

Novel, non-toxic formulation to make agrochemicals 'stick' onto plants, increasing delivery efficiency, reducing pollution

EXECUTIVE SUMMARY

Novel lipid nanoparticle based aqueous formulations improve delivery efficiency for a wide range of agrochemicals by making them 'stick' onto the plant surface. These agrochemicals are also rendered resistant to being washed off by rain, dew etc. This reduces pollution of soil, ground water by agrochemicals.

BACKGROUND

Agrochemicals are typically sprayed as aqueous dispersions onto plants. However, as leaf surfaces are hydrophobic, these aqueous sprays bounce off, resulting in inefficient delivery. In the case of pesticides, this results in the contamination of ground water and soil. Often, surfactants (such as Tween) are used to improve retention. However, these surfactants damage plant surfaces that they contact. Hence, there is a need for new formulations that would deliver aqueous solutions more effectively, and are resistant to being washed off by rain, dew, etc. Also, such a formulation should work for a variety of agrochemicals.

TECHNOLOGY DESCRIPTION

NCL scientists have developed a novel, aqueous formulation comprising lipid nanoparticles that results in unprecedented retention on hydrophobic plant surfaces. The lipid employed is a non-toxic, food-grade material and, unlike Tween, has no adverse effects on leaf surfaces. The lipid particles can encapsulate the desired agrochemical and deliver this directly to the plant. This formulation can also significantly enhance the efficacy of other delivery methods

(like controlled/slow release microparticles). Lab scale results indicate rain-proof retention on the plant surface.

MARKET POTENTIAL

The demand for formulated pesticide products in the US is estimated to reach \$10 billion by 2016.* Worldwide market for agricultural adjuvants (additives used to improve retention, spreading etc.) is currently \$ 2.3 billion and estimated to grow to 3.5 billion by 2021**

* [Source 1](#) ** [Source 2](#) [Source 3](#)

VALUE/ADVANTAGES

- Significantly improved retention on hydrophobic plant surfaces, minimizing agrochemical waste and associated pollution
- Food grade lipids without phytotoxicity
- Lipid dispersions can encapsulate wide variety of agrochemicals and can enhance efficacy of controlled/slow release formulations.

APPLICATIONS

- Efficient delivery of agrochemicals to plants

TECHNOLOGY STATUS

- Patent application filed: Application number (India): 201611023934
- Looking for licensing/spinoff partners