



## Value proposition

Oxiteno's response to the evolving needs of agriculture is to develop innovative solutions that will help farmers to shape the agriculture of tomorrow.

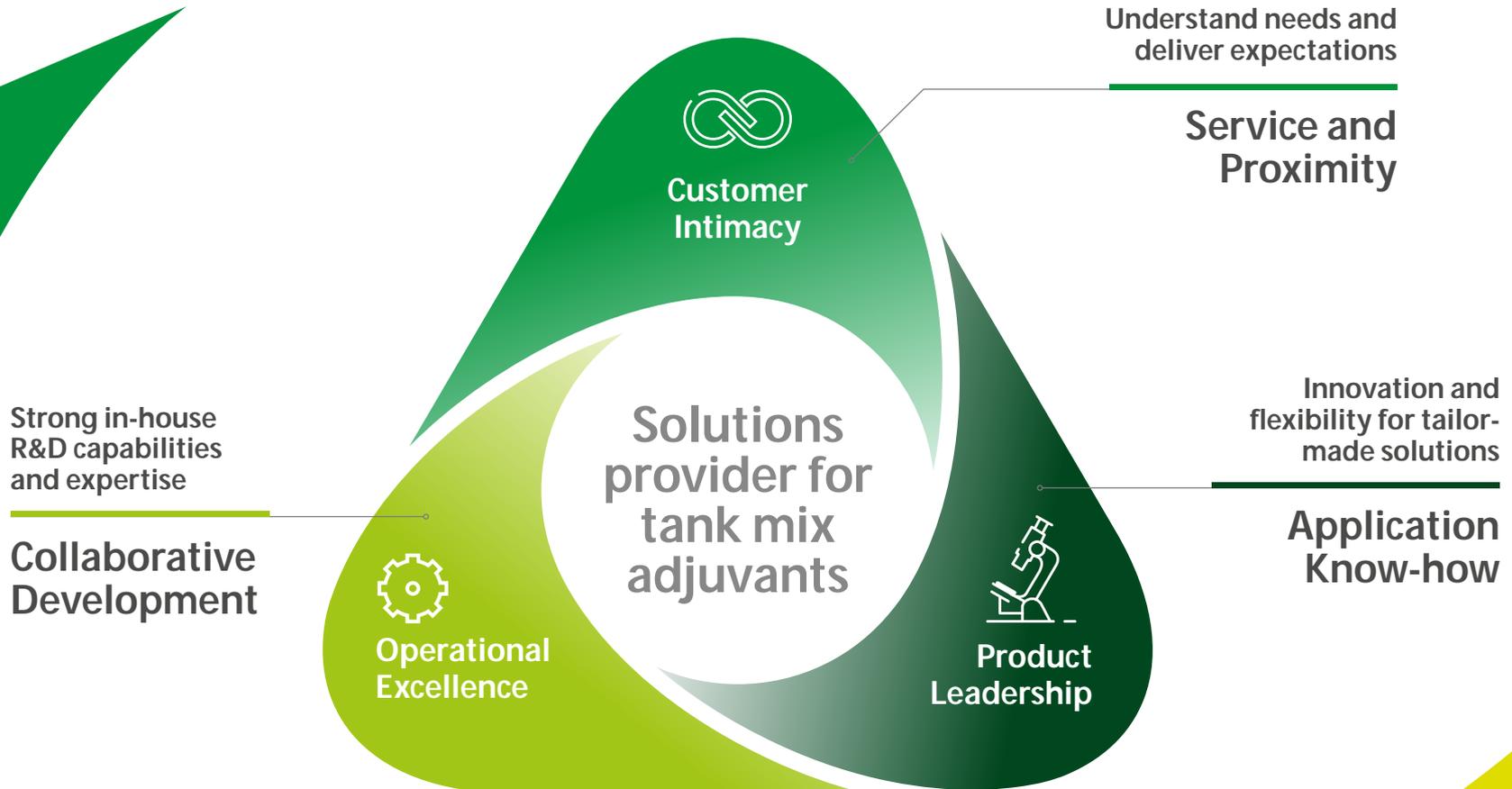
**Agricultural** production must keep pace as demand for the quantity and quality of food grows. Changes in climate and increasing pressure on natural resources challenge the availability of water, land and biodiversity necessary for productive, sustainable agriculture.

**Designed** to enhance the application performance of crop protection products, our broad portfolio of adjuvants can be used in agrochemical formulations to improve mixing and handling, safety and effectiveness of active ingredients while maximizing distribution over the target. As not all adjuvants can be incorporated "in-can", spray adjuvants are added in the tank mix to boost field performance, enabling farmers to get the most from each application.

**Spraying** operations, from handling concentrates and tank filling to achieving maximum efficacy, include various inefficiencies. Our tank mix adjuvants portfolio provides both single components and full solution for the encountered problems.

# Value proposition

Our value proposition is to advance agriculture through technology and added value solutions that maximize the application of agrochemicals in the field, based on three pillars:



# About adjuvants

Tank mix adjuvants are designed to achieve biological, chemical or physical effects to improve the efficiency of crop protection operation and end-results.

The science behind the need for adjuvants is multidisciplinary, but formulation chemistry is fundamental as tank mix adjuvants can be combined to optimize performance for each active ingredient and spray application.

## Spray performance

Spray performance relies on many factors, such as choosing the right pesticide, selecting the type of spray equipment and using it appropriately, accounting for spray quality requirements, and overcoming barriers to proper coverage.



### Pesticide Choice

Selecting the proper pesticide for target and application



### Application Equipment

Applying a product effectively under correct conditions with proper setup



### Spray Chemistry

Managing the challenges found in tanks and the air during application



### Spray Barriers

Managing plant defenses and environmental conditions

Source: Purdue University - Adjuvants and the Power of the Spray Droplet





## Tank mix adjuvants can improve spray performance through the application process by



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**MIXTURE** Compatibility  
Stability  
pH  
Foam



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**APPLICATION** Droplet size distribution and relative span  
Drift Potential  
Volatilization  
Viscosity



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**RETENTION** Wetting/Spreading  
Sticking  
Contact Angle  
Evaporation Rate



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**UPTAKE AND TRANSLOCATION** HLB/Solubility  
Partition-Coefficient  
Cuticular penetration  
Biological activity



Tank mix adjuvants can be classified by their functionality into two major categories:

## Activator adjuvants

These generally modify properties of the spray mixture to help the pesticide penetrate or protect the target organism. Although several classifications exist, the components in this category usually have properties that directly or indirectly enhance the active ingredient's performance. The interactions between adjuvants, active ingredients and targets are complex, so activators are chosen according to the active ingredient's needs and performance in each application.

The most typical activator adjuvants are wetting/spreading agents, stickers, humectants and crop oils.



## Utility adjuvants

These may affect handling, compatibility, foam, pH, droplet size and other characteristics critical to the application of the spray tank.

This category includes drift control agents, water conditioners, compatibility agents, antifoaming agents and deposition aids, among others.

## R&D capabilities

Oxiteno's strong research and development focus drives technologies and innovations from the laboratory to the farm. Ultimately, our capabilities are built to offer our customers a partnership for the collaborative development of unique solutions.



### Spray chamber

An adjuvancy goes beyond formulation. Spray application quality is essential to ensure successful application. We can simulate ground application and rainfastness for different required application features: boom height, pressures, nozzles, spray volume, etc.



### Droplet size distribution

Droplet size distribution, relative span, % of fines and drift potential by imaging analysis (Oxford Laser).



## Dynamic and equilibrium surface tension

Surface tension is a key parameter strongly correlated to wetting, spreading and adhesion of agrochemicals.



## Contact angle

Droplet contact angle on leaves and standard hydrophobic surfaces. Wetting and spreading properties are correlated to contact angle.



# SURFOM® ADJ LINE

Complete solutions for existing and future challenges

In the next few years farmers will face key transformations in crop protection management practices driven by the emerging resistance in insects, weeds and agricultural pathogens, as well as increased regulatory and new customer demands. This complex scenario requires innovative and creative technologies.

Oxiten's solutions for the tank mix adjuvant market are designed to support farmers in efficiently and sustainably managing the field of the future.

Our full-solutions portfolio includes both activator and utility adjuvants.



# Formulation additives



Our broad portfolio can be combined in:

## Ethoxylated Fatty Alcohol

Product	Description	Appearance @25°C / 77°F	HLB
ALKOSYNT® ID 30	Isodecyl alcohol 3 EO	Liquid	9.1
ALKOSYNT® ID 60	Isodecyl alcohol 6 EO	Liquid	12.5
ALKOSYNT® IT 30	Isotridecyl alcohol 3 EO	Liquid	7.9
ALKOSYNT® IT 60	Isotridecyl alcohol 6 EO	Liquid	11.2
ALKOSYNT® IT 80	Isotridecyl alcohol 8 EO	Hazy Liquid	12.8
ALKOSYNT® IT 90	Isotridecyl alcohol 9 EO	Hazy Liquid	13.3
ALKOSYNT® IT 100	Isotridecyl alcohol 10 EO	Hazy Liquid	13.8
ALKOSYNT® IT 120	Isotridecyl alcohol 12 EO	Hazy Liquid	14.5
ALKONAT® L 20	Lauryl alcohol 2 EO	Liquid	6.4
ALKONAT® L 30	Lauryl alcohol 3 EO	Liquid	8.3
ALKONAT® L 60	Lauryl alcohol 6 EO	Liquid	11.5
ALKONAT® L 70	Lauryl alcohol 7 EO	Hazy Liquid	12.1
ALKONAT® L 90	Lauryl alcohol 9 EO	Hazy Liquid	13.4
ALKONAT® L 230	Lauryl alcohol 23 EO	Solid	16.9
ALKONAT® CE 50	Cetyl stearyl alcohol 5 EO	Solid	10.0
ALKONAT® CE 200 F	Cetyl stearyl alcohol 20 EO	Solid	15.4
ALKONAT® CE 250 F	Cetyl stearyl alcohol 25 EO	Solid	16.1
ALKONAT® OC 20	Oleyl cetyl alcohol 2 EO	Solid	5.0
ALKONAT® OC 100	Oleyl cetyl alcohol 10 EO	Solid	15.3
ALKONAT® AO 20	Oleyl cetyl alcohol 25EO	Solid	16.1
ALKONAT® E 20	Stearyl alcohol 2 EO	Solid	5.0
ALKONAT® E 200	Stearyl alcohol 20 EO	Solid	15.3
ALKONAT® C 20	Cetyl alcohol 2 EO	Solid	5.0
ALKONAT® C 200	Cetyl alcohol 20 EO	Solid	15.4

# Formulation additives

Our broad portfolio can be combined in:

## Ethoxylated Castor Oil

Product	Description	Appearance @25°C / 77°F	HLB
SURFOM® R 50	Castor oil 5 EO	Liquid	3.9
SURFOM® R 150	Castor oil 15 EO	Liquid	8.3
SURFOM® R 200	Castor oil 20 EO	Liquid	9.9
SURFOM® R 300	Castor oil 30 EO	Liquid	11.5
SURFOM® R 360	Castor oil 36 EO	Liquid	12.6
SURFOM® R 400	Castor oil 40 EO	Liquid	13.2
SURFOM® R 540	Castor oil 54 EO	Solid	14.4

## Tallow Amine Ethoxylates

Product	Description	Appearance @25°C / 77°F
ULTRAMINA® CO 50	Coco amine 2 EO	Liquid
ULTRAMINA® CO 120	Coco amine 12 EO	Liquid
ULTRAMINA® CO 150	Coco amine 15 EO	Liquid
ULTRAMINA® TA 20	Tallow amine 2 EO	Liquid
ULTRAMINA® TA 50	Tallow amine 5 EO	Liquid
ULTRAMINA® TA 100	Tallow amine 10 EO	Liquid
ULTRAMINA® TA 120	Tallow amine 12 EO	Liquid
ULTRAMINA® TA 150	Tallow amine 15 EO	Liquid
ULTRAMINA® TA 200	Tallow amine 20 EO	Liquid

## Ethoxylated Fatty Acid

Product	Description	HLB
ULTRACID® E 130	Stearic acid 13 EO	13.1
ULTRACID® L 90	Lauric acid 9 EO	13.3

## EO/PO Alcohol & EO/PO Copolymer

Product	Description	Appearance @25°C / 77°F	HLB
ALKOMOL® L 408	EO/PO lauryl alcohol	Cloudy Liquid	15.6
ALKOMOL® L 504	EO/PO lauryl alcohol	Cloudy Liquid	6.9
ALKOMOL® L 603	EO/PO lauryl alcohol	Cloudy Liquid	13.9
ALKOMOL® IT 406	EO/PO isotridecyl alcohol	Cloudy Liquid	13.5
ULTRARIC® 5000 HM	EO/PO n-butanol	Solid	15.9
ULTRARIC® PE 61	EO/PO block copolymer	Liquid	3.8
ULTRARIC® PE 62	EO/PO block copolymer	Liquid	7.3
ULTRARIC® PE 64	EO/PO block copolymer	Liquid	15.8
ULTRARIC® PE 104	EO/PO block copolymer	Solid	8.0
ULTRARIC® PE 105	EO/PO block copolymer	Solid	10.0

# Formulation additives

Our broad portfolio can be combined in:

## Solvents (*check regional availability*)

Product	Description	Flash Point °C T.O.C	Solubility % *
ISOPENTANOL	Isoamyl alcohol	42.7	1.7
ISOBUTANOL	Isobutyl alcohol	31.1	9.5
SURFOM® CE 8115	Ester of natural alcohol	93.0	Insoluble
SEC-BUTANOL	sec-Butyl alcohol	26.7	60
ETHYLGLYCOL	Ethylglycol	54.4	100
ETHYLDIGLYCOL	Ethyldiglycol	96.1	100
ETHYLTRIGLYCOL	Ethyltriglycol	135.0	100
BUTYLGLYCOL	Butylglycol	73.9	100
BUTYLDIGLYCOL	Butyldiglycol	115.6	100
SURFOM® CE 8090	Phenylglycol	126.7	2.1
SURFOM® EMS 2000	Soybean methyl ester	186.0	Insoluble
SURFOM® EMP 3000	Palmiste methyl ester	>130.0	Insoluble
SURFOM® CE 8434	C8C10 methyl ester	90.0	Insoluble
SURFOM® CE 8119	Palmitate 2-ethylhexyl ester	203.0	Insoluble
EMCAPLUS LINE	White mineral oil	>100.0	Insoluble
EMCAPAR LINE	White mineral oil	>100.0	Insoluble

\* weight solvent by weight water

## Polysorbates & Sorbitan Esters

Product	Description	Appearance @25°C / 77°F	HLB
ALKEST® SP 20	Sorbitan monolaurate	Liquid	8.6
ALKEST® SP 60	Sorbitan monostearate	Liquid	4.7
ALKEST® SP 80	Sorbitan monooleate	Liquid	4.3
ALKEST® TW 20	Sorbitan monolaurate 20 EO	Liquid	16.7
ALKEST® TW 60	Sorbitan monostearate 20 EO	Liquid	14.9
ALKEST® TW 80	Sorbitan monooleate 20 EO	Liquid	15.0
SURFOM® 1352	Sorbitol hexaoleate 40 EO	Liquid	10.2

## Polymers

Product	Description	Appearance @25°C / 77°F
SURFOM® SC 8223	Acrylic polymer	Liquid

