

## Silicone adjuvant QS-302

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### 1. Description

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QS-302 spray adjuvant is a super-spreading surfactant based on a trisiloxane ethoxylate. QS-302 spray adjuvant lowers the surface tension of spray solutions, beyond that which is achievable with conventional adjuvants.

Typically, QS-302 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.

QS-302 spray adjuvant helps lower the aqueous surface tension more effectively than conventional spray adjuvants. Because QS-302 spray adjuvant is a super-spreading surfactant, the contact angle of spray solutions on leaf surfaces is reduced, leading to an increase in spray coverage (**Figure 1**).

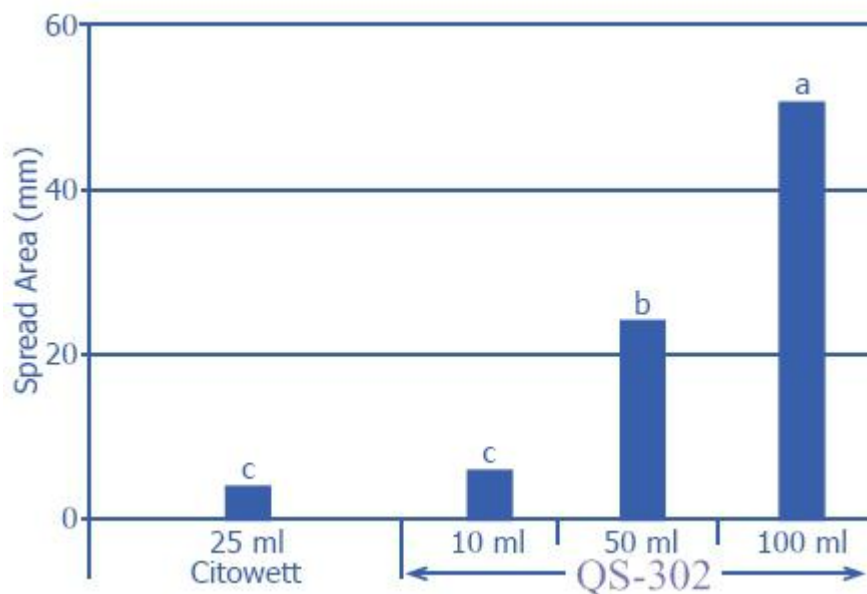
Additionally, under specific conditions, QS-302 spray adjuvant promotes rapid uptake of agrochemicals into plants via stomatal infiltration. Spray solutions taken into plants in this way become rain fast, thereby improving application reliability (**Figure 2**).

Unlike other trisiloxane alkoxyates, which are negatively affected by oil based components (i.e. EC formulations, spray oils, etc.), QS-302 spray adjuvant provides enhanced spreading in many of these types of formulations relative to competitive organosilicone based adjuvants (**Figure 3**).

QS-302 spray adjuvant is nonionic in nature, making it useful with a broad range of agrochemical formulations.

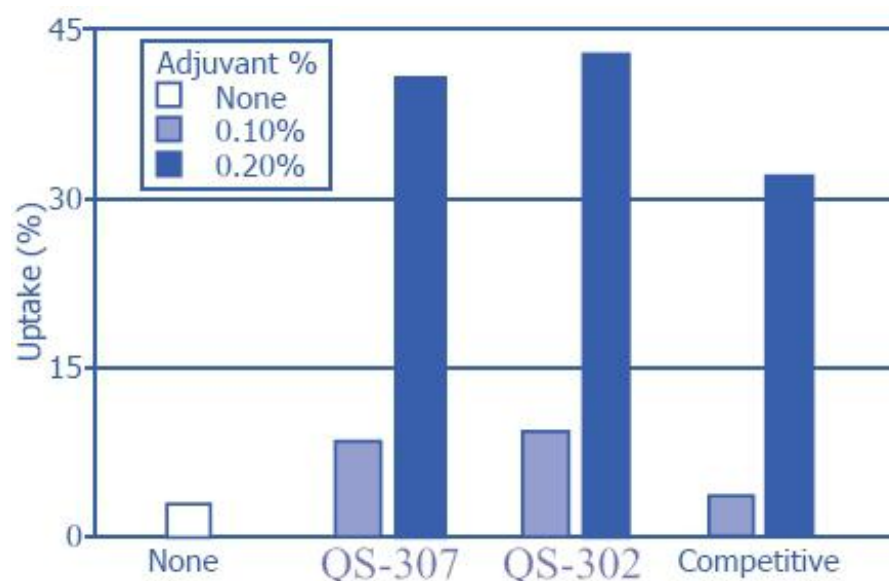
#### **Figure 1: Spreading**

Spreading of Mancozeb Spray Formulation on Potato Foliage (Adjuvant Rate : X mL/100 Liters)



**Figure 2: Uptake**

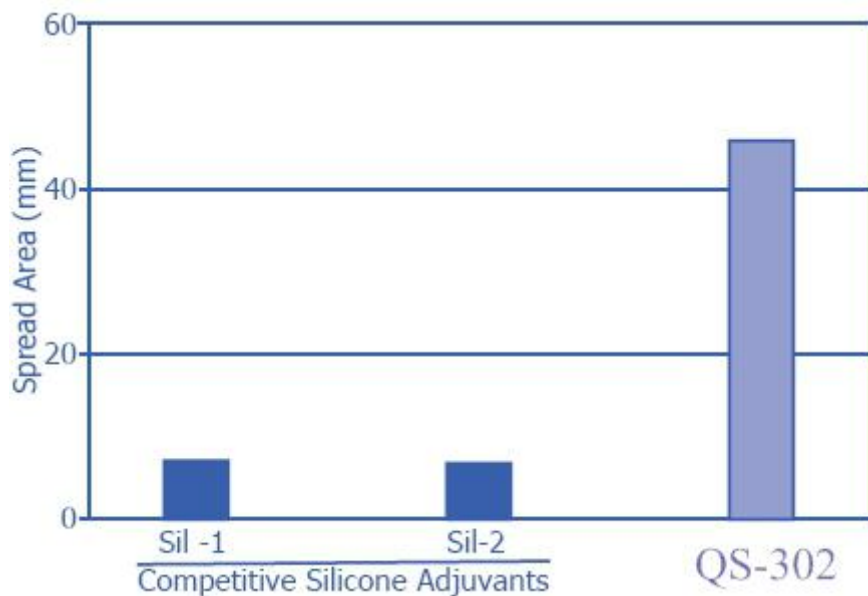
Uptake of C-DOG into Bean Leaf (10 Min.A.T.)



DOG=Radio Labeled Deoxyglucose uptake at 10 Minutes After Treatment

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

Influence of Adjuvant on “Tank-Mix” Spreading Properties Organosilicone (0.1 wt%)+Triclopyr ,Butoxy Ester EC @ 0.3%



Triclopyr as the butoxy ester @ 600 g/L (Emulsifiable Concentrate Formulation )

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## 2. Key Features And Typical Benefits

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- ◆ 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

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## 3. Typical Physical Properties

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Property	Result
Surface Tension (0.1%, mN/m) <sup>(a)</sup>	21.5

Cloud Point (1 wt%), °C	<10
Viscosity (cst @ 25°C)	35
CMC (Wt%)( <sup>b</sup> )	0.007
Pour Point, °C	-8
Specific Gravity (25°C)	1.015
Flash Point( <sup>c</sup> ) °C	117

(a) Surface Tension by Wilhelmy Plate Method

(b) Critical Micelle Concentration

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

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## 4. Potential Application

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QS-302 spray adjuvant has been used successfully in spray applications globally. Typical applications include:

<b>Application</b>	<b>Typical Use Rate<sup>(a)</sup></b>
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.

## **5. How To Use**

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### **In Agrochemical Formulations**

QS-302 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 QS-302 spray adjuvant be used at a concentration of 0.5-8%, based on the total formulation.

### **As A Tank Mix Adjuvant**

QS-302 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. QS-302 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 QS-302 spray adjuvant. In fact, QS-302 spray adjuvant has the potential to provide adequate coverage in many low volume spray applications at rates between 0.025% and 0.1%.

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## **6. Patent Status**

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Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

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## **7. Product Safety, Handling And Storage**

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Customers should review the latest Material Safety Data Sheet (MSDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, and any special storage conditions required for safety.

### **PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Avoid contact with skin and eyes. Keep out of reach of children.

Attention: Not for injection into humans

## **OTHER PRECAUTIONS**

Consult the manufacturer before using an aerosol of the neat liquid.

## **STORAGE**

Keep container closed. store in original container.

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## **8. Limitations**

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Customers must evaluate TianSheng New Materials products and make their own determination as to fitness of use in their particular applications.

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## **9. Contact Information**

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For product prices, availability, or order placement, contact our customer service by visiting <http://www.jxtsxcl.com/contactus.htm>. For literature and technical assistance, visit our website at: [www.jxtsxcl.com](http://www.jxtsxcl.com).

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## **10. Other Information**

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These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.