



Shell
Risella X
Shell Process Oils

Next-generation mineral-oil-free agricultural spray oils for crop protection

Beijing Grand AgroChem has developed a widely applicable emulsion concentrate product offering enhanced environmental safety.

A national high-tech enterprise, Beijing Grand AgroChem is engaged in the research, production and marketing of agricultural adjuvants, accompanied by technical services. The company manufactures key products that are used in crop protection on a large scale.

Grand AgroChem provides its customers with quality synergists, formula adjuvant products and sophisticated pesticide reduction and phytotoxicity control solutions. It is the first agro-adjuvants manufacturer in China with a drive to scientifically reduce the use of pesticides, thereby enhancing environmental safety.

Agricultural mineral oil can be promoted and used alone as a pesticide, and in most practices as a synergist of insecticides and fungicides. However, its improper use can harm crops and result in foliage scorching and even leaf fall.¹ To achieve the ideal effect, the base fluid must be carefully chosen for its specific properties, and it is necessary to carefully consider environmental factors such as temperature and humidity.

Why was Shell Risella X chosen for the FEI-TUO® emulsion concentrate product?

Grand AgroChem's emulsion concentrate product, FEI-TUO®, uses Shell Risella X 415 oil, which the company chose for its unique properties of low density, high flash point,

By 2050, the global population could increase by 30% and food demand by 70%.^{*} To meet this, we must protect crops from pests while minimising impact on the environment.

- 82% of our calories and 63% of our protein derive from plants.
- 46% of habitable land is used for agriculture.
- 23% of agricultural land (1.1 bn ha) is used for crop production.
- 35% of crop yields are potentially lost to pre-harvest pests.^{**}

^{*}Popp, Pető, K. & Nagy, J., "Pesticide productivity and food security. A review," *Agron. Sustain. Dev.* 33, 243-255 (2013).

^{**}Oerke, E., "Crop losses to pests," *The Journal of Agricultural Science*, 144(1), 31-43 (2005).

fully isomeric saturated alkane composition, high purity and narrow distillation range. Moreover, Shell Risella X 415 is inherently biodegradable, and more so than conventional mineral oils with a similar viscosity when tested according to OECD 301B. This product is an ideal base oil ingredient for emulsion concentrates, making them safer for crops and the environment, including beneficial insects, compared with using mineral oils originating from conventional oil refining.

¹Walsh, D., Zalom, F. and Grove, G. (adapted by Pscheidt, J. W.), "Horticultural spray oils," Pacific Northwest [Disease Management Handbook](#)



Risella X 415 is an ideal alternative for mineral oil emulsion concentrates, making them safer for crops and better able to protect beneficial insects, compared with using minerals oils from conventional oil refining."



An effective, mineral-oil-free crop protection solution

In September 2016, Beijing Grand AgroChem Co., Ltd. chose Shell Risella X 415 as the base fluid for its agro-spray oil in emulsion concentrate (EC) type, which offers enhanced environmental safety. EC typically contains 95–99% oil and a small amount of emulsifiers.

The mineral oil EC product of Grand AgroChem uses Shell Risella X 415 process oil. Its unique properties include low density, high flash point, fully isomeric saturated alkane composition, high purity and narrow distillation range. In addition, Shell Risella X 415 is inherently biodegradable and, when tested according to OECD 301B, more biodegradable than conventional mineral oils with similar viscosities.

Why Shell Risella X was chosen

Shell Risella X 415 is produced from natural gas using Shell's industry-leading gas-to-liquids process. Its exceptional purity makes it an ideal ingredient for a spray oil EC as it offers higher safety for crops and better protection for the environment and beneficial insects than emulsions using mineral oils originating from conventional oil refining.

Shell Risella X 415 features a more concentrated carbon distribution than other competitor oils.

A higher unsulphonated residue value indicates higher purity, which minimises phytotoxicity and foliage scorching.

Shell Risella X oils offer a cost saving: they can reduce adjuvant oil consumption by up to 20%.*

*Based on test results shared by a customer; actual results may vary case by case.

Proven value

Compared with traditional chemical pesticides, the features and advantages of an agricultural spray oil for crop protection include:

- physical function – no pesticide resistance, wide control spectrum
- longer-lasting protection with reduced pesticide use
- reduced impact on beneficial insects and natural enemies
- low toxicity – safer to use
- safer for the environment due to superior biodegradability.



After the farmer sprayed FEI-TUO® onto the orange, we could see that the fruit surface was intact, clean and bright. The safety of the fruit was ensured, proving that FEI-TUO® caused no phytotoxicity, and it can be used safely in combination with high-concentration pesticide liquids."

Safety test by Chengdu Haolinong Agricultural Materials Co., Ltd.



Find out more: talk to Shell Process Oils

If you are interested in unlocking valuable competitive advantage, talk to Shell about the benefits that Shell Risella X oils could have for your business.

www.shell.com/processoils