

Ananas (Pineapple)

Cultural Information – Container Production



Ananas 'lucidus' and Ananas 'Fritzmuelleri'

Introduction

The pineapple is a tropical perennial plant, belonging to the family of the Bromeliaceae. Most of the species are native to South America, more specifically to various regions of Brazil. The commercial varieties of Ananas in production today are the result of extensive breeding and selections achieved by hybridizers worldwide. Even though the cultural practices we will discuss apply to most pineapple varieties, we are focusing on the varieties 'Lucidus' and 'Fritzmuelleri'

Container and Substrate

Pineapple can easily be produced in containers ranging from 5" to 14" in size. The producer needs to determine what kind of final product is best suited for his/her market. Regardless of the container size, the pineapple plant needs to be grown past its juvenile size before the plant is ready to be induced to flower. Juvenile plants produce undersized fruit or do not flower at all. Plants that will be planted in 6" or larger containers, should go through a rooting period in a smaller pot, a 3"-4" pot for approximately 3 months.

The substrate used for pineapple production needs to be well drained. A variety of components can be incorporated to form a good pineapple mix. The two most important factors are: drainage and pH. A mix with good air space and drainage will promote vigorous roots and go a long way in preventing root disease. You should also use a soilless mix with an acidic pH. Ideally your medium pH should be around 4.5 and it should not be allowed to reach 6.

Light and Temperature

Pineapple plant production benefits greatly from high light levels. We recommend that the plants be produced under light conditions between 70,000 – 90,000 LUX. In the northern part of the country these light levels approach full sun, whereas in the South 30% shading is usually recommended. Short days with lower light levels in winter at higher latitudes will greatly slow the growth of the plants.

The optimal temperature range for pineapple production is 70° F to 90°F. The plant can support higher temperatures, but damage will occur above 104°F. Being a tropical plant, the pineapple is sensitive to low temperatures. Its growth is significantly reduced at temperatures below 60°F and permanent damage will occur at temperatures below 40°F. Plants grown under cooler and darker conditions will present elongated leaf growth and may need to be spaced further apart. These plants will also have a longer production cycle and may develop smaller fruits.

Humidity and Air Circulation

Pineapple plant production requires relatively high relative humidity conditions. We suggest producers to maintain the relative humidity in production areas between 60% and 75%. Low humidity conditions will stress the plants and it may have cultural consequences, from reduced growth to yellowing of leaf tips.

Air circulation is another important cultural factor. The plants prefer to be grown under well-ventilated conditions, and not doing so may slow down plant metabolism and increase foliar disease problems.

Watering and Nutrition

As mentioned above, the pineapple likes to grow under well-drained conditions. Water logged medium and over watering will most likely cause root problems. It is suggested that the medium should be allowed to dry relatively well before the subsequent watering. Evidently extreme medium dryness is detrimental to the plant and may create problems in its re-hydration. Therefore, allowing the medium to dry without depleting all of its moisture is the most recommended watering program.

The pineapple has a moderate nutritional need. The most recommended method of fertilizing the plants is by using liquid injection through the irrigation system. Although more difficult to control, the use of granular or slow release fertilizers applied or incorporated to the medium can also be used.

Liquid fertilization should be performed at every watering at a rate of 150ppm to 200ppm N. These applications should be performed during the early part of the day, since fertilization during high light hours may cause leaf burn. The grower has the option of lightly rinsing leaves with clear water if temperatures and light are high at the time of the application.

Pineapple plants prefer a nutritional ratio of N:P:K of 1 : 0.5 : 2.5. One can select a pre-formulated fertilizer with such ratios, or use a rotation of formulations to achieve this goal. Pineapple also requires relatively high levels of Mg. Supplemental applications of Mg using magnesium sulfate (Epson salt) or magnesium nitrate will be very important for the healthy development of the crop. The nutritional ratios taking into account Mg and Ca would look like the following:
N : P : K : Ca : Mg ----- 1 : 0.5 : 2.5 : 0.5 : 0.5.

Micronutrients are also important for the vigorous development of the plants, although the micronutrient needs of pineapples are lower than most crops. If the grower is using a pre-formulated fertilizer with micronutrients, this should be enough to supply the plant necessities. Otherwise, a foliar application of a balanced micronutrient formulation twice during the growing cycle should suffice.

It is important to note that pineapples are very sensitive to high levels of copper and boron. High concentrations of either element on fertilizer or fungicide applications may damage leaves of the plants.

Insects and Diseases

Pineapple is fairly resistant to most insect and disease problems. By far, the most serious insect problem in pineapple is scale. The grower should monitor plants closely for initial signs of scale infection, and control it early. Plants that develop a severe scale problem, should be discarded at once to prevent the spread of the insect to healthy plants. A wide spread infestation of scale on pineapple is difficult to control, and it should be prevented.

Mites can also become a problem, although less common. Heavy infestation of mites may damage leaves permanently and it should be prevented.

Most of the fungal problems of the pineapple are associated with cultural mistakes. Pythium and Phytophthora root rot can be a problem under water soaked conditions and soggy medium. Foliar fungal problems are less prevalent and are usually due to Fusarium or Helmithosporium leaf spot. Preventive fungicide applications can be done under high disease pressure conditions, and when air circulation is less than ideal.

Production Timings

It is very hard to determine exact production timings for this crop, since it will vary drastically depending on the pot size used and the environmental conditions of each grower. For a medium size plant, under favorable environmental and cultural conditions, the grower can expect a vegetative growth period of 8 to 12 months. The vegetative growth cycle is followed by the flowering and fruit development cycle, which lasts 3 to 4 months.

Flower Induction and Fruit Development

The pineapple is a short day plant, and under natural conditions may come into bloom during winter months if the plant has reached full maturity. But under nursery conditions, plants are artificially induced to flower using chemical growth regulators. The most widely used chemical for pineapple flower induction is ethephon. This chemical is sold under different brand names (Florel, Ethrel, etc.) and under different concentrations of a.i.

Under most conditions, a solution containing between 25ppm and 100ppm is sufficient to promote flowering. A single application of the ethephon solution (2 to 4 fl oz) in the center of each plant is recommended. In addition, ethephon's effectiveness is greatly increased at higher pH levels. A treatment solution with pH between 8 and 10 significantly increases the induction percentages. Calcium hydroxide is one of the options to increase the solution's pH. $\text{Ca}(\text{OH})_2$ can be applied to the ethephon solution at a rate of 1oz per 30 gallons.

Four weeks after the treatment, the grower will be able to observe the first signs of flowering. A change in the shape of the rosette and the elongation of the apical meristem will be the first signs. If some plants do not show physiological changes by 4 weeks after treatment, than the grower may try one additional ethephon treatment.

Flower and fruit development will follow a few weeks later. It is worthwhile noting that fruit development and color are intensified by cooler nights. Nigh temperatures in the 60's and day temperatures in the 80's are ideal conditions for fruit development and maturity.

Please note that above instructions are only a guide and results depend upon the specific conditions of each producer.