) ^(b)	0.007
Pour Point, °C	-8
Specific Gravity (25/25°C)	1.020
Flash Point ^(c) °C	118

(a) Surface Tension by Wilhelmy Plate Method

(b) Critical Micelle Concentration

(c) Pensky-Martens Closed Cup, ASTM Method D93

Potential Applications

Silwet 408 spray adjuvant has been used successfully in spray applications globally. Typical applications include:

Application	Typical Use Rate ^(a)
Plant Growth Regulators	0.025% to 0.05%
Herbicide	0.025% to 0.15%
Insecticide	0.025% to 0.1%
Fungicide	0.015% to 0.05%
Fertilizers and Micronutrients	0.015% to 0.1%

(a) Note: use rates are dependent on crop, agrochemical and spray volume requirements.

Product Usage**In Agrochemical Formulations**

Silwet 408 spray adjuvant may be used as a component in agrochemical formulations. Although organosilicone surfactants are subject to hydrolysis under acidic or basic conditions, optimum performance is achieved by buffering the formulation to pH 6.5 - 7.5. Additionally, it is recommended that Silwet 408 spray adjuvant be used at a concentration of at least 5%, based on the total formulation.

As A Tank Mix Adjuvant

Silwet 408 spray adjuvant, when used as a tank-side adjuvant may be used to improve spray coverage, improve uptake or to allow for a reduction in spray volume. Silwet 408 spray adjuvant is most effective as a tank-side adjuvant when spray mixtures are 1) within a pH range of 5-8, and 2) used within 24 hours of preparation.

High spray volumes, coupled with high surfactant rates, are not required to achieve sufficient coverage with Silwet 408 spray adjuvant. In fact, Silwet 408 spray adjuvant has the potential to provide adequate coverage in many low volume spray applications at rates between 0.025% and 0.1%.

Patent Status

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