



FerteniaManufacturedProduct

Process innovation
in the production of EDDHA chelated iron



From nature... to nature

Ferland by ECO-Iron

New production technology

**No chloride and phytotoxic
substances**



**Quality guarantee and
agronomic efficacy**

**Respect of
microbial flora of soil**

No emissions in atmosphere

**Innovative plant for a
revolutionary product**



MACFRUT
INNOVATION
AWARDS **2016**



Target achieved for Fertenia:
**Improvement of product quality and
Environmental Sustainability**

FERLAND

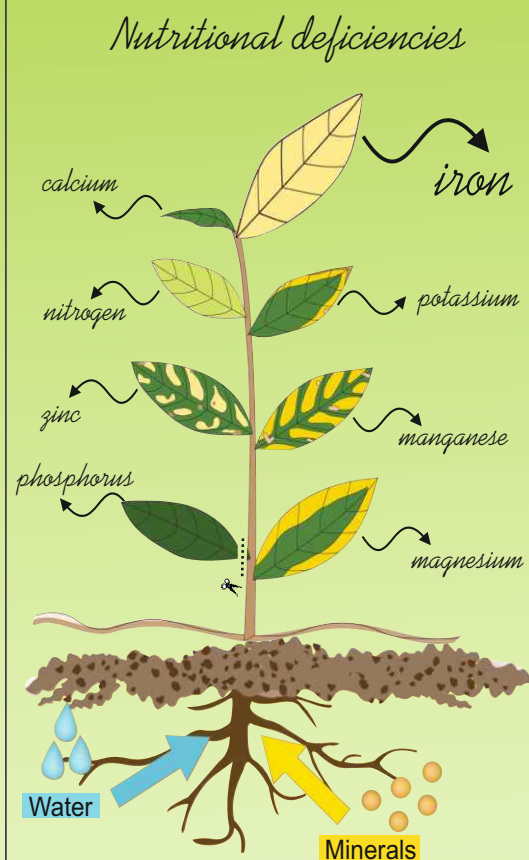


The importance of iron in the plants

The iron is fundamental for the plants because it is necessary in several biochemical and metabolic processes and in particular it is essential for the photosynthesis, the breathing and the nitrogen biologic fixation. The iron is plentiful in the soils but is bio-available in the acid and few aerated soils. The majority of agricultural soils presents an high quantity of carbonates (alkaline soils) which the iron ion binds with to form compounds with low solubility and so not available for the roots absorption. Also in clay soil, due to the difficult roots development, the iron absorption is jeopardized.

Iron chlorosis: physiopatology of plants which appear with a progressive yellowing of leaves, with basipetal carrying, from the peak to the base, with affect the plants veins; the leaves exhibit reduced dimensions and trend to early fall down. In the most serious cases, the iron chlorosis causes the necrosis and the death of plants.

The response of EDDHA chelated iron: The Fertenia EDDHA chelated iron are compounds which bond and protect the iron from the low solubility in the soil, holding the Fe^{3+} ion and leaving it, in bio-available form, directly to the roots. They enhance the complete absorption of microelement in the strong alkaline soils (pH more than 8) also. The EDDHA chelated irons are identified the more agronomically efficacious for their stability in the soils, persistence and effectiveness to release the microelement.



The new ECO-Iron technology



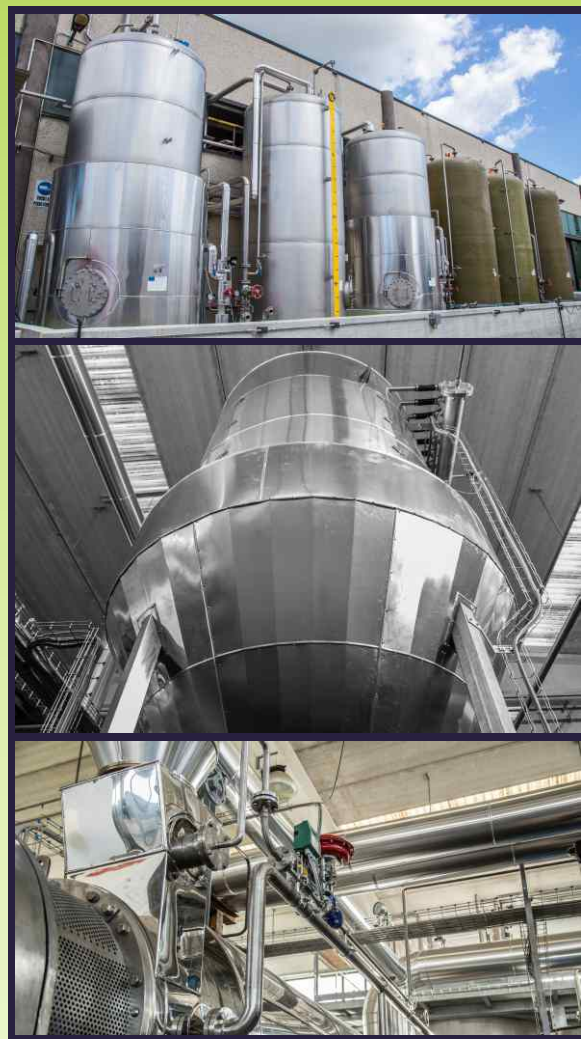
The new Fertenia production plant is the first and the only one in the world with the ECO-Iron technology

The strenght points:

- New production process with the removal of phytotoxic substances and **chlorides**
- Introduction of raw materials of high purity and quality to obtain a perfect agronomic response
- Closed-loop production process: no production residuals and complete environmental sustainability
- Innovative drying system, perfect hydration and final product solubility

Thanks to this innovation, Fertenia has managed to improve the synthesis and production process of chelated iron in agricultural use.

Fertenia yearly invests a great part of profit in the research and experimentation in order to develop new products. Thanks to this policy it has been possible to carry forward this internationally relevant project which will lead to «new era» in the production of EDDHA chelated iron.



FERLAND

The product **FERLAND**

The best isomeric balance between ortho-ortho and ortho-para

Fe-EDDHA (ortho-ortho isomeric form)

Thanks to its chemical bonds (6) the iron ion results much stable, highly soluble in the soils ensuring *persistence in the time* and the conservation of green color of plants. The high reload capacity permits to make bio-available the iron and the others microelements (Mn,Zn, etc..) otherwise presents in the soil but in insoluble form.

Fe-EDDHA (ortho-para isomeric form)

Thanks to its chemical bonds (5) the isomeric form ortho-para (o-p) releases the iron ion *in a fast and quickly available way* to the plants, preserving a good stability in the soils.



Packaging:
Bags 1 - 5 - 20 kg



**Allowed in
Organic Farming**

Hence due to different percentages of isomeric forms (o-o) (o-p) of our various products, it is possible to employ the one which is more appropriate according with soils characteristics (pH) and cultivations.

Product	Fe (sol. in H ₂ O) Mn - Zn (sol. in H ₂ O)	Fe (chelated fraction)	Chelating agent	Isomeric form (o-o)	Isomeric form (o-p)	Stability chelated fraction pH range
FERROCHEL	6,5%	6,0%	EDDHA	2,0%	4,0%	3,5 - 12
FERLAND 634	6,5%	6,0%	EDDHA	3,4%	2,6%	3,5 - 12
FERLAND 640	6,5%	6,0%	EDDHA	4,0%	2,0%	3,5 - 12
FERLAND	6,5%	6,0%	EDDHA	4,2%	1,8%	3,5 - 12
FERLAND 644	6,5%	6,0%	EDDHA	4,4%	1,6%	3,5 - 12
FERLAND 648	6,5%	6,0%	EDDHA	4,8% (*)	1,2%	3,5 - 12
FERLAND Trio Fe+Mn+Zn EDDHA	Fe 5,4% Mn 0,9% Zn 1,45%	Fe 3,8% Mn 0,25% Zn 0,45%	EDDHA	-	4,0%	4 - 11
FERLAND fluid	2,5% p/p-3,0% p/v	-	EDDHA	2,0%	-	4 - 11

(*) Limited production capacity

CHARACTERISTICS

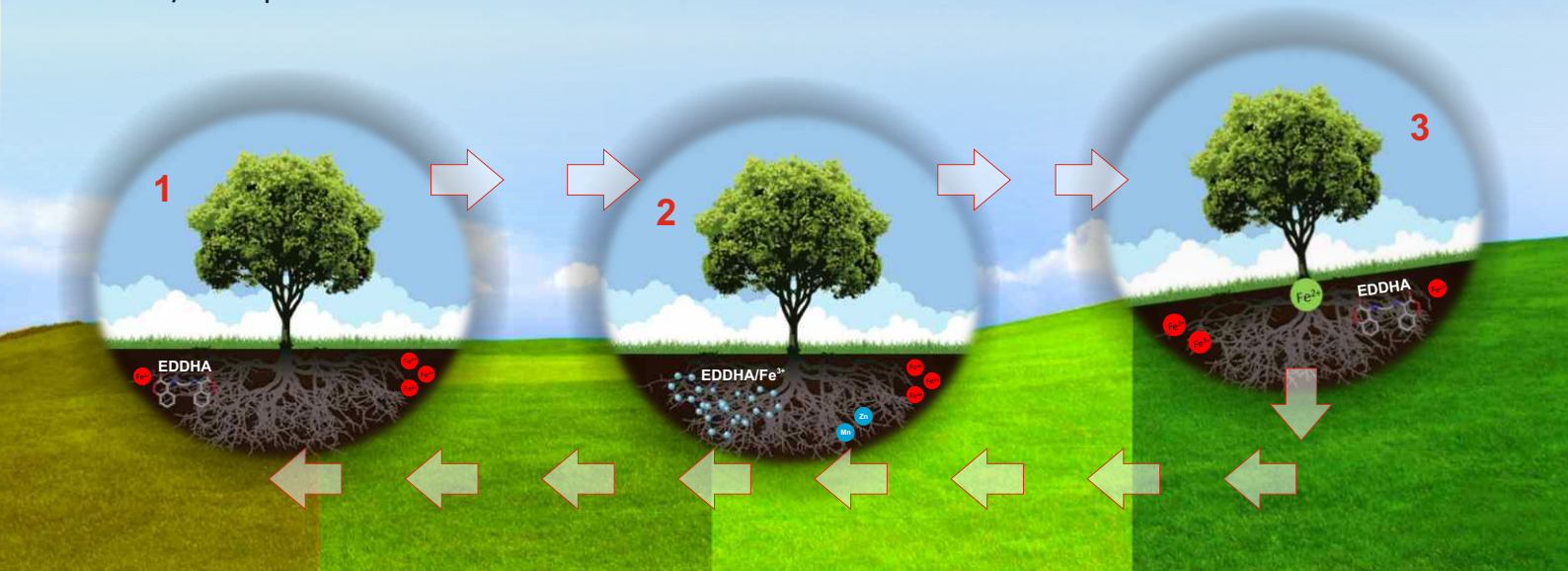
High purity of raw materials; high microelements stability; no phytotoxic substances; (intervalli di pH 3,5-12). food and environmental safety; greater stability of chelated fraction

EDDHA chelated iron mechanism of action

EDDHA chelating agent bonds the iron present in the soil but not available for the plant, forming the EDDHA/Fe³⁺ complex

Close to the roots, the chelating agent (EDDHA) releases the Fe ion, which it is absorbed as Fe²⁺, and it promotes the absorption of other microelements

Thanks to the extraordinary reloaded capacity the EDDHA chelated agent start again the cycle, ensuring the continuous supply of iron necessary to the life of the plants



Effects and advantages **FERLAND**

- ✓ High stability and solubility in H₂O, at acid pH (pH 3.0) and alkaline pH (pH 9)
- ✓ Maximum iron bioavailability
- ✓ Best isomeric balance for an immediate and long- lasting iron chlorosis treatment
- ✓ Maximum efficacy guarantee in several environmental and agronomic conditions
- ✓ No interference with microbial activity of soil
- ✓ Possibility of focused and reduced dosage compared with similar product
- ✓ High quality and quantity guarantee of productions
- ✓ Admitted in biological agriculture



DOSE AND CONDITIONS OF USE

CHINESE GOOSEBERRY	Periodically 10 -15 g/stump Post harvest 5-10 g/stump	POMACEOUS AND DRUPACEOUS	Small plants: 20-40 g/plant Big plants: 50-100 g/plant
FLORICULTURAL CULTIVATIONS	3-5 kg/1000 m ²	CITRUS	Small plants: 30-50 g/plant Big plants: 70-150 g/plant
HORTICULTURAL CULTIVATIONS	5-10 kg/ha	VINE: DESSERT GRAPES AND MUST GRAPES	To prevent and treat the iron chlorosis: 10/15 g/stump To increase the quality of bunches: 10-20 g/stump when start the stretching of rachis
INDUSTRIAL CULTIVATIONS	5-10 kg/ha		

OFFICIAL TEST



ECO-Iron Process



ECO-Iron Process



The first stage:
Iron deficiency in citrus young plant



Ferland application in the soil
considering 20 g/plant of product

The second stage:
Release of iron in the soil



Quick and long-lasting absorption
after 5 days

The third stage:
The final result after the treatment
with Ferland (ECO-Iron)



Assimilation of iron also present
in the soil after 12 days



From nature... to nature



Ferland and ECO-Iron are registered brands by Fertenia

Information present in this depliant are mainly indicative.

In the product applications, it is recommended to carefully follow the indications and the cautions written in the labels.

The manufacturer declines any responsibility for consequences due to a wrong use of products.