Banana Fertiliser Requirements

Bananas generally require a tropical or subtropical climate for optimum growth but can be grown in cool temperate climates if given a warm position. Although bananas have shallow root systems (top 500mm), they require well drained soil that is high in organic matter.

Current industry guidelines recommend frequent small applications of fertiliser, rather than fewer applications of greater amounts. Applications and products should vary throughout the year to best match the growth cycle of the plants. An average farm produces 1,500 cartons per hectare which represents 20 tonne per hectare of fruit sold. This represents the following nutrient removal;

Nitrogen	72kg
Phosphorous	7kg
Potassium	116kg
Magnesium	8kg
Calcium	10kg

Plus other TE’s

Potassium is the key element in banana nutrition and symptoms of deficiency include:

- Yellowing and premature death of older leaves ("banana yellows").
- Reduced leaf size, delay in bunch initiation.
- Reduced fruit numbers per bunch, and reduced fruit size.
- Inadequate fruit filling, especially in Spring.

Soil tests are recommended in April - May to ensure that the most accurate fertilizer requirements are prepared for the coming spring season .Leaf tests should be taken between October and January. The optimum soil pH for banana growing is 5.0-5.5($CaCl_2$).

Banana Fertilizer Application

In terms of dry fertiliser application, it is recommended that all fertiliser be broadcast evenly through out the plantation. Nitrogen should be applied in frequent small amounts to minimise leaching. Otherwise an Amgrow Specialty Ferticote blend containing 2 month controlled release Nitrogen should be used. Fertigation is the ideal way to apply nitrogen .Nitrogen should be applied up to 10 times per year as a dry application.

Phosphorous can be applied 1-2 times per year.

Potassium needs to be applied 4-5 times per year.

Growers should match fertiliser applications to weather conditions, growth rates and yield. Trace elements should be applied per soil and leaf test recommendations .Most uptake of nutrients occur prior to bunch emergence ,therefore the majority of fertiliser should be applied prior to this point.

Amgrow specialty recommend the use of Cal-banana plus Zinc and Boron (12-1-14+Zn&B) as a dry fertiliser. This is normally applied 4 times a year on ratoons from Spring to Autumn. A general rate of application is 200-250gm per stool.
At a rate of 250gm per stool in a plantation of 1,700 stools per hectare this represents a fertiliser application rate of 425kg/ha.

Another fertiliser included in the Amgrow Specialty range is Prolific Blue AN ,which is an ammonium nitrate based compound fertiliser which is applied 4 times per year on ratoons at a rate of 200gm/stool.
Prolific Blue AN can be used at Planting at a rate of 200gm per stool in the drill, avoiding direct contact with the planting material.

See an example of fertilizer rates for each season as both granular and soluble fertilisers below.

Spring Fertilizer Usage Rates

As banana plantations in New South Wales come out of Winter into Spring, the warmer conditions stimulate root activity and leaf initiation. The application of fertilizer during this period is vital in order to have readily available nutrients to meet plant demands. The aim is to maximize the leaf surface area, which will enable the plant to develop larger bunches. Fertilizer programs developed in conjunction with soil and leaf tissue test results will help to maximize economic yield.

- **Granular fertilizers** - soil applied
- **Cal-Banana + Zn + B** - 250 g per stool x 2 applications during Spring
- **Calcium Nitrate + Boron** - 65 g per stool x 2 applications during late Spring (Oct-Nov)

Summer Fertilizer Usage Rates

Summer is the time of most active growth for banana plantations in New South Wales. For maximum bunch size to be reached, growth must be unrestricted and all essential nutrients will need to be freely available for uptake by the stools.

- **Granular fertilizers** - soil applied
- **Cal-Banana** - 250 g per stool x 1 application mid-Summer
- **Calcium nitrate** - 60 g per stool early Summer, or
- **Calcium Nitrate + Boron** - 65 g per stool after heavy rain

CALCIUM NITRATE (15.5%N-19.0%Ca) and **CALCIUM NITRATE + BORON** (15.5%N- 18.5%Ca-0.2%B) are ideal fertilizers for either ground application, or dissolved and put through an irrigation system. The nitrate ion is the ideal form for immediate uptake, and will carry calcium into the plant to the targeted tissue at the growing tips, where it is required for cell growth. Use of **CALCIUM NITRATE + BORON** is recommended, especially after heavy rains when boron may leach out of the root zone. Boron plays an essential part in root tip and shoot growth.

Autumn Fertilizer Usage Rates

Before banana growth ceases in the cooler months at plantations around New South Wales, it is advisable to apply nutrients in order to build up reserves in the plant's pseudostem ready for rapid Spring growth, and to assist in cold tolerance through Winter.

- **Granular fertilizers** - soil applied
- **Cal-Banana** - 250 g per stool x 1 application
- **Potassium nitrate** - 80 g per stool

POTASSIUM NITRATE (13.0-0-38.2) is the preferred fertilizer for premium banana production. It is non-acidifying, fully soluble and all of the nutrients are available for immediate uptake by stools. Potassium nitrate can be used as a dormancy breaker with the arrival of warmer Spring weather. The use of potassium nitrate, either soil applied or through the irrigation system, helps with cold resistance and contributes to fruit filling of the November crop. Foliar applications of Potassium leading into the Winter help to build up reserves for Spring growth.

Winter Fertilizer Usage Rates

In the colder months, plants typically require adequate carbohydrates to be laid down in storage tissue as food reserves. Little growth is observed in bananas during this period. The Summer/Autumn fertilizing programs will provide sufficient nutrients to enable plants to carry through the winter months. A maintenance program of nutrient sprays through winter will build up reserves in the plant's storage tissues in readiness for rapid Spring growth.

- Liquid fertilisers - foliar applied