

Vegetable Fertiliser Guide for Top End Gardeners

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BASE FERTILISER

For rapid healthy development vegetables need adequate available nutrients from germination onwards. A very important element at this stage is phosphorus as it is involved in root development; some plants take up their entire phosphorus requirements in the first few weeks of growth.

Fertilisers come in various formulations, for vegetables a complete high analysis fertiliser is recommended. The formulation of the fertiliser should be printed on the bag; one suitable for a base application for vegetable growing would contain the following rates:

nitrogen (N)	10-16%
phosphorus (P)	10-16%
potassium (K)	10-16%

If you can get one which includes trace elements such as sulphur (S), zinc (Zn) and molybdenum (Mo) so much the better.

Because our soils are very low in phosphorus it is beneficial to add extra to the base application in the form of single super phosphate, as this contains extra sulphur, it is also available with trace elements e.g. zinc, molybdenum etc.

The base fertiliser should be applied to the soil at least 2 weeks before planting and lightly worked into the top 2 cm. The soil should be damp to allow the fertiliser time to begin dissolving so that when seedlings are planted out or when seeds germinate they have nutrients immediately available to them.

Rate: NPK Fertiliser 700 kg/ha (70 g/m²) plus single super phosphate 700 kg/ha (70 g/m²)*.

*This is for new ground, after a couple of crops the phosphorus levels should have built up in the soil and the extra super will not be necessary.

If using poultry manure, apply it at a rate of 2 to a maximum of 5 tonnes per ha (200-500 g/m²). This should be worked into the soil before planting for maximum benefit. The best method would be to apply 1 tonne (100 g/m²) of poultry manure and reduce the base chemical fertiliser rate to half.

NB Fresh poultry manure should never be used as burning of plant roots can occur. It should be allowed to weather for at least a couple of months before use.

SIDE DRESSING (SUPPLEMENTARY FERTILISER)

The base fertiliser will not supply enough nutrients to see the crop through, it will only get the plants off to a good start, after the plants are 2-3 weeks old they will require additional fertiliser in the form of a side dressing, if they are to develop to their maximum potential yield. There are a number of methods of applying the side dressing.

1. DIRECTLY TO THE SOIL

Using a 50:50 mixture of urea and muriate of potash apply around plants at the rate of 200 kg/ha (20 g/m²). Generally 2-3 applications should be sufficient depending on the condition of the plants.

For longer term crops such as capsicums, tomatoes and egg fruit, the high analysis NPK fertiliser used in the base can be used at the rate to 20 g/plant every 7-10 days.

2. FOLIAR FERTILISING

This is applied as a spray ensuring that the whole plant is wet. To be effective it is important to use Agral 600[®] as the "wetting agent", at the recommended rate. Sprays are applied weekly to the crop. The urea used must have a low biuret formulation (below 0.4%) or burning of the leaves will occur. The rate is:

Agral 600 [®]	0.1%	15 mL/15 L Knapsack
urea	0.5%	75 g/15 L Knapsack
potassium Nitrate	1.5%	225 g/15 L Knapsack

Never apply foliar fertilisers when plants are under stress eg in need of water or during the heat of the day. These are usually applied weekly from about the 3rd week onwards. If necessary an insecticide can be included in the "brew" but manufacturer's directions must be followed.

3. FERTIGATION

This method may be a bit complicated for the home gardener on a small scale but is gaining in popularity with commercial growers. Basically it involves dissolving the fertiliser in water and injecting it into the irrigation system. With this method, highly soluble technical grade fertilisers are used and metering devices are needed to accurately apply the fertiliser.

TRACE ELEMENTS

Plants require trace elements for healthy growth, but over supply of these elements can be toxic to them. Some fertiliser mixes have trace elements added, which help build up reserves in the soil with continual use.

Trace elements are also available in packets as a trace element mix. These should be included in potting mixes used for seedling raising at the rate of 6 g/ 40 litres of mix. (The most convenient and efficient method of applying trace elements is as a foliar spray). Seedlings should be given two "cocktail" sprays as an insurance against molybdenum and zinc deficiencies which occur in the Top End, cabbage, cauliflower and broccoli are particularly susceptible to molybdenum deficiency. The first spray should be at transplanting, or in the case of direct seeded crops at the 4 leaf stage, this is followed 2-3 weeks later by a second application.

The rates are:

sodium molybdate	1 g/L
zinc sulphate (heptahydrate)	2 g/L
The addition of a low biuret urea at	5 g/L
Plus Agral 600® (a wetting agent) at	1 mL/L

will greatly assist the uptake of the trace elements.

CORRECTING SOIL ACIDITY

The pH level of the soil is the measurement of acidity or alkalinity, a pH of 7 is neutral, readings above this indicate alkaline soils and readings below 7 indicate acid soils. Most Top End soils are acid, generally reading pH 6 or lower. The ideal pH level for growing crops is pH 6.5. At this level all nutrients are available to the plant, at levels above or below, certain elements become tied up in the soil and are not available to plants. This is especially the case with trace elements.

To raise the pH in acid soils (that is to make them less acid) it is necessary to lime the soil with dolomite or agricultural lime. Dolomite is preferred because it contains both calcium and magnesium in the approximate ratio of 3:1 which is desirable for optimum plant growth. Other forms of lime may only contain calcium and create an imbalance in the Ca: Mg ratio in the soil, which can be difficult to rectify.

Most virgin Top End soils require an application of at least 2.5 tonne of dolomite per hectare (250 g/m²) to raise the pH to the optimum level of 6.5.

To maintain the pH level at 6.5 in any soil where vegetables are grown on a regular basis requires an additional 0.5 to 1 tonne of dolomite per year (50-100 g/m²). This is best applied at the beginning of the Wet and dug into the soil together with any organic matter at least a month before applying any nitrogenous fertiliser.

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