

The total potato hectares planted in South African during the past 5 years have fluctuated between 52 000 and 55 000 hectares with an average annual production of approximately 265 million 10kg bags/ pockets. This was produced by 497 commercial potato growers and in 2019 the total consumption of potatoes (fresh and processed) was almost 40kg per capita. The industry information above was provided by Potato South Africa (A non-profit company who serve as the mouthpiece of SA potato producers). Potatoes are susceptible to many fungal and bacterial diseases and therefore ensuring root and tuber health is crucial during potato production. Examples of fungal diseases are *Rhizoctonia*, Early blight, late blight and Powdery scab. Main bacterial diseases include Bacterial black leg, Bacterial soft rot (both caused by *Pectobacterium* spp.) and Common scab.

Andermatt Madumbi has evaluated the combination of ***Eco-T*** (*Trichoderma asperellum*), ***AmyProtec 42*** (*Bacillus amyloliquefaciens*) and ***V¹² Initiate*** (balanced nutrition for early growth phases) for root and plant health on commercially produced potatoes. ***Eco-T*** contains *Trichoderma asperellum*, produced by Andermatt PHP and it is associated with larger, healthier and more effective root systems.

AmyProtec 42 (manufactured by ABiTEP GmbH) is a highly concentrated liquid formulation of the beneficial bacterium *Bacillus amyloliquefaciens*. This bacterium forms a close symbiotic relationship with plant roots improving general root health and root development. It is registered in South Africa for the reduction of Bacterial black leg and Bacterial soft rot on potatoes.

V¹² Initiate is a well-balanced product to support rapid growth during the early stages. It contains kelp, fulvic acid as well as micronized gypsum and diatomaceous earth resulting in slow release of Calcium, Silica and Sulphur.

The application strategy on potatoes is as follow:

- ***V¹² Initiate*** is applied at a rate of 5kg per ha. It can be applied in-furrow during planting or via the irrigation directly after planting.
- ***AmyProtec 42*** is applied at a rate of 500ml per ha during planting. It can be applied in-furrow (tank mixed with ***V¹² Initiate***) or via the irrigation system.

- 500g *Eco-T* is applied 2 weeks after the *V¹² Initiate* / *AmyProtec 42* application. *Eco-T* can be applied via the irrigation system or conventional spraying equipment. Ensure that it is washed into the rootzone within 8 hours of foliar application.
- *Eco-T* follow up applications may be necessary when combating high levels of soil pathogens. Apply 250g *Eco-T* per ha during week 6 and week 10 after planting.
- For additional root health support and disease suppression a second application of 500ml per ha *AmyProtec 42* can be applied 4 weeks after planting.

Figures 1 and 2 below show the visual differences observed in a commercial potato trial where half a pivot was treated with the grower's standard program and the other half of the irrigation pivot was treated with the Andermatt Madumbi program.



Figure 1. *Standard program* size distribution
– significantly smaller sized potatoes



Figure 2. *AM guideline* size distribution
– more medium and large potatoes

Comparison of the producer's standard potato program (Fig. 1) with the Andermatt Madumbi potato guideline (Fig. 2) showed significant differences. Size distribution with the standard program had many extra small, small and medium potatoes (From back to front, conveyor belts one to three in Fig 1.). The Andermatt Madumbi guideline had less extra small, small and medium potatoes and more medium/large and large potatoes (From back to front, conveyor belts four and five in Fig. 2).

Figure 3 and 4 show the difference in disease presence (*Rhizoctonia*) in the 2 strategies. Overall, the AM guideline had less disease incidence.



Figure 3. Presence of Rhizoctonia in standard program



Figure 4. Less disease presence in AM guideline

The benefits following the Andermatt Madumbi potato guideline include:

- healthier root systems,
- larger and more uniform potatoes,
- better quality potatoes (due to suppression of various potato diseases)
- an increase in yield.

Above mentioned benefits were demonstrated in another commercial trial when the root health strategy was compared to a standard program (A 30ha irrigation pivot was divided into two 15 ha trial blocks).



Figure 5. Healthy potato plant with a healthy, well developed root system and excellent tuber set after following the Andermatt Madumbi root health guideline.



Figure 6. Harvested potatoes from AM trial block being processed.

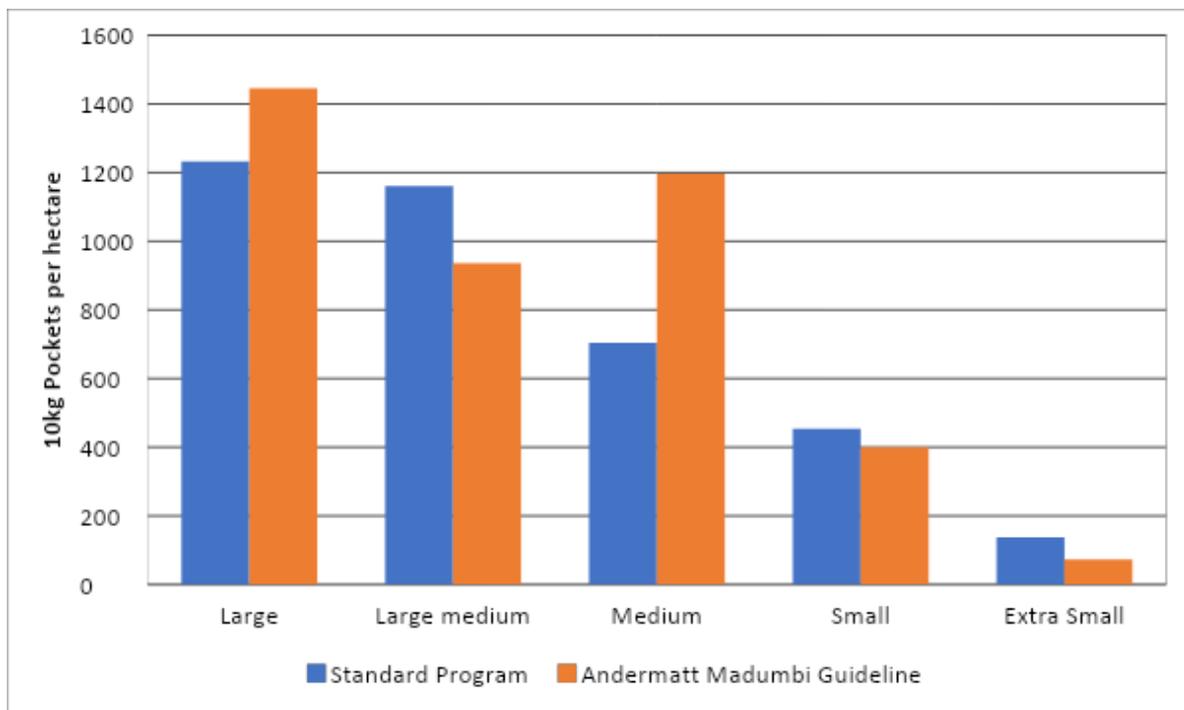


Figure 7. Potato size comparison between standard program and Andermatt Madumbi guideline.

Figure 7 shows that the average sizing (after processing in the packhouse) improved for the area treated with the Andermatt Madumbi guideline. This area produced less extra small and small potatoes and significantly more medium and large potatoes compared to the standard program.

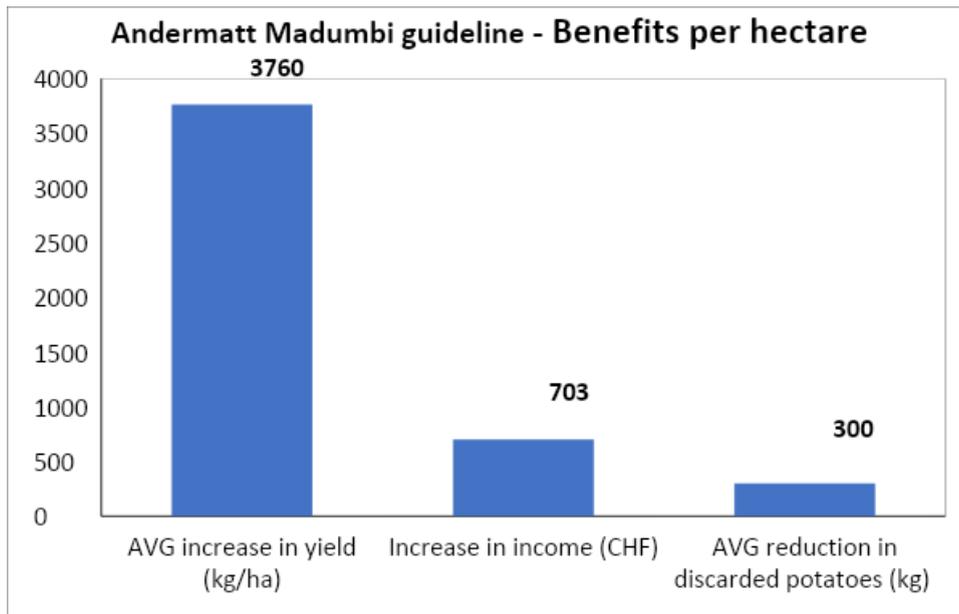


Figure 8. Benefits per ha due to Andermatt Madumbi root health guideline.

Due to disease suppression and overall increased plant health, potato yield increased by an average of 3760kg/ha, revenue increased by R 5 694.30/ha and discarded potatoes were reduced from an average of 58 to 28 ten kilogram pockets/ha (A reduction of 30 x 10kg pockets per ha, refer Fig. 8).

Registration and commercial trials have shown that the Root Health strategy on potatoes is effective, resulting in the increase of not only quantity but also the quality of potatoes and therefore a positive return on investment.