

Kynoch

VOLUME 1
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Kynoch



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construction camp site »

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Enhanced efficiency through innovation.

« Foreword »

Dear Food producer

Kynoch Fertilizer is a leading supplier of a complete range of top quality granular, liquid and speciality fertilizers and technologies to food producers in Southern Africa. Kynoch operates warehouses as well as import and blending facilities in all the major ports and a number of inland locations in the Southern Africa region from six decentralized facilities.

Kynoch aims to pursue enhanced efficiency and our vision is to be an innovative plant nutrition partner that complements our clients' businesses through our in-house **Yield Enhancing Technologies™**, **Yield Enhancing Services™** and innovation. This, as well as a comprehensive range of agronomic services, plant **nutrient scheduling™** aligned to plant development and growth enhancers, allows us and our clients to manage the growth and development of their crops optimally thus contributing to their profitability. At Kynoch we believe it best to remain at the forefront of research and product development and are excited about the on-farm successes we experience time and again.

Kynoch provides a complete range of plant nutritional products to cater for the crop-, growth- and site-specific needs of your crops. In short, this means that the unique needs of a specific crop for a specific land can be met throughout the growth season. With Kynoch's innovative and tailor-made products you can apply fertilizer according to the specific needs and growth stages of your different crops. In this way, Kynoch ensures that your crops are given what they need, when they need it most. Furthermore, you have peace of mind, because you know with Kynoch on your farm from the outset, you get the most out of your crop and can be assured of improved efficiency which can result in better crop quality and yield potential.

Kynoch also supplies basic straight fertilizer, but we constantly strive to improve the efficiency of our plant nutritional products to benefit our clients. Kynoch is also the exclusive distributor of globally proven **Agrotain®** nitrogen stabilisers that limit nitrogen losses through volatilisation to a great extent. This technology is sold as **KynoPlus®**. A complete range of plant nutrients is available to meet the needs of various crops. Other fertilizer raw materials, products and enhancers are integrated into our product offer. As far as we are concerned there are no silver bullets, but long-term success results from the sum total of all we do.

Producers are serviced by an extremely knowledgeable sales and agronomic technical support team. The entire Kynoch team is excited about the future and is looking forward to service our clients and to make a difference on the farm. Speak to one of our regional managers, sales personnel or agriculturalists to find out more regarding the specific products or nutrition programmes that will address the specific needs of your crops.

We are looking forward to see **Enhanced Efficiency through Innovation™** in action on your farm to not only add value to your business, but to improve the profitability of your farming enterprise.

Kynoch wishes you a prosperous season.



Eugene Miller

Managing Director

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IMPROVED
YIELD with
enhanced efficiency



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« Enhanced efficiency through innovation »

Dr. Johan J. van Biljon, Yield Enhancing Systems, Kynoch Fertilizer.

Kynoch Fertilizer aims to increase the producer's chance of improving the profitability of his farming enterprise. From a plant nutritional view, this objective can be reached by increasing the efficiency of both the crops and the fertilizer products. One way to improve the profitability of a farming enterprise is to increase the yield of the crops. Little wonder then that the agricultural division is known as Yield Enhancing Systems. This name was chosen to focus on the client's interests. To increase the efficiency of the crop production system, the following is important:

Photosynthesis and respiration

Life depends on sunlight (energy), water (reactions), nutrients (carbohydrates, proteins, fats, minerals, etc.) and certain gases (e.g. carbon dioxide and oxygen). In the presence of water, nutrients and gases, plants or crops have the ability to convert the sun's energy into food (for example sugars) for humans and animals. This process is called photosynthesis.

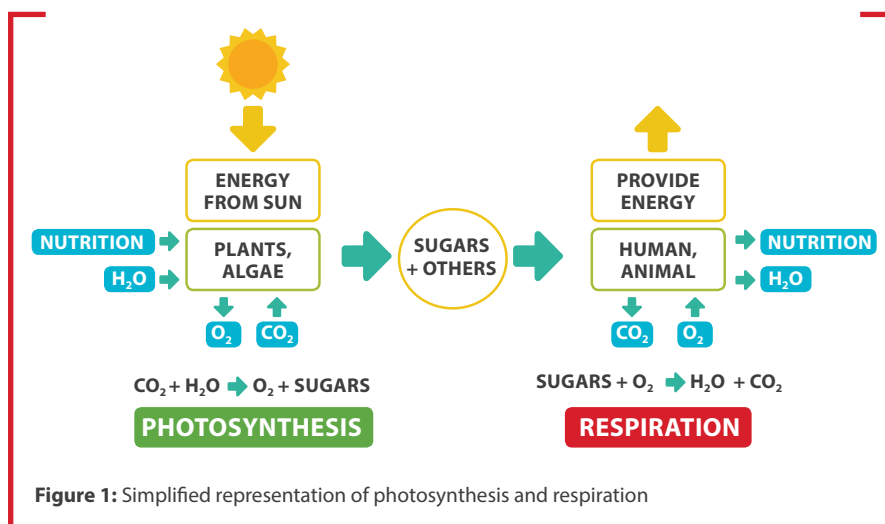


Figure 1: Simplified representation of photosynthesis and respiration

Figure 1 is a very simplified schematic representation of photosynthesis (building process) and respiration (breaking down process). In photosynthesis sugars are formed and in respiration the sugars are broken down to release energy for humans and animals.

Improving photosynthesis will result in enhancing crop efficiency. Therefore, Kynoch offers products specifically aimed at enhancing crop efficiency. As can be seen in **Figure 1**, this is a cyclic process. Oxygen released through photosynthesis is again used for respiration and the carbon dioxide released during respiration, is then used for photosynthesis.

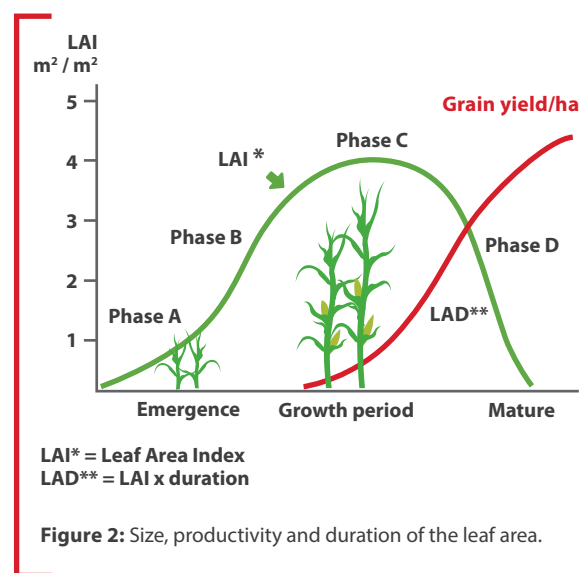
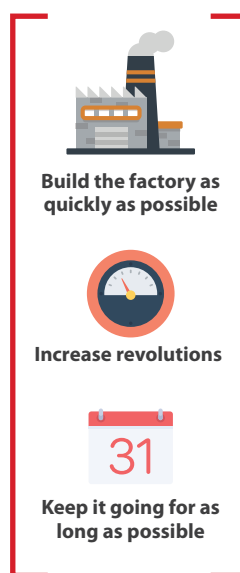


Figure 2: Size, productivity and duration of the leaf area.



The crop as factory

The plant (crop) can be seen as a factory in which the leaf area plays a vital role.

Figure 2 is a representation of the development of the leaf area index (LAI). In the beginning of the growing season, the leaf area index develops very slowly (**Phase A**), whereafter it increases rapidly (**Phase B**, exponential phase) before it levels out (**Phase C**) or even declines (**Phase D**). The secret of crop production lies in building the factory as quickly as possible (**Phase A** and **B**) and then to keep it going for as long as possible (**Phase C** and **D**). At the same time the factory needs to produce as efficiently as possible (high revolutions) to produce as much sugars as possible.

Leaf area duration (LAD) is an indication of how long the leaves remain active and is directly linked to crop yield. The longer the LAD, the higher the yield. In short it means:

- 1) Build the factory as quickly as possible
- 2) Keep the revolutions as high as possible, and
- 3) Keep the factory producing for as long as possible for maximum yield and thus income.

Plant nutrition proposals

The days of applying general fertilizer to crops are long gone. Not only does each crop have its own unique requirements, but these requirements also change during the growing season and, to top it all, these requirements also change depending on the site.

Crop specific: Crops can be divided into different groups. Firstly, there are annual crops and perennial crops. Depending on the nutrients, perennial crops are often fertilized for the next season as the fertilizer will be utilized up to the next season. If you neglect the crop this season, you will pay the price in the next season. Also keep in mind that with perennials, application in the growing season has its place and cannot be ignored. Our tree crops are a good example.

The approach for annual crops is completely different as the nutrients you apply now will be utilized more rapidly and in the same season. The effect of fertilization can be seen a lot sooner as the growth rate of annual crops is significantly faster than that of perennial crops. Annual crops are very diverse and include all our grain and vegetable crops. It is clear that being so

varied, the crops definitely cannot have the same nutritional needs. The days of mainly using generic foliars on the various crops, are over. If you want to prosper, crop-specific products are the answer.

Growth-stage specific: Apart from products being crop specific, they also need to be growth-stage specific. Some nutrients are more important than others during specific growth stages. Such an approach comes down to **Nutrient Scheduling™**. Just as water has to be scheduled under irrigation according to the crop's life cycle, the same applies to nutrients to achieve better profits. There are 17 essential nutrients without which the crop cannot survive, but during specific growth stages certain nutrients are more important than others. To generalize is dangerous, but broadly seen, phosphate is important especially during the establishing phase, after which nitrogen becomes more important during the vegetative phase. Potassium and calcium are again more important during the grain fill or flowering and fruit set phase. All the nutrients should be applied according to specific growth stages to yield the best results.

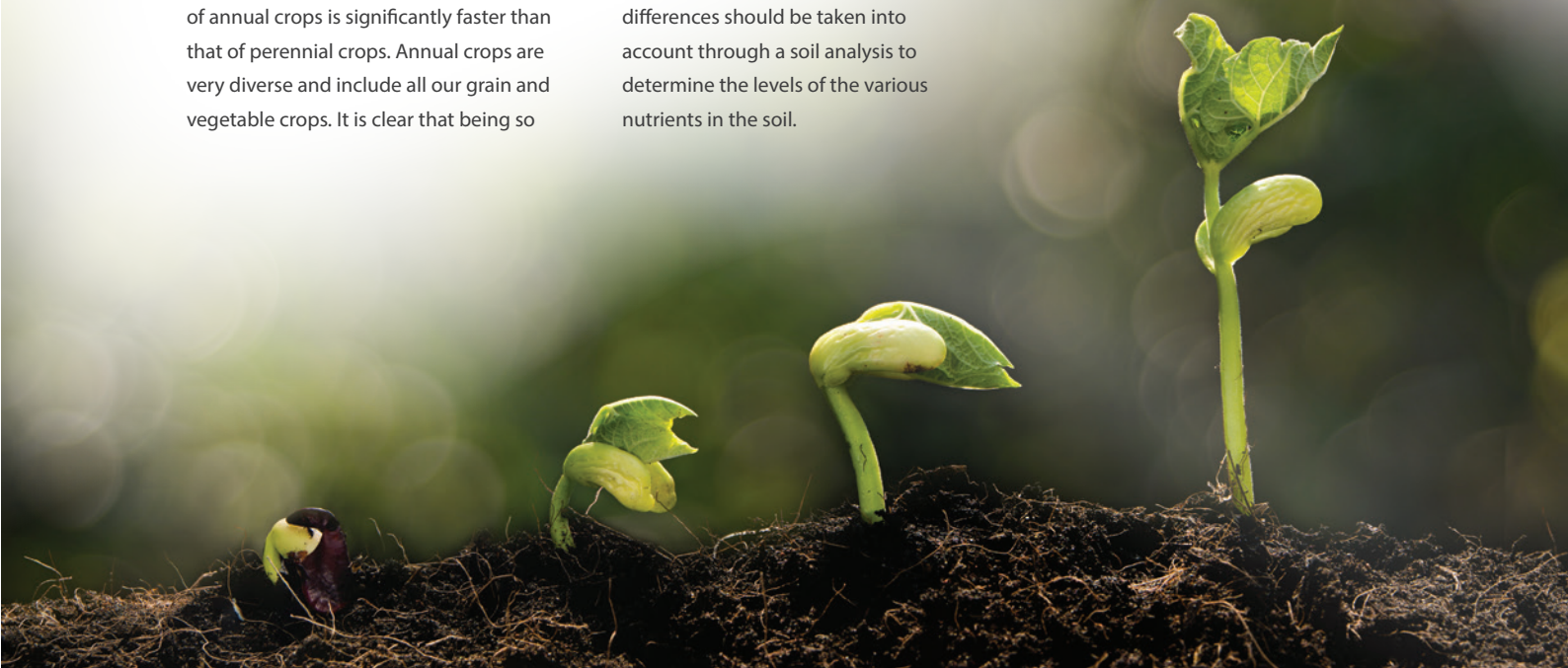
Site specific: Taking into consideration a crop- and growth stage-specific approach, the soil and climatic environment should also be taken into account. The soil fertility status of a sandy soil and a clay soil will differ drastically. These differences should be taken into account through a soil analysis to determine the levels of the various nutrients in the soil.

No fertilization proposal can be done without a chemical soil analysis. A chemical soil analysis together with a planning yield and scientifically-based fertilizer guideline is a prerequisite for an economic fertilizer proposal. This proposal can further be aligned through the use of crop analyses. The use of crop analyses to evaluate the fertilizer programme is strongly recommended. In order to recommend a site-specific fertilizer programme, a soil analysis, but preferably also a plant analysis, is necessary. A plant analysis is essential to make a meaningful fertilizer proposal for tree crops.

In summary

In summary, the Kynoch approach manages the photosynthesis process and the crop's development phases and makes proposals that are crop, growth-stage and site specific. The use of these combinations results in:

Enhanced efficiency through innovation that can improve the producer's profit margin.



« Kynoch farmer's day on the South Coast »

Published in Coastals News – August 2016

Kynoch Fertilizers held a farmer's day at Rocky Bay Lodge, South Coast on Friday 26th August 2016. The guest speaker for the day was Dr Brian Wade. Brian is the Innovation Director at Koch Agronomic Services and is responsible for technical support and growing **Agrotain®** sales, knowledge and associated products into international markets, including Africa. **KynoPlus®** is the trademark name for products containing **Agrotain®** in Southern Africa. Kynoch has been working with Brian for a number of years and he has vast knowledge and experience of **Agrotain®**, the volatilization of urea and the benefits of using **KynoPlus®**.

Brian is focused on the efficiency of fertilizer and therefore the value the farmer receives. He also works with authorities on preventing fertilizer loss into the environment by using technological improvements instead of increasing regulations. In addition to a farming background and practical experience, he has completed a PhD degree in Agronomy at the University of Illinois. Brian is considered an expert in nitrogen fertilizer – the one input for the farmer that is simultaneously a high cost and greatest generator of profit from production.

Brian's presentation focused on specific benefits of using **KynoPlus®** in a farmer's fertilizer program and crop production cycle. Following is a summary of some of the main points he focused on.

- Efficiency of **KynoPlus®** over normal urea
- Drastically reduced volatilization, therefore potential for increased yields
- Being able to work with the unpredictable weather patterns
- High concentration – so reduced transport costs
- More environmentally friendly
- Safe to use **KynoPlus®** where cane has been trashed
- Proven product that has been used around the world for many years.

The talk was extremely informative and enjoyed by all. Kynoch will continue working closely with Brian and Koch Agronomic Services to further the range of innovative and **N-hanced-N™** products available to their customers.



Left to right: Alan Arde, P.J. Fryer, Brian Wade and Richard Wichmann

« KynoPop® on planted sugarcane »

William Gibson and Diddle Mahabir, Northern KwaZulu-Natal

SUCCESS
STORY



Two strip trials of sugarcane were planted in the Empangeni North region. The treated plots received 7 kg/ha KynoPop® sprayed over the setts before covering them with soil. No KynoPop® was sprayed over the setts in the untreated plots. The first trial was implemented by Kynoch's agent in the area. The second trial was implemented by the farmer.

Trial 1

This was planted in October with low soil moisture conditions. The site is in a valley bottom with heavy soils. Drought conditions continued after planting.

Results

At six weeks after planting, setts were dug up from the treated and untreated plots. It was noted (**Figure 1**) that the KynoPop® treated setts had superior sett roots in comparison with the untreated setts. The first substantial rains were received from 5 to 16 December.



Figure 1: Top sett was treated at planting with KynoPop®, the bottom sett had no KynoPop® (photo taken 41 days after planting).

At the next site inspection on 19 December (eight weeks after planting), setts were again dug up from the treated and untreated plots. Once again it was observed that the treated setts had superior root systems. The above-ground growth of the sugarcane was also substantially better in the treated plot than the untreated plot.

The site was inspected again at 12 weeks after planting. Very little rainfall had fallen since the previous site inspection. The difference in growth between the treated and untreated plots was still visibly dramatic. Good rainfall was received during the last week of January.



Figure 2: No KynoPop® was applied left of the peg and the sugarcane on the right of the peg received KynoPop® at planting (photo taken 97 days after planting).

February and March were hot and dry again. The difference in growth between the two plots remained clearly visible at the site inspections at 97 (**Figure 2**), 110 and 136 days after planting.

Trial 2

This trial was planted by the farmer in November. The site received some rain just prior to planting.

Results

Setts were dug up and inspected at five weeks after planting. The roots were visibly more developed in the KynoPop®-treated plot compared to the untreated plot. There was a difference in above-ground growth; however this was not as dramatic as the early response in Trial 1. The difference in vegetative growth remained visible right through to the last sight inspection at 118 days after planting (**Figure 3**).



Figure 3: KynoPop® was applied on the left and the sugarcane on the right received no KynoPop® at planting (118 days after planting).

Conclusion

In both trials the KynoPop® plots had better early root development and above-ground growth was visibly better than the untreated plots.

This translated into a positive net economic return for the farmer at harvesting.

« Soil Tillage: Soil and Climate specific »

Published in Afgriland – July/August 2016

Martin Smith, Agriculturalist, Yield Enhancing Systems, Kynoch

Indications are that rainfall in the coming season (2016/2017) will be average or above average. Due to the difficult 2015/2016 season, this opportunity must be used to the full extent. Soil tillage plays a pivotal role in optimal soil water usage which will lead to improved yield in the coming season. The following principles need to be adhered to whether no-till, minimum tillage or conventional tillage systems are used.

Tillage systems

Regardless of the tillage system used, the soil profile needs to remain aerated and the stability of soil aggregates needs to remain intact. If soil stability is reduced, soil surface compaction will increase which will increase run-off, increase surface erosion and negatively affect water infiltration. Combined, these factors will reduce the water available to the crop, thus water use efficiency of the crop. To optimize water infiltration and improve water use efficiency soil tillage practises must be tailor-made to the soil type and the crop which will be produced on it.

The soil profile

No two soils are exactly the same and therefore no fixed recipe can be used for

soil cultivation. Evaluation of the soil profile remains the best way to determine the best cultivation methods for a specific area. If possible, evaluation of the soil profile before and after primary tillage, as well as during the growing season (when root development can be studied) is very helpful to see if cultivation goals were reached and identify problems that may still exist. During the season, the best time to evaluate a soil profile is around flowering as root development will have reached maximum at this stage. The main aim of these evaluations is to identify any restricting and compacted soil layers which can be eliminated before establishing the next crop.

Root development

Root volume is restricted as soon as roots cannot penetrate the soil vertically or horizontally and the plant's ability to absorb water and nutrients are limited, which in turn could lead to yield losses. **Photo 1** indicates a soil profile with no restricted layers and excellent root development deep into the profile, while the negative effect on root development due to wheel and subsurface compaction (at about 250 mm), is shown clearly in **Photo 2**. Such compacted layers must be alleviated regardless of the tillage system used, to ensure development of sufficient root volume in the subsequent crop. Once alleviated, various methods like traffic control can be implemented to reduce future compaction. Farm equipment is becoming increasingly heavier which makes the management of soil compaction with traffic control even more important.



Photo 1: Roots penetrated the whole soil profile which indicates the absence of restricting layers.



Photo 2: A sub-soil compacted layer at about 250mm reduced root penetration to deeper soil layers.

Clay percentage

The soil texture (clay percentage) of the topsoil determines the problems with compaction that can be expected in a specific climatic zone and remains an important factor when deciding on appropriate cultivation methods. In the sandy soils of the Eastern Highveld, compaction, fertility, soil acidity, nitrogen leaching and wind erosion remains the biggest challenges. In loamy soils, soil acidity, fertility and leaching causes the most problems, whilst surface crusting and sufficient aeration remains the biggest challenge in soils with high clay content.



Timing

If soil conditions are favourable, the best time to start with soil cultivation is directly after harvesting. If conditions are not favourable it is best to postpone cultivation until such time that the soil can be worked properly. It is however very important to wait until the soil has dried out properly because cultivation of soil when too wet, can cause a lot of damage to the soil structure. Working the soil when to wet will cause smearing and virtually destroy the soil structure that has been built up, resulting in severe compaction. Working the soil that is too dry will result in clod forming which is difficult to rectify and which may result in improper seedbed preparation.

Working depth

Sandy soils with less than 10% clay content is usually worked to about 400 mm, but it may be required to work very sandy soils (<5% clay) to a depth of 500 mm. Working depth must be guided by evaluation of the soil profile to determine the depth of the compacted layer. Although it might be expensive to alleviate compaction at these soil depths, leaving the compaction in place could have a detrimental effect on yield.

Working depth can be reduced as clay percentage of the topsoil increases. Soils with >20% clay content can be worked as shallow as 100 mm, while loamy soils (10-20% clay) would normally require cultivation between 100 mm and 400 mm.

Very heavy soils and soils with high stone fractions are usually well suited for minimum or no-tillage. This is because compaction (especially sub-soil compaction), are less severe. Some soils require no cultivation at all due to self-swelling and crimping action of the clay.

Lime and fertiliser

Lime is most effective when well incorporated, especially to address sub soil acidity which develops over time. It is important to lime regularly to maintain good soil fertility and prevent soil acidity to spread into the sub-soil layers.

While phosphorus move minimally in the soil, nitrogen and potassium (potassium to a lesser extent), move through the soil profile freely and is very vulnerable to leaching. Therefore phosphorus must be available close to the root zone (preferably band placed), while some sources of nitrogen can be broadcast on the soil and will move into the root zone with rain water.

Weeds

Weed control, especially with minimum and no-till remain a challenge because mechanical control is restricted or not an option. Once residue starts to accumulate and seed banks starts to increase, it becomes even more challenging. A firm and level seedbed without weeds remains important to ensure good stand, whether it is created by cultivation or a specialised planter. Disking should be prevented and only used when absolutely necessary because it tends to destroy soil structure and causes shallow compacted layers. It also tend to cultivate the surface layer too fine which can lead to crusting if heavy rain falls before emergence.

Summary

The end result of soil cultivation depends on how evaluation of the soil profile, study of root development, deciding on suitable working depth, taking clay percentage into account, timing of cultivation, liming and fertilisation as well as efficient weed control, can be integrated to maximise water availability and water use efficiency by the plant. Making the most out of available water ensures the best possible yield and profitability of the cropping system.

**For more information,
contact Martin Smith at 076 150 8419.**



« The right combinations for 20 tons maize per hectare and more »

Martin Breytenbach and Jan vd Walt, Brits.



To produce 20 tons of maize per hectare requires a thorough knowledge of the soil's physical and chemical properties, as well as the crop's characteristics. Should these properties be understood and successfully integrated, then crop-, growth stage-, and site-specific plant nutrition programmes to produce more than 20 tons of maize are possible.

Soil properties

A field in the Brits area has black vertic soils that shrink and swell; the clay content is above 50%. Although the soil is black in colour, the organic material content is quite low. Irrigation scheduling on these soils is very important, thus the soil moisture content was continuously monitored.

Cation ratios need to be handled with considerable caution, however, there is still a possibility that the potassium in these soils is not plant available. Vertic soils consist of 2:1 clay minerals which can also have a negative impact on, for example, the plant availability of potassium. For this reason particular attention was paid to potassium fertilisation.

Nutrient Scheduling™

Kynoch believes that there is no such thing as a "silver bullet", therefore a combination of products is used in order to supply the

total nutritional requirements over all growth stages of the crop's growing season. True to this approach, a combination of **KynoPlus®** 18:20:0 (35), **KynoPop®**, **KynoPlus® TopStar S**, **GreenGold™**, **FoliGrande™** and **Mielie Oemff®** was used to supply the crop's nutrient requirements throughout the growing season. Just as irrigation scheduling controls the supply of water, Kynoch applies **Nutrient Scheduling™**.

At planting, **Kynoplus®** 18:20:0 (35) and **KynoPop®** were applied. All of the **KynoPlus®** 18:20:0 was band placed to ensure that the young seedlings have sufficient phosphorous to ensure good root development at this early growth stage. Particularly on these soils the band placement of the phosphorous increases the effectiveness of the phosphorous because band-placed phosphorous is less prone to fixation by the clay minerals than broadcast phosphorous.

The **KynoPlus®** portion of the planting blend increases the efficiency of the nitrogen in that it, amongst others, limits losses due to nitrogen volatilization. Apart from the reduced risk, the **KynoPlus®** also represented the best value for money.

KynoPop® has been developed by Kynoch to ensure strong, healthy seedlings that emerge as quickly as possible to make maximum use of the sun's energy to promote optimal growth.

After planting, the maize was fertilised according to growth stage. **GreenGold™** and **KynoPlus® TopStar S** were used for top-dress applications to supply nitrogen, potassium, calcium, sulphur and boron at specific growth stages. The foliar feed **Mielie Oemff®**, a balanced foliar application consisting of primary, secondary, and micronutrients and also certain plant enhancers, was sprayed after topdressing. **FoliGrande™** was used during the later growth stages especially to assist with grain fill.

Result:

In the past this producer obtained yields of approximately 16 ton/ha, but with the Kynoch programme the yield improved to 20.2 tons maize/ha. Admittedly, the Kynoch programme cost R1 800 more than the regular programme. However, at a maize price of R2 500/ton, the margin increases by R8 700/ha, in other words a return on investment of 483% for the growing season.



« Crop specific foliar products give your **crops** that extra **OEMFF®** »



Specific ratios of macro-, secondary- and chelated micro-elements in the **OEMFF®** product range can deliver:

-  *better root development*
-  *more efficient use of water*
-  *better photosynthesis*
-  *improved stress management and*
-  *increased yield and quality.*



Kynoch's crop specific **OEMFF®** foliar range for **maize, soya, sunflower** and **wheat** provides specific nutrients when it is needed most.

Kynoch – enhanced efficiency through innovation.



Not trading in the Western Cape.
Maize OEMFF® K8702, Sunflower OEMFF® K8701, Soya OEMFF® K8700, Wheat OEMFF® Early K8917, Wheat OEMFF® Flag Leaf K8918.
All products are registered under Act 36 of 1947.



« A fresh approach to citrus nutrition »

*Published in SA Vegetables & Fruit – November/December 2015
Hantie Reed and Martin Breytenbach. Yield Enhancing Systems, Kynoch Fertilizer*



Citrus nutrition in South Africa has changed drastically over the past years due to external factors, especially global competitiveness. However, these changes have been to the advantage of the South African citrus producer.

Citrus product prices are under pressure as a result of international competition and local producers are therefore compelled to produce better quality fruit as well as greater volumes of fruit. As a result this has led to a more scientific approach to citrus production, ensuring more sustainable and profitable production.

Yield Enhancing System of Kynoch Fertilizer, is to ensure that scientifically sound knowledge is applied to citrus production systems that could thereby increase the producer's profitability while simultaneously decreasing risk. When considering citrus nutrition, the focus should be on the following points:

- Apply nutrients according to phenological stages
- Carbohydrate management throughout the season
- Site specific nutrient management based on soil- and leaf samples
- The application of a combination of fertilizer products within a plant nutritional proposal

All the above mentioned points should be managed simultaneously and in the correct sequence to reach optimum yield, quality and fruit size.

Phenological stage specific nutrition

A strategy that is common to describe most citrus types in terms of growing season, would be to sub-divide the growing season into five prominent growth stages:

- a) Bud differentiation
- b) Flowering period
- c) Fruit set
- d) Fruit growth
- e) Fruit maturity

Products used for citrus fertilisation should be scheduled in such a way that the citrus tree receives nutrients, when needed and in the right quantities needed.

Below is a description of phenological stages for most citrus variety's:

Flower initiation: During this stage the growth points are subjected to the influence of plant hormonal changes that induce bud differentiation that in turn produce flowers. This stage can endure for a period of a few days up to four months and occurs during the winter dormant period.

Flowering period: Flowers are formed and pollination takes place. Temperature and water play a decisive role in this stage. Warm dry conditions can affect pollination adversely, resulting in poor fruit set.

Fruit set: New fruitlets are generated after pollination. The yield potential is therefore determined at this stage.

Fruit growth: Rapid cell division and cell growth now takes place. Fruit size and quality is determined during this stage.

Fruit maturity: Fruit maturity is reached and fruit ripens. Cool temperatures are required to induce fruit veraison (colouring).

Carbohydrate management

The management of photosynthesis (carbohydrates) is one of the most important aspects of citrus nutrition. The more efficiently carbohydrates are managed, the higher the yield potential and less fluctuation in actual yield over production seasons. Regular orchard inspections together with yield estimates during the growing season is very important when managing **Nutrient scheduling™**. The aim of this would be to ensure sufficient nutrition and carbohydrate and thereby reduce the risk of alternate bearing as a result of depletion of carbohydrate during the current growing season. The optimum management of carbohydrate during the current growing season will determine fruit quality and yield in the next season.

Site specific nutrient management

The starting point of any nutrient proposal for citrus should be a leaf- and soil sample. Always strive to make use of a reliable and accredited soil analysis laboratory and acquaint yourself with the analysis methods. The soil analysis forms the basis of the nutrient proposal and together with all other relevant information becomes an important management tool for citrus production. The timing of leaf- and soil analyses is important and results must be filed in order to build up a history of production factors.

The previous three years' analysis results are usually used to propose the current year's nutritional program. This information in conjunction with the nutritional history is then used to evaluate the efficacy of previous nutritional programs and the result is a nutrition proposal that, including other management factors, could give optimum yield and quality.

Plant nutritional proposal

The nutritional proposal for citrus includes a combination of different fertilizer products that are applied in the correct sequence. These nutritional programs over the entire growth period of the citrus tree, which includes phosphate (P), sulphur (S) and micro elements (zinc, manganese, copper, iron, boron and molybdenum) act as balancing nutrients for the citrus tree and it is very important that sufficient quantities of these elements are supplied in order to manage the tree nutrition to a maximum.

Nitrogen (N) and potassium (K) are used to manage the carbohydrates during different growth stages. During the vegetative growth stage of the citrus tree, nitrogen is used to stimulate vegetative growth and results in increased photosynthetic area. In this process, it is also important to have an adequate supply of calcium (Ca) for optimal cell division together with magnesium (Mg) to enhance chlorophyll production (green colour of the leaves).

The potassium (K) levels are kept relatively low during the vegetative stage and vice versa during the reproductive stage. Nitrogen application rates are also reduced in the fruit set stage and phosphate (P), sulphur (S) and micro elements remain continuously important in order to manage the citrus tree throughout the different growth stages. In the event of a shortage of nutrients for the specific crop yield potential, the citrus tree will commence using reserves to grow the crop to maturity. The result is that the crop yield is adversely affected in the next season.

Summary

Citrus yields can be managed through the application of nutrients at the right time, at the right quantity and at the right place. Soil analysis, chlorophyll meter readings and leaf analysis are important tools in citrus nutrient management.

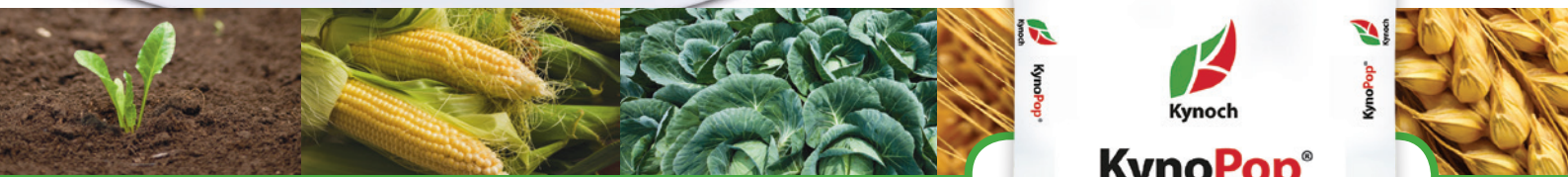
Make use of crop specialists that understand the physiology of citrus trees in conjunction with fertilizer product knowledge to enhance and manage the financial advantage of the producer.



« KynoPop® »

Give your crop the ideal start. »

With strong seedlings your harvest has the best prospect of success, with lower risks.



KynoPop® promotes:

- Young, strong seedlings.
- Enhanced efficiency of the seedling for optimal growth.
- Improved early root development.
- Better tolerance against stress conditions, diseases and pests.

Kynoch – enhanced efficiency through innovation.

KynoPop® Reg. No. K9101 Act 36 of 1947



« KynoPop® shows its metal on potatoes »

Hantie Reed and Albert van Zyl, Lowveld, Mpumalanga



A potato trial with **KynoPop®** was planted during May on the farm Kaalrug in the Malelane area. The cultivar Fianna was lifted during September.

The producer followed his usual fertiliser programme, which is not a Kynoch programme; the only additional application to this programme was Kynoch's **KynoPop®**. The producers programme is as follows: pre-plant application of 700 kg/ha 4:3:4 (33) supplying 90 kg N/ha, 68 kg P/ha and 90 kg K/ha. No topdressing was applied. This programme is for a yield of about 20 ton/ha.

The **KynoPop®** treatment was done on four replicates at 7 kg/ha on the seed potatoes at planting using a 20% solution. The usual recommendation is a 10% concentration as opposed to the 20% solution used here, once again demonstrating the safety of **KynoPop®** at the proposed application rate per ha. The safety of the product goes hand-in-hand with the choice of the raw materials. Quality raw materials are more expensive, but with the combination of right products is the key to success, therefore, Kynoch insists on the use of quality raw materials.

Trial results are shown in **Table 1**. From the Table it is obvious that not only has the number of tubers increased, but so too has the yield. Where **KynoPop®** was added to the programme the yields increased by a massive 15 924 kg/ha. This represents an increase attributable to the **KynoPop®** of 76%. This type of performance is not seen every day.

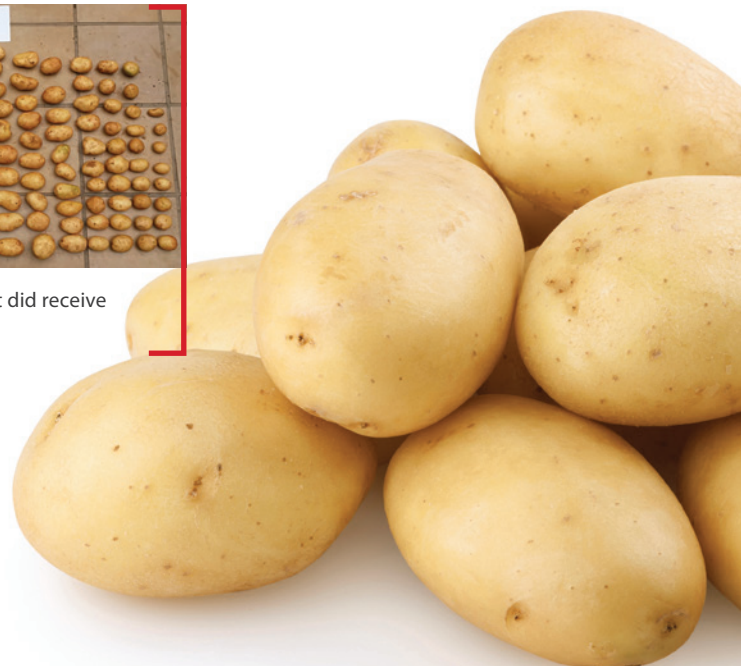
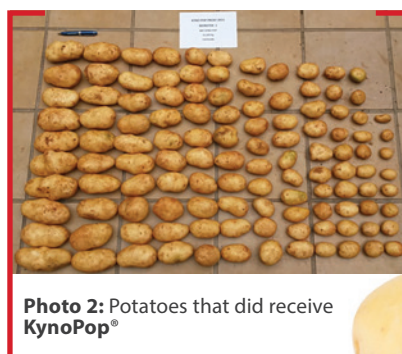
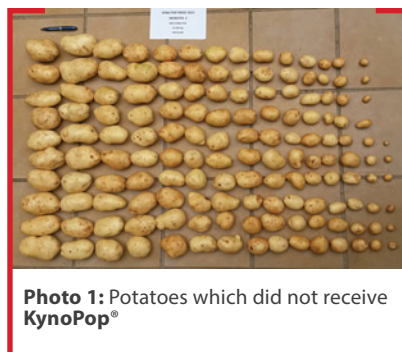
Number of Tubers:		
Without KynoPop®	With KynoPop®	Improvement (%)
83	130	57

Mass (kg/ha):		
Without KynoPop®	With KynoPop®	Improvement (%)
20 948	36 872	76%

Table 1: Number of tubers and potato yield where **KynoPop®** is applied in addition to the usual programme.

Comparing **Photos 1** and **2** it is clearly visible that the number of tubers is higher, but also that the tubers are bigger where the **KynoPop®** was used. There are many more larger tubers where the **KynoPop®** was used than where it was not. **Table 1** and **Photos 1** and **2** very clearly show the improvement brought by the **KynoPop®**. Assuming that only 70% of the total yield improvement is good marketable tubers, at a price of R2.80/kg (medium/large) an increase in income of R31 210/ha is realised, whereas the **KynoPop®** only cost about R220/ha.

The KynoPop® advantage is an additional margin of R31 210/ha!



« Macadamia nutrition »

Published in SA Vegetables & Fruit – September/October 2015
Schalk Grobbelaar and Cassie Dorfling.



During the recent production season, it was recorded, that Jacques Bower of the farm Rabeja, in the Soutpansberg (Limpopo Province) experienced unprecedented success with his macadamia production. According to Jacques the success can be attributed to a number of factors.

“Identify the correct plant nutritional program and apply nutrition according to a plan”

As part of his management program, leaf- and soil samples are collected every two years. As a result, his nutritional program can be thoroughly monitored, while correcting deficiencies detected in the leaf- and soil analysis.

In addition to analysis results the yield and harvest data are also used to propose a nutritional program for the coming season. This ensures that the producer does not over supply nutrients and gives him the peace of mind that the plants “get what they need”. This nutrient program task is entrusted to Kynoch Fertilizer agricultural services.

The specific block was planted in 2005 with the cultivar (344) on heavy red Hutton soils with a clay percentage of 40-45% and a

plant population of 8x5 (250 trees/ha). The soil pH was 5.88 (KCL). Starting from the first crop yield in 2010, the following yields were realised: The average crack out percentage of the cultivar (344) was 28% while the crack out percentage on the Beaumont's was 31% in comparison to the area (crack out factory) of 25% average on 'integs' (344 included) and 30% on hybrids (Beaumont's). The smaller crop yield in 2013 was due to relatively younger trees and an alternative bearing pattern.

Year	kg/tree	kg/ha (NIH)	kg/ha (NIS)*
2010	2.47	617.5	302
2011	3.18	795.0	389
2012	10.68	2 670.0	1 308.3
2013	6.08	1 520.0	744.8
2014	20.37	5 092.5	2 495

Table 1: Yield summary for the orchards where the plant nutrient program was followed.

NIH – Nut in husk

NIS – Dry nut in shell (1.5% moisture)

*Please note: NIH multiplied by 49% = NIS

“Making tree nutrition cost effective”

With the above-mentioned information and agricultural service inputs it was possible to incorporate the most innovative fertilizer products in the nutrient program which resulted in enhanced efficiency of the fertilizer products.

“A Fresh approach bears fruit(nuts)”

Over the past years Kynoch has developed a product range that satisfies the plants needs directly. One of Kynoch's new Miracle-range products namely: “**BRIO**”, was included in the nutrient program and contains nitrogen, phosphate, potassium, calcium, magnesium, sulphur, zinc and silicon. **BRIO** was applied in three equal amounts in April, August and October, while nitrogen supplements were applied with the product **GreenGold®**. **GreenGold®** is a unique product from the Kynoch stable and developed by innovation. **GreenGold®** contains 33% nitrogen and 8% calcium plus 0.1% boron. The orchards were treated in addition with a standard foliar program, applied at different phenological stages: bud break, early flowering, full flowering and fruit growth (pea size). In addition to the nutrient program, 30-40 tons of organic compost was applied during September/October. The product Eclomax, to stimulate root growth was also applied at the time of foliar applications.

During November and early December of 2014, the specific block showed symptoms of a serious magnesium deficiency (**Photo 1**). This condition can probably be explained by the extremely dry conditions and low rainfall. From the 8th to the 29th of December, 157 mm of rain was measured. The reaction of the trees after the rain was striking. The new growth of “flush” had no deficiency symptoms (**Photo 2**).

It would appear evident that the product **BRIO**, with magnesium, corrected the deficiency.

Looking at the photo's it is evident, for the 2015 season, that the crop yield is potentially above average, which can be explained by the balanced nutrient program from the Kynoch stable. **Photo 3** illustrates the cultivar Beaumont (695) which is adjacent to the specific trial block and followed the same nutrient program as in 2014/2015. The nut set speaks for itself.

Summary

Kynoch fertilizer's starting point is that crop specific, phenological or growth stage specific and site specific nutrient program proposals must be made. This approach results not only in effectiveness of plant nutrients but also the effectiveness of the crop itself improves. An integrated approach of such a nature is followed consistently by agriculturalists in Yield Enhancing Systems to increase the profitability of the producer.



Photo 1: Magnesium deficiency symptoms observed prior to absorption of product.



Photo 2: Magnesium deficiency symptoms disappear on new flush after absorption of product.



Photo 3: Beaumont setting/fruiting in the treated orchard.



« Rehabilitation of Kiesbeen construction camp site »

Dr. John Tolmay and Pontso Mokoena, Swinburne, Free State

**SUCCESS
STORY**

The Kiesbeen Camp site (a road construction camp site) close to Swinburne on the N3 was rehabilitated on behalf of Gorogang Plant Hire. Due to the prevalent drought conditions during spring, the project only started on 23 November 2015.

Fertiliser Applications

The EMP (Environmental Management Plan) served as a guideline for nutrients to be applied. However, soil samples revealed that the soils were fairly fertile and fertilisation of the site was adapted accordingly (Table 1). The products that were used were MAP+Zn, **KynoPop®**, **Saffire** and **Pasture Oemff®**.

MAP and **KynoPop®** was applied and the site was seeded with a mixture of *Eragrostis tef*, *Cynodon* and *Rhodes Grass* at a rate of approximately 10 kg/ha.

Result

The site was rolled with a heavy roller directly after seeding. Although conditions remained dry with heatwaves experienced during December, the stored soil moisture helped

to keep the seedlings alive until the end of December, when good rainfall was received. Growth remained slow during this period but some seedling development by 18 January 2016 (Figure 1).

Saffire was applied on 18 January 2016. This application boosted growth and with fairly good rains in the last week of January it ensured that the grass utilised the moisture and fertiliser to develop quickly (Figure 2), taken on the 2nd February 2016. Further good rain, sufficient nutrition and the lack of grazing animals helped the rehabilitated area develop into a valuable pasture by 16 March 2016 (Figure 3).

The foliar feed **Pasture Oemff®** was applied on 16 March 2016 to boost growth and seed production of the grass. The farmer decided to cut and bale the grass on the site which was of considerable economic value, especially in a season when fodder was extremely valuable due to the drought. Figure 4 shows the remaining ground cover after the hay was cut and removed. Sufficient perennial grass (*Rhodes Grass*) and a lot of seed remained on the soil surface. This will keep the soil stabilised and help re-seed itself in the following season.

Conclusion

This successful rehabilitation effort is proof that the principles of plant nutrition can be applied much wider than just crop production and horticulture. Plant nutrition should always be based on soil information from analysis. Merely following guidelines as prescribed in EMP's can lead to over-fertilisation as well as environmental damage and nutrient pollution.



Figure 1: Grass cover at Kiesbeen Camp site on 18 January 2016.



Figure 2: Grass cover at Kiesbeen Camp site on 2 February 2016.



Figure 3: Grass cover at Kiesbeen Camp site on 16 March 2016.



Figure 4: Grass cover after material was cut and baled at Kiesbeen Camp site on 7 May 2016.

Nutrient	EMP requirement	Kynoch proposal
N	152	67
P	80	4.3
K	100	21
Ca	200 – 300 (by liming)	15
Mg	60 – 130 (by liming)	1.2
S	0	9
Zn	18 kg/ha	2.5
Micro nutrients	Unknown (by manure)	As formulated in KynoPop® and Pasture Oemff® .

Tabel 1: A comparison of the EMP requirement and the Kynoch proposed fertiliser programmes in kg/ha.



«TurboGrass™ and Topstar +S™ – the easy fertilizer solution. »

Grass pastures are often deficient in potassium and phosphate, while nitrogen and sulphur which are the “building blocks” of protein are also essential. Magnesium is also important for both plants and animals.

TurboGrass™ at the start of the season and **Topstar +S™** later in the season provide pastures with what is needed, when it is needed most, and can:

- increase yield,
- increase TDN (total digestible nutrients),
- increase protein,
- improve performance of grazing animals.



The nitrogen in **TurboGrass™** and **Topstar +S™** comes mainly from **KynoPlus®**, which provides protection against nitrogen loss due to volatilisation.

Kynoch – enhanced efficiency through innovation.



Kynoch

Not trading in the Western Cape.
TurboGrass™ K8933, Topstar +S™ K8921, KynoPlus™ K8024. All products are registered under Act 36 of 1947.



« Improved yield with enhanced efficiency »

*Published in SA Grain – April 2016
Dr. Johan van Biljon, Kynoch Fertilizer*

The South African grain producer has increased yield significantly over time through improved practices and products. This achievement is even more remarkable given our relatively low and erratic rainfall.

Yield increase

If we look at yield over time, maize yield during 1920 was about 0,5 t/ha. The yield (five years' grouped yield – in other words, each point is the average national yield for the previous five years) gradually increased to approximately 1 t/ha during 1960, which means a yield improvement of approximately 12,5 kg/ha per year. The period from 1960 to 2015 showed significantly better growth and can essentially be divided into four periods (Graph 1):

Period 1: 1960 to 1970

During this ten-year period the average yield increased from approximately 1 t/ha to 1,4 t/ha. This is approximately 40 kg/ha per year – significantly higher than the 12,5 kg/ha per year of the previous 40 years. During this period there was an increase in more powerful tractors resulting in deeper ploughing. The result was that more organic material was broken down and more nutrients became available to the crops. The benefit was that yield increased, but the organic material content of the soil, with adverse effects, declined. During this period maize hybrids were introduced as well – which also contributed to the increase in yield.

Period 2: 1970 to 1980

During these ten years, yield increased from approximately 1,4 t/ha to 2,1 t/ha. This increase is approximately 70 kg/ha per year – which was even higher than the previous 10 years. During this period the focus was mainly on fertilizer research. Fertilizer guidelines for various crops were developed and especially maize research received major attention. Following on this research, soil analyses, hence fertilization planning (taking into account the nutrient status of the soil as well as the planning yield) were used more and more. The use of nitrogen as topdressing increased even more, which also contributed to the increase in yield.

Period 3: 1980 to 1995

During these 15 years the yield moved sideways at approximately 2,1 t/ha. At the same time sanctions were instituted against South Africa. Food security was critical and the government did everything in its power to promote maize production. This resulted in maize being planted on marginal soils which were not suitable for maize production. These "poorer" soils were partly the reason why the average yield did not increase. Another result of the sanctions was that new technology did not enter the country. It was only during the next period that these new technologies could contribute to increased yield.

Period 4: 1995 to 2015

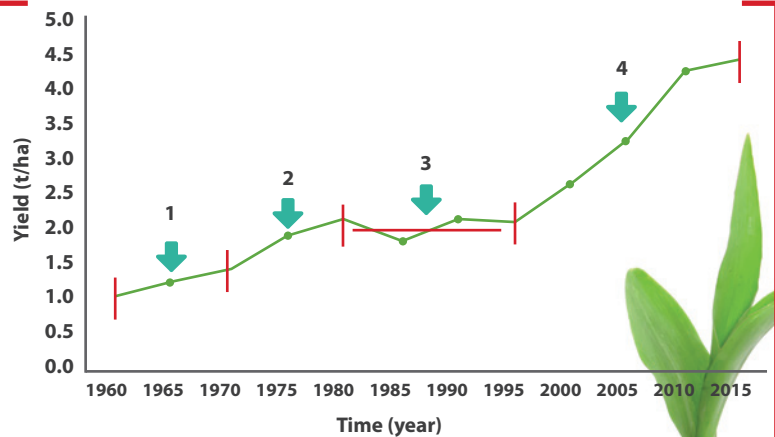
During the past 20 years there has been an unheard increase in maize yield. The yield increased from approximately 2,1 t/ha to 4,4 t/ha. This is an unparalleled increase of approximately 115 kg/ha per year, the highest in history so far. One of the major changes during this period was the introduction of the free market system. The playing field changed overnight and to survive it was necessary to make adjustments. One of the adjustments was to withdraw marginal soils from maize production. This meant that maize was only planted on the better soils – which contributed significantly to the increase in maize yield.

The launch of the new generation cultivars, namely genetically modified organisms, gave a completely new dimension to crop production. The yield potential of cultivars increased overnight and other new technologies were put into place to exploit this potential. Not only were conservation tillage practices used more and more, but technology such as precision farming was used to make crop production more effective. Fertilization practices were also adjusted and new products were developed to utilise this new potential.

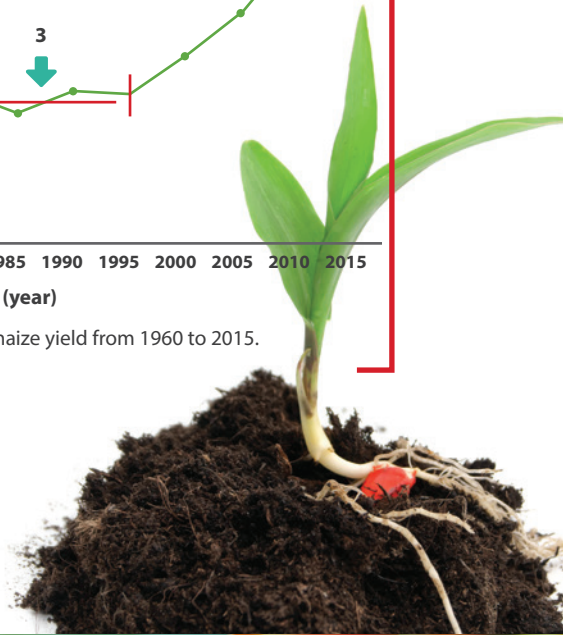


New approach in fertilization

The increase in the yield potential necessitated the adjustment of fertilization practices to take advantage of the potential. This new generation cultivars also meant that the soil threshold values of various nutrients had to be increased. The adjustments did not stop here, because new generation products had to be developed to meet the new requirements. **Thus Kynoch Fertilizer began to enhance the efficiency of fertilizers as well as the efficiency of crops. Together with this a site-specific, crop-specific and growth-stage-specific approach is used. It is precisely a combination of these products and approaches that enables the producer to utilise the potential available for each year optimally.**



Graph 1: Grouped average maize yield from 1960 to 2015.



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GreenGold® 30 is a must for vegetable growers.

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Agriculture remains a challenge ...

Yet, despite the odds, in a country often buckling under crippling droughts and unreliable rainfall, our food producers continue to work every day – undeterred – because there is always another season. That's why our food producers continue to farm, with a vision of improved yield, increased profit and to feed the nation, regardless of the ongoing challenges.

We thank you that the nation can depend on your love of the land. Our nation sees the outcome of your hard work and how you tackle the future with courage and confidence.

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