

When applying liquid termiticides to the soil to create a chemical barrier, many factors can influence the active ingredient within that soil. In all areas, professional pest managers are required to create a complete and continuous liquid chemical barrier. What happens to a pesticide when it is applied to soil depends on the pesticide's individual characteristics and the soil environment to which it is applied.

The influence of Pesticide Characteristics for soil applied termiticides

The fate of pesticides in soils is determined by a combination of properties including persistence, adsorption, solubility, surfactant loads, and formulation type. Formulation type and quality can have a large effect on the effectiveness of the pesticide in a soil matrix.

FMC has two distinct formulations for soil applied termite management systems. These are Biflex® Ultra-Lo-Odour 100EC (Biflex® Ultra) and Biflex® AquaMax Water-based Insecticide and Termiticide 100SC (Biflex® AquaMax). Whilst both of these products contain the same active ingredients at the same concentration they are entirely different products. The question is which formulation is best for a specific application or situation. Table 1 summarises the main differences between Biflex® formulations.

Table 1: Characteristics of FMC's Biflex® Formulations

Characteristic	Biflex® Ultra-lo-odour	Biflex® AquaMax
Formulation type	Emulsifiable concentrate (EC)	Suspension concentrate (SC)
Concentration	100 g/L	100 g/L
Main formulation component	Hydrocarbon solvent	Water
Average particle size	< 1000 nm	> 10000 nm
Odour	Very low	Very Low
Suspension	Little agitation	Constant agitation
Tank Stability of emulsion	Can be left over night*	Shouldn't be left over night
Ideal for situation	Outdoor general pest work, intensive termite treatments including reticulation systems and work involving vertical and horizontal applications.	Indoor general pest work and suitable for termite work.

* should be agitated prior to use after long period of settling

Formulation Types – Key differences

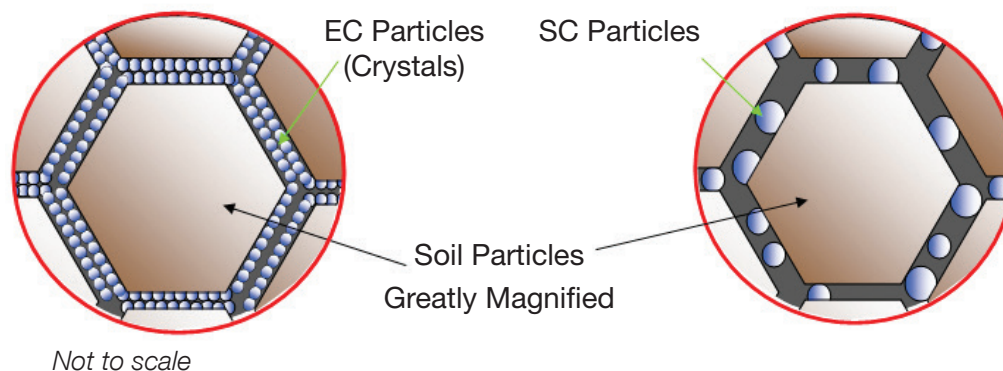
Suspension Concentrates (SC) and Emulsifiable Concentrates (EC) are formulated in two very different styles. One of the most obvious differences is the size of the active ingredient (a.i.) particles with EC formulations having a smaller particle size than normal SC formulations. If you understand that SC formulations are a suspension of bifenthrin particles in water whilst for EC formulations the bifenthrin is dissolved in hydrocarbon solvents. For this reason the two formulations act quite differently in soil.

Particle size interaction – soil and active content

Knowing that soil types change and a.i. particle sizes differ between SCs and ECs, it is easy to see why knowing which formulation to use is important when selecting a liquid termiticide. Figure 1 demonstrates the interaction between soil particles and the active ingredient particles during the application of the product.

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Figure 1: Illustration showing the difference between EC and SC a.i. particles within the macro environment of soil



The very small particle size of the EC formulation creates a ‘film’ over the surfaces of the soil colloids due to the active content being dissolved in the emulsion. Conversely, the active content particles in the SC formulation are relatively large. These particles randomly settle in the soil once the emulsion dries. As a guide, an EC formulation will be more accommodating of changes within soil types due to its capability to create a treated layer around most soil particles.

The importance of tank agitation-

Thorough and constant agitation of the spray tank is a necessity when using SC formulations for any application. Many pest management technicians underestimate the importance of spray tank agitation whilst undertaking critical applications. Many state they have agitation devices fitted to their tanks, however, in most cases it is merely a bypass agitation. The basic requirement for effective tank agitation is for the movement of water (turbulence) to actually “sweep” the bottom of the tank so that any precipitated particles are picked up and re-mixed with the rest of the solution.

As a general rule, EC formulations require less agitation and will not settle out over a short period of time

Recommendation

For pest management professionals whose majority of work is soil treatment for termites (e.g. reticulation, preconstruction, and post construction), Biflex® Ultra is recommended. For companies that have a mixture of general insect pest work with a small amount of termite work, we recommend the Biflex® AquaMax SC formulation because of the convenience of using a multi-insecticide for most pest situations.

Biflex® Ultra-Lo-Odour Termiticide and Insecticide (100g/L EC):

Best suited to all soil applications, including, trenching, rodding, and especially for charging reticulation systems in soil types that may prove difficult to treat or where nozzle cleanliness is essential. Biflex® Ultra is also well suited to applications where constant spray tank agitation may not be practical.

Biflex® AquaMax Water based Insecticide (100g/L):

The formulation of AquaMax makes it the ideal product to obtain long residual control for all indoor and outdoor general insecticide applications. The solid a.i. particles across a range of treated surfaces are readily available for a crawling insect to contact and absorb causing a fast knockdown and long residual effect.

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