



EUTREMA

Fungicide Reduction Action Plan (FRAP)



What is the 'Fungicide Reduction Action Plan' (FRAP)?

At Eutrema we have been working with many forward thinking farmers who have been using regenerative agriculture farm practises.

These farmers have trialled different methods for integrating different crop health solutions into their production methods.

Together, we have progressed these methods so that they can be easily applied on other farms; both those already using regenerative methods, but also those who are simply looking to reduce their fungicide levels.

Farmers are looking to reduce the level of conventional fungicides used on cereal crops both for economic reasons (they are simply becoming too expensive to return a good profit on the crop), and because of an increasing awareness of the detrimental effect these compounds are having on the soil health and wider environment.

Hopefully you will see that the plan we have developed is easy to follow and implement into any conventionally grown cereal crop.

Dr Russell Sharp, Managing Director, Eutrema Ltd, 2023



Fungicide Reduction Action Plan (FRAP)

Growth stage	Stored seed	Drilling	GS0 - emergence	GS1 - leaf development	GS2 - tillering or at T0	GS3 - stem elongation	GS4 - booting / flag leaf	GS5 - ear emergence	GS6 - flowering	GS7 - milk stage	GS8 - dough development	GS9 - ripening
First pass	Mycorrhizal spores and/or chitosan*	Mycorrhizal spores and/or chitosan	Cold-press seaweed extract 3L/ha	Chitosan 2L/ha	Chitosan 2L/ha	Chitosan 2L/ha	Chitosan 2L/ha	Sea Silica 4L/ha	Sea Silica 4L/ha	Sea Silica 4L/ha		
				Chitosan 2L/ha	Chitosan 2L/ha	Chitosan 2L/ha	Chitosan 2L/ha	Sea Silica 4L/ha	Sea Silica 4L/ha	Sea Silica 4L/ha		
Second pass or co-applied				Sea Silica 4L/ha + Salicylic acid 100-200mL/ha	Sea Silica 4L/ha							
Application method	Seed coating	Directly into furrow with seed	Foliar	Foliar	Foliar	Foliar	Foliar	Foliar	Foliar	Foliar		
Notes	Alternatively apply when drilling	Alternatively apply as a seed coat										

See our Eutrema Youtube video on how to seed coat mycorrhizae and chitosan. Dilute 100mL of Eutrema chitosan in 10L of water for spraying seed.

Eutrema Lime Sulphur can be applied pre-drilling to the soil or as a foliar if disease is severe and uncontrollable by other methods. For foliar treatment apply with Yucca extract to improve foliar adhesion.

The key to tank mixing success

Chitosan, seaweed extracts and silicon products can fall out of solution if mixed incorrectly.

This blocks filters and may deactivate the active ingredients.

To prevent this:

Always conduct bucket tests to confirm compatibility.

If mixing potassium silicate and other products; always add the water first, then the potassium silicate, then add citric acid to neutralise it to pH 6.0. Then add the chitosan at the end. Do not store for long periods.

Many of our farmer customers have successfully co-applied the products in this program. However, if you cannot successfully perform a bucket test with your water source and these products, apply them as separate passes.



Prices

Chitosan £90 / 20L polycans, £3050 / 1000L IBC

Sea Silica £105 / 20L polycans, £3600 / 1000L IBC

Salicylic acid 12.5% £190 / 20L

Full technical support free



Costs / ha of a full program

Chitosan; 4 applications x 2L =
£24.40

Sea Silica; 7 applications x 4L =
£100.80

Salicylic acid; 4 applications x 100mL
= £3.80

Total = £129.00



Costs / ha of applying at the 2 priority stages

Chitosan 2 applications x 2L = £24.40

Sea Silica 2 applications x 4L = £28.80

Salicylic acid 2 applications x 100mL =
£1.90

Total = £55.10

Pre-harvest interval comparison

Active ingredient	Example products	Manufacturer	Crops	Pre-harvest Index / last application	Other considerations
Chitosan	Chitosan	Eutrema	All	0 (right up until harvest)	All year round use Up to 8 applications
Tebuconazole	Ohio	Clayton	Barley, Rye	GS41	
Boscalid	Entargo	BASF	Cereals	GS51	
Folpet	Mirror	Syngenta	Cereals	GS59	
Bixafen	Inception	Bayer	Barley	GS61	
Metrafenone	Flexity	BASF	Cereals	GS61	
Azoxystrobin	Amistar	Syngenta Agrigrem	Cereals	GS71 wheat GS61 barley	Only two applications allowed
Mancozeb	Dithane	Nufarm	Cereals	GS65	
Prochloraz	Mirage	Adama	Cereals	GS65	
Metconazole	Metfin 90	Clayton	Cereals	GS71	

Prothioconazole
and N,N,-Dimethyl
decanamide.

Traciatin

Clayton

Oilseed rape

56 days before
harvest

Metalaxyl-M

Caveo

Pan Agriculture

Root veg and
beans

35 days before
harvest

Mancozeb

Dithane/Laminator

Nufarm

Legumes

Only one dose
allowed



Chitosan has NO pre-harvest interval!

Chitosan



Chitosan is manufactured from **chitin**; the structural polysaccharide found in the exoskeletons of insects, crustaceans, and in the cell walls of fungi.

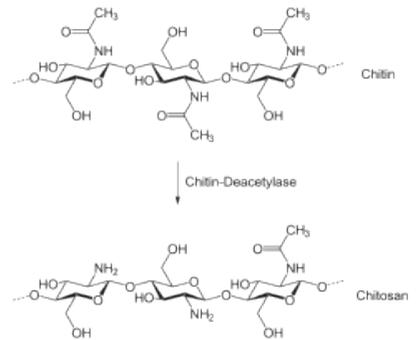
Chitosan is one of a few cationic polymers found in nature.

Authorised for use as a bio-fungicide in the UK & EU.

1 Stimulates plant defenses. Plants have evolved to detect chitosan as it is a component of all pests and pathogens, and is never found in or on healthy plants.

2 Forms a microscopic 'bio-plastic' that creates a cap over any fungal lesions, and thus impedes the release of spores into the air, and thus infection of other plants in the field.

3 Bio-stimulation of plant growth.



Sea Silica



Sea Silica is the only silicon fertiliser approved for use in organic farming in the UK.

Plants absorb silicon and use it to make their cell walls tougher (like glass!). This helps them resist attack by pests, diseases, and resist extremes of weather. Professional growers routinely use silicon fertilisers to help protect their crops.

We can also supply straight Potassium Silicate, which is more concentrated, but not authorised for use on organic crops.

Salicylic Acid Solution



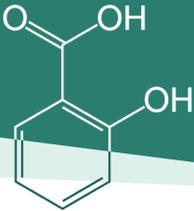
- Bioactive compound, named after willow (*Salix*), which contains high levels of salicylic acid.

12.5% concentration.



Strongest liquid salicylic acid product on the market.

- Elicitor of plant defences.
- Excellent tank mix compatibility.
- No synthetic solvents or surfactants used in formulation.



Although 'salicylic acid' sounds similar to 'silicic acid', they are two very different compounds:

Salicylic acid; organic molecule that acts as a defence elicitor.

Silicic acid; the active ingredient in Sea Silica, that physically strengthens plant cell walls.

Whilst these are two very different compounds, they are both help protect crops from disease. That is why both our Salicylic Acid and Sea Silica products are crucial to reducing the synthetic fungicides used on a crop.

Lime Sulphur



- As lime sulphur is a sterilant, it should be used as a tool of last resort as it will harm both harmful and beneficial organisms.
- Can be used in the UK and EU as a **fungicide, insecticide and miticide**. This includes organic crops; as covered in **EU Regulations (EC) No 889/2008**.
- Classified as hazardous. Always follow the instructions and use recommended PPE.
- Breaks down into harmless plant nutrients in a few hours after application to the crop. Hence, no residues and safe to use up until the day before harvest.

Customer feedback

"Having only discovered the Eutrema range of products well into the spring growing season and therefore missing the first priority treatment, we trialled Chitosan and Potassium Silicate in winter barley, triticale and wheat. All the crops stayed remarkably clean with the triticale only receiving a cheap flag leaf Triazole and the barley only receiving an ear wash to keep the awns clean!

The wheat however, still having received zero conventional fungicides, now going into the natural pre harvest senescence is possibly showing slightly higher levels of disease on the lower leaves but both fields are visibly greener than the conventionally treated block next door!

I am convinced of the value of these products and the service and the backup from Eutrema is excellent and I look forward to working with Russell and using them with the addition of salicylic acid on a larger scale next season."

Richard Tagg, Grange Farm, Lincolnshire

"My default position is always scepticism, but when I **triated the chitosan against grey mould I was honestly FLABBERGASTED!** The lesion dried up and the disease stopped spreading."

Anthony Rowland, Tree Tops, Worcestershire

"We struggled with tank mixing the chitosan to begin with, but Eutrema were happy to share some tips from other farmers who had success in this area last year. We used chitosan to replace chlorothalonil (CTL) in wheat and barley, and to control botrytis in our specialist non-food crops. **The rust control was particularly impressive as the lesions dried up almost immediately.**

We will be using chitosan again next year along with salicylic acid which we also trialed with success in 2023."

Name redacted for privacy, Yorkshire

"While making the transition to a more sympathetic approach to farming we decided first to try to **eliminate insecticides which we have done successfully**, the next focus was **PGR use in cereals, again this has proven successful with the use of a silicon program** whilst being slightly more expensive than PGR use, it also carries the benefit of stiffer straw better nutrient mobilisation (synergies) and not causing stress on the plants.

Chitosan was a leap of faith after seeing work done to abroad we decided to give this a go, in what has been a very challenging year in terms of plant disease where we choose to commit to a limited fungicide program based on nutrition and elicitors like chitosan, where we took this approach we still needed one application of tebuconazole to dry up some yellow rust, our other wheat fields have had a full fungicide program that hasn't been without challenge in itself and at greater cost."

David Hankey, Dunkirk Farm, Co. Durham

- Founded in 2019 in Daventry, Northamptonshire.
- Primary manufacturer of all the products in our portfolio.
- We sell from factory gate to farm = no middlemen or distributors! Unique distribution model that minimises the costs to the farmers.
- Next-generation chemistry not found in any other suppliers' catalogues.
- Full technical support for customers on all aspects of crop health. We do not just advise on our own products.
- Clean room manufacturing facility. Open door policy for all customers to visit our Daventry site.



EUTREMA

Opening Hours:
Monday - Friday
9am - 5pm



5.0 ★★★★★

www.eutrema.co.uk

