



Foliar Micronutrients for all Crops

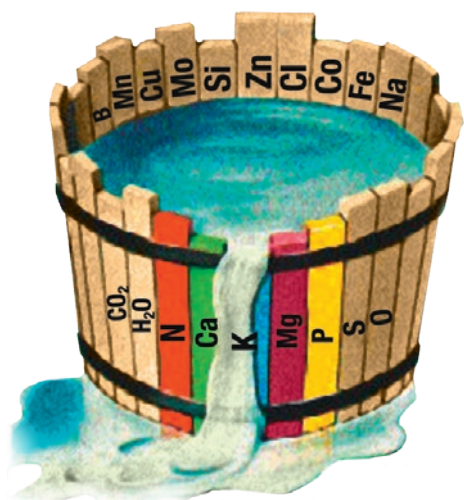


Fetrilon[®] Combi

- High quality chelated trace element formulations for foliar application
- For the effective prevention and cure of trace element deficiencies
- Finest free flowing microgranulation

What is Fetrilon® Combi?

- Fetrilon® Combi products contain carefully formulated mixtures of all trace elements required for plant nutrition. All metallic elements are fully chelated by EDTA for protection from soil fixation.
- Fetrilon® Combi products offer a high quality, cost effective solution for safeguarding and optimizing both yield and quality of crops.



Any essential plant nutrient which is not in sufficient supply may limit the crop yield (J.v. Liebig 1803–1873)

Factors influencing availability of micronutrients in the soil

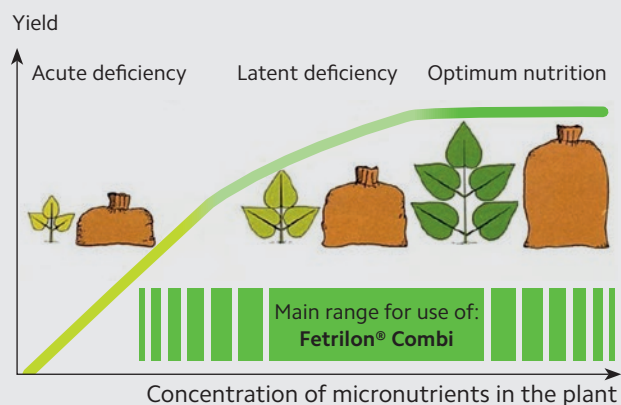
	Cu	Fe	Mn	Zn	B	Mo
pH > 7.0	-	-	-	-	-	+
pH < 5.5	+	+	+	+	-	-
Water-logged soil	-	+	-	-	-	-
Drought	-	-	-	-	-	-
High organic matter content	-	-	-	-	+	-
High P-content	-	-	-	-	-	+

+ = available

-- = not available

- Under conditions of high abiotic stress, regular preventative applications of micronutrients can help to alleviate stress effects.
- Deficiency symptoms may also occur latently (invisible). Preventive spray application should be considered.

Relationship between micronutrient supply and crop yield

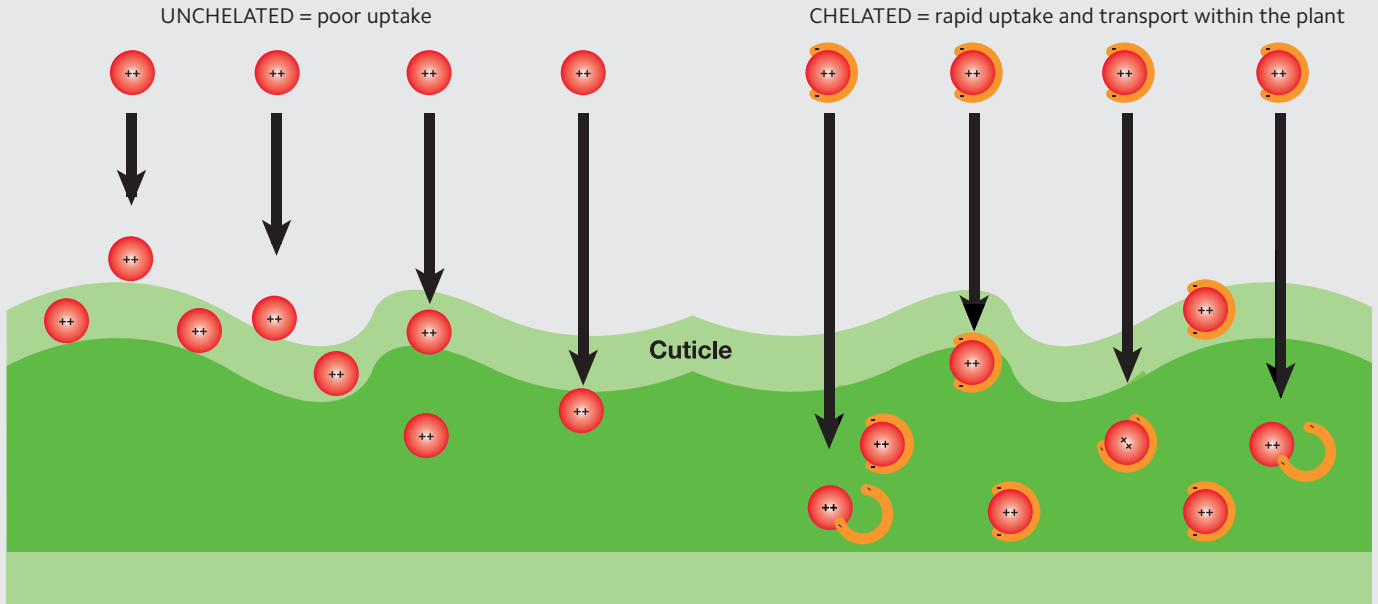


Micronutrient demand of sensitive crops

	Cu	Fe	Mn	Zn	B
Cereals	+	+	+	+	
Maize			+	+	+
Cotton		+		+	+
Sunflower					+
Rice		+	+	+	
Tobacco		+	+		+
Tea		+	+		
Citrus	+	+	+	+	+
Apple/pear	+	+	+	+	+
Apricot		+	+	+	
Peach		+	+	+	
Strawberry	+	+	+		
Melon		+	+	+	
Grapevine	+	+	+	+	+
Tomato	+	+	+	+	+
Olive			+		+
Bell pepper		+	+		+
Potato			+	+	+
Lentil	+	+	+	+	+
Chick pea	+	+	+	+	+

+ = high demand

Principle and effect of chelation (leaf penetration)



UNCHELATED
 Ions of metallic micronutrients carry a positive charge Mn^{++} , $Fe^{++/+++}$, Cu^{++} , Zn^{++} (Sulphates, Oxides and others).



CHELATED
 Metallic ions with a positive charge are "wrapped" by a chemical substance which is negatively charged. This means the originally positively charged metallic ion is now "neutral".

- Rapid uptake and utilization due to chelation by EDTA.
- EDTA chelates (from greek = "claw") protect the nutrient by 6 connections.

Mineral nutrition with micronutrients; comparison of salts and chelates

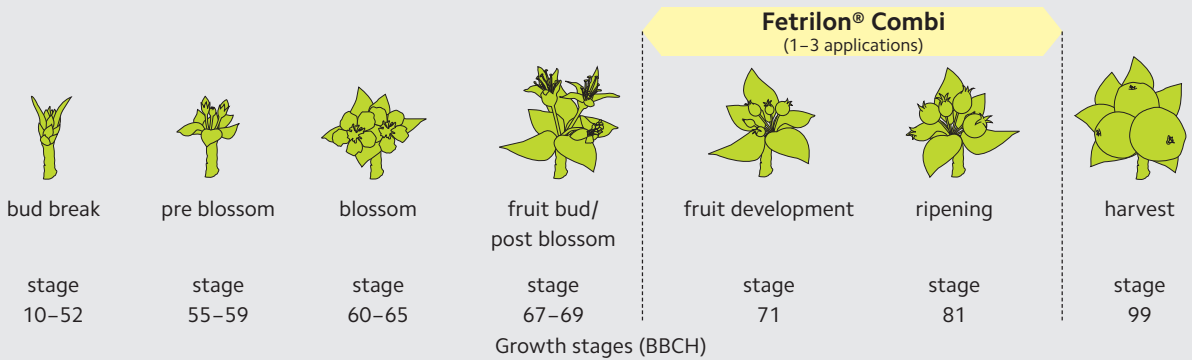
Criteria	Chelates	Salts
Foliar uptake	+++	++
Availability in soil	+++	----
Change of conductivity in soil	----	+++
Leaf necrosis / chlorosis (osmotic effect)	----	+++
Miscibility with plant protection products	+++	+
Solubility in water	+++	++
Residues	----	++
Wettability on leaves	+++	+
Stability of solution	+++	+
Tank-mix compatibility	+++	+

+ = positive / high
 - = negative / low

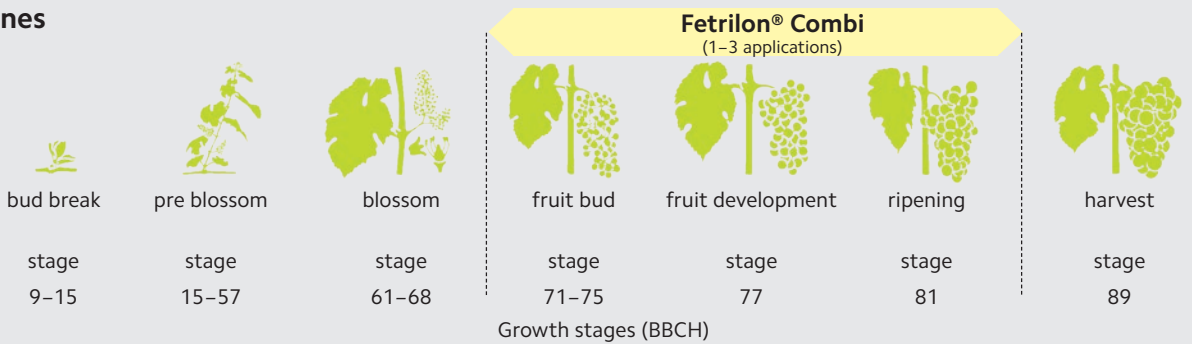


Recommendation for foliar application

Apples



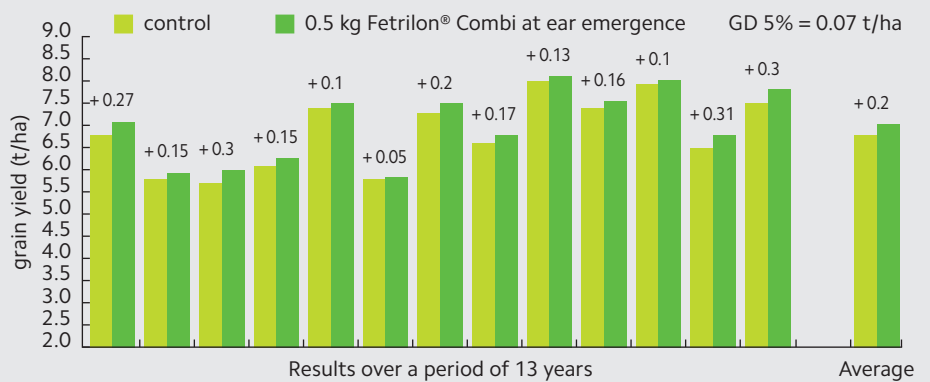
Grapevines



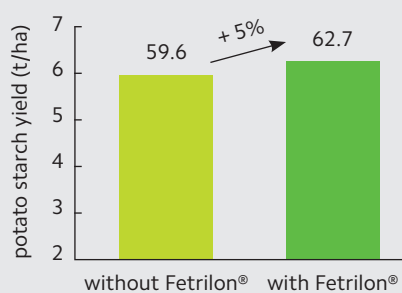
- Equal performance under variable weather conditions.
- 0.2 t/ha yield increase on average.



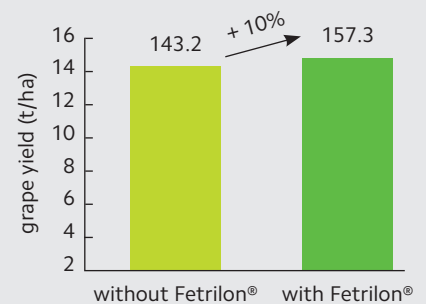
Fetrilon® Combi in winter wheat, Germany, 83 trials in 13 years



Fetrilon® Combi in potatoes, Germany, 8 trials (1kg/ha)



Fetrilon® Combi in Riesling grapes, Germany, 4 trials



Recommendations for foliar application

Crop	Number of applications per growing period	Application rate kg/ha	Maximum concentration in %
Citrus	1–4	0.5–1.5	0.2
Pomefruit, grapes	1–3	0.7–1.0	0.1
Stone fruit, berries	1–3	0.5–0.7	0.1
Coffee, cocoa, tea	1–3	0.5–1.0	0.2
Bananas	1–8	0.5–1.5	0.2
Pineapples	1–6	0.5–1.0	0.2
Cotton	1–4	0.7–1.0	0.3
Rice, wheat, barley	1–3	0.5–1.0	0.3
Maize, sorghum, pearl millet	1–3	0.5–1.0	0.3
Soybeans, peanuts, beans, lucerne	1–3	0.5–1.0	0.2
Peas, other grain legumes	1–3	0.5–0.7	0.1
Potatoes, sweet potato	1–5	0.5–1.0	0.3
Tomatoes, peppers, egg plant	1–5	0.5–1.0	0.2
Cucumbers, melons	1–4	0.5–0.7	0.2
Cabbages, cauliflower	1–6	0.5–0.7	0.2
Onions, garlic	1–4	0.5–0.7	0.2

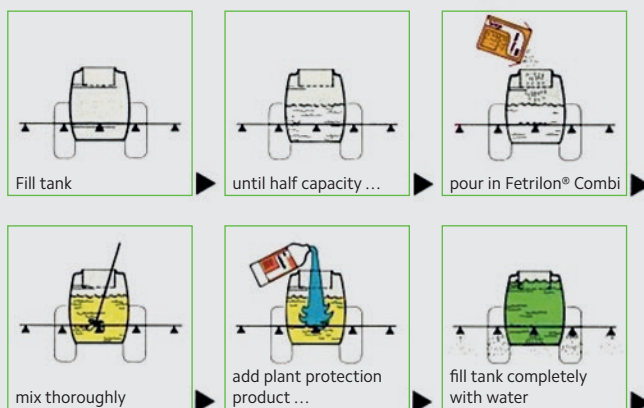
Additional remarks on the application rate and frequency

- Preventative treatment: application with lower rates* sufficient.

- Slight deficiency: higher rates* should be applied at 3–4 week intervals.
- Severe deficiency: application with lower rates* every 2 weeks.

*within the recommended range

Preparation of spray solution












Where Fetrilon® Combi is to be applied together with Basfoliar® SP this sequence should be followed:

- Basfoliar® SP
- Fetrilon® Combi
- Plant protection products

Mix thoroughly after adding each component.

Dosage recommendations

	Fetrilon® Combi	Fungicide	Water
Motor-sprayer	1 kg  1	 2	 400 l 400
Knap-sack-sprayer	50 g  1	 2	 20 l 400
Test	5 g  teaspoon 1	 teaspoon 2	 400 ml 400

- Mixing with fungicides or insecticides is possible.
- A bucket mixing test is recommended.



Product	Composition	Characteristics	Packing	Use
Fetrilon® Combi 1	3.3 % MgO 0.5 % B 1.5 % Cu 4 % Fe 4 % Mn 0.1 % Mo 1.5 % Zn	- Multi micronutrient fertilizer for all crops - Metallic trace elements fully EDTA chelated for preventive and curative use - Green homogenous microgranules	1 kg 25 kg cartons Pallet size: 40x(16x1kg) = 640kg 18x25kg = 450kg	For detailed recommendations please contact your local dealer/agent.
Fetrilon® Combi 2 Not available in SA	1.2 % MgO 1.5 % B 0.6 % Cu 4 % Fe 3 % Mn 0.05 % Mo 4 % Zn	- Multi micronutrient fertilizer for all crops - Metallic trace elements fully EDTA chelated for preventive and curative use - Green homogenous microgranules	1 kg 25 kg cartons Pallet size: 40x(16x1kg) = 640kg 18x25kg = 450kg	
Fetrilon® 13 Not available in South Africa	13 % Fe	- Iron micronutrient fertilizer for all crops - Metallic trace element fully EDTA chelated for preventive and curative use - Brown homogenous microgranules	1 kg 25 kg cartons Pallet size: 40x(16x1kg) = 640kg 18x25kg = 450kg	
Zitrilon®	15 % Zn	- Zinc micronutrient fertilizer for all crops - Metallic trace element fully EDTA chelated for preventive and curative use - White homogenous microgranules	1 kg 25 kg cartons Pallet size: 40x(16x1kg) = 640kg 18x25kg = 450kg	