YaraVita™ Rexolin® D12

DTPA Chelated Iron – Product Data Sheet

Application

In agriculture and in horticulture in soil or hydroponics applications or as foliar feed.

Specifications

Item	Specification Method of analysis available on request
Appearance	Yellow green crystals
pH (1% solution)	2.5 - 3.5
Iron (Fe) content, typical*	11.6%
Iron (Fe) content, minimum	11.3%
Level of chelation	fully

Product meets requirements for an EC-fertilizer
* EC-fertilizer label value.

Main Characteristics

YaraVita™ Rexolin® D12 is a stable, water-soluble iron chelate;
Iron is chelated by DTPA.

Item	Characteristic
Stable within pH	1.5 – 7.5
Bulk density untapped	approx. 650 - 750 kg/m3
Solubility in water	approx. 110 g/l (20 °C), 160 g/l (50 °C) (at pH as such)

(Solubility under practical conditions (at pH = 7) is approx. 575 g/l (20 ºC))

Storage

Store in original packing at a dry place at ambient temperature (below 25 °C).
It is advised to re-test after three years of storage. Exposure to sunlight may cause degradation of the product.

Chemical Name

Diethylenetriaminepentaacetic acid ferric-sodium hydrogen complex; DTPA-FeHNa

Chemical Formula

$C_{14}H_{18}N_3O_{10}FeHNa$

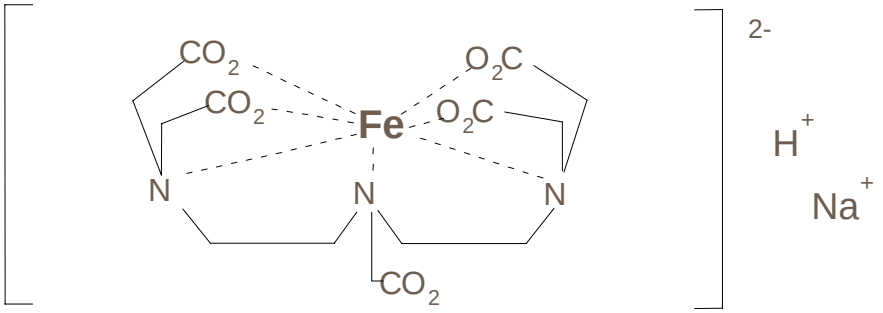
Molecular Weight

468.2

Environmental Aspects

Biodegradability:	slow
Chemical oxygen demand (C.O.D.):	approx. 750 mg/g

Structure



Further Information

For transport, handling and first aid instructions please refer to the Safety Data Sheet, which is available on request.
For samples, technical service and further information (ask for our User Recommendation Sheets), please contact your nearest Yara Sales Office.

July 2008
update 1) Packing 2) Address 3) New Spec Number

YaraVita™ Rexolin® D12

User Recommendation Sheet

YaraVita™ Rexolin® D12 is a product developed for usage on iron deficient soils with acid to neutral pH and for iron deficient crops through foliar application. Foliar application is recommended when the soil is neutral to alkaline or when soil application is impossible for other reasons. It has an excellent performance in hydroponic systems. For other applications and products please ask for our other Akzo Nobel Micronutrients products.

YaraVita™ Rexolin® D12 contains 116 grams iron per kg of product as **Fe-sodium-DTPA** derived from diethylenetriaminepentaacetic acid.

Crops and Soils Susceptible to Iron Deficiency

Horticultural crops, particularly perennials, and fruit crops are most commonly susceptible to iron deficiency. This is of commercial importance in fruit trees like apple, pear, apricot, cherry, plum, lemon, orange, lime and mandarin; in berries like strawberry and grape, and in vegetables like tomato, cucumber and bean. Other crops susceptible to iron deficiency include roses, ornamentals and arable crops such as cotton, cereals and soybean. Iron has to be applied to most high productive crops under arid and semi-arid conditions and always in green houses and soilless media for productive and economic growth.

Soils susceptible to iron deficiency are primarily alkaline and calcareous. These soils may be rich in iron but most of it is not available to the plants. Other soils poor in iron and where iron deficiencies might occur are highly leached soils and soils in areas with a low level of iron in the mother material.

Effects and Symptoms of Iron Deficiency

Iron deficieny starts with interveinal yellowing.The deficiencies of Fe and Mg (magnesium) are somewhat similar as both are characterized by a failure in chlorophyll production. Iron deficiency, however, unlike Mg deficiency always begins to show in the younger leaves. Mn (manganese) deficiency, on the other hand, demonstrates a more spotted appearance of yellow/white spots against the green leaf color.

These are the most frequent symptoms of iron (Fe) deficiency:

- Chlorosis, yellowish spots on leaves, spreading until the leaf becomes almost white.
- Premature leaf fall.
- Reduced production of new fruit bearing branches.
- Small, woody textured, flavorless fruit.
- Die back of new growth.
- Stunting.

Directions for Use

YaraVita™ Rexolin® D12 is meant for application to plants, as a solution in water.
YaraVita™ Rexolin® D12 is photodegradable: it has to be mixed with the soil during or immediately after application.

Application of the Product

The product can be applied by foliar feeding, soil application or in hydroponic systems.

Soil Application

Soil application is only recommended when soil pH is below 7.5. Apply it dissolved in water to the soil close to the plants or trunks. After each application water carefully to enhance nutrient uptake. Application must be made in a way that ensures the solution to reach the roots.

Hydroponics

The preferred pH near plant roots in soilless cultures for most plants is 5.5. However, in practice it may rise to as much as 7.5. That is why DTPA iron rather than EDTA iron is generally preferred. Vegetable crops (tomato, cucumber, etc.) do need 15 µmol/l Fe (0.8 mg/l) in the form of Fe-DTPA continuously, flower crops (roses, gerbera, carnation, etc.) 25-35 µmol/l Fe (1.4-2.0 mg/l). Consult table A for equivalents in grams of product.

Never bring **YaraVita™ Rexolin® D12** in direct contact with concentrated acids. **YaraVita™ Rexolin® D12** is stable between pH 1.5 – 7.5. Use chelated zinc, manganese and copper if these elements are dissolved in the same tank. Keep the solution in the dark and use it within one or two weeks. Check the Fe-level after recirculation or desinfection and add extra **YaraVita™ Rexolin® D12** if necessary.

When the pH near the roots is rising to 7.5 or higher, or when the water used contains very high levels of zinc, it is advised to substitute half of the Fe-DTPA by Fe-EDDHMA (or a high quality Fe-EDDHA).
For more information please ask for our leaflet "Chelation of micronutrients in soilless culture".

Foliar Application
Foliar feeding provides a rapid response and is recommended when fast correction is necessary or soil application is expensive and impractical, or impossible, for example if the soil is extremely wet. Repeated applications are usually necessary. For improving leaf coverage it is advisable to add a wetting agent, efficacy may be further increased by adding urea. Dissolve the product to a suitable concentration, and apply with spraying equipment. The pH of final concentration should be lower than 7, the final EC lower than 1. Dose rates for a specific crop should be tested first on a small scale.
Preventive treatment is made at the beginning of the growing season, when leaves are emerging. Curative treatment should be made upon early signs of chlorosis induced by iron deficiency. To reduce the risk of leaf scorching avoid application during hot, sunny days. Do not apply when crop is in bloom.

Compatibility
The product can be mixed with most other fertilizers and agrochemicals without inactivation, precipitation or scorching problems. Do not mix with chemicals based on copper or zinc. With liquid fertilizers use the mixture without delay. Chelates are sensitive to daylight.

Mixing
Add the required amount of product to a half filled sprayer tank, then complete the filling process. Ensure that sprayer nozzles are adequate for 200-1000 liters water/ha. Use the higher volume under dry conditions, when treating larger crops and at dense foliage.

Packing
Contact Yara for information regarding packaging. Shelf life of the product is more than 3 years.

Precautions
- ✓ Store in original container, keep tightly closed and store in cool dry place.
- ✓ Store away from children, pets, livestock and foodstuff.
- ✓ Wash hands after application and before meals.

No health hazards are involved in normal handling of **YaraVita™ Rexolin® D12** but it is advisable to follow the above precautions.

Dose Rates
The following dosages can be used as guidance.
Always adapt to the crop and cultivar involved and to the local circumstances.

A. Glass house Crops:

Crop	Deficient soil / compost	Soilless culture*	Foliar application
	For every watering		1-2 weeks interval
Vegetables	20-30 g/1000 l	8 g/1000 l	0.1-0.5 g/l
Cut flowers	20-45 g/1000 l	12-18 g/1000 l	0.1-0.5 g/l
Potted flowers, pot plants		8 g/1000 l	0.1-0.4 g/l

*) For the dose rate of a $1m^3$ tank, 100 times concentrated: multiply the amount of grams mentioned with 100.

B. Arable Crops and Open Field Horticultural Crops:

Soil application, arable crops	3 kg/ha	Apply pre-drilling or pre-planting to bare soil in a convenient volume of water, cultivate after spraying.
Soil application, horticultural crops	3-30 kg/ha	Apply through the watering system. Use enough water to wet the top 10 cm of the soil. Use clean water immediately afterwards to wash the iron chelate from the foliage. Or use the last 5 minutes the foliar application rate.
Foliar application	0.6-1.2 kg/ha	Apply in a water volume that gives adequate coverage of the crop (200-1000 L). Do not exceed a concentration of 0.1%.

1 kg/ha = 0.9 lbs/acre 1 g/l = 0.13 oz/gal

Main characteristics
- Solubility in water: 110 g/l (20 ºC)
- EC (1 g/l): 0.35 mS/cm
- Poor in Chloride

Modified:June 02