



ARIZONA[®]

Technical Brochure



POWERED BY

MSI Protech



ADAMA.COM/UK



The multi-site fungicide ARIZONA® can future-proof your cereal disease control

With mounting resistance to single-site SDHI, azole and strobilurin chemistries making the effective control of wheat and barley diseases increasingly difficult to achieve, ADAMA is advocating the inclusion of a multi-site fungicide in all cereal crop protection programmes – not just to ensure crops are adequately protected, but also to prolong the effective lifetime of at-risk single-site products.

Disease control: Where are we now?

In recent years, the efficacy of some of the principal wheat and barley ‘single-site’ fungicides (SDHIs, azoles and strobilurins) has been eroded by mounting disease resistance. At the same time, other active ingredients have been lost as a result of continuing regulatory restrictions. Meanwhile, the new chemistries which are on the horizon are all single-site actives which means they too are at risk of being made ineffective by sensitivity shifts and disease resistance.

- 1 Regulatory restrictions
- 2 Increasing resistance
- 3 New chemistries all single-site

With these factors making effective disease control harder to achieve, growers must think carefully about how they structure their crop protection programmes and are urged to increase the diversity of their spring spray programmes by including Folpet as an alternative mode of action; not only to provide effective control of diseases such as septoria in wheat and rhynchosporium and ramularia in barley, but also to safeguard the long-term efficacy of single-site fungicides by slowing the rate of further sensitivity shifts.

Implementing integrated disease management strategies such as selecting disease resistant varieties, instigating cultural and rotational changes to prevent the spread of disease and using disease forecasting technologies to understand when crops are at risk are also recommended.

ARIZONA® is a unique, cost-effective multi-site protectant fungicide containing straight Folpet at 500g/L for the control of septoria in wheat and rhynchosporium in barley and additional activity against ramularia.



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Product Description

Active ingredients: 500g/L Folpet **Water volume:** 200-400L/ha
Formulation: Suspension Concentrate **Spray quality:** Medium
Pack size: 5 litres

Crop Information

Crop	Max individual dose (L/ha)	Max total dose (L/ha)	Latest time of application
Winter & spring wheat, winter & spring barley and triticale	1.5	3.0	Before end of heading/inflorescence fully emerged (GS 59)

For more information about Folpet visit our website www.adama.com/uk/en



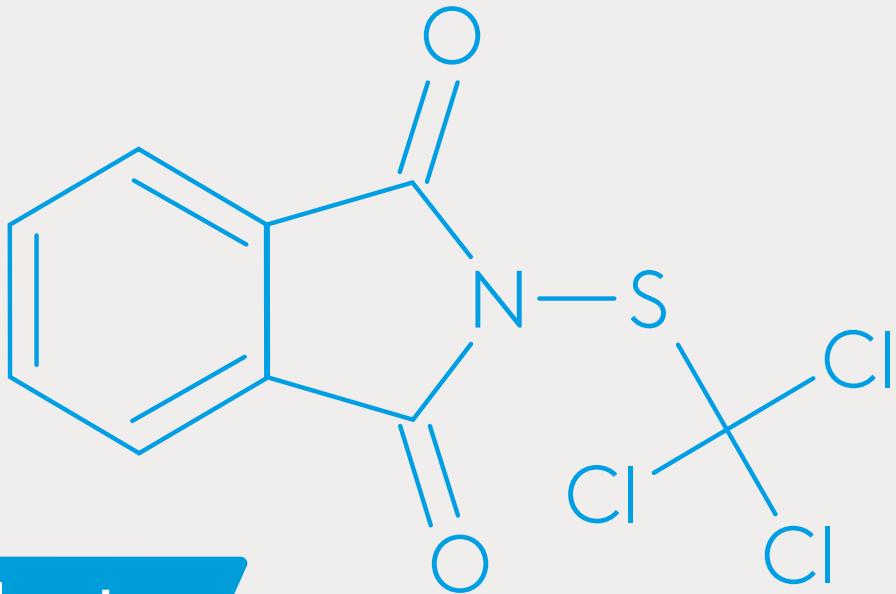
The active ingredient Folpet belongs to the chemical group of β -phthalimides.

The active ingredient Folpet is a contact fungicide and belongs to the group of “**M**ulti-**S**ite **I**nhibitors” (**MSI**), which attack several places in the fungal cell.



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Folpet

1

Spore germination inhibitor

2

Cell division inhibitor

3

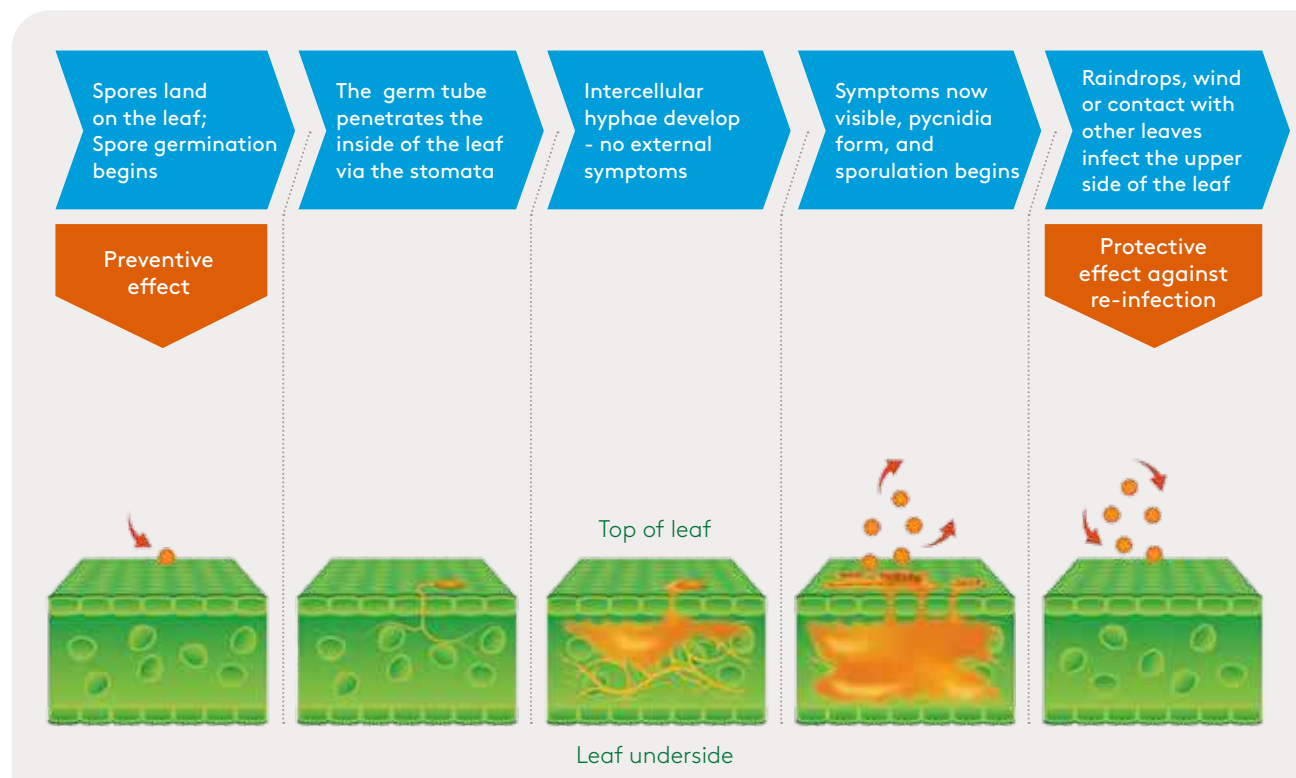
Reduces energy production in mitochondria

Since Folpet attacks several biochemical sites, the risk of resistance is very low. This enables Folpet to remain effective and protect at-risk single-site chemistries (such as azoles and SDHI's) from the development of resistance.

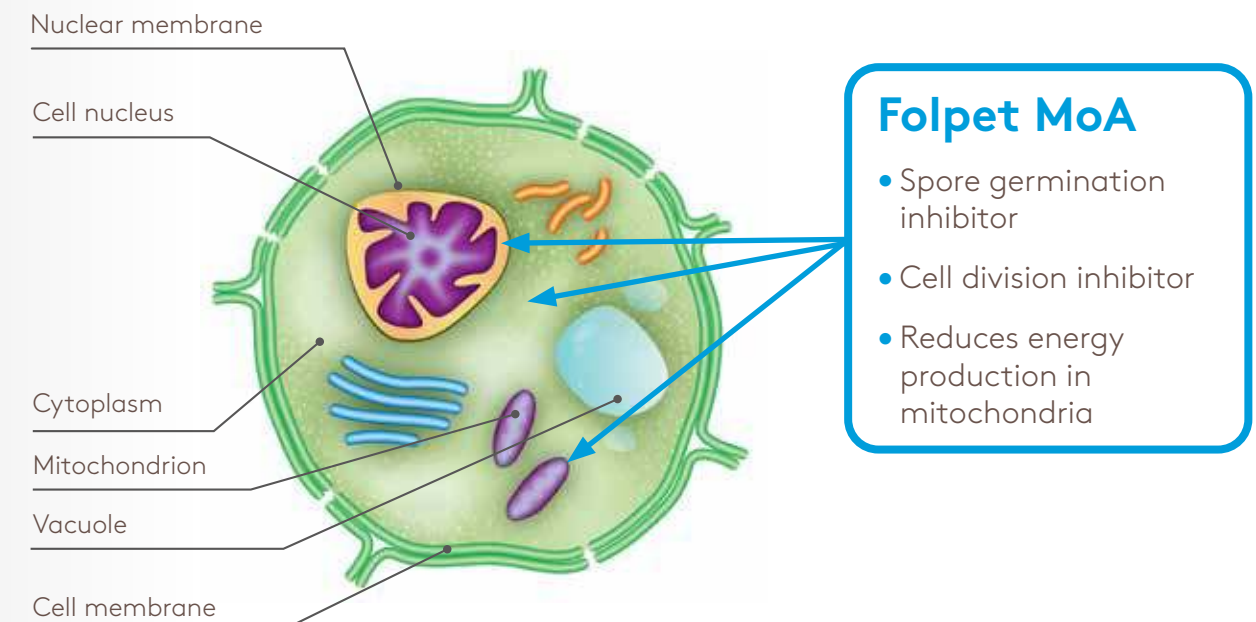
FOLPET mode of action

Folpet is a contact ingredient and has a preventive effect against important fungal diseases. The active substance has no systemic properties and following application remains on the leaf surface, bound to the cuticular wax layer where it inhibits fungal spore germination and mycelial formation thus preventing diseases infecting leaf tissues.

FOLPET 500 SC protects the leaf from the outside:
preventive and protective contact effect



FOLPET® 500 SC – a **M**ulti-**S**ite-**I**nhibitor (**MSI**) active on multiple bio-chemical pathways



Mechanism of action (FRAC): M 04 = **M**ulti-**S**ite-Inhibitor



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What is powered by MSI Protech?

MSI stands for the special action as a **M**ulti-**S**ite **I**nhibitor.

Protech stands for **Pro**ven **Tech**nology.

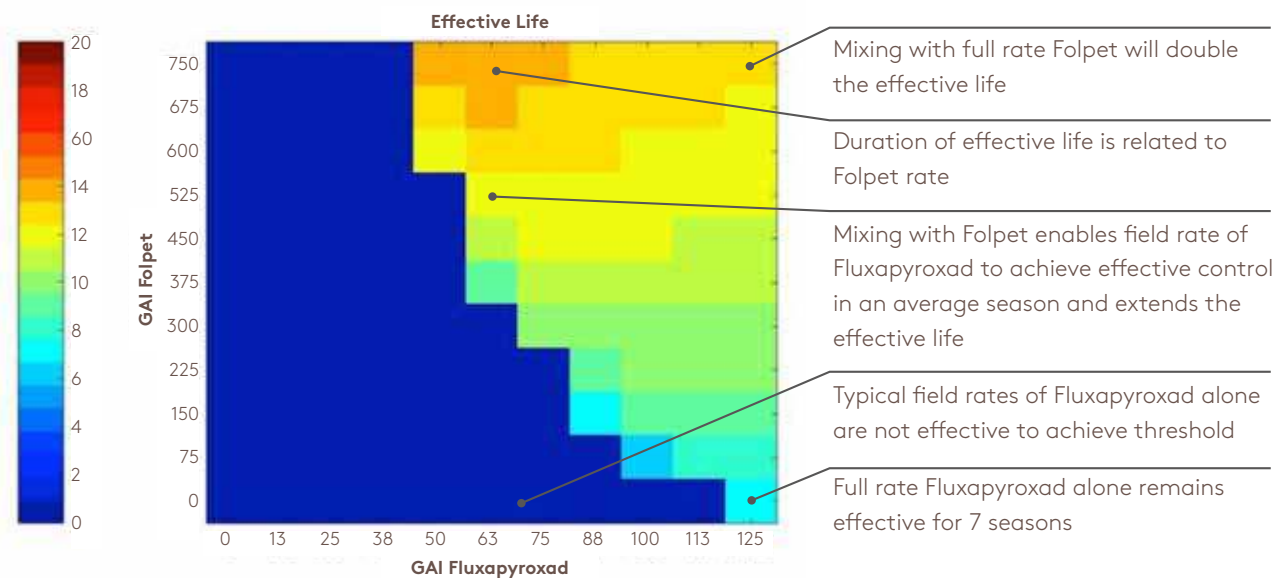
MSI Protech® is the **ONLY** multi-site cereal fungicide technology proven to prolong the effective life of single-site partner products. It's super fine grind of active ingredient means the formulation is fully optimised for the best results.

ARIZONA®: Proven to prolong the effective life of higher risk fungicides

Folpet is the only multi-site proven to prolong the life of single-site actives.

Previous Septoria modelling studies by Rothamsted, showed Folpet doubled the life expectancy of the at-risk fungicide Epoxiconazole from 8 to 16 years. More recently, in 2019 new modelling work was undertaken by ADAS evaluating the fungicide Fluxapyroxad. The ADAS model set out to track the number of seasons the single-site fungicide gave effective control, alone and when mixed with Folpet. ADAS set the effective control threshold as 'no more than 5% loss of healthy green leaf area duration of the upper leaf canopy'. The graphic below represents the model output assuming a Septoria resistance scenario of a partial sensitivity shift with fitness penalty, considered a more typical field scenario.

Folpet extends the effective life of Fluxapyroxad



Key findings:

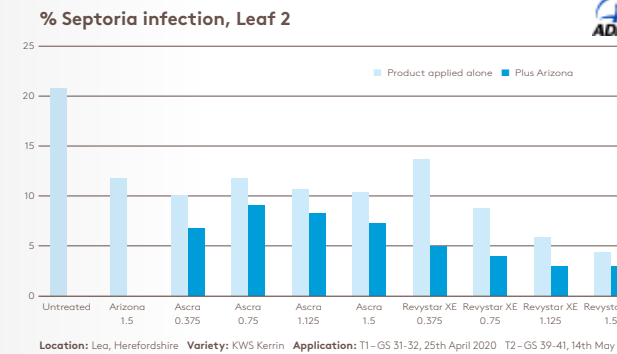
Reducing the rate of the high risk fungicide and mixing with Folpet slows resistance development to the SDHI and extends the effective life of the at-risk fungicide, whilst maintaining efficacy and return on investment.

In general, the higher the Folpet dose, the greater the extension to effective life and the delay in resistance development. When Fluxapyroxad is used in mixture with Folpet, effective control can be achieved (in an average season) with less than full label dose rate of Fluxapyroxad – this strategy also extends effective life of Fluxapyroxad.

While the best resistance management from Folpet will be seen at full rate (750gai), the modelling shows that it is possible to strike a safe yet cost-effective balance at 500g in mixture with 63-75g Fluxapyroxad.

ARIZONA® in wheat

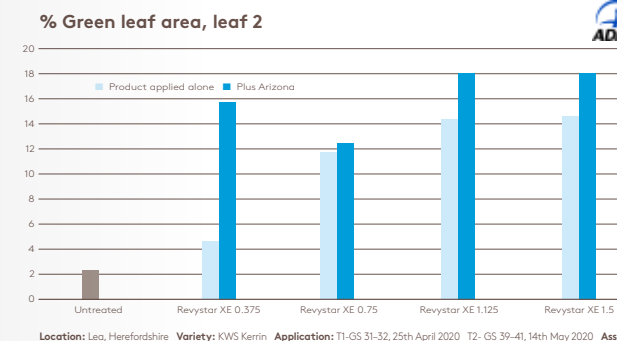
ARIZONA® adds valuable Septoria control to leading products



Location: Lea, Herefordshire Variety: KWS Kerrin Application: T1 - GS 31-32, 25th April 2020 T2 - GS 39-41, 14th May 2020 Assessed: 10th July 2020 LSD (P=0.05): 3.39

- ARIZONA® alone reduces septoria by around 50%
- ARIZONA® consistently improves Septoria control when mixed with Revystar XE or Aspra Xpro

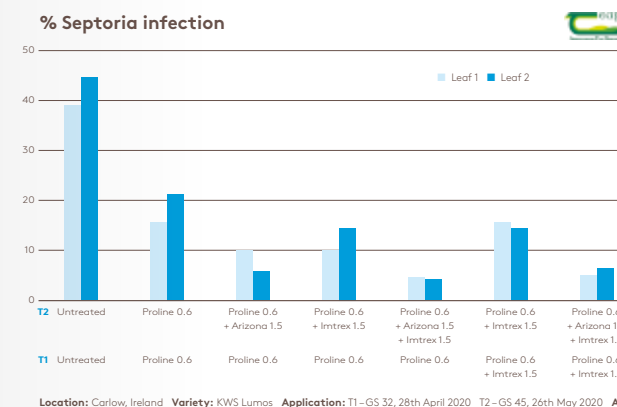
Increased green leaf area adding ARIZONA® to new chemistry



Location: Lea, Herefordshire Variety: KWS Kerrin Application: T1 - GS 31-32, 25th April 2020 T2 - GS 39-41, 14th May 2020 Assessed: 10th July 2020 LSD (P=0.05): 7.2

- In a high risk situation on a Septoria susceptible variety
- Best return on investment from including ARIZONA® 3 x 1L compared to 2 x 1.5L

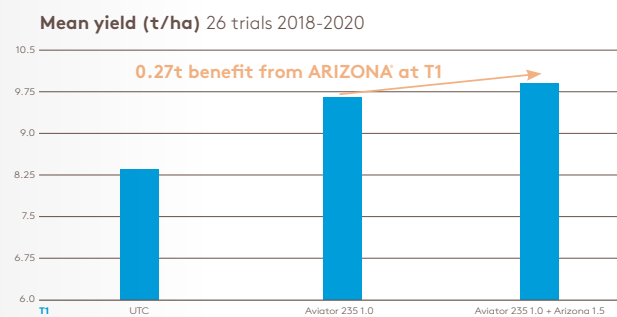
ARIZONA® improves efficacy at T2



Location: Carlow, Ireland Variety: KWS Lumos Application: T1 - GS 32, 28th April 2020 T2 - GS 45, 26th May 2020 Assessed: 17th July 2020 LSD (P=0.05): 10.71, 9.33

- Improved Septoria control where ARIZONA® added at T2
- ARIZONA® protects single-site chemistry from Septoria infection events following T2 timing

The ideal multi-site partner for azole/SDHI mixtures...

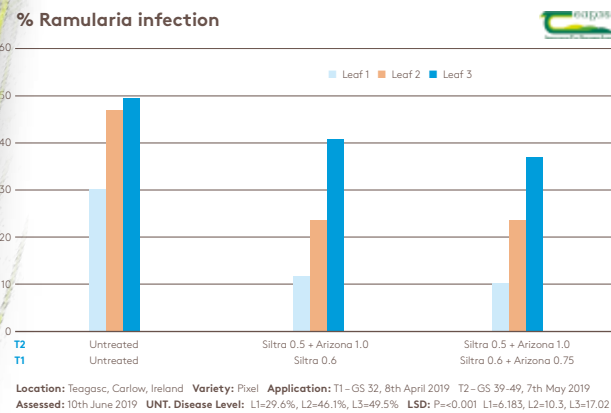


Yield benefit from addition of 1.5L/ha ARIZONA® to Aviator at T1, T2 - 2L Manitoba + 1L Imtrex in all trials. From a range of independent trials.

- Including ARIZONA® at key T1 timing
- Consistent 0.27t/ha yield benefit across multiple trials over 3 year period
- Average €30.50 additional profit/ha

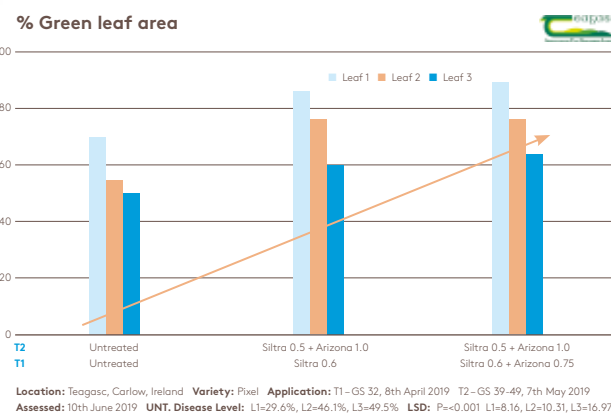
ARIZONA® in barley

Benefit of ARIZONA® against Ramularia



In high Ramularia situations a single application of **ARIZONA®** provides a significant reduction in the disease.

When **ARIZONA®** is used twice in a programme Ramularia is further reduced.



ARIZONA® keeps the crop greener for longer especially when used in a split programme.

ARIZONA® Ramularia control



Recommendations for use



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Wheat Recommendations Ireland

1.5L/ha at T1 & T2

Maximum 3.0L product/crop

T1 is the key timing for including ARIZONA® in any scenario

Rate selection dependent on risk;

- Variety
- Drilling date
- Location
- Disease levels
- Weather
- What fungicide has been applied previously
- Partner product

Use recommendations by variety where Septoria is the driver for inclusion

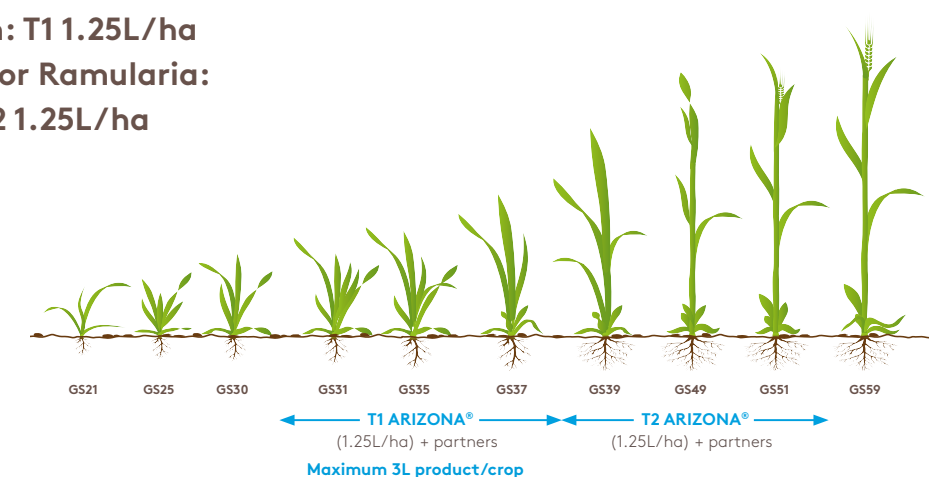


Barley Recommendations Ireland

Rhynchosporium: T1 1.25L/ha

Best guidelines for Ramularia:

T1 1.25L/ha Fb T2 1.25L/ha



ARIZONA®

TANK MIXES

2-Way Mixes

The following tank mixes have been tested under continuous agitation for physical compatibility with ARIZONA® and will mix at recommended rates:

Herbicides

Ally Max SX	Chekker	Hatra + BioPower	Monitor	Spitfire
Atlantis + BioPower	Chimera SX	Hunter	Pacifica + BioPower	Starane XL
Axial + Adigor	Cleave	Horus + BioPower	Palio	Sword + oil
BiPlay SX	Eagle	Hurricane SC	PicoPro	Topik + oil
Broadway Star	Easel	Inka	Pixxaro	Traton SX
CC Mondial#	Finish SX	Jubilee SX	Quantum SX	Zypar
Calibre SX	Harmony M SX	Lorate	Refine Max SX	

Fungicides

Adexar	Cortez	Juventus	Osiris P	Talius
Agate	Cyflamid	Kansas	Plover	Tracker
Amistar	Elatus Era	Kayak	Priaxor EC	Toledo
Artemis	Elatus Plus	Kestrel	Prizm	Tucana
Ascra Xpro	Enterprise	Keystone	Proline	Unix
Aviator 235 Xpro	Envoy	Kingdom	Prosaro	Unizeb Gold
Bontima	Epic	Librax	Revystar XE	Vareon
Boogie Xpro	Fandango	Mancozeb	Revystar XL	Variano Xpro
Brutus	Firefly 155	Manzate 75WG	Savannah	Vertisan
Caramba 90	Flexity	Mirador Xtra	Seguris	Vivid
Ceando	Flyer	Mirage 450	Serpent	Vortex
Cebara	Folicur	Mobius	Siltra Xpro	Zephyr
Cello	Helix	Monkey	Skyway Xpro	Zulu
Ceriox	Ignite	Nebula# (2-way only)	Sparticus Xpro	
Chord	Imtrex	Opera	Sunorg Pro	
Comet	Justice	Opus	Swift	

Insecticides

Alert	Clayton Sparta	Hallmark Zeon	Sumi-Alpha
Aphox	Decis	Mavrik*	
Bandu	Gandalf	Sceptre	

Growth Regulators

Adjust	Chlormephon	Optimus + chlormequat (max ½ rate of each)
Barleyquat B	Medax Max	CC Cutlass
Bettaquat B	Meteor	Selon
Bogota	Moddus	Socom
Canopy	Moddus + chlormequat (max ½ rate of each)	Terpal
Cerone	Optimus	Upright

Adjuvants

Arma	Intracrop Tonto	Kantor	Intracrop Salute
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Trace Elements

4-Yield Extra	Human Extra	P-Kursor	Yara Phosyn Magflo 300
Archer	Jett	Riser	Yara Phosyn Maize Boost
Combi man	Liquid Boron	Sitec	Yara Phosyn Mancozin
Copperman	Liquid Manganese	Safagrow Manganese Alloy	Yara Phosyn Mancuflo
CuproMan	Magnesium Express	SMART ATS	Yara Phosyn Mantrac DF
Epostop	Magnor	SMART MagiK	Yara Phosyn Mantrac 500
FF-7	Mancure Hi-activ	SMART Manganese	Yara Phosyn Phosamco
FTB 88	Manganese DF	TerraSorb Foliar	Yara Phosyn Photrel
FTX 25	Master Manganese Plus	Uptake Plus (Add Phoenix 1st)	Yara Phosyn Rapitrel
Headland Cereal Mix	Maxman 400	Verdicrop Sulpha-N	Yara Phosyn Safe N
Headland Copper	Nortrace Magister	Yara Phosyn Bortrac	Yara Phosyn Stopit
Headland Jett	Nortrace Mensa	Yara Phosyn Coptrel	Yara Phosyn Sulphur F5000
Headland Link	Nortrace Nuture	Yara Phosyn Croplift	Yara Phosyn Zintrac 500
Headland Manganese	Nutriphite Excel	Yara Phosyn Ferleaf	
Headland Zinc	OptE-Mag	Yara Phosyn Foliar Potash	

3-Way Mixes

The following tank mixes have been tested under continuous agitation for physical compatibility with ARIZONA® and will mix at recommended rates:

Bowman + Mirage 450	Cortez + Mirage 450	Proline + Mirage 450
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Incompatible Mixes

Yara Phosyn Magphos K are not compatible when mixed with ARIZONA® in a tank mix of 3 or more products. Other incompatible 3-way mixes include ARIZONA® + Master Magnesium + Trace Elements.

*Note: Do not tank mix MAVRIK® with Boron.

Add product to tank 1st.





...your Harvest Partner

For more information
on ARIZONA® in Ireland
contact the Croplink team:

EDDIE YOUNG
eddie.young@croplink.ie

SCOTT LOVELL
scott.lovell@croplink.ie

THOMAS DELANEY
tdelaney@croplink.ie



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Croplink Ltd. Springhill Industrial Estate, Carrigtwohill, Co. Cork. Telephone 021 488 2806
ADAMA Agricultural Solutions UK Ltd. Third Floor East, 1410 Arlington Business Park, Theale, Reading RG7 4SA. Telephone 01635 860 555. UKenquiries@adama.com.