



**DOVE**  
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## Information

### Iron Chelates

### Librel Fe-Lo

Contains chelated iron as Fe EDTA equivalent to 13.2% Fe.

#### Product Use

1. To correct iron deficiency in most agricultural, horticultural and fruit crops. Recommended for foliar application or application to acid soils (pH below 6.0).
2. As a micronutrient source in hydroponic and liquid feed solutions and soil-less growing media.

**Librel Fe-Lo** gives best results when crops have adequate supplies of water and major nutrients and are not under stress for any other reason. Conditions which are responsible for one particular deficiency can also induce deficiencies of other micro-nutrients. Always ensure that deficiencies are confirmed before treatment is carried out.

#### Mixing With Water

Simply add the powder to water while it is being agitated, do not pre-mix. Continue agitation for a short while to ensure complete dissolution.

**Librel Fe-Lo** should be dissolved in a convenient volume of water to suit the spraying machine being used and the target crop leaf area. The following points should be observed:

1. The sprayer should be fitted with nozzles that produce a fine mist.
2. Only sufficient spray solution should be applied to coat the leaves and stems with a film of moisture with little or no "run off".
3. Spraying should be carried out on a calm day BUT NOT DURING STRONG SUNSHINE OR HIGH TEMPERATURES. The best time is late afternoon or evening.
4. If rain is imminent, spraying should be postponed. If rain falls within 4 hours of spraying, the crop should be re-sprayed 3 or 4 days later.

#### Rates of Use - Field Crops

- Severe deficiency: 2kg/ha
- Moderate Deficiency: 1kg/ha
- Fruit Crops 1kg/ha (maximum spray concentration of 0.1%)

#### Fruit Crops

Do not exceed a solution of 0.1% (1g/l) for any one or combination of **Librel** chelates. Some fruit varieties and cultivars can exhibit unpredictable sensitivity to EDTA chelates. Where local experience of successful use is not available, we strongly recommend small scale test applications before wide spread use.

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## Fruit Trees, Bushes and Canes

Soil pH under 6.5

Plant Size	Rate per tree or bush	
	Slight Deficiency	Severe Deficiency
Fruit Bushes	10g ( $\frac{2}{5}$ oz)	20g ( $\frac{4}{5}$ oz)
Small Fruit Trees	20g ( $\frac{4}{5}$ oz)	40g ( $1\frac{1}{2}$ oz)
Large Fruit Trees	100g ( $3\frac{1}{2}$ oz)	200g (7oz)

Apply in solution, in a minimum of 10 litres of water per tree (2 gallons) to the area beneath the branch spread.

Crop	Slight Deficiency	Severe Deficiency
Blackberry, loganberry, strawberry and closely planted bush fruit	4kg per hectare (4lb per acre)	8kg per hectare (9lb per acre)

Apply as a spray to the soil between the rows and cultivate immediately after spraying.

### Timing

The best time for soil applications is towards the end of the dormant season, but early enough to allow winter rains to wash it down to the roots.

### Soil Irrigation/Liquid Feeding

Where the pH is below 6.5 it may be convenient to supply it through soil irrigation or feeding systems. If deficiency symptoms are apparent the aim should be to supply 6 mg/lt (6 ppm) Fe until symptoms abate. The rate should then be reduced to 3 mg/lt (3 ppm) Fe to control further deficiency.

The amount of EDTA to be added to the stock solutions to give the required final concentration is dependent on the dilution rate used.

Final Conc.	Amount in stock solution	
6 mg/lt Fe	Dilution 1:100	43g per 10lt (1oz/gal)
	Dilution 1:200	86g per 10lt (2oz/gal)
3 mg/lt Fe	Dilution 1:100	22g per 10lt ( $\frac{1}{2}$ oz/gal)
	Dilution 1:200	43g per 10lt (1oz/gal)

### Mixing

These products are readily soluble in water. Add the weighed amount of the powder to the bulk of the water and stir or agitate until dissolved.

### Water Volume

The amount of Librel Fe-Lo to be applied should be mixed with a volume of water appropriate to the crop leaf area of the type of spraying machine being used.

- Arable crops: 200-600 litres per hectare.
- Fruit crops: 500-1000 litres per hectare.

NB: Do not exceed a solution concentration of 0.1% (100 grams per 100 litres of water).

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### **Wetting Agent**

Unless **Librel Fe-Lo** is to be applied with a pesticide containing sufficient wetter, a non-ionic wetting agent should be added at the recommended dose rate.

### **Small Scale Use**

Knapsack sprayers: prepare a 0.05-0.1% (0.5-1.0 gram per litre) solution and apply so as to coat the leaves and stems with a thin film of moisture with little or no run-off.

**Soil Application:** The appropriate amount of **Librel Fe-Lo** should be dissolved in a convenient volume of water to suit the application equipment and to ensure even ground coverage.

**General Crops:** Apply as a coarse low pressure spray immediately before the last cultivation prior to sowing or planting. Where crops are established, apply between the rows.

**Perennial Crops:** Apply as a coarse low pressure spray in a wide circular band under the limit of the full branch spread. For best results, nutrients should be in the root zone before seasonal growth begins and this can be achieved by appropriate application timing.

**Rates of Use:** Apply 1.5-6.0 kg/ha depending on the degree of deficiency crop size etc.

**Storage:** This product will store indefinitely under normal conditions. For user convenience it is recommended that the product is stored in a dry place. Re-seal partly used packs tightly. Store away from children, pets, livestock and foodstuffs.

**Compatibility:** **Librel Fe-Lo** is compatible with all other **Librel** chelates and many crop care chemicals. They are also fully compatible with solutions containing soluble phosphates such as liquid feeds and foliar fertilisers.

Where applications are made by knapsack or hand held sprayers care should be taken to avoid application rates in excess of those recommended.

Fan assisted sprayers are not suitable for the application of Chelates as the low water volumes used preclude the use of correct spray concentrations.

### **PRECAUTIONS**

**WASH HANDS** before meals and after work.

**STORE IN ORIGINAL CONTAINER**, tightly closed in a safe place.

**STORE AWAY FROM CHILDREN, PETS, LIVESTOCK AND FOODSTUFFS.**

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## Librel Fe-HI

- An iron EDDHA product (7% w/w)
- For the treatment of iron deficiency in crops and ornamentals growing in moderately alkaline and calcareous soils. (For soil treatment of acid soils where pH is under 6.5, use EDTA).

### Mixing with water

The powder should be added slowly to the main bulk of the water while it is being agitated. Continue agitation for a short while to ensure complete dissolution.

### Compatibility

Librel Fe-HI is compatible with all Librel chelates and solutions containing soluble phosphates.

### **Soil applications**

Apply as a coarse low pressure spray. If the soil is densely compacted, the surface should be broken up before application.

Always incorporate applications into the top few centimetres of soil as soon as possible after applying. This can be done by harrowing or hoeing in, or by irrigation.

Librel Fe-HI may also be applied through irrigation systems by periodically adding the equivalent of 1kg/ha in 10,000 litres of water. Frequency of addition will depend on the degree of deficiency.

### **Rates of use**

<b>Crop</b>	<b>Rates of use</b>
Field crops	Apply 1 - 5kg/ha
Trees	25 - 100g per tree
Shrubs	0.5 - 2.5kg per 100 bushes
Soft fruit	0.5 - 1kg per 100 plants

These rates indicate upper and lower limits. Actual amounts depend on crop size and/or degree of deficiency.

Apply, pre-planting or pre-drilling, to bare soil in a convenient volume of water and cultivate in immediately after spraying.

### **Soil Application – Fruit Trees, Bushes and Canes**

<b>Plant size</b>	<b>Rate per tree or bush</b>	
	<b>Slight Deficiency</b>	<b>Severe Deficiency</b>
<b>Fruit Bushes</b>	5g ( $\frac{1}{5}$ oz)	25g (1oz)
<b>Small fruit trees</b>	25g (1oz)	100g ( $3\frac{1}{2}$ oz)
<b>Large fruit trees</b>	50g (2oz)	200g (7oz)

Apply in solution, in a minimum of 10 litres of water per tree (2 gallons) to the area beneath the branch spread.

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<b>Crop</b>	<b>Slight Deficiency</b>	<b>Severe Deficiency</b>
<b>Blackberry, strawberry, loganberry &amp; closely planted bush fruit</b>	5kg per hectare (5lb per acre)	10kg per hectare (10lb per acre)

Apply as a spray to the soil between rows, and cultivate in immediately after spraying.

### **Timing**

The best time for soil application is towards the end of the dormant season, but early enough to allow winter rains to wash it down to the roots.

### **Soil Application – Ornamentals, Roses and Calcifuge Plants**

	<b>Rate per bush, plant or pot</b>	
	<b>Slight Deficiency</b>	<b>Severe Deficiency</b>
<b>Alpines, heathers and herbaceous flowers</b>	2.5g ( <sup>1</sup> / <sub>10</sub> oz)	5g ( <sup>1</sup> / <sub>5</sub> oz)
<b>Shrubs and roses</b>	5g ( <sup>1</sup> / <sub>5</sub> oz)	10g ( <sup>2</sup> / <sub>5</sub> oz)
<b>Azaleas, camellias, magnolias and rhododendrons</b>	10g ( <sup>2</sup> / <sub>5</sub> oz)	25g (1oz)

Use the lower rate for newly planted stock.

Dissolve the required amount of EDDHA in a minimum of 5 litres (1 gallon) of water and water round the base of the plant. Water again or irrigate after treatment to wash it down to the roots.

### **Timing**

The best time for application is in the early part of the growing season, but application can be made at any time during the growing season.

### **Soil Application – Container grown nursery stock**

Container grown nursery stock can be very susceptible to iron deficiency, which is often induced by factors such as poor watering, lack of control of pH and high manganese levels, particularly in bark based composts.

Successful control of deficiency on a wide range of subjects, including ericaceous species, has been achieved by applying an early spring spray at 8 grams of EDDHA per square metre of bed. It should be mixed with water and sprayed over the area. Following treatment, irrigate from overhead to ensure that the Iron 6 is washed off the foliage and into the growing medium.

Alternatively use in the compost at a rate of 60g per cubic metre before potting up.

### **Soil Irrigation/Liquid Feeding**

Where the soil pH is above 6.5 it may be convenient to supply EDDHA through soil irrigation or feeding systems. If deficiency symptoms are apparent the aim should be to supply 6mg/lit (6 ppm) Fe until symptoms abate. The rate should then be reduced to 3mg/lit (3 ppm) Fe to control further deficiency.

The amount of EDDHA to be added to the stock solution to give the required final concentration is dependent on the dilution rate used.

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<b>Final conc.</b>	<b>Amount in stock solution</b>	
6mg/l <sub>t</sub> Fe	Dilution 1:100	100g per 10 lt
	Dilution 1:200	(2oz/gal)
3mg/l <sub>t</sub> Fe		200g per 10 lt
	Dilution 1:100	(4oz/gal)
	Dilution 1:200	
		50g per 10 lt
		(1oz/gal)
		100g per 10 lt
		(2oz/gal)

### **Repeat Applications**

On perennial crops, especially fruit trees, it may take more than one year of soil application at the higher rate to remedy serious longstanding deficiencies. After several years of treatment with iron chelate, chlorosis may start to develop in the older leaves as a consequence of induced manganese in a combined programme.

### **Nutrient Film Technique (NFT)**

Iron is an essential ingredient of the nutrient solution. EDDHA may be used but the most economical treatment is Fe EDTA.

### **Mixing**

EDDHA is soluble in water. Add the weighted amount of the powder SLOWLY to the bulk of the water and stir or agitate until dissolved.

### **APPLICATION DETAILS**

Foliar sprays of iron chelate alleviate the symptoms of deficiency in the year of application. Foliar sprays combined with soil treatments will speed the recovery of severely affected trees. For foliar application the most suitable chelate is Fe EDTA.

Foliar sprays of trace elements are most effective in the early morning or late evening. Do not apply in bright sunshine or when the temperature is over 20°C.

DO NOT MIX EDDHA with pesticide sprays as scorch may occur.

DO NOT ADD extra wetting agents.

Where applications are made by knapsack or hand held sprayers care should be taken to avoid application rates in excess of those recommended.

Fan assisted sprayers are not suitable for the application of Chelates as the low water volumes used precludes the use of correct spray concentrations.

### **PRECAUTIONS**

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## Hortifeeds

### **HortiFe 120**

- 12% Fe product

CROP	APPLICATION RATE AND TIMING
Vegetables and salad crops (foliar)	100g / 100 litres water. Repeat 3-8 times every 7-14 days.
Fruit Crops (foliar)	100g / 100 litres water. Repeat 3-8 times every 7-14 days.
Field Crops (foliar) Moderate Deficiency	100g / 100 litres water. Repeat 3-8 times every 7-14 days.
Field Crops (foliar) Severe Deficiency	200g / 100 litres water. Repeat 3-8 times every 7-14 days.
Salad Crops (soil/fertigation)	2 - 5 Kg/Ha
Vegetables (soil/fertigation)	4 - 6 Kg/Ha
Fruit trees and citrus (soil/fertigation)	
Full production	20 - 50 grams / plant
Fruit trees and citrus (soil/fertigation)	
3 to 5 year old trees	5 - 15 grams / plant
New trees (soil/fertigation)	3 - 5 grams / plant

<https://www.hortifeeds.co.uk/products/hortife-120/>

## Solufeed

### **Solufeed Fe13 (13.2%)**

- Soluble powder for foliar applications.
- Irrigation water of pH <6.5. Stable up to pH 6.5 so is suitable for hydroponic systems where the pH is under control.
- Application details as per Librel Fe-Lo above.
- <https://uk.solufeed.com/products/chelates/solufeed-fe-13-edta>

### **Solufeed Fe6 (6%)**

- EDDHA soluble microgranules for soil applications.
- Irrigation water pH <9.5. Stable up to pH 9.
- Can hold iron in the soil solution and keep it available to the plant.
- EDDHA is the most stable and available form of iron and can boost iron availability in low temperatures.
- Application details as per Librel Fe-Hi above.
- <https://uk.solufeed.com/products/chelates/solufeed-fe-60-eddha-extra>

## Yara

### **Ferleaf (EDTA Fe)**

#### **All crops**

- Application rate is 1 lt/ha. Repeat 3 to 8 times at 7 to 14 day intervals. Start applications as soon as there is sufficient leaf cover to intercept spray (preventative application) or as soon as first symptoms of chlorosis appear (curative treatment).
- Do not apply during flowering.
- Water rate: 1,000 lt/ha.
- <https://www.yara.co.uk/crop-nutrition/fertiliser/micronutrient/yaravita-ferleaf-100/>

### **Hydroponics**

The rate will vary according to the concentration of iron requirement in the final solution. Mixing 10ml of product with 1,000 litres of water will give a solution containing 1ppm iron.

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## **Fersoil (EDDHA Fe)**

### **Application Rates and Timings**

- Slight chlorosis: 30 lt/ha (30ml/10m<sup>2</sup>)
- Moderate chlorosis: 50 lt/ha (50ml/10m<sup>2</sup>)
- Severe chlorosis: 70 lt/ha (70ml/10m<sup>2</sup>)

### **Application via drip irrigation equipment**

- Fruit: 10 - 15 lt/ha spread over 3-4 weekly applications
- Vegetables: 4 - 6 lt/ha spread over 3-4 weekly applications
- [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi1oCbDrb\\_xAhUSTsAKHYIfD3UQFjAAegQIAhAD&url=http%3A%2F%2Fwww.yara-i.com%2Flabels%2Fwluk22641.pdf&usg=AOvVaw20IH2yYND7nC5XTysNKjH3](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi1oCbDrb_xAhUSTsAKHYIfD3UQFjAAegQIAhAD&url=http%3A%2F%2Fwww.yara-i.com%2Flabels%2Fwluk22641.pdf&usg=AOvVaw20IH2yYND7nC5XTysNKjH3)

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