HELENA®

SPECIALTY PRODUCTS

VEGETATION MANAGEMENT /// AQUATICS /// FORESTRY

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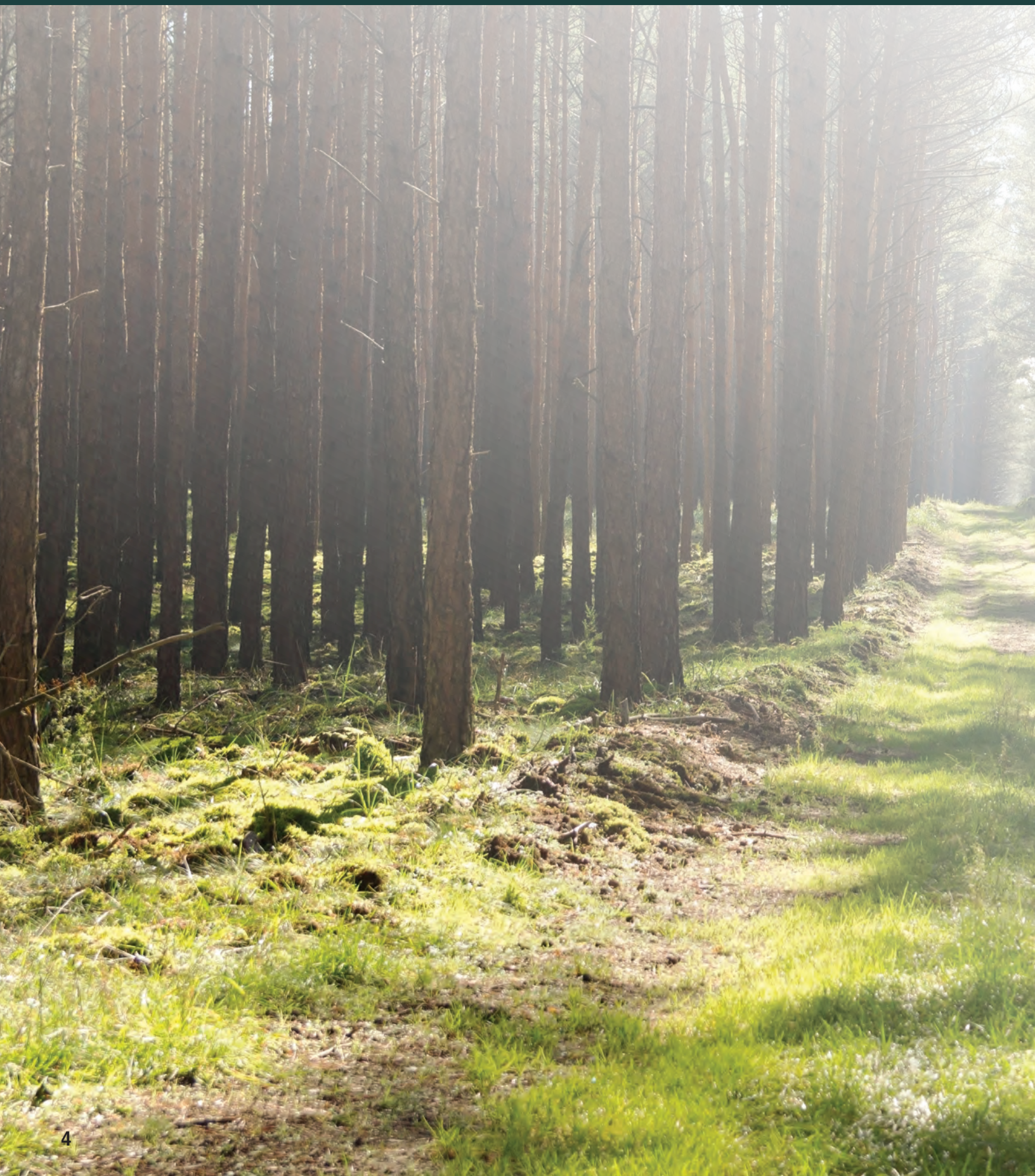


OUR PHILOSOPHY

People...Products...Knowledge®...

Helena is dedicated to providing the best, most cost-efficient solutions for our customers. We achieve our goals every day by delivering friendly customer service by knowledgeable, experienced professionals who supply innovative, proven formulations and the information you need to maximize the benefits of our products.

In addition to distributing a wide range of inputs from basic manufacturers and other companies that supply the turf and ornamental industry, Helena has an impressive line of its own products. In this catalog, we have outlined many of our branded products.

Innovative and useful products, along with professional service and advice, help Helena maintain its reputation for excellence in the turf and ornamental industry. Our company theme "People...Products...Knowledge..." drives our commitment to customers. Our People are professionals whose primary goal is to exceed customer expectations. We do this by offering Products that provide customers with the benefits they expect. We also serve as a source of technical Knowledge that we transfer to customers to help them improve and grow their business.

At Helena, we know that our success depends on the success of our customers. That's why we will continue to serve you with the best People who provide effective Products and valuable Knowledge to help you continue to succeed.

OUR SERVICES

CHEMICAL SIDE TRIM

Roadside vegetation management is an important part of providing customers with reliable electricity and maximizing safety along power lines. Trees near power lines must be properly maintained in order to allow for safe service, as limbs can fall on power lines during storms and cause outages that could affect many residences and businesses. Encroachment of trees and vegetation along roadsides can also obscure a driver's view of road signs and approaching vehicles, endangering motorists.

The use of herbicides to control the growth of tree limbs or entire trees, known as chemical side trimming, bypasses the safety hazard and labor expense for mechanical trimming. Chemical side trimming is an innovative treatment option for managing roadsides and power lines, pruning treated limbs so the tree can still grow, but not into the right-of-way where problems occur.

Helena has developed a vehicle that is operated by a two-man crew. It performs chemical trimming projects more quickly, with greater safety and higher efficiency than typical mechanical trimming. There are no branches to clean up, no wood chippers and no additional trailers or trucks. The herbicides used in this application also make these applications "grass friendly".

The two-man crew consists of an operator and a spotter. The operator acts as driver and applicator which allows all aspects of the application to be controlled within the cab of the vehicle. The spotter assists the operator to ensure the application runs as smoothly as possible and to correct any complications. The vehicles improve worker safety, are cost effective and save time on applications. This application method disperses the product directly where it needs to go, improving herbicide efficacy and efficiency.

This application offers two sizes of vehicles to choose from, depending on your needs.

OUR SERVICES

WATER QUALITY

The quality of the water you use to mix pesticides can have a big impact on the efficacy of your application. In some cases, water can make up 95% of the total spray mix. Pesticides often take the blame when an application does not achieve desired effects. However, the reality is, the quality of the water was the most likely culprit in a failed application.

Some of the factors that impact water quality include pH, carbonates and hard water. The following is a review of the impact of pH and hard water on pesticides. Many pesticides perform best between a pH of 5 and 6.5. When water pH is above 7, pesticides can degrade in the water and lose their effectiveness. For example, flumioxazin is stable at a pH of 5, but at a pH of 7, it is very unstable and its half life is reduced to 24 hours. At a pH of 9, the half life of flumioxazin drops to 15 minutes. Alkaline pH may also impact the rate that glyphosate and other weak acid herbicides are absorbed by plant tissue. Reducing the pH of spray application mixes may increase efficacy. Some insecticides and fungicides are also subject to degradation in spray water with pH > 7.0. Adjusting the pH of your water can help prevent the degradation of your pesticides. You can improve efficacy by adding water conditioners like Induce pH or Buffer Xtra Strength.

HARD WATER

Hard water refers to the amount of positively charged minerals in the water, particularly calcium, sodium, magnesium and iron. Products like 2,4-D carry a negative charge. When you add 2,4-D to hard water, the negative charge of the 2,4-D reacts with the positive charge of the hard water, reducing the effectiveness of that pesticide. A product like HardBall is not affected by hard water because it is formulated as a free acid. While the active ingredient in Hardball is 2,4-D, it does not carry the negative charge that amine forms of this herbicide carry. If your water exceeds 150 ppm, you should consider using Helena's acid technology that resists hard water charges, along with a water conditioner such as Quest, which can help remove carbonates from the water.

The most important thing you can do to ensure your pesticides are working to their fullest potential is invest in a water test. Understanding what is in your water can help you make the right decision when choosing pesticides or water conditioners. If your water source changes from site to site, you can purchase a pH litmus kit or pH meter. For more information on water quality or water testing, please contact your local Helena representative.

PRODUCT APPLICATION KEY

Helena produces a comprehensive range of protection and production inputs that can be utilized across different markets. Use the icons below to determine the appropriate product application for the Helena products in this catalog.

AQUATICS

FORESTRY

SPORTS TURF

GOLF

NURSERY

TURFGRASS

ROW* / VM*

ORNAMENTALS

*Rights of Way, Industrial Vegetation Management

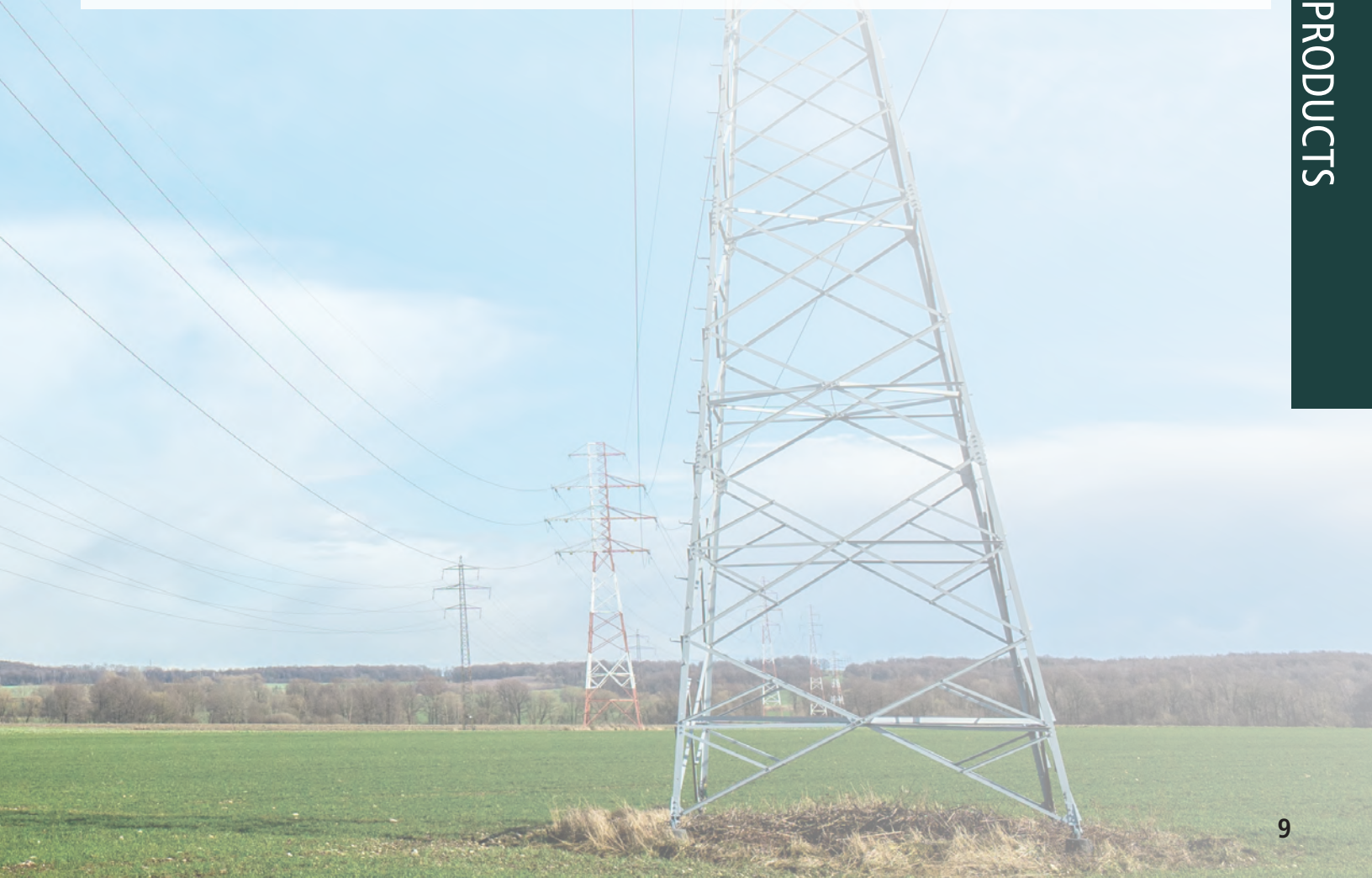
OUR PRODUCTS

ADJUVANTS

Enhance the effectiveness of your fertilizers, pesticides and other applications with Helena's proven selection of adjuvants. These products help you maximize your chemical investment in a variety of ways: improving uptake, reducing drift and run-off, promoting uniform spread, decreasing the amount of water required and more. Adjuvants include surfactants, water conditioners, deposition agents, utility products and colorants/spray pattern indicators.

VALUE-ADDED PRODUCTS

Helena's lineup of value-added products includes many familiar chemistries that are made more unique with our technologies. Throughout its 50+ years of experience in pest management, Helena has been one of the country's premier formulators. Our expertise includes combining active ingredients into unique and useful products and creating new patented chemistries and formulation technologies. The common goal in creating Helena value-added products is to provide users with superior products and demonstrable results that stand out among other products.



HELENA ADJUVANT MILESTONES

Helena's leadership position in the adjuvant industry can be seen by reviewing the company's extensive history of introducing new technologies. This includes many patented technologies, which are so innovative they are considered the exclusive property of Helena.

Helena has several adjuvant products registered in California, a state known for its adjuvant registration requirements. These requirements include extensive performance, safety and toxicological testing. If an adjuvant is registered for use in California, it means the product has passed the most extensive testing requirements in the U.S.

1970 — AGRI-DEX®
Commercial introduction of the original ATPLUS® 411-F crop oil concentrate formulation for use with herbicides

1976 — PENETRATOR®
The first commercial utilization of crop oil concentrate technology with fungicides and insecticides

1986 — INDUCE®
Introduction of 90/10 nonionic surfactant with enhanced deposition, defoaming and sticking properties

1987 — PENETRATOR PLUS
Introduction of the first premixed buffering agent/crop oil concentrate

1989 — PATROL®
First commercial introduction of a blended nonionic surfactant/UAN nitrogen solution product

1990 — KINETIC®
First commercial introduction of an organosilicone-based co-surfactant blend with reduced spray deposit evaporation

1991 — QUEST®
First use of liquid ammonium sulfate replacement technology

1994 — AERO DYNE-AMIC®
Introduction of the first buffered methylated seed oil/organosilicone-based spray adjuvant

1992 — DYNE-AMIC®
Introduction of the first organosilicone-based surfactant/methylated seed oil blend

1995 — COHORT® DC
Introduction of the first dry concentrate (DC) spray adjuvant product

1995 — JOINT VENTURE®
Development of the first adjuvant designed for insecticides, fungicides and miticides

1995 — GROUNDED®
First deposition agent for soil-applied herbicides

1996 — HYPER-ACTIVE®
Commercial introduction of pest surface-active agent

1998 — COHERE®
Introduction of non-film forming spreader/sticker technology based on alkanolamide chemistry

2000 — INTERACTIVE®
Commercial introduction of a combination of a liquid ammonium sulfate replacement and translocating agent technologies

2000 — ACCUQUEST®
First liquid ammonium sulfate replacement adjuvant with drift reduction qualities

2005 — CIDE WINDER®
First spreader/penetrant/deposition agent for applications requiring excellent coverage and heavy canopy deposition

2006 — HEL-FIRE®
Advanced herbicide activator with high deposition properties

2010 — FIRE-ZONE®
A specialized MSO-based material for burndown applications only

2013 — ZAAR®
A patented blend of MSO, buffers and surfactants

2014 — JUSTIFIED®
Patent-pending, oil-based drift control agent

2017 — OCULUS®
Patented non-AMS water conditioner

HELENA ADJUVANTS

Standard Technology Relating to Tank Mix Adjuvants

To properly classify adjuvants and discern their characteristics, it is important to use common terminology. The following terminology has been approved by the American Society for Testing and Materials (ASTM) and accepted by the Adjuvants and Inerts Committee (AIC) of the Council of Producers & Distributors of Agrotechnology (CPDA).

This terminology is used or is likely to be used in test methods, specifications, guides and practices related to tank mix adjuvants. These definitions are written to ensure that standards related to tank mix adjuvants are properly understood and interpreted.

TERMS AND DEFINITIONS

Acidifier—Material that can be added to spray mixtures to lower the pH.

Activator—Material that increases the biological efficacy of agrichemicals.

Active Ingredient—A component of the formulation that produces a specific effect for which the formulation is designed.

Adjuvant—A material added to a tank mix to aid or modify the action of an agrichemical or the physical characteristics of the mixture.

Amphoteric Surfactant—A surface-active agent capable of forming, in aqueous solution, either surface-active anions or surface-active cations depending on the pH.

Anionic Surfactant—A surface-active agent in which the active portion of the molecule containing the lipophilic segment forms exclusively a negative ion (anion) when placed in aqueous solution.

Anti-Foaming Agent—Material used to inhibit or prevent the formation of foam.

Attractant—Material that attracts specific pests.

Basic Blend—A combination of wetting agent and buffering agent that maintains pH of the spray mixture greater than 7.

Buffer or Buffering Agent—A compound or mixture that, when contained in solution, causes the solution to resist change in pH. Each buffer has a characteristic limited range of pH over which it is effective.

Canopy Penetrating Agent—An adjuvant that increases the penetration of the spray material into the crop canopy. See Deposition Aid.

Cationic Surfactant—A surface-active agent in which the active portion of the molecule containing the lipophilic segment forms exclusively a positive ion (cation) when placed in aqueous solution.

Colorant—A material used to alter the color of the tank mix.

Compatibility Agent—A surface-active material that allows simultaneous application of liquid fertilizer and agrichemical, or two or more agrichemical formulations, as a uniform tank mix, or improves the homogeneity of the mixture and the uniformity of the application.

Crop Oil Concentrate—An emulsifiable petroleum oil-based product containing 15 to 20% w/w surfactant and a minimum of 80% w/w phytobland oil.

Crop Oil (emulsifiable)—An emulsifiable petroleum oil-based product containing up to 5% w/w surfactant and the remainder of a phytobland oil.

Crop Oil (non-emulsifiable)—See phytobland oil.

De-Foaming Agent—Material that eliminates or suppresses foam in the spray tank.

Deposition Aid—Material that improves the ability of agrichemical sprays to deposit on targeted surfaces.

Dormant Oil—A horticultural mineral oil applied during the dormant phase of the targeted plant.

Drift Control Agent—A material used in liquid spray mixtures to reduce spray drift.

Emulsifier—A surfactant that promotes the suspension of one immiscible liquid in another.

Evaporation Reduction Agent— A material that reduces the evaporation rate of a spray mix during or after application, or both.

Extender—Material that increases the effective life of an agrichemical after application.

Foam Suppressant—See De-Foaming Agent

Foaming Agent—A material that increases the volume or stability of the foam formed in a spray mixture.

High Surfactant Oil Concentrate—An emulsifiable oil based product containing 25–50% w/w surfactant and a minimum of 50% w/w oil.

Humectant—A material which increases the equilibrium water content and increases the drying time of an aqueous spray deposit.

Modified Vegetable Oil—An oil, extracted from seeds, that has been chemically modified (for example, methylated).

Modified Vegetable Oil Concentrate—An emulsifiable, chemically modified vegetable oil product containing 5 to 20% w/w surfactant and the remainder chemically modified vegetable oil.

Naphtha-Based Oil—A petroleum oil containing a majority of the naphtha fraction.

Nonionic Surfactant—A material having no ionizable polar end groups, but comprised of hydrophilic and lipophilic segments.

Oil—See Petroleum, Paraffinic and Vegetable Oils.

Paraffinic Oil—A petroleum oil (derived from paraffin crude) whose paraffinic carbon type content is typically greater than 60%.

Penetrant—A material that enhances the ability of an agrichemical to enter a substrate or penetrate a surface.

Petroleum Oil—Oil derived from petroleum. Contains a mixture of hydrocarbons that are broadly classified as paraffins, napthenes, aromatics or other unsaturates, or combinations thereof.

Phytobland Oil—A highly refined paraffinic material with a minimum unsulfonated residue of 92% v/v.

Spreader—A material which increases the area that a droplet of a given volume of spray mixture will cover on a target.

Spreader/Sticker—A material that has the properties of both a spreader and a sticker.

Sticker—A material that assists the spray deposit to adhere or stick to the target and may be measured in terms of resistance to time, wind, water, mechanical action or chemical action.

Surface-Active Agent—A material that when added to a liquid medium modifies the properties of the medium at a surface or interface.

Vegetable Oil—Oil extracted from seeds, typically those of corn, cotton, peanut, rape-seed, sunflower, canola or soybean.

Vegetable Oil Concentrate—An emulsifiable vegetable oil product containing 5 to 20% w/w surfactant and a minimum of 80% w/w vegetable oil.

Wetting Agent—Wetting agents can be considered synonymous with spreading agents in function.

This terminology is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.22 on Pesticide Formulation and Application Systems. First edition approved Feb. 15, 1994. Published April 1994. Originally published as E 1519 - 93. Last previous edition E1519 - 99. 2.

Note: All surfactants are adjuvants, but NOT all adjuvants are surfactants.

ADJUVANTS BY FUNCTION

RELATIVE RANKINGS BY FUNCTION 1=LOW & 10=HIGH

PRODUCT NAME	SPREADING	CUTICLE PENETRATION	DEPOSITION	WATER CONDITIONING	BUFFERING	COMPATIBILITY	WETTING	EVAPORATION REDUCTION	STICKING	CA REGISTRATION NUMBER
Water	1	1	1	1	1	1	1	1	1	
AccuQuest® WM	1	1	8	10	1	2	1	4	2	
AccuZone® DC	1	1	9	10	2	2	1	5	2	
Aero Dyne-Amic®	5	9	7	5	6	4	8	5	3	5905-50080-AA
Agri-Dex®	3	7	8	1	1	1	3	9	6	5905-50094-AA
Blendex® VHC	5	2	3	6	8	10	5	3	2	
Buffer™ Extra Strength	2	2	3	7	10	7	2	4	2	
Buffer™ P.S.	3	2	3	5	5	5	2	4	2	5905-50062-AA
Cide Winder®	5	7	6	2	2	2	6	7	2	
Citru-Film®	3	7	8	1	1	1	3	9	6	
Clasp®	1	1	8	1	1	1	1	5	3	
Cohere®	6	3	5	1	1	2	6	5	10	5905-50083-AA
DLZ®	4	7	8	5	5	3	5	9	6	
Duce®	5	7	6	2	1	2	6	7	2	
Dyne-Amic®	5	10	8	1	1	1	7	6	3	5905-50071-AA
Dyne-A-Pak®	5	10	8	3	1	1	6	7	3	
Fasten®	4	4	5	1	1	1	3	8	8	5905-50101-AA
Fire-Zone®	3	10	7	3	3	4	4	6	2	
Ground Zero®	1	1	8	1	1	1	1	5	3	
Grounded®	3	7	9	1	1	1	3	10	6	
Hel-Fire®	4	4	4	8	10	6	4	6	3	
Hyper-Active®	5	3	5	1	1	1	5	6	10	5905-50082-AA
Induce®	5	4	6	2	2	1	6	5	5	5905-50091-AA
Induce® pH	5	4	6	5	5	6	6	5	4	

PRODUCT NAME	SPREADING	CUTICLE PENETRATION	DEPOSITION	WATER CONDITIONING	BUFFERING	COMPATIBILITY	WETTING	EVAPORATION REDUCTION	STICKING	CA REGISTRATION NUMBER
Inlet®	5	3	4	1	1	1	5	4	2	
InterActive®	5	3	5	10	2	2	5	5	3	
Joint Venture®	5	10	7	1	1	1	7	6	3	
Justified®	3	7	10	1	1	1	3	10	9	
Kammo® Plus	3	9	8	1	1	1	3	7	5	
Kinetic®	9	3	4	1	1	1	10	2	2	5905-50087-AA
Kinetic® HV	9	3	4	1	1	1	10	4	2	
Lastik®	3	2	4	1	1	1	2	8	10	
OnLine®	5	3	7	6	8	10	5	3	2	
Optima®	3	3	5	5	4	2	5	4	3	5905-50075-AA
Patrol®	5	3	6	3	1	1	6	7	2	5905-50078-AA
Penetrator® Plus	3	8	9	3	4	3	3	10	6	5905-50074-AA
PointBlank® WM	1	1	8	1	1	1	1	5	3	5905-50100-AA
Quest®	1	1	2	10	8	2	1	4	2	5905-50076-AA
ReDuce®	5	1	4	10	3	1	5	5	2	
Re-Quest®	1	1	2	10	1	2	1	4	2	
Smoke®	3	4	4	7	9	5	4	6	2	
Strike Zone® DF	1	1	10	1	1	1	1	8	8	5905-50084-AA
Surfix® P	3	2	4	1	1	1	2	8	10	5905-500900-AA
TransActive® HC	4	4	3	7	7 (Alkaline)	2	4	4	3	
Vegetable Oil Conc.	5	5	7	1	1	1	4	8	7	
WipeOut® XS	1	1	1	NA	NA	1	1	NA	NA	
Zaar®	5	10	7	5	4	7	5	7	3	

ADJUVANTS

SURFACTANTS

Induce

Induce is a special blend of nonionic, low-foam components. It is designed to quickly wet and spread a more uniform spray deposit over plant leaf and stem surfaces. With a high level of free fatty acids, Induce resists wash-off.

INDUCE

HIGHLIGHTS

- Excellent spreading qualities
- Increases re-wetting
- Resists wash-off
- Enhances spray deposition
- Low foaming properties

Agri-Dex

Agri-Dex is one of the most widely used, reliable crop oil concentrates (COC) available. This unique blend of high-quality, paraffin-based mineral oil and nonionic surfactants was designed to boost the performance of herbicides in adverse conditions. Agri-Dex enhances absorption and provides effective coverage for superior weed control.

AGRI-DEX

HIGHLIGHTS

- Consistent, reliable results
- Improves coverage & canopy deposition
- Non-phytotoxic
- Reduced evaporation & volatilization due to high-quality oils

Kinetic

Kinetic is a nonionic organosilicone-based wetter/spreader/penetrant spray adjuvant. It is designed to provide rapid spreading and absorption of pesticide and nutrient sprays into plant leaves and stems. Because of its unique abilities, Kinetic can be used at much lower rates than conventional surfactants.

KINETIC

HIGHLIGHTS

- Superior spreading
- Improves the absorption of systemically active and/or water-soluble pesticides
- Reduces spray droplet bounce
- May allow for the reduction of water volumes

Dyne-Amic

Dyne-Amic is an effective blend of highly refined methylated seed oils in combination with specialized organosilicone-based nonionic surfactants. With its low phytotoxicity qualities, Dyne-Amic is much easier on plants than conventional crop oil concentrates. The oil component of Dyne-Amic provides excellent penetration, while the surfactant provides highly effective spreading and coverage.

HIGHLIGHTS

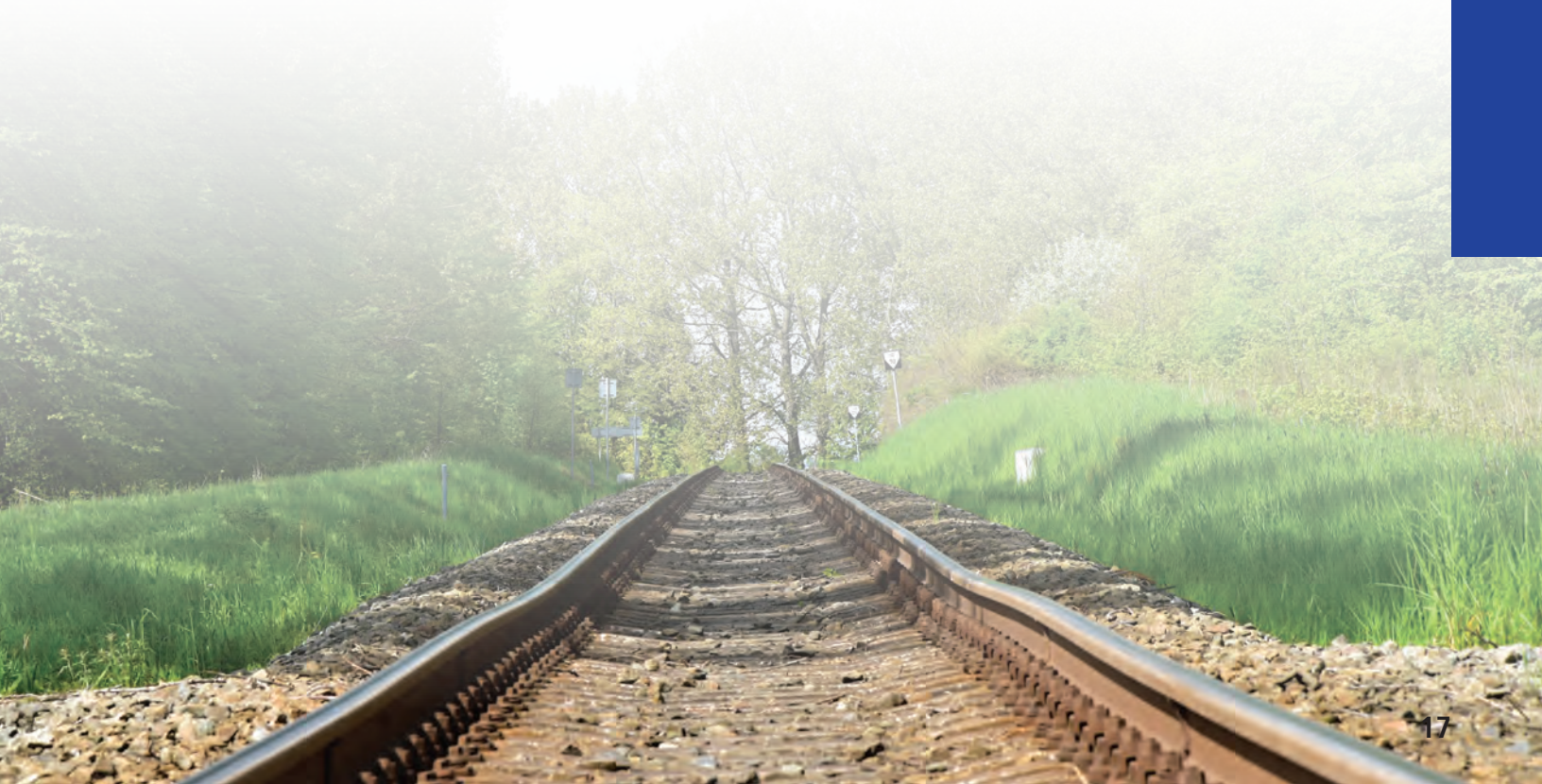
- Excellent canopy deposition & spreading for thorough coverage
- Excellent penetration of plant tissue
- Reduced evaporation
- Low use rate

Smoke

Smoke, a unique herbicide activator, is a blend of deposition agents, activators and water conditioners that enhances herbicide efficiency. Smoke improves spray deposition and uptake, while preventing antagonisms caused by poor water quality.

HIGHLIGHTS

- Increases ai absorption
- Improves spray deposition
- Good wetting properties
- Corrects hard water antagonisms



ADJUVANTS

Hel-Fire

Hel-Fire is a combination of deposition agents, activators and water conditioners. Hel-Fire is designed to enhance the degree and speed of herbicide performance, particularly with glyphosate. It improves spray deposition and uptake, while preventing antagonisms caused by poor water quality.

HEL-FIRE®

HIGHLIGHTS

- Improves herbicide activity
- Corrects hard water antagonism
- Improves spray deposition
- Provides good wetting properties

Fire-Zone

Fire-Zone is a highly effective blend of methylated seed oils (MSO) and surfactants, designed exclusively for burndown, desiccation and industrial weed control applications. It provides a faster weed-killing response and works well in adverse weather conditions. It should not be used in over-the-top weed control applications in a growing plant.

Fire-Zone®

HIGHLIGHTS

- Optimized for use in burndown & desiccation applications
- Faster weed-killing response
- Outperforms standard MSO's
- Works well under adverse conditions

Zaar

Zaar is a blend of methylated seed oil (MSO), herbicide activators and water conditioners that can give your herbicide application extra weed-killing capabilities. Its 100% active formulation results in excellent translocation of active ingredients into weeds. Zaar is derived mostly from soybean oil. It produces mini-emulsions that provide good spray mix compatibility and easier equipment clean-out.

HIGHLIGHTS

- Provides water conditioning, pH reduction, buffering & herbicide activation all in one container
- Derived from soybean oil
- Improves spray mix compatibility

PointBlank WM

A user-friendly, polymer-based drift reduction and deposition agent with shear resistance, PointBlank WM disperses easily and is compatible with all glyphosate products. PointBlank WM provides excellent drift reduction and spray deposition for overall improved spray application performance.

California Reg. No. 5905-50102-AA

HIGHLIGHTS

- Excellent drift reduction
- Ultra low rate formulation
- Compatible with many products, including glyphosate

Kammo +

Kammo Plus is a superior blend of spray oils, surfactants and masking agents designed for use as a masking agent with a broad range of pesticides. The addition of Kammo Plus to your spray mix will impart a pleasant scent as well as adding a surfactant effect.

HIGHLIGHTS

- Pleasant scent
- Contains D'limonene
- Acts as a surfactant

ADJUVANTS

Cohere

A film-free, wax-soluble spreader-sticker adjuvant, Cohere is designed for use with fungicide and insecticide applications. It contains surface melding technology that allows the sprayed solution to insert itself into the plant surface. Cohere does not require sunlight exposure to set the solution. It leaves no sticky residues on spray equipment and has good spray mix compatibility.

California Reg. No. 5905-50083-AA

HIGHLIGHTS

- Film-free spreader sticker
- Unique mode of action
- Superior spreading & wetting properties

Optima

A specialized formulation of surfactants and buffering agents which improves application coverage while buffering the spray mix pH. Optima also contains adjuvant ingredients known to improve the absorption of certain herbicides and other pesticides.

California Reg. No. 5905-50075-AA
Not for use in Aquatics in California

HIGHLIGHTS

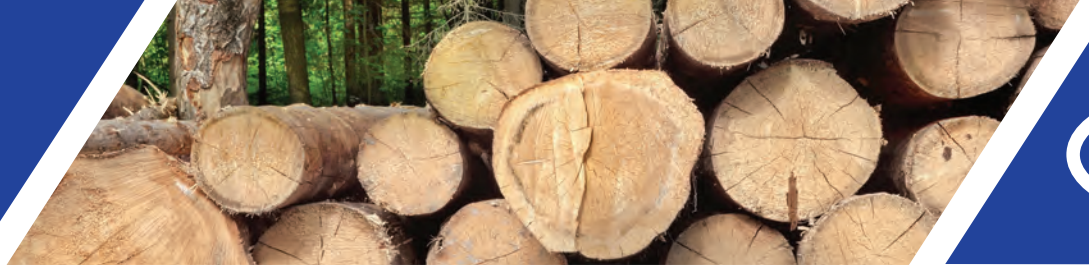
- Improves herbicide absorption
- Modifies the pH of the spray solution
- Improves wetting & spreading for greater coverage

MSO

Premium MSO Methylated Spray Oil is a multifunctional spray adjuvant developed as a penetrating surfactant concentrate with superior wetting and penetrating characteristics. It is designed as a replacement for non-ionic surfactants and crop oil concentrates in liquid spray mixtures.

HIGHLIGHTS

- Wetting & penetrating characteristics
- Maximizes the effectiveness of certain herbicides



Zandar

Zandar, when used as a surfactant, enhances activity and the effectiveness of agricultural chemicals such as acaricides, defoliants, desiccants, fungicides, foliar nutrients, herbicides, insecticides and plant growth regulators. When this product is used as a penetrant, a more uniform coverage is provided by decreasing surface tension of spray solutions. This product can be used as a buffer to lower pH of spraying solutions to prevent alkaline hydrolysis of pesticides sensitive to high pH.

ZANDAR

HIGHLIGHTS

- Solution for high pH or hard water problems
- Can be used to solve hard water, high pH & application issues in a variety of applications

ADJUVANTS

WATER CONDITIONERS

Induce pH

Induce pH is a special blend of nonionic, low-foam, buffering and conditioning components. It improves the efficacy of spray applications by increasing coverage, reducing run-off, minimizing evaporation and enhancing absorption and uptake. Induce pH also helps correct mixing problems and prevents water quality problems.

HIGHLIGHTS

- Excellent spreading qualities
- Increases re-wetting
- Resists wash-off
- Enhances spray deposition

Quest

Quest is an effective blend of water conditioning agents and spray adjuvants designed to make pesticide sprays more efficient. It removes carbonates and bicarbonates that can deactivate pesticides. It also sequesters metal cations and modifies the pH of the spray solution. Quest can be used as a liquid replacement and/or a supplement to ammonium sulfate.

HIGHLIGHTS

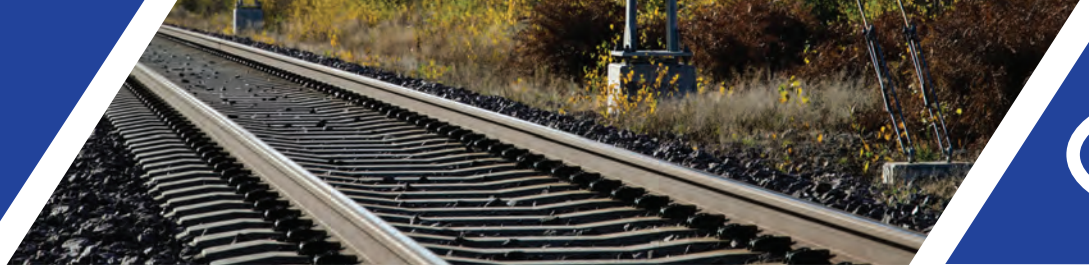
- Compatible with many pesticide formulations
- Conditions spray water by sequestering iron cations, calcium & magnesium salts & carbonates
- Reduces spray deposit evaporation
- Replaces or supplements dry ammonium sulfate

Buffer Xtra Strength

Buffer Xtra Strength is a buffering and water conditioning agent designed to adjust the pH of alkaline waters, condition spray water and minimize hydrolysis of pesticides which tend to decompose in alkaline spray solutions. Buffer Xtra Strength also has the properties of a wetter/spreader surfactant and compatibility agent and can positively affect pesticide spray application and pesticide efficacy.

HIGHLIGHTS

- Adjusts pH of alkaline waters
- Minimizes the breakdown of pesticides
- Excellent for use in situations where hard water is an issue



Buffer P.S.

Buffer P.S. is a spreader/buffering agent designed to adjust the pH of alkaline waters and minimize hydrolysis of pesticides which tend to decompose in alkaline spray solutions. It also has the properties of a wetter/spreader surfactant and compatibility agent.

BUFFER P.S.™

HIGHLIGHTS

- Improves ease of application by reducing spray mix thickness & lumping
- True buffering activity
- Prevents pesticide efficacy loss due to alkaline hydrolysis pH (values less than 7)
- Prevents the antagonism of herbicides from hard water carbonates

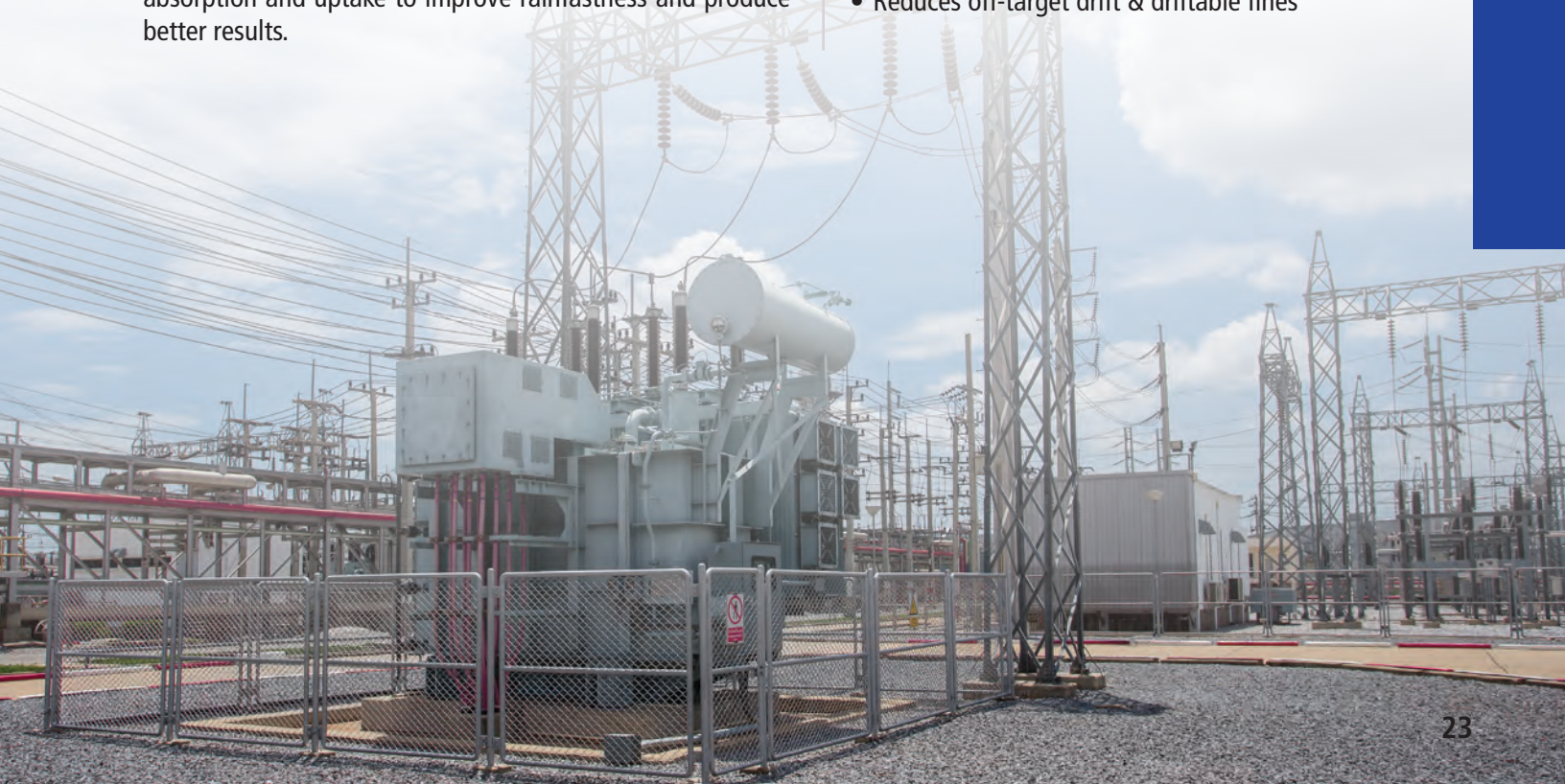
Oculus

Oculus combines water conditioners with drift management technology and a foam control agent to improve results in a wider variety of herbicides. It contains a 100% solvent- and oil-free, non-ammonium sulfate formulation that enhances crop safety and improves compatibility. It also corrects hard water problems and controls foaming, while managing drift and improving herbicide activity in hard water. Oculus contains a pump shear resistant polymer to reduce driftable fines and lower the risk of off-target drift. It also increases absorption and uptake to improve rainfastness and produce better results.

OCULUS™

HIGHLIGHTS

- Patented, multi-functional water conditioner
- Excellent compatibility with pesticides, including new over-the-top herbicides
- 100% solvent- & oil-free, non-ammonium sulfate (AMS) formulation
- Reduces off-target drift & driftable fines



ADJUVANTS

DEPOSITION AGENTS

Grounded

Grounded is a soil and spray deposition agent that improves the efficacy and adsorption of soil-applied herbicides, improves drift control and enhances application efficiency. It provides proven quality and performance that can improve results from your herbicide inputs.

Laying the Foundation
GROUNDED

HIGHLIGHTS

- Improves adsorption in the soil
- Can improve pre-emergence weed control
- Improves droplet size uniformity
- Reduces evaporation & drift

Grounded W

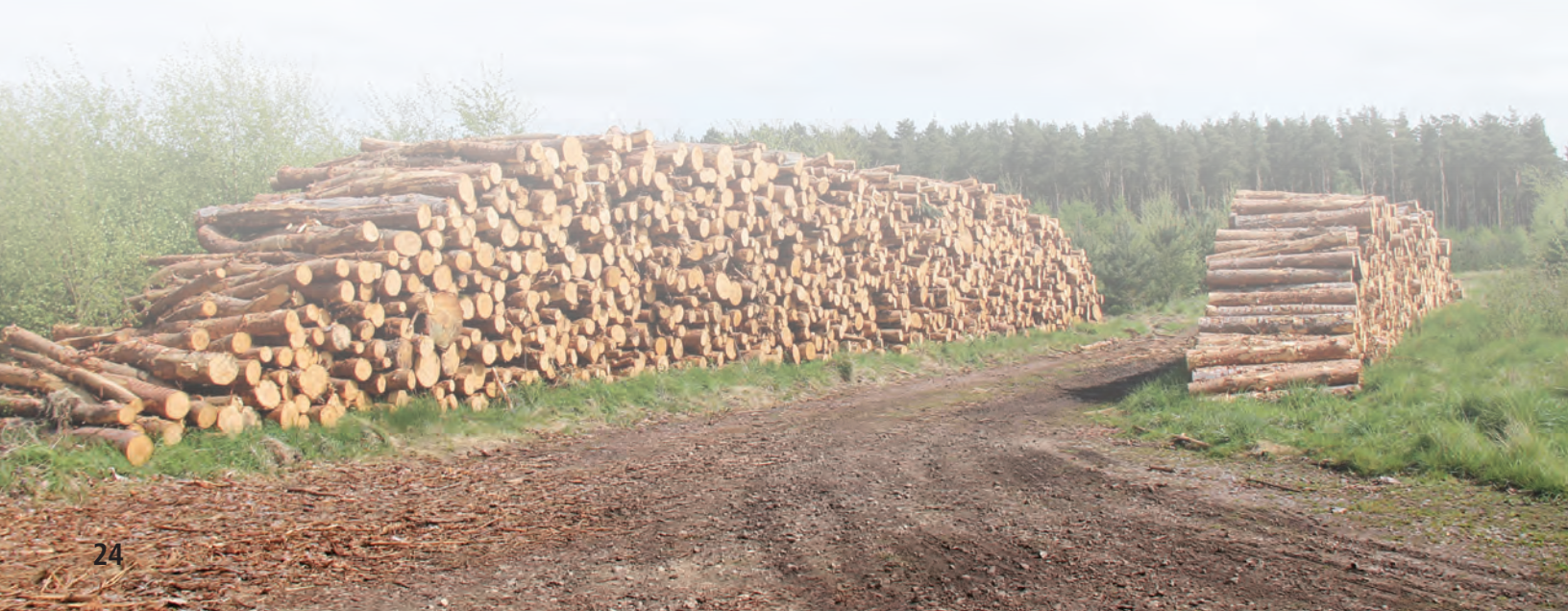
Grounded W can positively affect pesticide spray applications and efficacy with its nonionic blend of surfactants and refined spray oils. This is a product that can be used where an oil concentrate adjuvant is recommended.

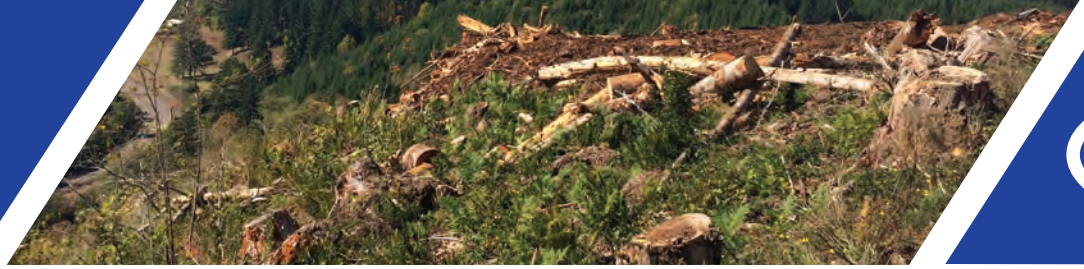
Grounded W California Reg. No. 5905-50105-AA
Grounded W Washington Reg. No. 5905-13001

GROUNDED-W

HIGHLIGHTS

- Even & uniform spray deposits
- Modifies wetting & deposition characteristics
- Improves pesticide application
- Deposition aid





Justified

Justified increases droplet size and reduces driftable fines for a lower risk of off-target drift. With an oil-based formulation, the driftable fine reduction achieved with Justified is not affected by pump shearing. It decreases evaporation and improves deposition and coverage, delivering more ai to the target. Justified also decreases foam and has excellent compatibility with tank-mix partners and equipments. Justified is made with a renewable resource.

JUSTIFIED®

HIGHLIGHTS

- Reduces off-target drift & driftable fines
- Improves deposition & coverage
- Decreases evaporation
- Decreases foam in spray applications

Ground Zero

Ground Zero is a drift reduction agent that helps keep spray fertilizers and herbicides on target. By delivering spray applications where they're needed most, Ground Zero helps reduce waste and the potential for complaints.

GROUND ZERO®
DEPOSITION AID and DRIFT RETARDANT FOR PESTICIDE SPRAYS

HIGHLIGHTS

- Excellent drift reduction & deposition
- Easy use & dispersion
- Low application rates
- Highly concentrated formulation for mixing efficiency

Clasp

This ready-to-use drift control agent was designed for easy tank mixing with a variety of compatible ingredients, including glyphosate, paraquat, boron and most nutritional products. It contains no petroleum solvents.

Washington Reg. No. 5905-13002

CLASP®

HIGHLIGHTS

- Excellent drift reduction
- Ready-to-use (RTU), non-foaming formulation
- Reduces spray droplet bounce
- Minimal pump shear impact
- No gel residues in equipment

ADJUVANTS

DEPOSITION AGENTS

DLZ

DLZ is a combination of surfactants, paraffinic oil and methylated seed oils that works three ways to improve application delivery. It improves the spreading, wetting and absorption properties of pesticide spray mixes, acts as a buffer in the spray mixture to enhance uptake, and its unique emulsifiers provide extremely stable emulsions when needed.

DLZ DROPLET LANDING ZONE

HIGHLIGHTS

- Improves deposition & reduces evaporation
- Enhances spreading, wetting & absorption of pesticides
- Acts as a buffer to improve uptake
- Stabilizes through emulsion

SPRAY UTILITY

WipeOut XS

WipeOut XS is an ammonia-free, sodium hydroxide-based tank cleaner with twice the active ingredient as conventional tank cleaners. It cleans spray tanks and equipment quickly and thoroughly by penetrating and solubilizing residues, while preventing re-adherence during flushing. It is specially engineered to clean application equipment after using multiple mode-of-action tank mixes. It elevates pH faster than other tank cleaners to quickly decompose crop protection products.

WIPEOUT® XS

HIGHLIGHTS

- Cleans residues from spray tanks & equipment
- Prevents re-adherence after flushing
- Neutralizes acid
- No ammonia odor
- Low foaming

FoamBuster Max

FoamBuster Max is a concentrated blend of foam-eliminating agents that significantly reduces foam once formed in a spray mix and prevents foam from reoccurring.

FOAMBUSTER® MAX

HIGHLIGHTS

- Effective with organosilicone-based surfactant products
- Better knock down of foam once formed in the tank

SPRAY PATTERN INDICATORS

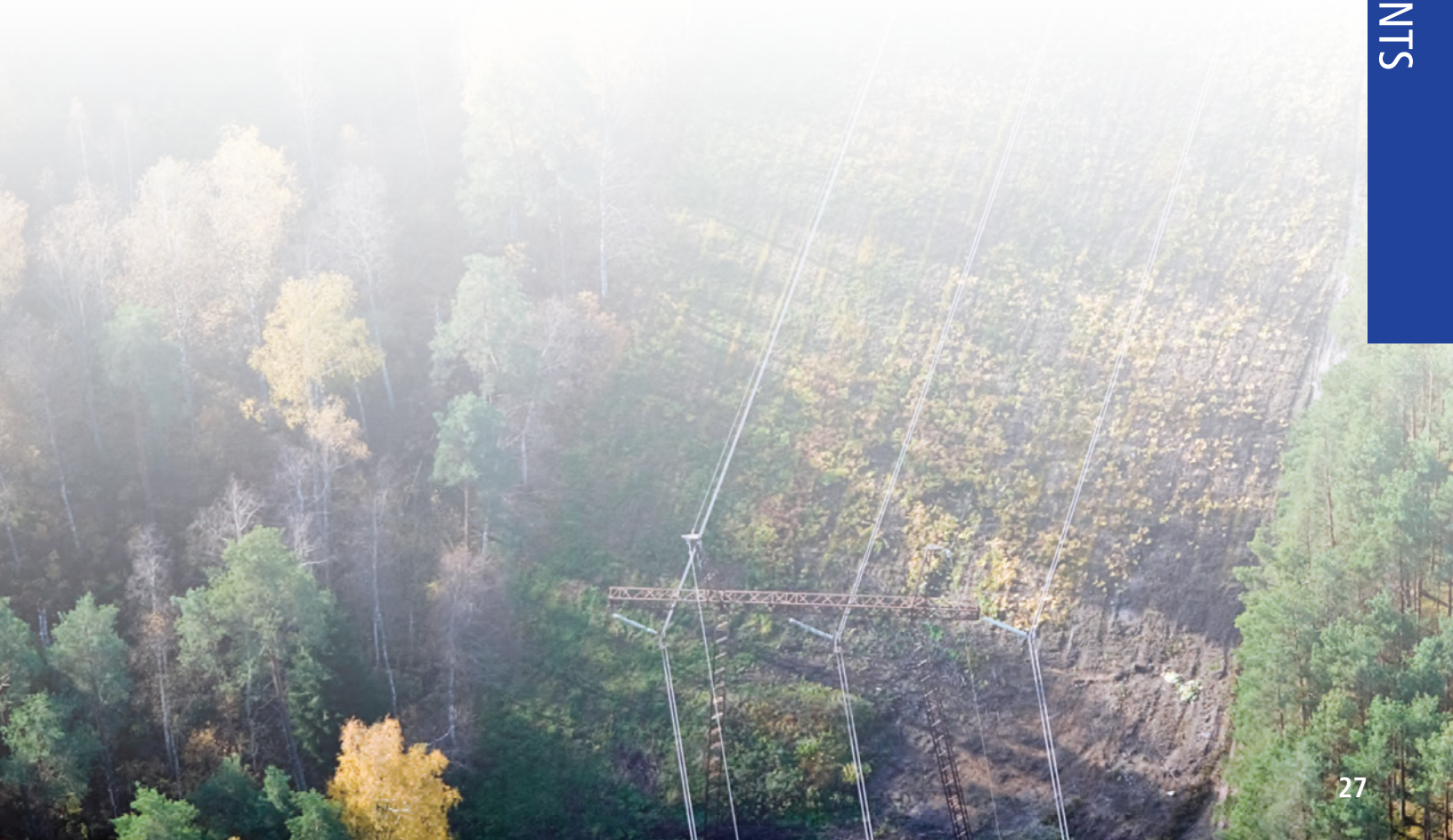
Spray Indicator XL

Spray Indicator XL helps applicators avoid costly oversprays and skips with a highly concentrated temporary colorant that shows them where they've sprayed. It dissipates quickly in wet and dry weather and mixes completely with water-soluble pesticides and fertilizers without affecting chemical efficacy.

Spray Indicator XL

HIGHLIGHTS

- Reveals where pesticides or fertilizers have been applied
- Indicates skips & overlaps at a glance
- Easy clean up — won't stain skin
- Dissipates under sunlight, rain or irrigation



VALUE-ADDED PRODUCTS

HERBICIDES

Trycera

Trycera is a specialized, patented triclopyr acid formulation designed to maximize weed control in a variety of environmental conditions, while minimizing spray application and mixing problems for industrial vegetation management. It features enhanced absorption, low volatility, good compatibility with most fertilizers and no phenoxy odor.

EPA Reg. No. 5905-580
Not Registered for Use in California

TRYCERA®
Selective Broadleaf Herbicide

HIGHLIGHTS

- Outstanding control of tough broadleaf weeds, even under environmental extremes
- Extremely low odor & very low volatility for applications in sensitive areas
- Optimized pH & water conditioning properties improve performance by reducing antagonisms
- Non-flammable (no petroleum solvents or alcohol)

ACTIVE INGREDIENTS

Triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid	29.40%
INERT INGREDIENTS	70.60%
TOTAL	100.00%

Velossa

Velossa is a non-selective, broad-spectrum herbicide that effectively controls many broadleaf, grassy and woody weeds. The active ingredient in Velossa is hexazinone. This formulation contains over 20% more of the active ingredient than similar products. It is water-soluble and non-flammable.

EPA Reg. No. 5905-579
Registered for Use in California

VELOSSA

HIGHLIGHTS

- Controls many broadleaf, grassy & woody weeds
- Active ingredient is hexazinone
- Co-formulated adjuvant system
- Mixes quickly in water & has excellent spray mix compatibility
- Non-flammable & non-corrosive
- Stable down to 5° & reconstitutes with warming

ACTIVE INGREDIENTS

Hexazinone 3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)dione	25.00%
INERT INGREDIENT	75.00%
TOTAL	100.00%

Copper-Z 4/4

This ready-to-use liquid copper sulfate product effectively controls many species of filamentous (mat-forming green) algae and planktonic (single cell blue-green) algae, as well as potamogeton pond weeds. Copper-Z 4/4 is ideal for algae management in potable or irrigation water, including reservoirs, ponds, lakes and water conveyance systems.

EPA Reg. No. 5905-486
Not Registered For Use in California

COPPER-Z 4/4

HIGHLIGHTS

- Effectively controls green & blue-green algae
- Safe for use in potable water & irrigation water

ACTIVE INGREDIENTS

Copper Sulfate Pentahydrate	15.9%
OTHER INGREDIENTS	84.1%
TOTAL	100.00%

VALUE-ADDED PRODUCTS

HERBICIDES

Opti-Amine

Opti-Amine is a unique 2,4-D amine, low odor formulation that features enhanced weed uptake for effective broadleaf weed control. It contains a specialized co-formulation system that increases the degree of 2,4-D uptake and enhances the absorption of other herbicides, such as glyphosate.

EPA Reg. No. 5905-501
Not Registered for Use in California

Opti-Amine

HIGHLIGHTS

- Improved weed control through enhanced uptake & absorption
- Improves performance of tank-mix partners
- Excellent spray mix compatibility
- Co-formulation system enhances uptake & deposition & lowers evaporation

ACTIVE INGREDIENTS

Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid	46.7%
INERT INGREDIENTS	53.3%
TOTAL	100.00%

Barrage HF

Barrage HF is a petroleum solvent free, low-volatile 2,4-D ester, designed to provide excellent broadleaf weed control. Barrage HF has technology that results in better deposition, penetration and absorption of the product on targeted weeds. It features low use rates, rainfastness and good compatibility with liquid fertilizers.

U.S. Patent No. 6,232,672
EPA Reg. No. 5905-529
Not Registered for Use in California

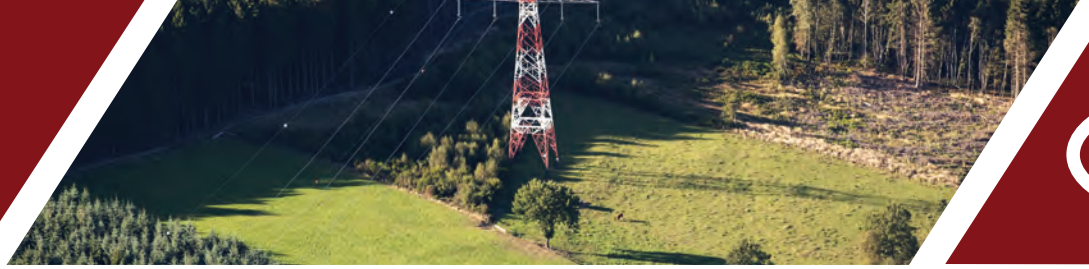
BARRAGE® HF

HIGHLIGHTS

- Low volatile 2,4-D ester
- Low use rates
- Excellent compatibility with liquid fertilizers
- Excellent tank-mix partner with glyphosate & residual herbicides

ACTIVE INGREDIENTS

2-Ethylhexyl Ester of 2,4-Dichlorophenoxyacetic Acid	78.1%
INERT INGREDIENTS	21.9%
TOTAL	100.00%



HardBall

HardBall is the perfect tool for effectively controlling broadleaf weeds, especially where odor and volatility are important considerations. Due to its unique dual-acid technology, it provides excellent weed control at lower rates and with less odor and volatility than conventional 2,4-D products. Even in cool conditions, Hardball provides effective control of broadleaf weeds.

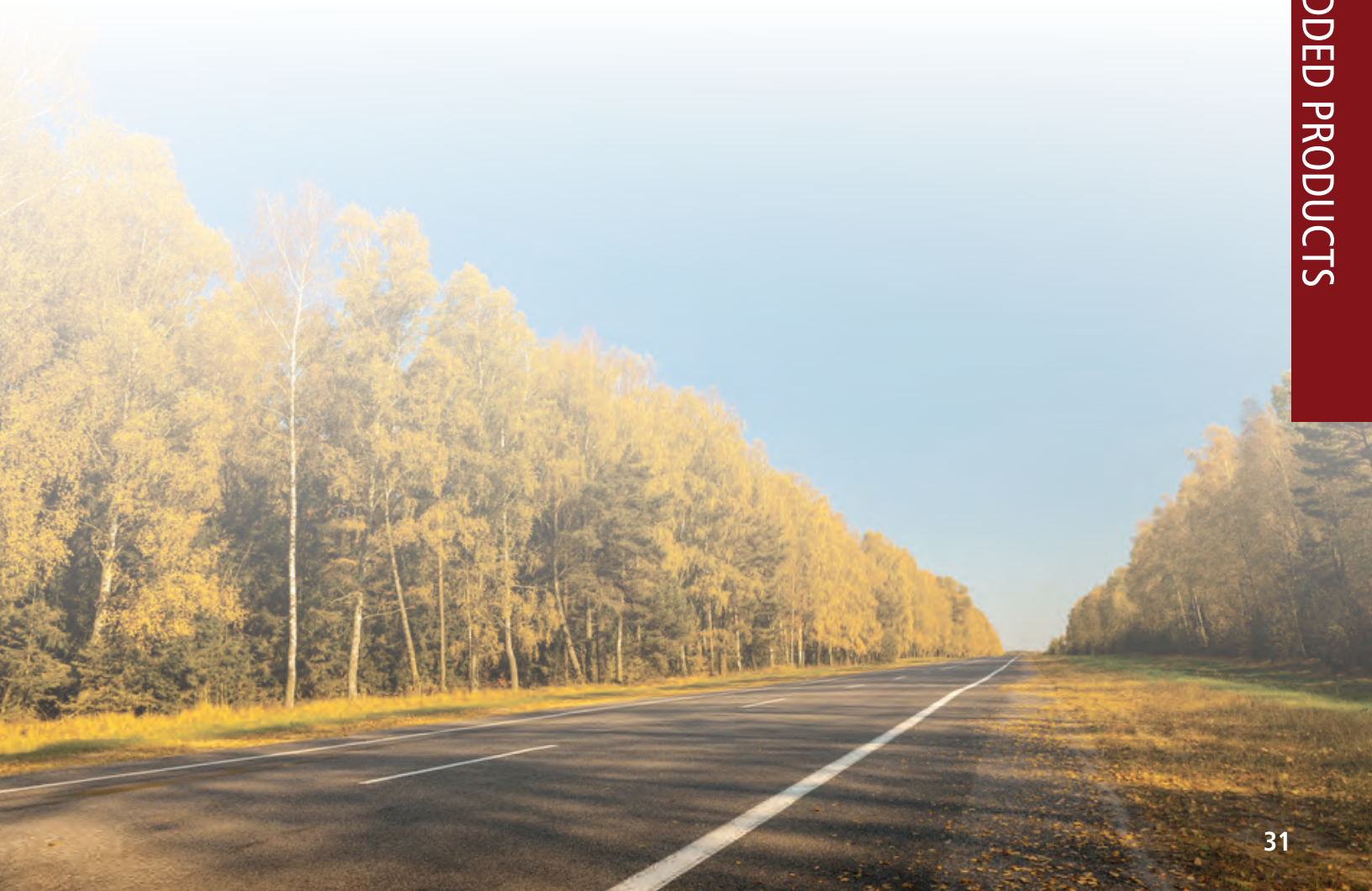
EPA Reg. No. 5905-549
Registered for Use in California

HIGHLIGHTS

- Enhanced weed control due to unique acid technology
- Petroleum solvent- & ester-free formulation
- Co-formulated adjuvant system enhances uptake, improves spreading/wetting & reduces spray droplet bounce & evaporation
- Contains pH reduction & buffering agents to prevent hard water problems

ACTIVE INGREDIENTS

2,4-Dichlorophenoxyacetic Acid*	19.60%
INERT INGREDIENTS	80.40%
TOTAL	100.00%



VALUE-ADDED PRODUCTS

HERBICIDES

Opti-DGA

Opti-DGA is a combination of dicamba DGA and a patented adjuvant system designed to protect turf from damaging broadleaf weeds, while maximizing herbicide spray mix efficacy. Opti-DGA can control tough weeds with greater efficiency across a wide range of operations.

EPA Reg. No. 5905-597
Not Registered for Use in California

OPTI-DGA™ HERBICIDE

HIGHLIGHTS

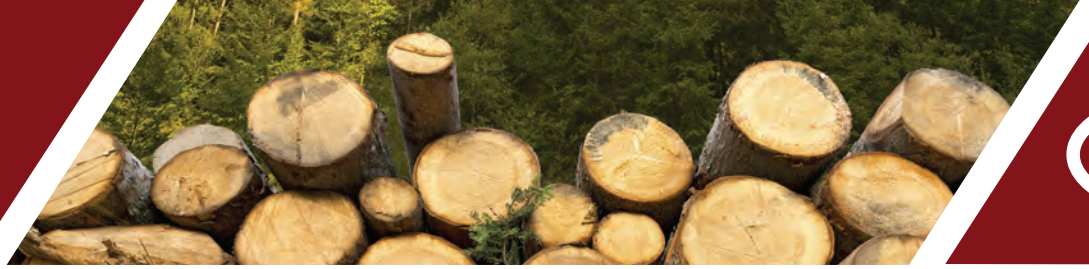
- Patented co-formulated adjuvant system provides enhanced wetting, spreading & coverage; enhanced uptake & absorption; reduced spray bounce & evaporation; quick rainfastness; low volatility; low odor; enhanced spray mix compatibility & improves performance of tank mix partners

ACTIVE INGREDIENTS

Dicamba (Diglycolamine salt of 3,6-dichloro-o-anisic acid)*	58.1%
Other Ingredients	41.9%
TOTAL	100.00%

*Contains 38.5% 3,6-dichloro-o-anisic acid (4 pounds dicamba acid equivalent per gallon or 480 grams per liter).

*CAS No. 1918-00-9



Brush-Rhap

Brush-Rhap is a dual-acid pre-mix of dicamba and 2,4-D formulated to provide broad-spectrum control of annual, biennial and perennial broadleaf weeds and brush. In addition to maximizing broadleaf weed control, it has minimal volatility and far less odor than standard dicamba/2,4-D combinations. It features a co-formulated adjuvant system that improves deposition, spreading and plant absorption as well as providing other benefits that minimize spray application and mixing problems.

EPA Reg. No. 5905-565
Not Registered for Use in California

HIGHLIGHTS

- Enhanced weed control due to unique dual-acid technology
- Mixes easily with other tank-mix products
- Co-formulation system provides enhanced uptake; no phenoxy odor; minimal volatility; spreading/wetting; reduced spray bounce & evaporation; enhanced spray mix compatibility & pH reduction & buffering agents to prevent hard water problems

ACTIVE INGREDIENTS

3,6-dichloromethoxybenzoic acid	18.28%
2,4-Dichlorophenoxyacetic acid	24.62%
INERT INGREDIENTS	57.1%
TOTAL	100.00%

Vision

Vision is a specially formulated dicamba acid herbicide that provides control of annual, biennial and perennial broadleaf weeds, woody brush and vines. Vision mixes easily with water, and in many applications, requires no additional adjuvants. Because it's application time is flexible, Vision can be used in summer.

EPA Reg. No. 5905-576
Not Registered for Use in California

HIGHLIGHTS

- Controls or suppresses more than 150 different weeds
- Contains co-formulated adjuvant system for enhanced wetting, spreading & compatibility
- Minimal volatility
- No antagonisms due to hard or soft water & carbonates

ACTIVE INGREDIENTS

Dicamba Acid*	40.00%
Other Ingredients	60.00%
TOTAL	100.00%

*Contains 3.8 pounds Dicamba acid per gallon or 450 grams per liter.

*CAS No. 1918-00-9

VALUE-ADDED PRODUCTS

HERBICIDES

Trump Card

Trump Card is a unique fluroxypyr/2,4-D acid herbicide combination for selective post-emergence control of broadleaf weeds in non-crop areas such as rights-of-way, roadsides, highways, industrial sites and more. Its reliable, high-quality formulation contains an adjuvant compound that provides faster and more complete absorption by weeds than conventional treatments.

EPA Reg. No. 5905-581
Not Registered for Use in California

HIGHLIGHTS

- Combination of fluroxypyr & 2,4-D acid that can be applied with all liquid fertilizers
- Low pH formulation that offsets 2,4-D antagonism
- Enhanced rainfastness & irrigation wash-off tolerance
- Non-corrosive to spray application equipment

ACTIVE INGREDIENTS

Fluroxypyr 1-methylheptyl ester: ((4-amino-3,5-dichloro-6-fluoro-2-pyridinyl)oxy)acetic acid, 1-methylheptyl ester	9.92%
2,4-Dichlorophenoxyacetic Acid	27.59%
INERT INGREDIENTS	62.49%
TOTAL	100.00%

On Deck

On Deck is an advanced concentrated formulation of dicamba and 2,4-D acids. It is designed to maximize weed control in a variety of environmental conditions, while minimizing spray application and mixing problems. On Deck has minimal volatility and far less odor than standard auxin-based products. The co-formulated adjuvant system in On Deck improves deposition, spreading and plant absorption.

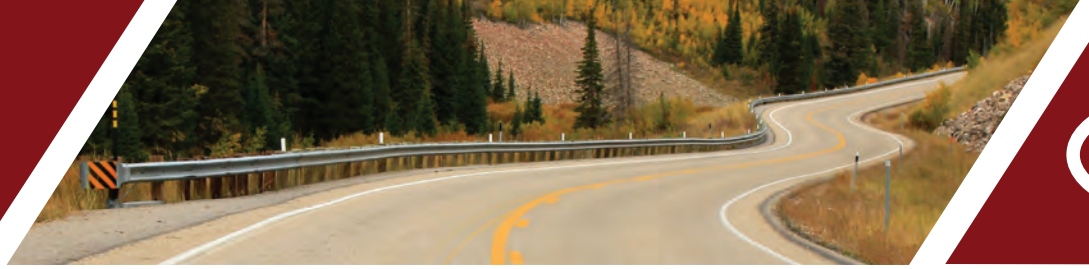
EPA Reg. No. 42750-144-5905
Not Registered for Use in California

HIGHLIGHTS

- Enhanced broadleaf weed control due to unique dual-acid technology
- Minimal volatility & no phenoxy odor
- Ester-free formulation
- No petroleum solvents

ACTIVE INGREDIENTS

3,6-Dichloromethoxybenzoic Acid	10.80%
2,4-Dichlorophenoxyacetic Acid	24.16%
Other Ingredients	65.04%



EndRun

EndRun is a surfactant-loaded, three-way herbicide containing 2,4-D, methyl chlorophenoxypropionic acid (MCPP-p) and dicamba. The product is designed to provide increased performance at a lower rate and spray volume over typical three-way herbicides.

EPA Reg. No. 2217-656-5905
Registered for Use in California

HIGHLIGHTS

- Broadleaf weed control in turf at lower rates than similar products
- Rapidly absorbed by weeds
- Contains a co-formulated adjuvant system

ACTIVE INGREDIENTS

Dimethylamine salt of 2,4-dichlorophenoxyacetic acid	30.56%
Dimethylamine salt of (+)-(R)-2-(2-methyl-4-chlorophenoxy) propionic acid	8.17%
Dimethylamine salt of dicamba: 3,6-dichloro-o-anisic acid	2.77%
INERT INGREDIENTS	58.50%
TOTAL	100.00%

TapOut

TapOut is a unique clethodim, selective post-emergence grass herbicide. It offers rapid and complete control of tough, annual and perennial weedy grasses*. Its co-formulated adjuvant system increases coverage, adhesion, absorption and uptake, ensuring enhanced overall activity.

*For control of grasses only.

EPA Reg. No. 5905-578
Registered for Use in California

Selective Grass Herbicide

HIGHLIGHTS

- Clethodim chemistry with co-formulated adjuvant system
- Selective control of annual & perennial grasses
- Enhanced activity & faster kill
- Improved coverage, adherence, absorption & uptake

ACTIVE INGREDIENTS

*Clethodim	12.60%
Other Ingredients	87.40%
TOTAL	100.00%

Contains petroleum distillates.

*(E)..2..[1 -[[(3-chloro-2-propenyl)oxyjimino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1 -one

Contains 0.97 lbs. clethodim per gal.

NOTES

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NOTES

HELENA®

People...Products...Knowledge.