FACT SHEET
JUNE 2024

FOLIAR FERTILISERS

Foliar sprays are a convenient way to apply additional nutrients to plants, supplementing those taken up from the soil. They are frequently used during peak demand periods and at critical growth stages, e.g. fruit filling. Foliar sprays also provide quick responses where a nutrient deficiency occurs.

There are limits to the amount of nutrient that can be applied in foliar sprays. It is normally not possible to meet the complete demand for the macronutrients, i.e. those nutrients taken up in large quantities such as nitrogen and potassium, through foliar sprays without burning the foliage. On the other hand, plant demands for the micronutrients or trace elements, which are taken up by plants in small amounts, can often be met through foliar sprays.

For some nutrients and crops, foliar sprays represent the best application method. Iron and manganese, for example, are abundant in soils. Deficiencies occur not because there is not enough iron and manganese in the soil, but because it is present locked up or fixed in forms that are unavailable for plant root uptake. Soil applied iron and manganese fertilisers are subject to the same fate.

Calcium deficiency can affect the quality of fruit and vegetables, even in soils that are well endowed with calcium, particularly if the crop is moisture stressed at critical growth stages. The use of soluble calcium fertilisers such as calcium nitrate in fertigation programs and/or as foliar sprays is one of the best ways to prevent calcium deficiency occurring in horticultural crops that are susceptible to it.

FOLIAR BURN

Crops vary in their sensitivity to leaf burn. A crop's sensitivity to salinity is a good guide of its sensitivity to fertiliser burn to the foliage. Cotton is one of the most salinity tolerant crops, followed by cereals. Among the vegetable crops, brassicas and cucurbits are reasonably tolerant, while beans are among the most susceptible crops.

The incidence of fertiliser burn is also influenced by many other factors, including the prevailing weather conditions and water quality. Unless instructed otherwise, avoid spraying during flowering, as fruit, nut and seed set may be reduced.

TOXICITY SYMPTOMS

The early symptoms of boron toxicity are usually marginal and tip chlorosis of the older leaves. As the toxicity becomes more severe, leaf necrosis progresses from the tip or margins and gradually covers the whole leaf, resulting in premature leaf drop.

While boron may be present in toxic concentrations in the soil, e.g. clay sub-soil in semi-arid regions. One of the more common causes of toxicity is over-fertilisation. Toxicity can also be associated with poor placement of boron fertiliser. Strawberry, peach, grape, bean, pea, and cucumber are sensitive to boron toxicity.

APPLICATION

The table on the back of this page has been prepared as a guide and a quick reference to application rates and spray concentrations for commonly applied foliar fertilisers. Lower rates may be required in sensitive crops, e.g. strawberry, and if two or more fertilisers are foliar applied simultaneously.

As a rule of thumb, micronutrients are applied as 1% solutions (1 kg/100L) in low volume sprays (<100L/ha) in field crops, and as 0.1% sprays (100g/100L) in high volume sprays in horticultural crops. Typical spray volumes in horticulture, wetting the leaves to the point of run-off, are 500–800 L/ha in vegetable crops, and 1500 L/ha in tree crops.

Macronutrients are applied at higher concentrations, typically in the range of 5 – 10% w/v in field crops (5 – 10 kg/100 L), 1 – 2% in vegetables (1 – 2 kg/100L), and 0.5 % in tree crops (500 g/100L).

ADVICE

Except for Urea, Incitec Pivot Fertilisers does not sell “Solution Grade” soluble solids. If using such products, specific Use Directions should be sought from the product’s supplier.

Check that all ingredients (fertilisers and crop protectants) are compatible before mixing. If applying a foliar spray or mixing products for the first time, or application details and environmental conditions have changed, test spray a small area and wait for a few days to check for signs of crop damage (foliar burn) before spraying the entire crop.

FURTHER READING

More detailed advice is available in the Incitec Pivot Fertilisers Agritopic on “Foliar Fertilisers” and the available Agritopics on the individual specific nutrients.

SAFETY DIRECTIONS

Refer to the Safety Data Sheet (SDS) for more detailed safety advice. Before use, read the Product Label and the SDS. Use safe work practices and avoid contact with the eyes and skin. Avoid ingestion and inhaling dust. Protective clothing, eyewear and dust masks should always be used when dealing with this product. Observe good personal hygiene, including washing hands after use. Avoid loss of fertiliser to waterways.

WARNING

This document contains information of a general nature. Before using fertiliser seek independent agronomic advice. Fertiliser programs may need to be varied depending on the plants being grown, climatic and soil conditions, application methods, irrigation, agricultural and livestock management practices, the soil’s fertility, and cultural practices. (‘Unforeseen Elements’)

Fertiliser may burn and/or damage crop roots or foliage. Foliar burn to the leaves, fruit or other plant parts is most likely to occur when fertilisers are foliar applied at high concentrations and/or on a regular basis, different products are mixed and sprayed together at cumulatively high rates, the water is of poor quality, or the spray is applied under hot dry conditions, e.g. in the heat of the day.

Fertiliser and supplements may affect animal health. Seek independent advice before using any supplements in livestock rations.

DISCLAIMER

As Unforeseen Elements are beyond the control of Incitec Pivot Limited, in no event Incitec Pivot Limited and its related bodies corporate be liable or accept any responsibility whatsoever for any direct, indirect, punitive, incidental, special or consequential damages (including but not limited to loss of revenue, crops and livestock), in respect of the illness, injury or death of a person, damage to property (including of a third party), or any other loss whatsoever arising out of or connected with the use or misuse of this fertiliser, or its transport, storage, handling or application. Where Incitec Pivot Limited and its related bodies corporate's liability cannot be lawfully excused, it and its related bodies corporate's liability shall be limited to the replacement of, or cost of the fertiliser supplied. The buyer accepts and uses this product subject to these conditions.

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Products *Urea products in bold type are marketed by Incitec Pivot Fertilisers.*	**Rate per spray**	**Typical Spray Volume (L/ha) & Spray Concentration (kg/100 L)**			**Comments**
		Crops	**Vegetables**	**Trees, Vines, Flowers**	
	kg/ha	50 L/ha	500 L/ha	1,500 L/ha	
Urea Liquifert N, Liquifert Lo-Bi	10	10 – 20	1 – 2	0.5	Up to 30 kg/ha (20 – 30% solution at 100 L/ha) can be used in winter cereals at mid-tillering. Use Liquifert Lo-Bi where sprayed repeatedly in horticulture.
MAP (solution grade) MKP (solution grade)	2.5 – 5	-	0.5 – 1.5	0.25 – 0.5	As phosphorus is important in the early stages of plant growth, the complete crop requirement is normally applied as a basal soil dressing at planting. Foliar phosphorus sprays are not commonly used.
Potassium Nitrate	5 – 10	*Cotton* Ground 5% Air 10–20 %	0.5 – 2	0.5 – 1	Up to 20 kg/ha may be used in a single spray in tolerant tree and field crops, e.g. cotton. Potassium sulfate (Sulfate of Potash) may also be used to foliar apply potassium, but it is less soluble, and therefore not recommended for use through low volume spray equipment.
Calcium Nitrate	5	-	0.8	0.5	Regular, e.g. weekly, sprays are required during the fruit filling period as calcium is immobile in plants.
Magnesium Sulfate	2 – 5	2 - 5	0.25 – 1	0.25 – 0.5	Some authorities recommend 1 % (1 kg/100 L) sprays in horticultural crops. Fortnightly sprays are often required during critical growth stages.
Solubor	0.5 – 2.5	1 – 2	0.2 – 0.5	0.1 – 0.25	Two or more sprays during critical growth stages, to apply 1 – 7.5 kg/ha in total through the growing season or per annum. The lower rates are used on sensitive and low boron demanding crops. Cumulative foliar rates may approach those recommended for soil application.
Copper Sulfate (Bluestone)	0.5 – 1	1	0.05 – 0.1	0.05 – 0.1	One or two sprays in early growth stages; one spray to spring flush in tree crops. In cereals, a late spray prior to pollination may be required.
Iron Sulfate	1		0.1	0.05 – 0.1	Iron is immobile in plants. Three or four sprays may be required during the growing season.
Manganese Sulfate	1 – 2	1	0.1 – 0.5	0.1 – 0.2	One or two sprays early in growing season or to the spring flush. Higher rates, two sprays at up to 3.5 kg/ha at 6 - 8 and 12 - 14 weeks after seeding are recommended in grain crops on calcareous soils in South Australia.
Zinc Sulfate Heptahydrate	1	1 - 2	0.2 – 0.25	0.1	Two sprays after emergence or transplanting; One spray to spring flush in tree crops.
Sodium Molybdate	50 g		0.05 – 0.1		One or two sprays at seedling stage at 30 – 100L/ha, enough to wet foliage.