

PRECISION MANAGEMENT OF APPLE NUTRITION IN POOR AND VARIABLE SOIL FOR INCREASED YIELDS AND QUALITY

Tienie du Preez Consulting, South Africa – June 2016

Introduction

There are three main apple growing areas in South Africa, namely the Elgin/Villiersdorp area in the Western Cape with approximately 9700 ha of apples. The second biggest apple area is also in the Western Cape with 6850 ha while the Eastern Cape (Langkloof area) have 5200 ha. About 50 percent of the apples are exported and 25% is marketed locally. The rest is processed and dried.

Poor performing patches in apple orchards

Some poor performing areas within orchards can probably be found in any apple industry over the world. The fastest and most economical way to increase yield, quality and income is to upgrade such poor areas. If done correctly you get your money back fast. Unfortunately most producers and advisors tend to throw fertilizer and foliar sprays at the problem. It could be the correct way to go but in most cases the problem is caused by other limiting factors.

Factors influencing nutrition

Before an orchard or the nutritional program thereof can be optimized it is necessary to alleviate all the limiting factors especially in orchards with poor patches. The fertilizer program is influenced by factors like the variety, rootstock, tree spacing, and production of the orchard, soil type, climatic factors like wind and rainfall as well as many soil conditions like the stone content, soil temperature, water content, soil preparation and soil density. Tree root factors like root density, root distribution, root diseases (crown gall, Phytophthora, Pythium, Specific replant disease, nematodes and virus infection must also be taken into account before developing the fertilizer program.) Then, of course, the base of the program is soil, leaf and fruit analysis and the foliar program. The aspect, type of fertilizer, fertilizer placement, timing of fertilizer, inter row management (cover crops, weed control, mulching) and mineralization and fixation will also influence plant performance and hence the nutritional program.

Identification and alleviation of limiting factors

The first step in creating a proper nutritional program for variable orchards is to do a detailed soil investigation to identify and eliminate all limiting factors. Uneven nutritional distribution is very common in replant situations where the difference in chemical content between the berm and the work row was never corrected. Other general limitations are compaction or re-compaction, poor soil preparation, wetness and soil variation. Nematode problems are also common. Specific replant disease must not be underestimated. It is always best to eliminate

any factor on a precision way. Use all technology available to ensure the base factors are at optimum.

Optimizing the nutritional program

Probably the best way is to start using an open hydroponic fertilizer system where all essential elements are mixed in the ideal ratio and amounts in a large fertilizer tank and then applied continuously through a drip system. The cost is a bit more but the rewards are amazing. With this system the soil is basically taken out of the equation as the balanced nutrients is applied directly to the root system and as the tree demands it.

In South Africa the MB1000 was developed which logs all the relevant data to design the ideal fertilizer program on a block basis. This system take all the factors influencing the program into consideration. The foliar program is already automated. It automatically takes the new leaf analysis into account and also the previous seasons foliar applications and then create a new program for the autumn as well as the new season.

Summary

The only successful nutritional program for apples must take all limiting factors into account and must integrate all relevant factors influencing nutrition. A total approach is necessary to design perfect nutritional programs for apples.

Tienie du Preez

Tienie.dupreez1@outlook.com