PUSHING PERFORMANCE
ADJUVANT

SPRING 2021

Reduce disease, mix with ease - with Kantor

Optimise the performance of crop protection products with Kantor

- ✓ Improves tank mix compatibility and buffers pH
- ✓ Reduces spray drift
- ✓ Improves spreading & retention
- ✓ Increases cuticle penetration
- ✓ May increase yield

INTERAGRO
THE ADJUVANT EXPERTS

PUSHING PERFORMANCE
ADJUVANT

Optimise the spray delivery process

A lot of thought and attention goes into picking the most appropriate crop protection products and rates to do the job, yet efficacy is highly dependent on good delivery to the target. With increasing pressure on pesticide actives and often suboptimal spraying conditions at application, improving performance has never been more important. Kantor is the only adjuvant with corrective action at every step of the spray application process, delivering greater freedom for plant protection products to perform to their potential.

Poor tank mix compatibility reduces active availability and crop safety

Only plant protection products fully dissolved in the spray tank can perform in the field. Whilst tank-mixing chemicals improves efficiency, an incompatible mix can cause antagonism and reduce efficacy in the field. Incompatibility can be caused by physical or chemical properties, cold temperatures, incorrect mixing order, water source. Compatibility agents can be added to aid mixing by allowing the chemicals to disperse and mix in water.

High pH can lead to pesticide breakdown

The pH of water indicates its acidity or alkalinity and is measured on a scale of 1 to 14. A neutral pH is 7. Most water has a pH between 6.5 and 8. Water above 7 is alkaline and water below 7 is acidic. Alkaline water can break down some chemicals through a process called alkaline hydrolysis. The longer a mixed chemical is left in the tank prior to spraying, the greater the breakdown – it is not recommended to leave spray mixes overnight. Reduced product performance may not be obvious. In some cases, the influence of water on the pesticide reduces its effectiveness only slightly, yet enough that tolerant or tough-to-control weeds, insects and diseases aren't well controlled.

Spray drift reduces coverage and threatens safety

Spray drift is a risk to every application and occurs when ultra fine droplets are carried away by air movement. Lifting the boom, perhaps due to uneven ground, so nozzle tips are 20cm above the recommended height of 50cm, can double spray drift. Drift can be minimised with appropriate nozzles and by adding an anti-drift adjuvant to optimise spray deposition and coverage on the target.

Water beading limits coverage across the leaf

When it comes to fungicides, coverage is vital to prevent disease infection but often compromised without the use of a suitable tank-mix adjuvant to reduce surface tension and facilitate full spreading across the leaf/ear. Multisites act as a protectant but do not move on the leaf – this means they can only protect the parts of the leaf that the spray covers. Azoles and SDHIs have acropetal movement, so will move from where they land towards the end of the leaf. So if the base of the leaf doesn't receive adequate coverage, the fungicide will not move in a downwards direction and that part of the leaf will either be completely unprotected or have received a sub-lethal dose of active ingredient. Whilst in-can adjuvancy can help, it is often insufficient as the adjuvant rate is fixed by the pesticide rate per hectare, whereas tank-mix adjuvants can be adjusted to fit the water volume being used.

The leaf cuticle is the biggest barrier to pesticide applications

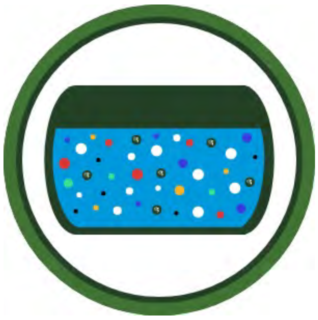
With the exception of protectant fungicides that are adsorbed to the outside of leaf surfaces to protect it, systemic fungicides, PGRs and post-emergence herbicides need to penetrate the leaf cuticle and living tissue inside. The cuticle is on the upper and lower sides of the leaf to protect it from water loss and is the biggest barrier to water soluble compounds. Fungicides & PGRs can normally penetrate the cuticle by simple diffusion through the waxy components but can be slow under suboptimal conditions e.g. cold temperatures. A suitable tank-mix adjuvant, such as Kantor, can improve the speed of penetration into the leaf, which is particularly useful in curative situations where speed of uptake is key to limit the spread of disease.

PUSHING
PERFORMANCE
ADJUVANT

Kantor action
tank to tissue

Kantor is a unique activator adjuvant that helps to optimise the performance of plant protection products at every stage of the spray delivery process, from tank to tissue.

IMPROVED PESTICIDE AVAILABILITY & SAFETY



Improves tank-mix compatibility & buffers pH

Kantor is the only plant protection tank-mix adjuvant with a micro-emuslfying compatibility aid which enables tank mix components to dissolve and remain thermodynamically stable in the spray tank. It also buffers the water to pH6 preventing alkaline hydrolysis.
Critical for:

- **Large complex mixtures**
- **Basagran safety in peas and beans**
- **Cold water**
- **Spray water >pH7**

IMPROVED DEPOSITION

Reduces spray drift

Kantor reduces the number of small droplets prone to drift, optimising droplet size and deposition for improved coverage and target leaf retention. It also offers excellent rainfastness.
Critical for:

- **Suboptimal spray days**

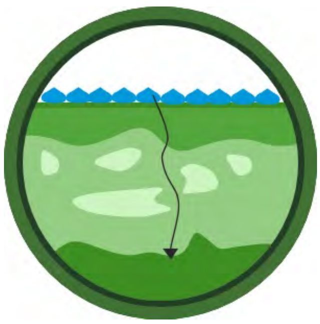
OPTIMUM COVERAGE

Improves spreading & retention

Kantor improves spreading across the leaf and ear, and also improves retention, resulting in improved spray coverage.
Critical for:

- **Multi-sites T0-T2**
- **Fungicide applications to the ear**
- **Other tank mix components where coverage is key**

HIGHER UPTAKE



Increases cuticle penetration

Kantor helps most fungicides, plant growth regulators and herbicides enter leaf cuticles more easily, increasing uptake.
Critical for:

- **Curative disease control**
- **Products that are metabolically activated eg prothioconazole, chlormequat**
- **Crops/weeds with thicky waxy cuticles**

Optimise compatibility & application versatility

Improved tank-mix compatibility

This simple demonstration below shows quite clearly that some mixtures can be hard to dissolve in water, particularly oil-based formulations. The addition of Kantor promoted mixing and enabled the components to remain fully dissolved in water even when left to stand for 30 minutes. Without Kantor, the mix started to fall out of suspension.

Phase separation on pouring

Oil formulation Oil formulation + KANTOR

30 minutes after shaking
Fully dissolved with Kantor

Oil formulation Oil formulation + KANTOR

Promoted compatibility of prothioconazole + chlorothalonil

Kantor is well known for its compatibility benefits and prothioconazole + chlorothalonil (eg Helix + Bravo) has always benefitted. Whilst chlorothalonil is no longer permitted in the UK, the below experiment proves the point that Kantor improves compatibility.

Helix + Bravo Phase separation Sedmiment at bottom

Helix + Bravo + Kantor - no separation

Helix + Bravo + Kantor after 1 hour - no separation

Making life easier on farm - some feedback from the field

"I've even had some anecdotal evidence from growers that if a tank-mix has gone wrong, tipping in a can of Kantor seems to settle it. It's a great product."

"The biggest benefit of Kantor is the improved compatibility in terms of safety in the tank-mix."

"While Kantor isn't a water conditioner as such, it definitely helps with tank-mix compatibility because of its slight buffering effect (to pH6). We've found that adding Kantor to the tank results in better compatibility, especially in early season when the spray water tends to be cold and when tank-mixes can be quite hefty."

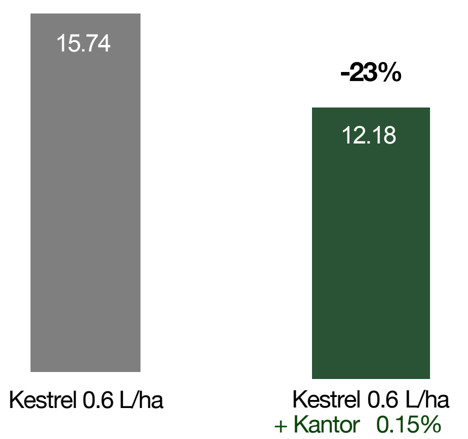
PUSHING
PERFORMANCE
ADJUVANT

Target sprays on suboptimal days

23% reduction in drift prone droplets

The effect of Kantor on droplet size and spray angle uniformity at the nozzle was investigated at Silsoe Spray Applications Unit. Kantor significantly reduced the number of drift prone Kestrel droplets and increased spray angle uniformity at the nozzle.

Effect of Kantor on spray droplet distribution
% spray volume <100 micorns



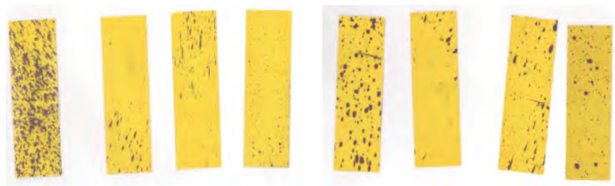
Source: Siloe Spray Application Unit, 2018. Lurmark 03 F110 Flat Fan, 200 l/ha of water. Measurements made of droplet size distribution using Laser diffraction.

Improved deposition & coverage

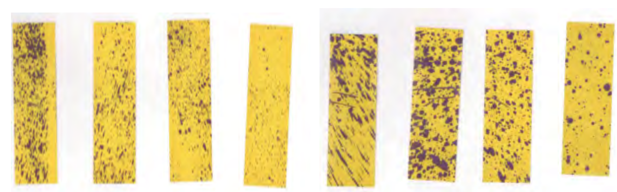
On farm deposition tests have demonstrated the improved spray coverage that can be achieved from the inclusion of Kantor, with both flat fan and low drift nozzles.

Lechler LU120° 03 flat fan medium spray quality | **Lechler IDK120° 03 air induction coarse spray quality**

Without Kantor



With Kantor 0.15%



Leaf 1 | Leaf 2 | Leaf 3 | Leaf 4 | Leaf 1 | Leaf 2 | Leaf 3 | Leaf 4

T0 spray without Kantor

T0 spray with Kantor - drift reduction

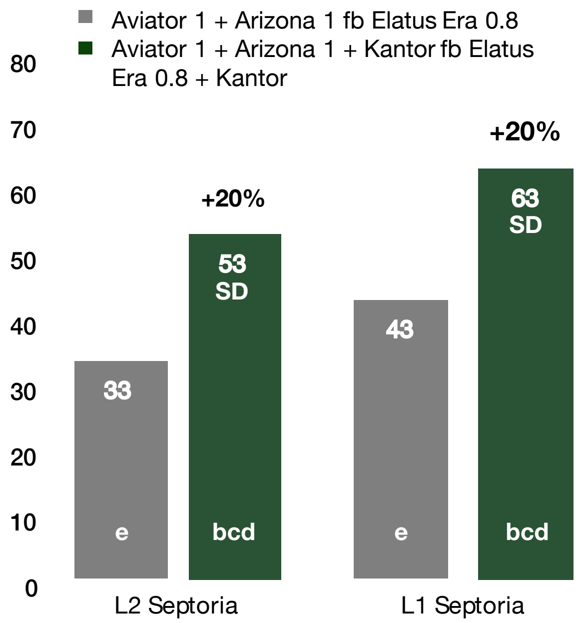
Source: Courtesy of grower in Wiltshire in 2015. 40m Bateman sprayer, 1.5 bar pressure, speed 9km/hr, water volume 100 L/ha. T0 application of 4 Yield Extra + Rover + Vareon + Meteor.

PUSHING PERFORMANCE ADJUVANT

Optimise protection, minimise infection

Improved protection against Septoria

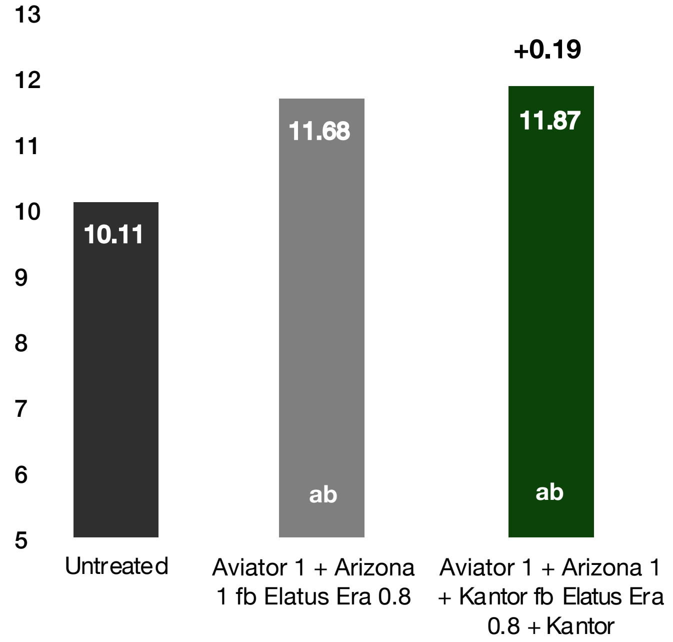
Effect of Kantor on % Septoria control on leaves 1 and 2



Prime Crop Research 2019. East Anglia, Winter Wheat c.v. Basset.
Applications at T1 and T2. SD = Significant difference

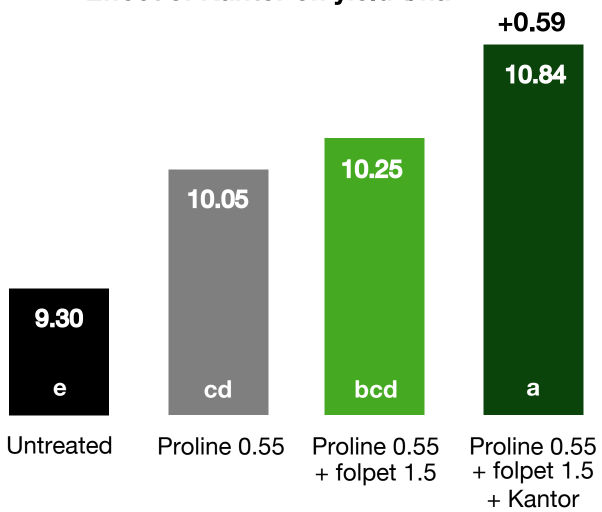
Higher yields & margin

Effect of Kantor on yield t/ha



With folpet - improved coverage, reduced disease, higher yields

Effect of Kantor on yield t/ha



Bottom left: Scottish Agronomy 2019 – Winter Barley c.v. Cassia. Fife. All Treatments applied T1 and T2. Low disease. Untreated was less than 2% Rhyncho.

KEY TAKEAWAYS

- The addition of Kantor to folpet to optimise coverage across the leaf has led to significant increases in Septoria control and yields in a range of replicated field trials
- Kantor has also proved beneficial in barley, increasing yield even in the absence of disease.

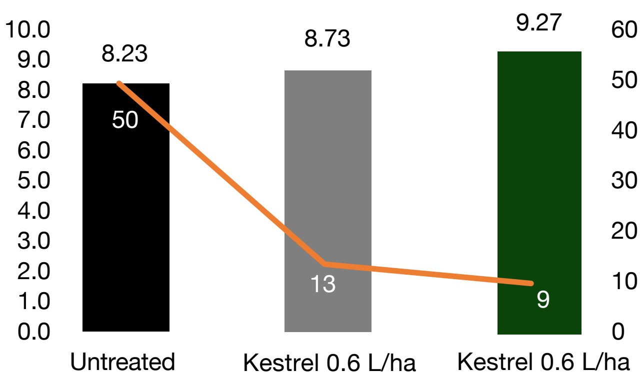
PUSHING PERFORMANCE
ADJUVANT

Optimise protection, minimise infection

Reduced fusarium, higher yields at T3

Kantor is proven to reliably enhance the effectiveness of T3 triazole sprays by reducing drift and improving coverage. In this trial in 2015, Kantor reduced fusarium infection and increased yield by 0.54 t/ha worth £76/ha

Effect of Kantor on fusarium infection & yield t/ha

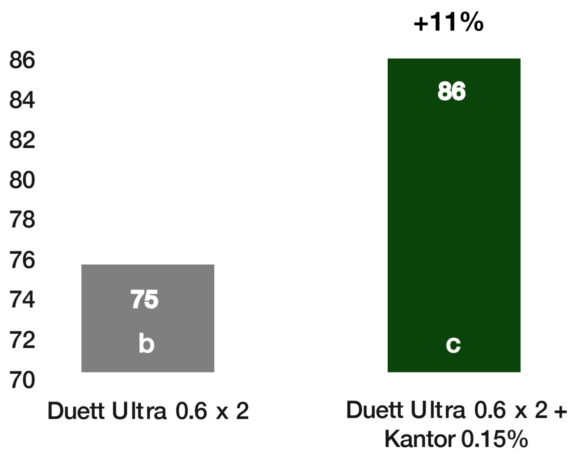


Source: Agrii, Yorkshire 2015 Applications at GS59

Optimised cercospera control in Beet

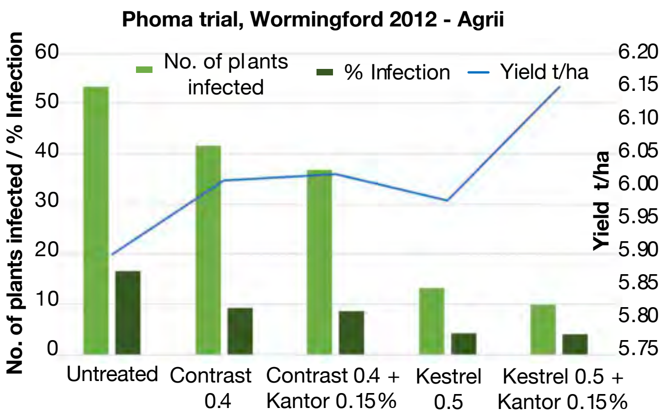
The effect of Kantor on disease control in sugar beet was investigated by Agricola in Germany. Infection in the untreated reached a peak of 74%. Kantor reduced cercospera infection significantly.

Effect of Kantor on % cercospera control in sugar beet



Proven to pay back in Oilseed Rape

The addition of Kantor to azole fungicides has been shown to increase yield by reducing Phoma infection and the number of plants that become infected.



KEY TAKEAWAYS

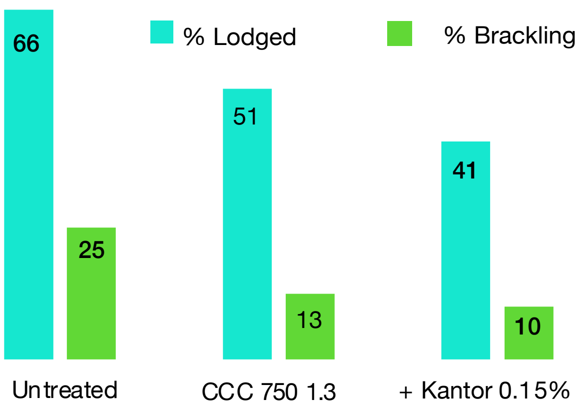
- Kantor is a valuable addition to fungicide sprays in a wide range of crops to optimise performance
- Improvements in coverage have resulted in improved protection, reducing disease infection - sometimes significantly
- Improvements in disease control often translate into improvements in green leaf area and higher yields.

Faster mobility, improved activity

Reduction in lodging and brackling with PGRs

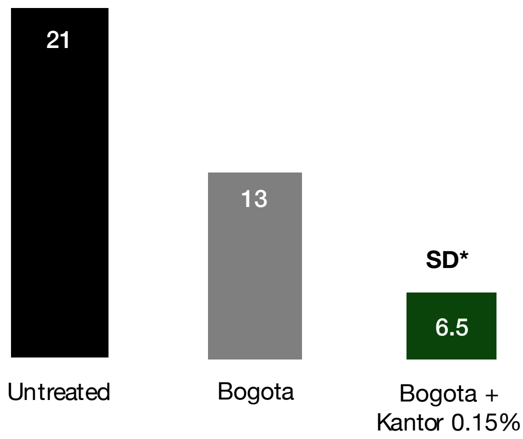
2020 field trials re-enforced Kantor's proven ability to optimise the performance of both early and late season PGRs resulting in reduced lodging and brackling. In Spring Barley, the reduction in lodging was statistically significant.

Effect of Kantor on % lodging and % brackling in Winter Barley



2020 trial, Friday Bridge. KWS Gimlet. Treatments Applied at GS25. Standard Adjust 1 + CC Alatrin Evo 1.5 @ GS32 and Bogota 0.75 + Kantor 0.15% at GS37. NSD.

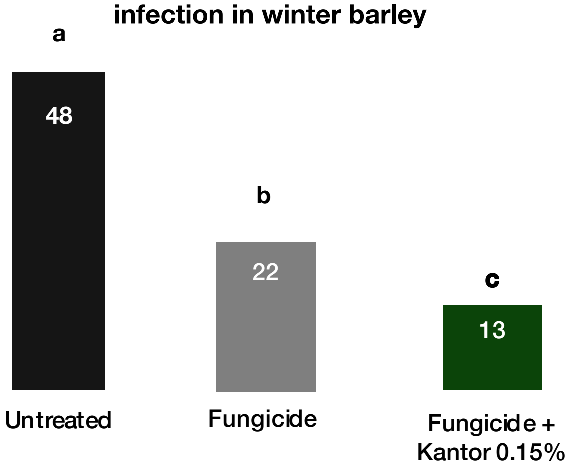
Effect of Kantor on % lodging in Spring Barley



2020 trial, agrifocus. KWS Sassy. Adjust 1.25 L/ha at GS12-13. CC Alatrin Evo 1.0 L/ha at GS30-31, Bogota 0.75 L/ha at GS33-37. Assesses 13th August. LSD 13.87 for % lodging. Significant difference compared to untreated.

Significant reduction in ramularia

Effect of Kantor on % ramularia infection in winter barley



Slovenia 2020. Institute of Hop Research and Brewing - Winter Barley cv Concordia. Fungicide programme: T1 Elatus Era 1.0 L/ha fb T2 Zantara (bixafen + tebuconazole) 1.5 L/ha. Assessed 28 days after T2 - 12th June.

KEY TAKEAWAYS

PGRs

- Kantor improved the (safe) uptake of early and late season PGRs resulting in reduced lodging and higher yields

Ramularia

- Kantor reduced ramularia infection significantly over fungicide alone
- Improvements in disease control translated into significant increase in green leaf area and helped protect yield (+0.13 t/ha).

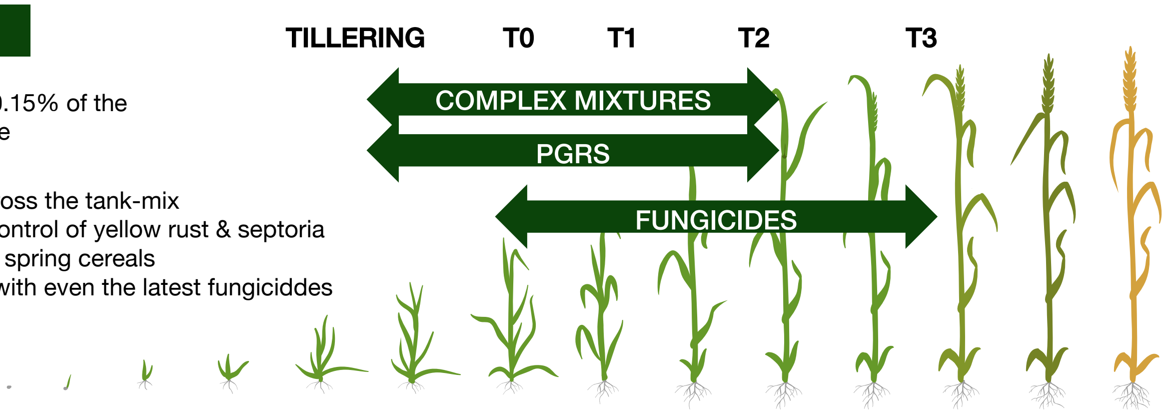
PUSHING PERFORMANCE ADJUVANT

Kantor recommendations in key crops

CEREALS

Apply Kantor at 0.15% of the final spray volume

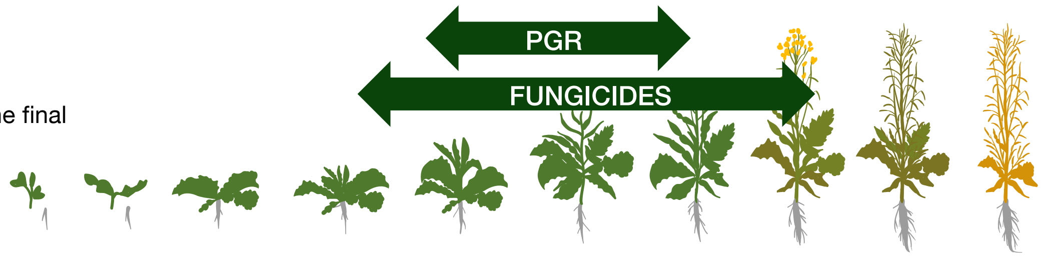
- Activity across the tank-mix
- Optimise control of yellow rust & septoria
- Winter and spring cereals
- Beneficial with even the latest fungiciddes



OSR

Apply Kantor at 0.15% of the final spray volume

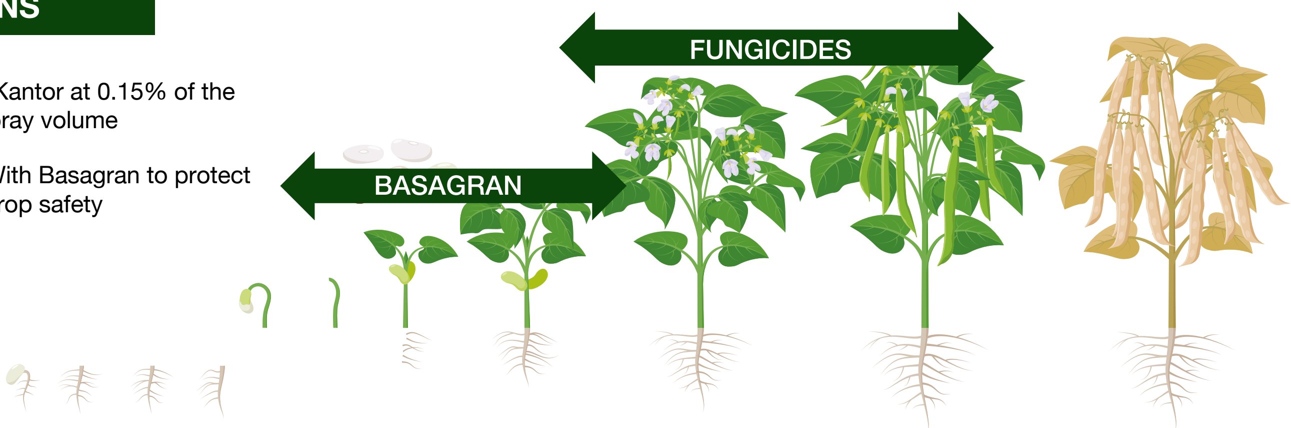
- Phoma & LLS control
- Triazole fungicides



BEANS

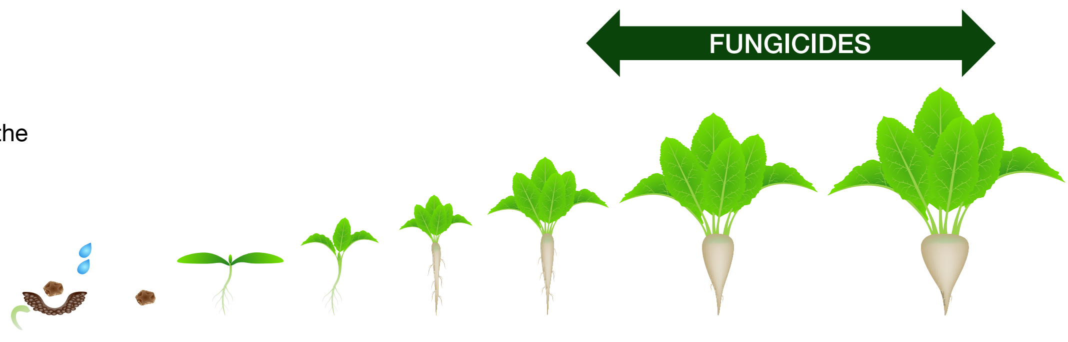
Apply Kantor at 0.15% of the final spray volume

- With Basagran to protect crop safety



BEET

Apply Kantor at 0.15% of the final spray volume



PUSHING PERFORMANCE
ADJUVANT

Kantor
Technical Summary

A unique activator adjuvant to reduce disease and mix with ease

Kantor	Product information
Classification	Adjuvant
Composition	Emulsifiable concentrate containing 790 g/l alkoxylated triglycerides
Recommended use	With all approved fungicides, plant growth regulators and post-emergence herbicides
Rates of use	0.15% of the final spray volume
Mixing	Add to the spray tank first before adding plant protection products or fertiliser
Pack size	5 litres
Key features / benefits	Improves tank mix compatibility & buffers to pH6, increasing pesticide availability & safety Reduces spray drift, improving deposition Improves spreading & retention across the leaf/ear, for optimum coverage & protection Increases cuticle penetration, resulting in higher uptake into the leaf May increase yield

Approved crops and application timings

Kantor may be used with all approved plant protection products applied at full rate up to and including the following growth stages below. Application of Kantor beyond the latest timing is permitted only where using half the approved rate of the plant protection product and up to the latest timing of the plant protection product. In cereals, Kantor may also be used with all authorised triazole (conazole) and morpholine fungicides at their full recommended rate and latest timing:

Arable & Veg.	Latest timing of application
Cereals	Up to and including 1/4 inflorescence (GS52)
Beans*	Up to and including first pod set
Broccoli/Calabrese	Up to and including heads begin to form
Brussel Sprout	Up to and including lateral buds begin to develop
Cabbage	Up to and including heads begin to form
Carrot and Parsnip	Up to and including 9 true leaves unfolded
Cauliflower	Up to and including heads begin to form
Collard and Kale	Up to and including main shoot at 30% of height
Combining Peas	Up to and including flat pod
Forage Maize	Up to and including tip of tassel visible
Hops	Up to and including cone set
Leak and Onions**	Up to and including 9 leaves clearly visible
Linseed	Up to and including 10% capsules formed
Oilseed Rape	Up to and including 10% of pods at final size
Potatoes	Up to and including tuber initiation
Pumpkin/Squash	Up to and including first fruit set
Soyabean	Up to and including first pods visible
Spinach	Up to and including leaf rosette 30% diameter
Red/Sugar Beet	Up to and including 6 leaves fully expanded
Swede and Turnip	Up to and including 9 true leaves unfolded
Vining Peas	Up to and including flat pod

Fruit and Salad	Latest timing of application
Almond	Up to and including first fruit set
Apple and Pear	Up to and including fruit 5-10 mm
Apricot and Cherry	Up to and including first fruit set
Aubergine	Up to and including first fruit set
Black/Strawberry	Up to and including first fruit development
Black/Redcurrant	Up to and including first visible green fruitlet
Chilli and Pepper	Up to and including first fruit set
Cucumber	Up to and including first fruit set
Lettuce (heads)	Up to and including heads begin to form
Lettuce (no heads)	Up to and including leaf rosette 30% diameter
Melon	Up to and including first fruit set
Peach and Nectarine	Up to and including first fruit set
Plum	Up to and including first fruit set
Raspberry	Up to and including first fruit set
Rocket	Up to and including 3rd true leaf unfolded
Sweetcorn	Up to and including tip of tassel visible
Tomato	Up to and including first fruit set on first truss
Wine/Table Grapes	Up to and including first fruit set

Beans*: Includes Broad, Dwarf French, Field, Runner, Edible Podded Pea
Onions**: Includes Bulb, Salad, Shallot, Garlic

PUSHING PERFORMANCE
ADJUVANT

Kantor
The UK's no.1 adjuvant

*Source: KynetecDmr AgriInsight adjuvant panel data 2019

Technical Support
For technical support, please contact:

Stuart Sutherland - Technical Manager
Mobile: 07384 460352
Email: stuart.sutherland@interagro.co.uk

General Enquiries
For general enquiries, please contact:

Interagro (UK) Ltd
Office phone: 01279 714970
Email: info@interagro.co.uk