

Reasons for using potassium nitrate in a foliar spray

Potassium nitrate can be used for one or more of the following reasons:

- To prevent the occurrence of nutrient deficiency before the first deficiency symptoms appear. This is especially the case when foliar analysis shows lower nutritional levels than the desired optimum levels.
- To correct nutrient deficiency.
- To increase pest and disease resistance.
- To promote well-balanced fruit and/or plant growth and development, especially in orchards with physiological disorders.

When to use potassium nitrate in a foliar spray

Potassium nitrate should be used only where there is a recognized need.

Situations that make foliar plant nutrition with KNO_3 very beneficial

One or more of the following situations make foliar plant nutrition with KNO_3 very beneficial:

- When there is a limited nutrient uptake via the root system, caused by:
 - Damaged roots: diseases, mechanical damage.
 - Unfavourable soil conditions:
 - Too wet (water logging, low oxygen content), too cold, too dry.
 - Nutrient deficiency or excess in the soil.
 - Fixation (K-fixing clay soil).
 - Salinization (cation competition).

- When peak demand exceeds the nutrient supply via the roots.
 - In situations when localized within-plant demand may exceed the capacity of within-plant nutrient redistribution
 - As in the vicinity of large fruit and nut clusters with high localized demand of many nutrients in the fruit.

 - In the case of limited nutrient mobility, when flowering precedes leaf expansion and thereby limits xylem nutrient transport.
 - For faster recovery of the leaves after stress caused by night frost.

Recommendations and guidelines for foliar sprayings

- Add potassium nitrate when the tank is half filled with water and stir until all potassium nitrate is dissolved.
- Do not exceed the maximum dissolution rates of potassium nitrate in water.
- The temperature of the dissolution water drops when potassium nitrate is dissolved.
- The dissolution time of potassium nitrate can be shortened when the temperature of the dissolution water is increased.
- Apply early in the morning or late in the afternoon, when the air humidity is sufficiently high in order to expand the leaf wet period and promote nutrient absorption by the leaf.
- Make a jar test to check the compatibility with pesticides.
- Make a test with different concentrations of potassium nitrate to assess when leaf burning takes place.
- Nutrient uptake is enhanced when the pH of the spray tank solution is slightly acidic (pH 4-5). Therefore, the use of an acidic potassium nitrate for foliar spray is recommended.
- pH levels of the final tank mix solution below 4 may provoke scorching.

Table 1 shows crop-specific recommendations for foliar KNO_3 sprayings in vegetables, flowers and field crops.

Table 1.

Crop-specific recommendations for foliar KNO_3 sprayings in vegetables,

Crop

Conc. (%)

Moments of application

Carrot

2

Every 2 weeks from carrot root expansion onwards

Corn

2-4

2 appl. during filling of grains

Cotton

3-7

4 appl. at 10-14 days interval, 1st one at beginning of flowering

Cucumber

1-4

2-4 appl. during fruit development of plants

Eggplant

1-4

2-4 appl. during fruit development of plants

Flowers

0,5-1

3-4 appl. during period of high vegetative growth

Onion/garlic

1-3

Apply every 2 weeks from pencil stage until bulb initiation

Pepper (Capsicum)

1-4

2-4 appl. from the first flower flush onwards until end of harvest

Potatoes

2

2-4 appl., 1st at inflorescence emergence

1-2

Weekly preventive sprays when risk of frost

Rice

2-4

3 appl., at active tillering, panicle initiation and at the end of flowering

Soybean

0,5-2

2 appl. (at R1 and R2 stage)

Sugarbeet

2

2-6 appl. from the 6th leaf stage onwards, minimum 2 weeks interval

Sugarcane

0,25-1

6 weeks before harvest to improve maturation

5-10

Aerial application

Sunflower

1

Just before flowering

Tea

2-3

8 appl. during the growing season

Tobacco

2-4

2-4 appl. during active plant growth

Tomatoes

4

2-6 appl., one per week, starting 2 months before harvest

Vegetables

1-4

2-4 appl. during active plant growth

Wheat

2-4

1 appl. at the beginning of flowering and 2 appl. during filling of grains

Table 2 shows crop-specific recommendations for foliar KNO_3 sprayings in fruits and nut tree crops.

Table 2. Crop-specific recommendations for foliar KNO₃ sprayings in fruits and nuts

Crop

Conc. (%)

Moments of application

Almond

2-4

3-4 appl. at monthly rates after petal fall

Avocado

5

2 appl., 1st after full leaf expansion

Banana

2

2-6 appl. at 10 day interval (during fruit development)

Berries

2

2-4 appl. weekly to promote berry growth, colouring and firmness

Cherry

2

2-4 appl. at 10 day interval (during fruit development)

Citrus

1-4

1-4 appl. at pre-bloom, post-bloom and during fruit growth

Coffee

2

6 appl. at monthly interval, 1st appl. at beginning of berry formation

Grapes

1

3-5 appl. starting when shoots are about 15-20 cm long until berry formation

Kiwi

1

3-5 appl. starting in spring when shoots are about 15-20 cm long

Mango

2-5

3-4 appl. at weekly interval to induce flowering

1-2

3 appl., 1st at full flowering, 1 and 2 months after flowering (to reduce fruit drop)

Melon

1-2

2-6 sprays from flowering until harvest

Nuts

2-5

2-4 appl. during nut growth

Olives

2,5-4

6 appl. on a monthly basis from fruit initiation onwards

Pineapple

2-6

Each 2 weeks from plant establishment until flowering

Pome fruit (apple, pear)

8

To break winter dormancy

2

2-4 appl. at 10 day interval (during fruit development)

1

To control *Psylla Pyri* (in combination with insecticide programme)

0,5-1

1 appl. 2 weeks before harvest (to prolong shelf life of the fruit)

Stone fruits (nectarine, peach)

10

To break winter dormancy

1-2

2-4 appl. at 10 day interval (during fruit set and development)

0,5-1

1 appl. 2 weeks before harvest (to prolong shelf life of the fruit)

