NO-TILL CLUB



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JULY 2014

BRINGING YOU THE FACTS ABOUT NO-TILL – CONSERVATION TILLAGE

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FROM THE EDITOR'S DESK

This winter has reminded me that there is a time to take matters regarding work a little slower, but this off season allows one to catch up with admin, planning and projects shelved during the rush of the activities of spring, summer and autumn. During the trip to NAMPO in May this year with Steve Morris, and Anthony Muirhead who is affectionately known in the Club as the Professor, and who always has good advice on many aspects of life, made a statement "No-Till farming should be called ***Timing Farming***!"

With that Steve found a parking place in a sunny spot in Golden Gate National Park where we were able to look at the grandeur of those wonderfully coloured mountains. Anthony got out last with his big plastic shopping bag and produced sandwiches Cindy had prepared for our trip. Thank you Cindy!

Steve in his enquiring way asked Anthony what is this? Is the pioneer of No-Till farming in South Africa and foundation member of The No-Till Club of KZN changing tack?

"No not at all. Nothing works unless it is planned and done at the right time. This achieves the goals of efficiency in using my investment to produce a profitable crop, while working with and striving to maintain and improve the environment. This process ensures sustainability in my farming enterprise!"

On our return from Nampo I was browsing through past editions of the Club's newsletters and came across an article that we need to be reminded of again, **"A Calendar for a No-Till Farmer".** This is still applicable and is reproduced in this Newsletter.

Have we learnt from the past?
Some years ago Keith Fey kindly gave me four volumes of books made up of monthly magazine called VELD and produced by Coopers. These books are fascinating and proved to me that we have not learnt very much from history in terms of looking after the environment when it comes to looking after our very precious top soil of our farms. I have included an article from this old magazine dated July 1929 "Soil Exhaustion in South Africa" written by Hubert D. Leypan Professor of Agricultural Economics, Transvaal University College Pretoria, along with an article titled Soil Erosion.

Peter Hittersay visited Tony da Costa of Manjoh Ranches Nigel; he submitted his article and photos for us to read.

Please communicate interesting news or any experiences or problems you have had with No-Till. Write to Richard Findlay at: richardfindlayntc2@gmail.com
Ons is op soek na iemand wat Afrikaanse artikels vir ons nuusbrief kan skryf teen kontantbetaling.
Richard Findlay 072-1479703 of 033-3302062

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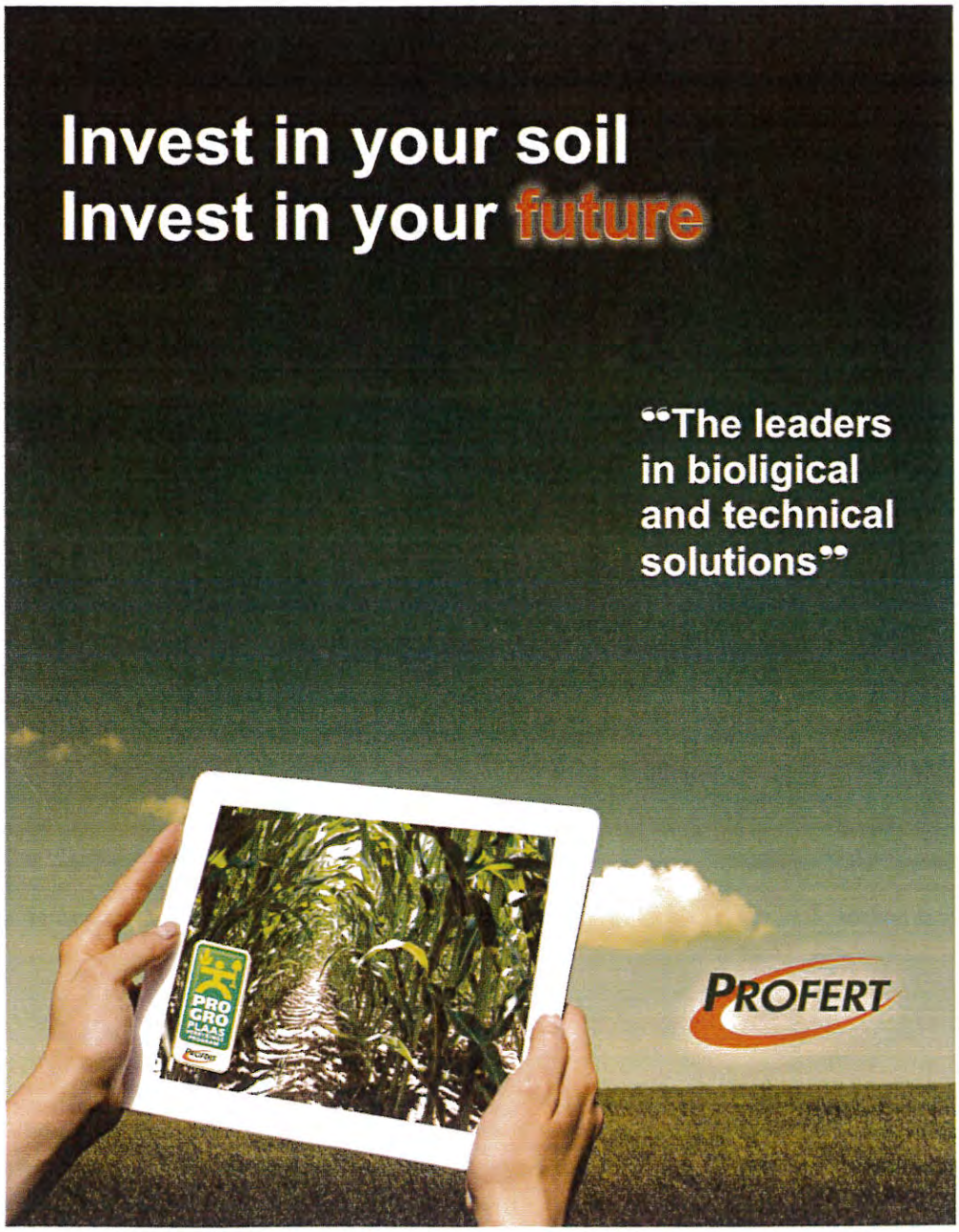


The No-Till Club would like you to meet...

MOIRA HORNE is our Public Liaison contact person for The No-Till Club, working on a freelance basis. It is a pleasure to introduce her to our readers and also to say that we enjoy her ever-positive and cheerful disposition, which will be an asset in the pursuit and purpose of our commitment to conservation agriculture.

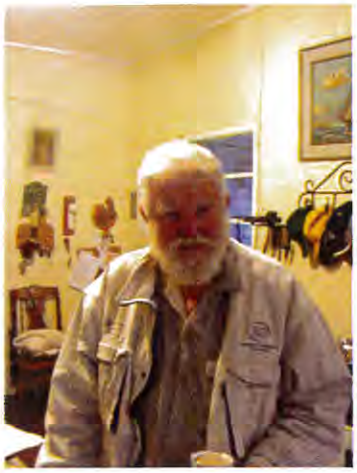
Having studied Travel after leaving school, as it happens so often, she ended up working in a totally different sphere, agriculture, for Nitrochem in Howick keeping farmers, soil scientists and representatives happy by making sure it all happened with regard to the correct product getting to the right farm when it was needed. Finally the opportunity arose for Moira to get into Travel and she started work here in South Africa and then the UK.

Moira is married to Kevin and they have two young boys



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ADVICE ANT MUIRHEAD GAVE TEN YEARS AGO IS STILL RELEVANT

A Calendar for a No-Till Farmer

1. **Be aware of what you are trying to do**
   - to improve the structure and fertility of the soil by not cultivating it for long periods, leaving crop residues on the surface to increase the organic matter content and keeping the land weed free in winter to maintain soil moisture.
   - No-Till cropping requires more attention than conventionally cultivated crops.
   - "Growing no-till crops is a continuous learning process and one cannot assume hard and fast rules," (Rob Wood) "so ask no-till farmers and company staff for information and advice."
   - Join a no-till organisation.

2. **How to start**
   - Keep a record all your activities and observations.
   - Convert your best lands and start planning the change while harvesting the crop before, in autumn.
   - Excess soil acidity must be corrected.
   - Dig pits to check for compacted layers, where do they occur?
   - Repair all contours and waterways, some are still required. Consult a specialist.
   - Do you have suitable equipment, e.g. planter, sprayers and harvester?
   - What is the following crop to be, crop rotation is very important?

3. **Autumn tasks**
   - Check soil surface pH, nitrogen fertilizer applied to the surface affects the pH.
   - Plan residue management, how many days grazing?
   - Kill all weeds ("one year's seeds = seven year's weeds").
   - Check compaction, how to combat compaction caused by harvesting?
   - Consider planting a winter cover crop to reduce weeds and increase residue.
   - Prepare firebreaks around land.

4. **Winter tasks**
   - Check rate at which residue is being grazed; graze heavily where layer is thick.
   - Beware trampling by stock after out-of-season rain; you must leave at least 35% of soil covered.
   - Try to keep residue "pinned" to the ground. Is residue being lost by wind?
   - Kill all weeds to conserve soil moisture.
   - Broadcast lime according to bags of nitrogen fertilizer applied the previous season; 1 bag lime for 1 of LAN or 2 bags lime for 1 of Urea, or apply 1-2 tonne lime every second year.

5. **Spring tasks**
   - Check you have enough equipment, planters and sprayers, for area to be planted and it is working; chain guards essential on planters to stop residue "choking" chains. Conveyor belt attached underneath chains is effective.
   - Check for couch/kweek grass *(Cynodon dactylon)*, mark patches with pegs; spray with 6-7 L/ha *glyphosate* followed 5-10 days later with 2L/ha paraquat.
   - Apply a knockdown spray containing paraquat and a pyrethroid to
     a) stop weeds using soil moisture and
     b) to control cutworm, 6 weeks before planting. Spring weeds are a source of cutworm. Another weaker spray of *glyphosate* may be necessary before planting to kill emerging weeds.
   - Has residue of previous crop been correctly treated, i.e. not too much removed and soil not compacted? Is it still pinned to the ground?
   - Mount herbicide tank on planter if you can and apply an overall application at planting
   - Do not plant lands which are too wet, or before the dew has dried, because the coulters will not cut through residue cleanly.

6. **Post plant tasks**
   - Watch for cutworm at germination.
   - Weeds must be controlled at all times to harvest, use the spray equipment/herbicide combination which will do the job at each stage of the crop. Backpack sprayers are very effective in the late season.
   - Eradicate weeds that have "escaped" routine treatment with hand work.
   - Watch for Stalkborer moth flights with pheromone bio-traps from mid-September.

Later check maize leaves for shot hole damage, treat when 5% occurrence seen.
Watch for damage from tasseling to cobbing caused by second generation.

- Grey Leaf Spot – when 3% of the 5th leaf is infected, apply fungicide. No-Till maize more prone to leaf diseases than other crops - **seek advice early.**

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INTEGRATING CA CROP PRODUCTION AND PASTURE-BASED LIVESTOCK FEEDLOT PRODUCTION SYSTEMS

Peter Hittersay

The trials, tribulations and successes of adopting and integrating Conservation Agriculture (CA) crop production practices into a pasture-based livestock feedlot production system are many and varied. Tony da Costa, a director of Manjoh Ranch headquartered in Nigel, shares their experiences along this road.

"The family farming business of Manjoh Ranch was founded in 1935 in Delmas by my grandfather Antonio da Costa following his immigration from Madeira," explained Tony da Costa. "My father, Manuel da Costa, joined him in 1969 and my uncle, Johnny da Costa, later in 1974. Currently the directors are Manuel, Johnny, me and my brother, Andre. I was born on 26 April 1977 and grew up on a family farm in Delmas, which at that time produced vegetables, maize, dry beans, pigs and cattle. I did my tertiary education at the University of Pretoria where I obtained my BSc in Agricultural Economics following which in 2000 I joined the family business and married my wife, Anabela, and we have since increased our family with a son, Matthew, and a daughter, Lia."

The family farming enterprise stretches over 5,500 ha, including those on which the cattle breeding herd are run on three main farms in Nigel, Delmas and Moloto, on which main activities are grain production, feedlotting, stud cattle breeding and maize milling. Soils on which crops are produced are mainly of the deep red Hutton type generally greater than one metre in depth and rainfall has averaged 687mm over the last 24 years.

NO-TILL CROP PRODUCTION

Arable land utilised totals 2,814 ha of which 300 ha is hired on an adjoining farm. Of this, 810 ha are under centre pivot irrigation and 25 ha devoted to permanent pastures. On the crop production lands, Bt Maize and Roundup Ready soya beans are produced following no-till practices on a 50 - 50% rotational basis to improve soil fertility and minimize fertilizer requirements resulting from the fixing of nitrogen by the soya beans. Maize and soya beans are planted in rows widths of 500 mm on both rain fed and irrigated lands. Maize under irrigation is planted at rates of 80/120,000 plants/ha and on the rain fed lands at 60,000 plants/ha yielding an overall average of 7.5t/ha. Soya beans under irrigation are planted at rates of 400,000 plants/ha and on rain fed lands at 200,000 plants/ha yielding an overall average of 2.5t/ha.



Tony da Costa, a director of Manjoh Ranch, standing next to one of their Nigel farm's Argentinean Pierobon no-till planters.

"We started experimenting with no-till on portion of our farm during 2007 and gradually increased the area under this practice till we finally adopted it on all our arable lands four years ago," said Tony. "During this period I toured Brazil and Argentina to observe and discuss no-till practices there and favoured those adopted by the Argentinean farmers. This belief was reinforced by the good results we obtained by following their practices after my father invited Grain SA and the three Argentinean partners of the Technical Cooperation Agreement between South Africa and Argentina to conduct trials on our farm. This agreement recognises and confirms the commitment of the partners to carry out and coordinate research on Direct Planting (no - till with crop residue) systems and technology with the aim of improving crop productivity in South Africa." Tony added that since adopting no-till their fuel and operating costs have been substantially reduced and tractor life extended due to less operating hours per hectare required, while herbicide and pesticide costs have only marginally increased. – nett result is a considerable reduction in both capital and operating costs requirements.

LIVESTOCK, FEEDLOTS & MILLING

Manjoh Ranch's feedlot operation started in 1989 with 24 of their own oxen and grew to have a capacity of 22,000 cattle at which they currently have 14,424. This feedlot presently feeds 38,000 cattle per annum at the rate of approximately 140t of feed daily provided by a computerised plant to ensure consistency of the recipes and 15,000t of silage they produce from green maize plants annually. All manure produced in their feedlot is used as an additional fertilizer on cultivated lands. On average they will have 5,000 calves on pasture at any one time, with the balance on feed in pens. All cattle purchased are firstly back-grounded on pastures to allow them to adapt to their new environment with calves also grazing on irrigated Perennial Ryegrass pastures. Range cubes of 20% protein lick in pellet form are scattered on the ground in the camps to prevent competition are fed to the cattle throughout the year.



Cattle in feedlot pens on Manjoh Ranch's Nigel farm.

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"Weight gains of cattle on pastures vary dependant on the type and size of animal, supplements fed, and the time of the year," informed Tony. "You could have an animal weighing 240kg fed on a good supplement which could gain 1.2 to 1.4kg/day. We have got some light animals weighing about 180kg I placed in a pasture to do a long term trial and they have been gaining weight at a rate of just shy of 1kg/day. Because of our back-grounding, feedlotting, pastures and managed use of our crop residue in winter we have been able to effectively keep 1 ACU (Adult Cattle Unit) per ha, but it's not sustainable at this level without the grazing of our crop residues without which our stocking rate would drop to 2ha per ACU. At this reduced rate with the animals only grazing on the more nutritious pastures, we expect that the weight grain would increase, but not double. While I truly believe that we have to move to not using the crop residues by say, alternatively producing hay silage to maintain 1 ACU per ha, this would come at additional cost. Frankly, I haven't as yet calculated the profitability between such an alternative, or continuing with the present practice of using the crop residue. The latter would require determination of all the attendant costs of producing and feeding hay silage in sufficient quantities and quality equal to the managed crop residue consumed to maintain the present stocking and weight gain rates, offset by any additional profit realised by a gain in crop yield and the value placed on the benefits of a long-term holistic CA regime."

As Beefmaster Alliance, a partnership between Manjoh Ranch and Compa Beefmasters, Manjoh Ranch have a breeding herd of 1,600 pedigree females producing about 1,400 calves per annum following the Lasater philosophy run on the three main farms in Nigel, Delmas and Moloto. In addition 200 performance tested bulls are sold annually. Manjoh Ranch also has a flock of about 1,600 Dormer breeding ewes and 1,800 lambs which are raised and sold for slaughter and/or to be auctioned off as breeding ewes and rams – their first such production auction was held this year.

The balance of the maize not used to produce silage is harvested as grain and stored on their Nigel farm, which has a permanent storage capacity of 6,000t for maize and 300t for soya beans plus an additional silobag storage capacity of 5,000t. Stored maize grain is then milled to produce maize meal by their on-farm mill at the rate of 1,000t per month, packaged and sold into the retail market under the Manjoh Foods brand name. A by-product of the milling process, hominy chop, is also used by the feedlot as a feed.



Information board placed at plot 4 of the trials planted by Manjoh Ranch on their Nigel farm for the Conservation Agriculture Farmer's Day held on March 18 for the Grain SA – Argentinean partners of the Technical Cooperation Agreement. Five plots of early season yellow single cob Bt maize were planted. One plot was planted under conventional tillage practices at 1m row widths at 40,000/ha plant population. The remaining four plots were all no-till planted by the farm's Argentinean Pierobon planters at 1m row widths at 40,000/ha plant population, 50cm at 40,000/ha, 50cm at 60,000/ha and 50cm at 80,000/ha.



Tony da Costa, a director of Manjoh Ranch, standing next to full, well formed, early season, yellow, single cob variety Bt maize no-till planted at 50cm row widths at 80,000/ha plant population by them for the trials on their Nigel farm for the Conservation Agriculture Farmer's Day held on March 18 for the Grain SA – Argentinean partners of the Technical Cooperation Agreement. The Argentineans were demonstrating their practice of no-till planting single cob maize in narrow rows at high densities to create shade to conserve soil moisture and thereby obtain higher yields.



Well formed, early season, yellow, single cobs of Bt maize no-till planted at 50cm row widths at 80,000/ha plant population by Manjoh Ranch for the trials on their Nigel farm for the Conservation Agriculture Farmer's Day held on March 18 for the Grain SA – Argentinean partners of the Technical Cooperation Agreement. The Argentineans were demonstrating their practice of no-till planting single cob maize in narrow rows at high densities to create shade to conserve soil moisture and thereby obtain higher yields.



Black Oats planted as a cover crop and for grazing in a cropland which was planted immediately after forage harvesting of the previous silage maize crop. This land will be planted to soya beans from mid- to end-November in keeping with Manjoh Ranch's crop rotation system.

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PASTURES

When Manjoh Ranch first started planting permanent irrigated pastures they put them to a Tall Fescue, Cocksfoot and Perennial Ryegrass mixture. Some four years ago they started a winter grazing system on two just harvested fields of the balance of their irrigated maize lands by immediately planting Perennial Ryegrass on which they then grazed their livestock on both the maize residue and ryegrass. However, as the ryegrass has a very shallow root system requiring irrigation two to four times a week, there wasn't sufficient time to allow the ground to dry out before allowing the livestock to graze. As a consequence, the soil formed a very heavily compacted layer within the first 100mm. "What we then had to do before planting the next maize crop with a conventional planter from mid- to end-November was to rip and disc it five to seven times to create a fine seedbed," said Tony. "The costs of these conventional tillage practices were horrendous."

After some thought as to how to contain these conventional tillage costs, the second year they purchased a robust no-till Brazilian planter and planted the next maize crop directly through the killed-off grazed ryegrass and heavily compacted soil layer. Today, these two fields still hold the record for highest maize yields! "Over the last two years we have changed from planting maize on the grazed ryegrass to planting soya beans, which has proved to be a lot more successful," explained Tony. The only problem they have found is that in attempting to graze the ryegrass for as long as possible by only killing it off with glyphosate in mid-October to start planting soya beans from mid- to end-November, is a reduction in plant population due to seeds being eaten by the doves and Egyptian geese that abound on the farm. However, even with this reduction they manage to get good yields. One benefit resulting from this change in practice from planting ryegrass after maize to after soya beans is that the compacted layer has diminished in spite of the cattle still being grazed, but managed, on wet, irrigated, lands. Tony attributes this to the improvement in soil structure and quality through an increase in organic matter and biological life, such as evidenced by the abundant return of earthworms resulting from the no-till and managed crop residue retention practices they have been following.

Tony says that it is difficult for him to estimate the costs of establishing a pasture as it depends on where one wants to start. For instance, on a pasture that needs to be re-established, they would first burn it down with glyphosate, plant and harvest soya beans to improve the soil quality for two years while controlling weeds as and when required, disc harrow it to get a fine seedbed and then plant it. So, he adds, does one include in any equation the input, husbandry and harvesting costs and subtract the income derived from the soya beans produced over two years. Their pastures are not rotated, but are re-established every 5 to 7 years as while, for instance, an eragrostis pasture may look good at eye level on the ground, aerial observation have revealed how little of the original pasture remained and the effects of weed infestation, etc.

"Due to the water high requirements of ryegrass and its compaction risks we have been experimenting with Black Oats and decided to move away from ryegrass pastures to more beneficial type cover crops, although I know that we will get a lower yield. This can be overcome by our reducing our pasture stocking rate," said Tony. Black Oats is one of the world's oldest cover crops. Planted specifically for its high production of biomass both above and below the ground, it is vitally important in increasing the organic and carbon content of the soil. Best planted within 6 weeks of the first frost and interplanting of Vetch will produce some of the largest volumes of biomass that can be used as green manure, mulch or as a feedstock. Cut off in early spring before seed setting just below the soil line will provide above ground mulch leaving the roots intact to decompose and form pathways for soil water infiltration and absorption. Tony has also trialled cowpeas into a grazed smutsfinger grass camp last year which, having been planted it too late, was smothered by the smutsfinger which rejuvenated itself due to heavy rains in December. He will continue this trial next year by planting the cowpeas earlier. Disaster also struck last year in the form of a veldt fire which totally destroyed two eragrostis camps into which this year he has direct seeded Black Oats.



Black Oats growing in a paddock previously under eragrostis pasture.

"So, we are following Conservation Agriculture (CA) practices on a work-in-progress basis as we strive to find varieties of grazing plants that have high protein levels for our cattle's consumption which, in concert with the field crops planted, enhance our soil's structure, biological and organic content and nitrogen fixing properties, amongst other benefits accruing from adopting CA practices," concluded Tony.



The picture on the left of a 50cm row of maize to conserve moisture for the high density 80,000/ha plant population clearly illustrates the increased shading of the soil and plant when compared to the 1m row on the right.

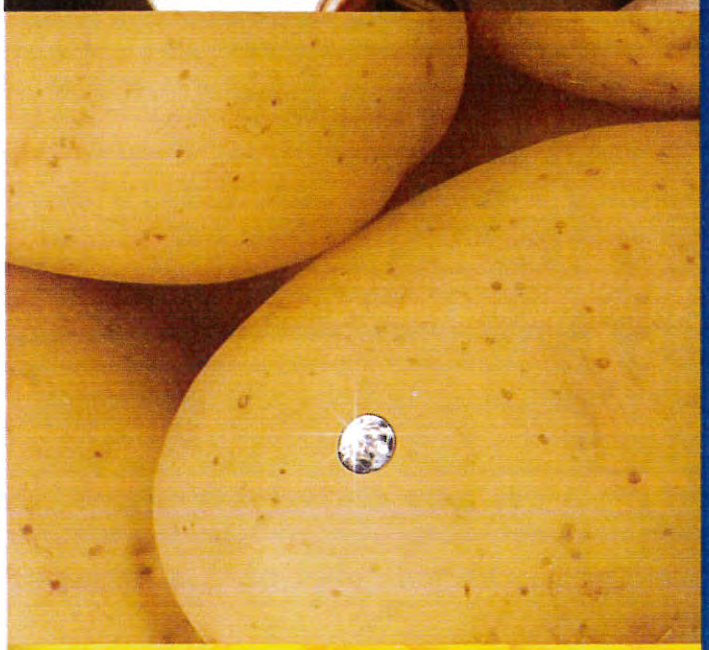


Forage harvesting green maize at about 38% moisture content for the production of silage. Note that the maize has been cut at a height of approximately 25 – 30cm to inhibit water and wind erosion.

For more information contact Tony da Costa on 083 254 1847 or email tony@manjoh.co.za

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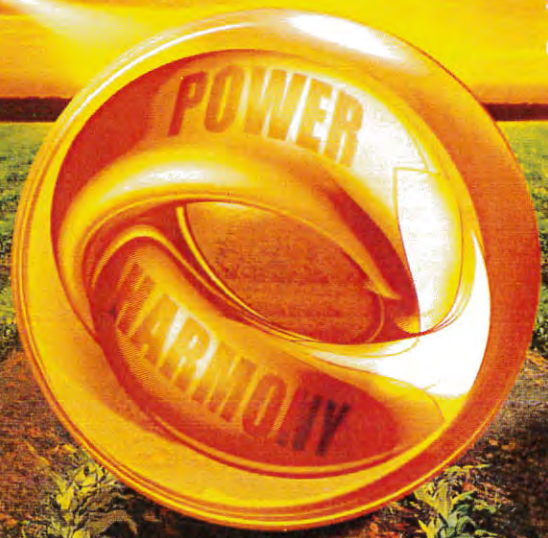
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FROM THE HEART by Richard Findlay

One of the reasons I became involved with Conservation Agriculture was the fact that I could become active in informing the agricultural society of the big problem of soil erosion and the degradation of our soils. This is a subject I have been concerned about ever since I was a school boy.

Armed with the motivating facts, which I believed had just recently been crunched off the researcher's computer and laboratories, I headed into the mission field of informing farmers of this newly found information that was going to save their farms, making them sustainable for generations to come. Oh what a feeling of telling the facts, thinking that our generation is far more informed than our grandparents' and parents' ever were. How clever our generation is???

As mentioned earlier in my Editor's slot, Keith Fey gave me some wonderful old volumes of the "VELD a Magazine for Farmers", a magazine printed by COOPERS, a famous veterinary supply company of yester year.

I started with August 1929 edition and came upon two articles which clearly convinced me that history repeats itself and that the older generation was not that *doff* after all. These two articles have been included from this old magazine for you to read and reflect on.

Have we taken the writer's findings to heart?

It seems as if what the writer of "Soil Exhaustion in South Africa" predicted how human nature would react to this article by saying "this will never happen to our soils". Read what he wrote at the beginning of this article, and I quote:

> ***Let it be said at the outset that the trend depicted below can be remedied and that this article is written in an attempt to draw attention to the situation which is insufficiently recognised.***

Yes! Eighty five years later we are still grappling with this problem which has a simple solution to it when you look at No-Till Conservation Agriculture.

The other article titled "Soil Erosion" is a good example of how quickly wrong actions, decisions and practices can have a marked effect on the troubles they will cause in the future.

Some things to ponder over and the right time to make the choice to correct and remedy these poor actions, is to DO IT NOW!!!

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FARMERS NEED ENCOURAGEMENT AND GUIDANCE

The No-Till Club's Committee congratulate two of their members who last year decided to assist emerging farmers. Here we learn about Anthony Muirhead's "Timing Farming", which we discussed over a *super* sandwich en-route to Nampo.

ANTHONY AND GRAEME'S CONCERN

They made the point that so many farmers from the Loskop area had come to them for advice and had followed what they had been told. However, they had commenced with what they had to do such as planting, side dressing or spraying for weeds either too early or too late. This had led to unsatisfactory results and the farmer ending up being despondent.

The idea behind the **Injasuthi No-Till Project** is to mentor the eager participants to get going at the correct time with all operations involved in producing a crop – "Timing Farming".

The other aspect of this initiative is that in the end Antony and Graeme would like to train people within the community. These trainees would then assist others, by co-ordinating activities of the participants so as to get the job done at the correct time. In this manner, say, spraying will be carried out by all the participants at the same time. By using pooled equipment, it will reduce repetition in setting up planters etc. As an operation will be executed on all participants' ground within a prescribed timeslot, as prearranged by the mentors and the weather, they are hoping it will lead to better farming and environmental practices.

We wish to thank Anthony and Graeme for tackling and becoming involved with this initiative. This project would not have taken off without Thenjiswa Gayi, Deputy Manager for Mbabazane and Mtshezi local municipality, who has given her full support to the project. Then also is Jabulani Ndluli, Crop Specialist for Uthukela District Municipality. He's done a lot of the ground work and is fully involved in the project.

These concerned agriculturalists are running with this initiative and we wait to see how it all works out. We asked Graeme to write a short account of what has happened.

INJASUTHI NO-TILL PROJECT 16 July 2014

by Graeme Oates Extension Officer in Estcourt

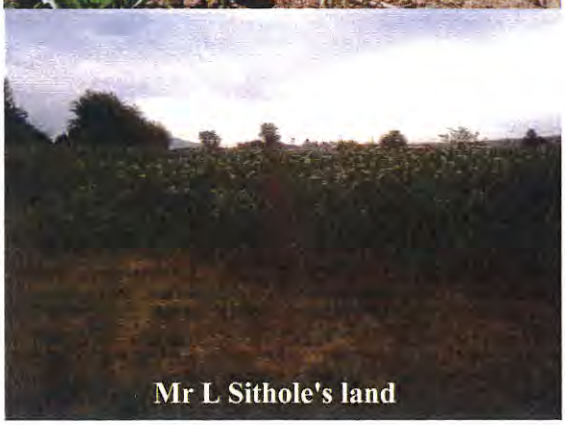

Mr Shelembe's land

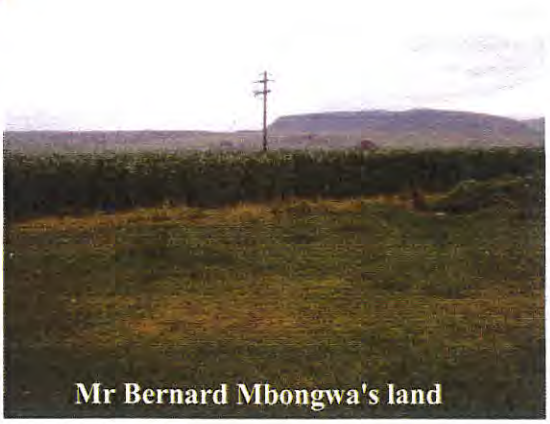
This is a No-Till initiative located in the Mbabazane Local Municipality in the Loskop area just outside Winterton. This project is being driven by a group of small scale farmers with the assistance of Ant Muirhead and support from the Department of Agriculture and Environmental Affairs.

The objective is to provide the farmers the opportunity to increase production on their high potential land.

The farmers fund their own inputs and the mechanisation is supplied by the Department of Agriculture and Environmental Affairs. The inputs per area are standardised to simplify the mechanised operations. This means that planting fertilizer, cultivar and the chemical program is the same on all the lands.

The first meeting to plan the way forward was held in September 2013. Thirty-two farmers attended the meeting which was held on Gourton farm in Winterton. Twelve of the farmers' lands were planted.


Mr L Sithole's land


Mr Bernard Mbongwa's land

The project did experience some teething problems. Most of these arose due to time constraints and not enough time to plan. Nevertheless the farmers were very happy and there was a marked improvement in yields.

Monthly meetings occur where the importance of planning and time manage-ment is instilled. There are now over 100 farmers who have shown an interest in the project and want to be involved.

Their lands are being mapped and soil samples are being taken. These samples will be sent so Cedara for analysis to determine the soil nutrient status. The farmers have started a savings club. This monthly saving will reduce the burden of buying the inputs at planting time.

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NO-TILL CLUB

CONSERVATION AGRICULTURE CONFERENCE 2014

VENUE: ATKV Drakensville DATE: 2, 3 & 4 September 2014



COBUS OOSTHUIZEN - Guest speaker at conference dinner



Times Are Changing – How Understanding My Potential Helps To Keep Up!

NB: The fee for the Conference includes lunch, dinner, and teas…but DOES NOT include breakfast, meat for the braai and accommodation!

2009 – Current:	PHD	Stellenbosch University	Mentoring Process Implementation
2007 – 2008:	MDIV	Stellenbosch University	Development, Counselling & Mentorship
2005:	LTH	BISA	Licentia Docendi (Teaching)
2004:	BA	Honours North-West University	Community Development
2001 – 2003:	BTH	North-West University	
1997 – 2000:	ND Marketing Management		Cape University of Technology

Amongst other positions as facilitator/mentor and Chief Operations Manager, Cobus holds the following positions:

2008 – Current: Executive Director, LIFEXCHANGE was found as a result of his research (Master's Degree) in mentoring, an organization specialising in social intervention through mentoring. He leads a team of 9 people implementing effective mentoring systems. He continues with his research on mentoring at the University of Stellenbosch, positioning LifeXchange as a global leader in the area of mentoring.

2010 – Current: Director, KAMBRO formed to reach out to the Fraserburg community. Cobus' responsibility is to create and maintain good governance systems as well as legal compliancy.

Because of his research in mentoring, his experience in counselling and development and his interest in Neurology and Sociology, Cobus is often invited as a motivational speaker for corporates, guest lecturer at Universities or presenting workshops in most sectors. He has spent time in the tourism industry as well as education.

The influence of genotype, maturity group, planting date, row spacing and plant population on soyabean yield

DR ANTONY JARVIE



2009 University of KwaZulu-Natal

PhD Plant Breeding **Thesis title:** Optimizing aspects of a soyabean breeding programme.

1986-2014 PANNAR Seed (Pty) Ltd, Greytown

Soyabean breeder

- Soyabean breeding programme manager for PANNAR.
- Bred / released 40 soyabean cultivars over a period of 28 years in 4 southern African countries.
- Travelled widely on soyabean business: China, Argentina, Brazil, Colombia, USA and most of southern Africa.

2004-2014 Research Station Manager

Manages Greytown research station activities for 45 staff, 16 technical staff and 14 professional staff.

WESSEL F. VAN WYK



BSc(Agric) Agronomy	1971 – 1975	University of Pretoria
BSc (Agric) (Hons) Agronomy, Soil Science	1984	University of the Orange Free State
MSc (Agric) Agronomy, Irrigation	1988	University of the Orange Free State

Registered with the South African Council for Natural Scientific Professions
Member of F.S.R.E (South Africa)
Authored 16 publications

Amongst many other positions between 1975 to the present, Wessel currently holds the following positions:

01 August 1985 to present:	ARC (Institute for Soil, Climate and Water) Does all the fertiliser recommendations for any crop according to soil analyses
01 November 2002 to present:	Private consultant (soil science and crop production)
1 August 2001 to present:	Contractor for Protein Research Foundation as soyabean agronomist
2001 to present:	Speaker on soyabean cultivation at more than 50 farmer's and information days

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Inoculation, Nodulation and Nitrogen Fixation: The impact of heat and moisture stress and potential benefits of biological nitrogen fixation

DR AHMED HASSEN



Born in Addis Ababa, Ethiopia in 1968.

Studied and graduated in Biology (BSc) in 1989 and in Applied Microbiology (MSc) in 1999 at the Addis Ababa University.

Lecturer of Microbiology at Haramaya University Ethiopia for three years.

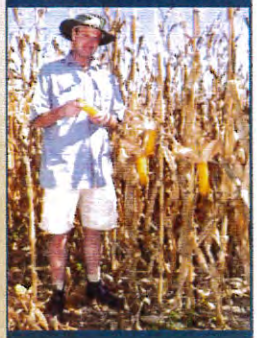
2003-2007 studied at the University of Pretoria and graduated with a PhD in Microbiology and Plant Pathology.

In 2008 worked as a postdoctoral fellow at the Department of Microbiology and Plant Pathology, University of Pretoria. Joined the ARC-Plant Protection Research Institute as a researcher **in 2009.**

Currently working on biological nitrogen fixation of legumes and other plant growth promoting soil microorganisms for sustainable agriculture.

Challenges and successes of no-till soyabean production at Bergville

BRUCE SHEPHERD



Bruce does no-till because it just makes sense!

There is an environmental benefit through a vast reduction in soil erosion. The residue-cover offers better rain infiltration and soil moisture in conservation, and so he ultimately harvests higher yields.

Managing Soyabean Disease Threats in Southern Africa

DR RIKUS KLOPPERS



Graduated from the University of the Free State with BSc Agric, BSc Agric Hons, MSc Agric and PhD degrees in Plant Pathology. After careers in research at the ARC Potchefstroom, he lectured at the University of the Free State. Joined PANNAR's research team in 1998 and has been based in Greytown for the past 15 years.

Over 26 years' agricultural research experience; academic roles included lecturing and supervising postgraduate students.

Authored and co-authored publications; made scientific contributions at multiple national and international congresses and workshops.

Member of scientific societies: the South African Society for Plant Pathology (SASPP), Plant Breeding Society of SA (SAPBA) and the American Phytopathological Society (APS).

Awards: The 2012 SA Agricultural Writers' Agriculturist of the Year for KZN; one of seven finalists for National Agriculturist of the year.

Challenges and successes of no-till soyabean production at Paulpietersburg

RALF KÜSEL



Farms in partnership with his father Jürgen, west of Paulpietersburg in the escarpment of Northern KZN.

Jürgen started minimum-till in the eighties.

Ralf gradually changed to some strip-till and no-till.

Since 2005 only no-till.

Comprises: 275 ha supplementary irrigation
400 ha dry-land
700 ha grazing

Crops grown in rotation: Maize, soyabeans and popcorn.

Commercial beef herd utilises the grazing in summer and the stover in winter.

Pros and cons of using strip tillage in soyabean production

JOHN & JAMES JACKSON



John Jackson was born in 1948.

He matriculated in 1965 at "Weston Agric. College".

He started work immediately with his Dad on Shamrock Farm in Bergville KZN. They followed the norm which was ploughing, disking etc. until the late 70's then moved to chisel ploughs and started no-till in 1984.

Married in 1973 and they have two daughters and a son. James joined them on the farm in 2003 and has been a great partner.

John tries to visit the USA regularly to keep abreast with the new technology and has since started with strip till.

Glyphosate effects on soil health, plant diseases and the development of super weeds: Real or supposed risks?

DR CARL (CHARLIE) REINHARDT



Was born and raised in Kimberley. Studied from 1975 to 1978 at the Orange Free State University and obtained the BSc degree followed by the BSc Honours degree in Botany.

After a brief career at Ciba-Geigy he started his career at the University of Pretoria in 1980, and obtained the following degrees: BSc Agric, BSc Agric Honours, MSc Agric en PhD Agric in Agronomy, specialising in Weed Science. During his 28 years as full-time academic.

Charlie has produced 60 peer-reviewed scientific articles, presented more than 80 papers at conference, and contributed more than 50 articles in popular agriculture-focus journals.

2001-2008: Professor and Head of the Department Plant Production and Soil Science.

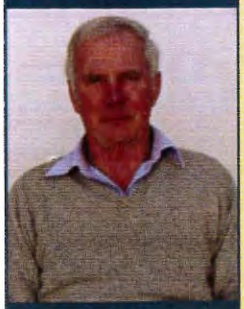
Since 2009, appointed part-time in the same department as Extraordinary Professor of Weed Science.

To date, has supervised the studies of 28 Masters and 7 PhD graduates in Weed Science. In 2012 he was appointed in his current fulltime position as Dean of the Villa Academy.

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"Principles in controlling slugs/snails in No-Till"

DR GEOFF TRIBE



Studied at the University of Natal (1969-1972) for a B.Sc. (Agric) in entomology. Seconded from Plant Protection Research Institute to the Australian CSIRO Dung Beetle Research Unit where he studied ball-rolling dung beetles for the biological control of dung breeding flies.

Transferred to the Apicultural Unit to study the ecology and management of the two indigenous honeybee races. Due to allergy reactions he was transferred to the Forest Entomology unit in Cape Town and was involved in the location, importation, and release of several biological control agents against pests of pines and eucalypts. Cape Town laboratories sold; posted to Stellenbosch to research the losses of canola seedlings which occurred virtually overnight.

How profitable are grass leys in no-till systems?

GERHARD VAN DER BURGH



Current position: Agro-Industrial Specialist

Honours degree in Agricultural Economics, University of Pretoria.

Currently writing up his Master's dissertation.

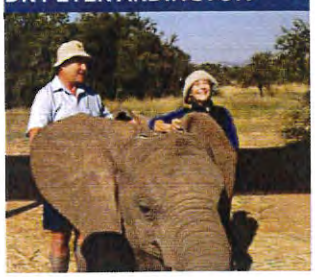
Further studies for PhD at the University of Minnesota, USA. Agriculture and academic research contributions include:

- Compiling a report for the National Planning Commission – Contributor
- Work done for the Maize Trust – Primary Author
- Compiling a report "Farm sectoral determination: An analyses of agricultural wages in South Africa" – Contributor
- Report for SABK – Primary Author
- Completed value chain analysis for Groundnut, Sunflower, Maize-Milling, Pork and Potato Industries – Primary and Contributing Author

Gerhard remains involved in primary agriculture. He and his wife reside between Pretoria and their family-farm in the Free State.

Integrated sugarcane and cattle production under minimum tillage at Mandini, KwaZulu-Natal

DR PETER ARDINGTON



1971	University Pretoria, Veterinary Science, BVSc.
1972–1974	Intern/Resident, University Pennsylvania, USA
1974 - 2013	Veterinarian/Farmer Beef Cattle, veld management, sustainable soil fertility
1976-1982	SA Veterinary Association Natal (Chairman) and National delegate
1982-2001	SA Veterinary Council (President 1994-1999)
1981-1985	Lecturer Herd Health U of P
1988-1999	External Examiner U of P
2006	Leader Visitation Team, Veterinary Faculty, U of P
2013	Visitation Team, Veterinary Faculty

The use of grass leys to improve soil biological and physical properties

DR WAYNE F TRUTER



Currently senior lecturer and researcher, Department of Plant Production and Soil Science, in the Faculty of Natural and Agricultural Sciences, University of Pretoria.

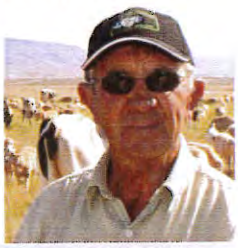
B.Sc. Agric degree in Animal/Pasture Science, M.Sc. Agric in Rangeland and Forage Science, Ph.D in Integrated Agricultural and Environ-mental Sciences.

He has spent 15 years establishing environmentally acceptable methods of reclaiming disturbed areas, to ultimately re-vegetate these areas with selective pastures (grasses and legumes) to improve the agricultural potential of these degraded areas to be utilized in animal production systems.

Currently the manager of research projects for the:
South African Water Research Commission (WRC), Southern African mined land reclamation projects for Coaltech - the Coal Mining Research Association of the South African Chamber of Mines, BHP Billiton, Xstrata Coal, Anglo Coal, TOTAL SA, Coal of Africa, Optimum Coal, SASOL, ESKOM and Pasture seed industry (Advanced Seed, Pannar etc.)

Managing grass leys using ultra high density grazing

ANDRE LUND



Born in 1939 in Beaufort West and lived on the farm Elandsfontein for 73 years.
Started farming in 1958 with his father and brother.

The farm became his classroom and the ruminant industry his subject.

Cooperated in research projects with National Botanical Society, Cape Town Technikon and Western Cape Department of *Agriculture.*

Followed the principals of John Acocks, Allen Savory and Johann Zietsman.

Ran Karoo Grazing Experiment for 10 years.

His passion is sustainable farming by proper management of natural veld.

Soil moisture, temperature and economic comparison of no-till versus tillage at Rietkuil near Reitz

RUHAN THEUNISSEN



Born 4 November 1986 and grew up in Bethlehem, Eastern Free State.

Studied at the North-West University, Potchefstroom and obtained a Bachelors and Master's degree in Mechanical Engineering.

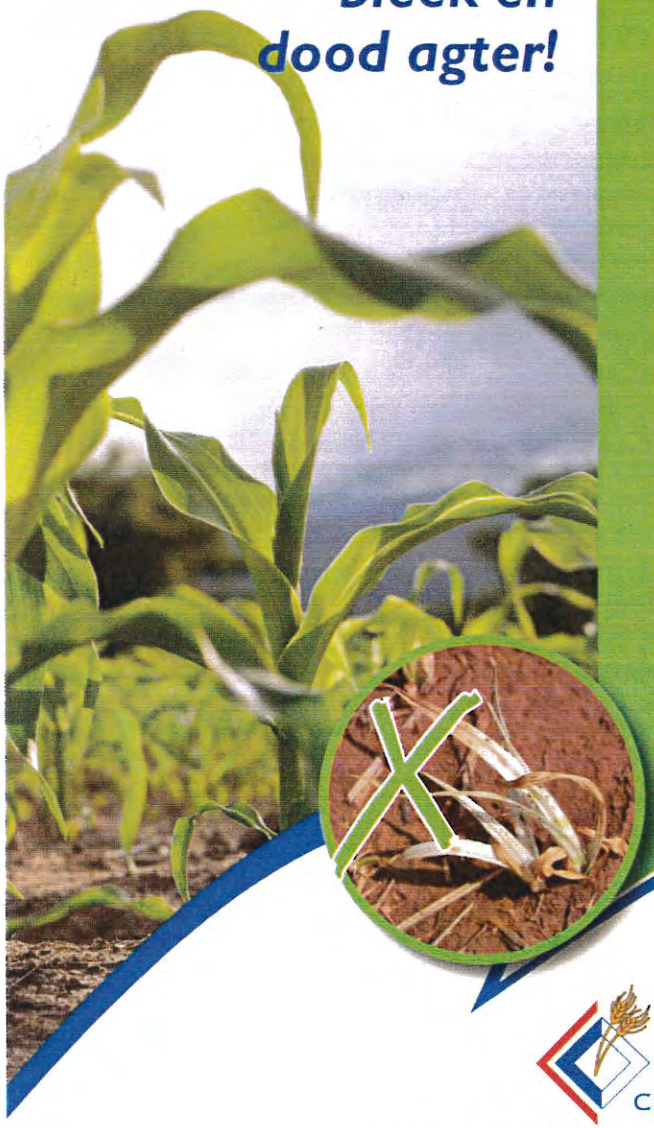
Worked in the energy management sector for three years and specialised in the measurement and verification of energy related data.

Always had a passion for farming and decided to change career to farming in May 2013. He is part of the Riemland study group and no-till trails in the Reitz district.

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Soil Exhaustion in South Africa

By Hubert D. Leppan, M.Sc.
Professor of Agricultural Economics, Transvaal University College, Pretoria.

Let it be said at the outset that the trend depicted below can be remedied and that this article is written in an attempt to draw attention to the situation which is insufficiently recognised.

SIMKHOVITCH in his powerful essay, "Rome's Downfall Re-considered," Gives irrefutable evidence to show that one of the main factors in the decadence of Rome was soil exhaustion. Bradley in "The Enclosures of England" furnishes conclusive data to prove that the poverty reigning in England during the 14th century, and culminating in the enclosure of land after the rural revolts of the 16th and 17th centuries, was chiefly due to the same cause. It need hardly be pointed out that modern rotative farming with a free use of artificial fertilisers was not practised by the Romans and early English farmers. These two instances are cited in order to emphasise lessons of the past and to indicate the national scope of the question of maintaining soil fertility.

Sir John Russell says: "the reduction of fertility brought about by cropping is called 'exhaustion' of the soil. It results from the circumstances that the nutrients and bases absorbed from the soil by plants are not returned to the surface but carried away more or less completely so that the restorative part of the cycle (of maintaining fertility) is broken." It must be understood, of course, that even badly "exhausted" soils will still produce crops, but of very low yields.

SOUTH AFRICA CONSIDERED

What is the situation in South Africa? It is our opinion that maize, our major crop, can be used as an index.

The Union's production of maize grain has been as follows:

1921-22	13,480,000	bags
1922-23	19,760,000	"
1923-24	11,230,000	"
1924-25	24,290,000	"
1925-26	10,092,000	"
1926-27	18,260,000	"
1927-28	19,170,000	"
1928-29	19,025,000	(official estimate)

Allowing for fluctuations connected with seasonal vagaries of the weather, the tendency has been for the country's production to remain more or less stationary. No one conversant with farming in South Africa can doubt the fact that, although an enormous improvement can still be effected, farmers are conducting their operations much more efficiently than in the past. The maize used as seed today is more acclimate-ised than in the past and is therefore inherently better suited to the various localities than has been the case hitherto: more care is exercised in cultural methods, and fertilisers are much more commonly used. But the country's production, on much the same acreage, does not show the upward trend one would expect. Is it that, while the productivity of some soils has been maintained and in some cases even improved, the general tendency is towards soil exhaustion?

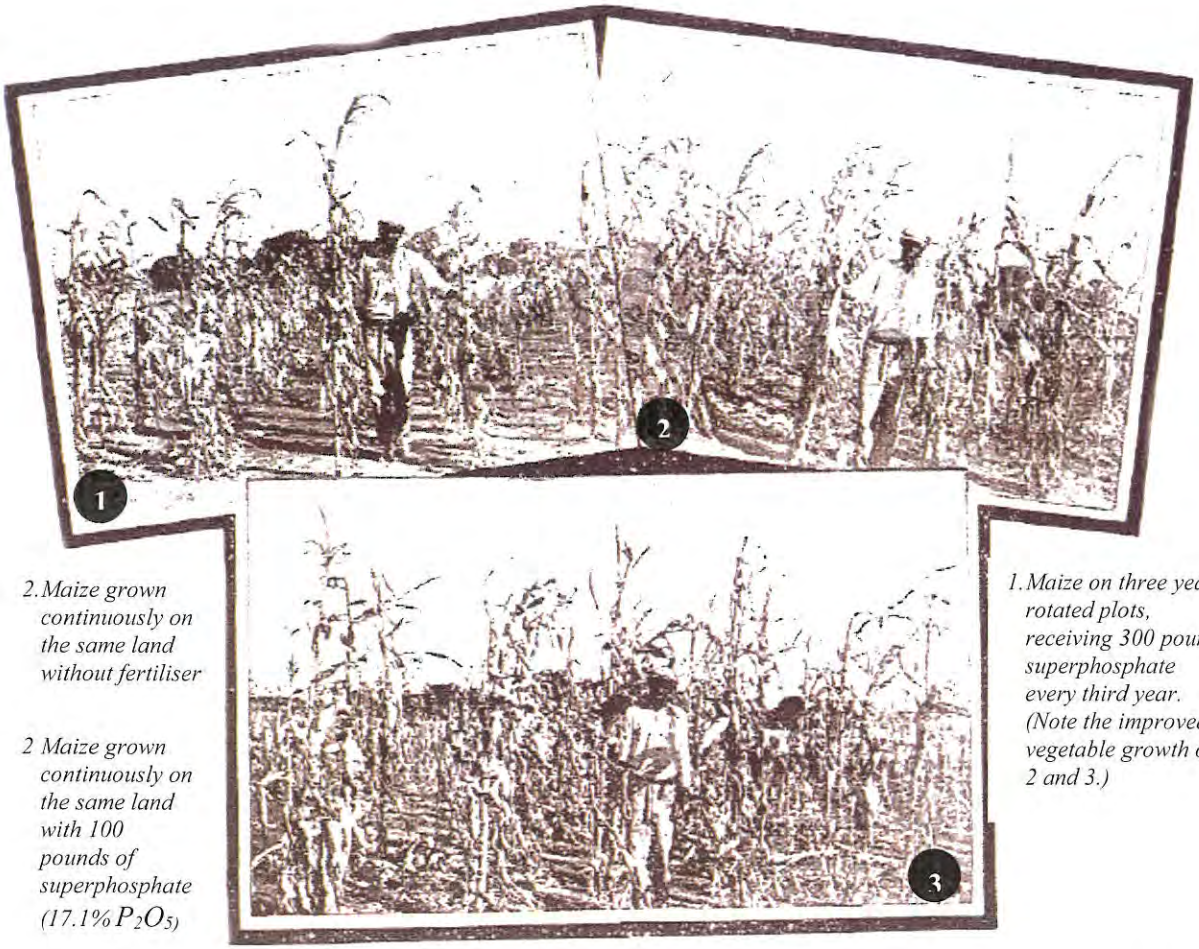
INSTRUCTIVE COMPARISON

In Germany and England the yields per acre of crops have gradually risen during the last fifty years. An enquiry as to why this should be the case in those countries may, by comparison, shed light on the subject. The high yields there are largely due to a more advantageous climate for cropping than is the case in South Africa, and the increased production per acre can be attributed to a number of causes.

Firstly, improved varieties have been obtained; secondly, better cultural methods, including a very liberal use of fertilisers, are general; thirdly, rotative farming, based largely on restorative crops, is almost the invariable rule; and, lastly, both these countries are deficiency countries with regard to concentrates, so that to meet the needs of the intensive feeding of animals considerable quantities of concentrates are annually imported, a large portion of which eventually finds its way to the soil in the form of animal manures.

Practice in South African farming differs from the above radically. A relatively small amount of the grain produced is fed to animals and an exceedingly small quantity of concentrates is imported; rotativc cropping is the exception rather than the rule; and, finally, the average fertiliser dressing is far below the requirements of comparatively low yields per acre.

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2. Maize grown continuously on the same land without fertiliser

2 Maize grown continuously on the same land with 100 pounds of superphosphate (17.1% P_2O_5)

1. Maize on three year rotated plots, receiving 300 pounds superphosphate every third year. (Note the improved vegetable growth on 2 and 3.)

TRANSVAAL EXPERIMENTS

Experiments conducted at the Transvaal University College Farm are relevant to our discussion. In 1921 a number of experiments employing different rotations were started. Some details concerning one will suffice to illustrate our point. A 3-year rotation (maize fertilised with 300 lbs of superphosphate, followed by maize without fertiliser, followed by cowpeas ploughed under) is compared with check plots on which maize is grown continuously with and without super-phosphate. The average maize yields of these plots for 1926-27 and 1927-28 were as follows:

	Bags per acre
Continuously without fertiliser	5.01
Continuously with 100 lbs. super per annum	8.47
In the rotation	9.31

The yields on the differently treated plots vary from year to year, but, after looking through the results over the full period during which the experiments have been conducted there is no question that on this soil (an average one of the Transvaal) the productivity of the plots on which maize is grown continuously without fertiliser is rapidly declining. On the other hand, the productivity of those receiving fertiliser is practically stationary, whilst of those in the rotation is slowly increasing.

In scrutinising the results it is significant too that during years of drought, e.g. 1925-26, the yield on the plots continuously cultivated to maize without fertiliser will be reduced to an extremely low level, while those rotated and fertilised will give substantial increases over their present good yields.

In his survey of the costs of maize production, Parish has shown definitely that the use of fertilisers pays handsomely in increasing yields.

SOME STRIKING FIGURES

According to the Agricultural Census (No. 8) in 1924-25 the cultivated land in the Transvaal received 27 pounds of fertiliser per acre and in the Orange Free State an average per acre of only 6 lbs. A fair maize crop takes about 12 pounds of P_2O_5 (Phosphoric Oxide) per acre from the soil. Assuming the fertiliser used to be entirely superphosphate of ordinary grade then about one-sixth of these amounts would be P_2O_5 so that during 1924-25 in the Transvaal approximately 3 pounds, and in the Orange Free State less than 1pound, of P_2O_5 was returned to the land to meet this drain. Since then the use of fertilisers has increased markedly, but is still totally inadequate to meet the needs of good crops on soils initially not high in productivity.

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From what has been said above, justification would seem to exist for the statement that our low yields per acre and almost stationary total production point to a situation in which the trend is towards soil exhaustion.

WHERE THE FAULTS LIE

In the writer's opinion the chief short-comings affecting the productivity of South African soils are:

a) The supplementary feeding of animals is very deficient in amount, with the result that only small quantities of manure are returned to the soil.

b) The exportation of grain, while possibly over-emphasised by some, must be looked upon as a drain on the available plant nutrients of the soil.

c) In parts where grain crops are precarious the policy should be to substitute crops grown for fodder. This would stimulate feeding and in turn would increase the supplies of manure.

d) Rotative cropping, employing restorative crops, is far too rare. In 1924-25 only 65,000 acres were green-manured in the Union. In constructive cultivation one to two million acres would be a conservative quota. (With our present knowledge some qualifications here are necessary. In the temporate humid regions green-manuring is unquestionably good practice; but in the summer rainfall parts of South Africa, especially the drier ones, the profit of employing green-manures has not been established beyond question. It is just possible that in some parts rotations, in which fertilisers are used judiciously, may not require green manures. The position can be clarified only by prolonged investigation and experiments are now in progress at the T.U.C. which, it is hoped, will furnish the required data.)

e) Fertilisers are insufficiently used. The average quantity used per acre, taken as spread over all the cultivated land of the country, is only a fraction of what is required to improve soil productivity. Increased dressings would tend to stabilise farming, for, during adverse seasons, moisture is more effectively used by a crop properly fertilised than by one unfertilised and, moreover, it is in these years that prices are highest and feedstuffs are most required by livestock. The improved chemical composition of the fodder of fertilised crops should not be lost sight of in its bearing on an animal industry already handicapped in many parts by the low phosphorus content of the natural vegetation.

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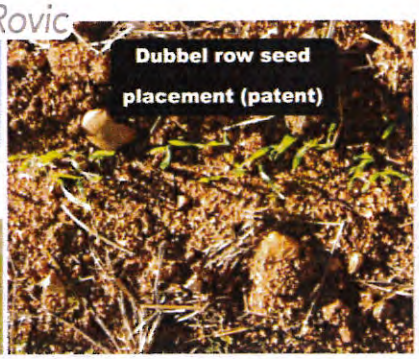
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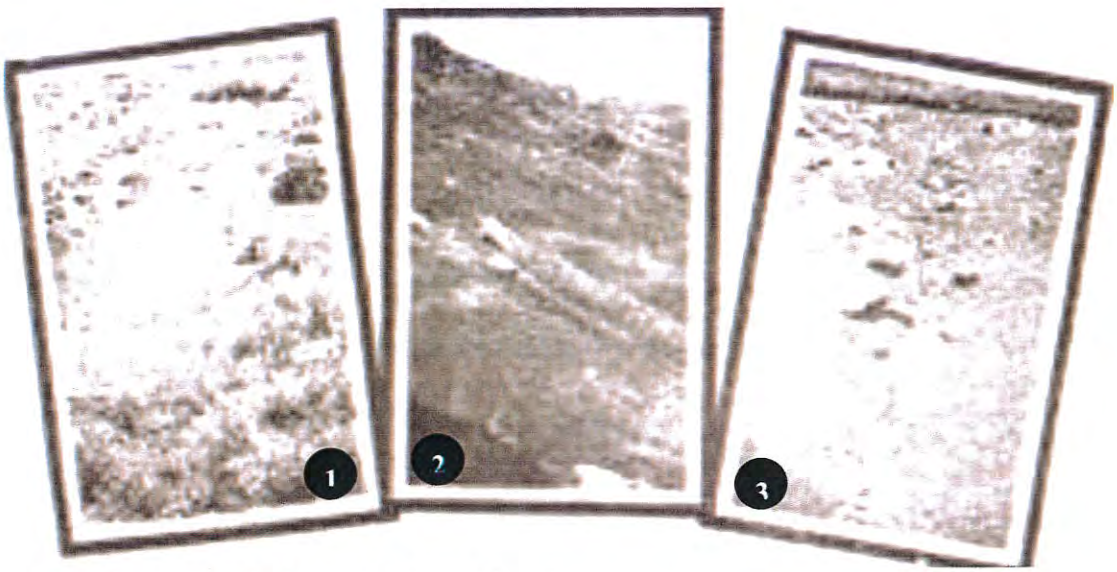
A foot of good soil and nourishing pasture has been washed away here after ploughing

SOIL EROSION

SOIL EROSION has been taking place for centuries in South Africa, but it is becoming more serious in the communal mountainous areas, where an all too general practice of ploughing up portions of the steep mountain slopes is common practice. This procedure is doubly unfortunate because valuable sheep and goat pasturage is being destroyed whilst only a fleeting return is being obtained from the cultivation of the ground.

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The photographs were taken recently by M. J.W. Shoebotham, our Rhodesian manager.



1. The starting of a donga on a ploughed patch.
2. Mountain slope washed clear of soil.
3. View of old ploughed area completely denuded. Top of page: Original top layer of soil and grass.

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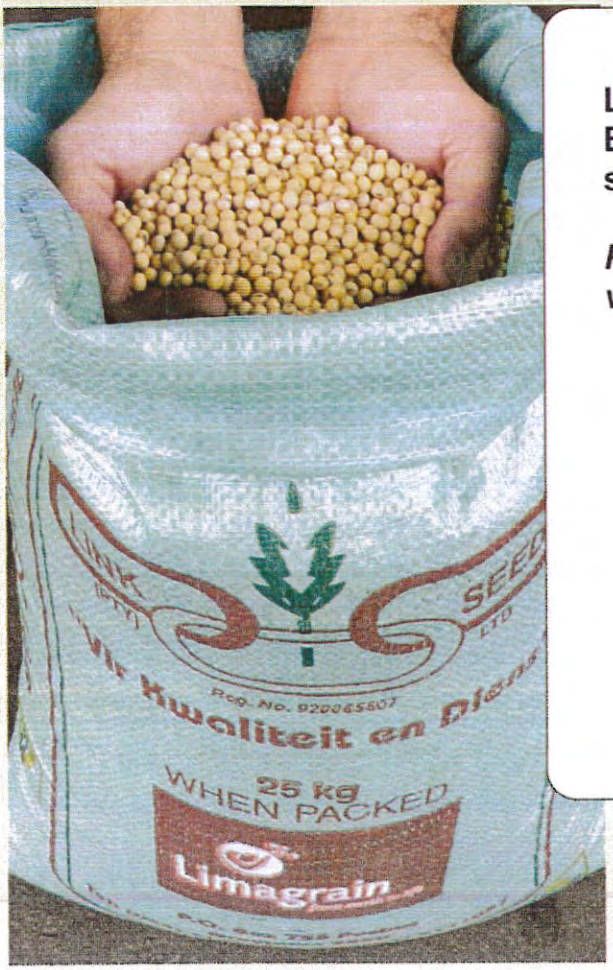
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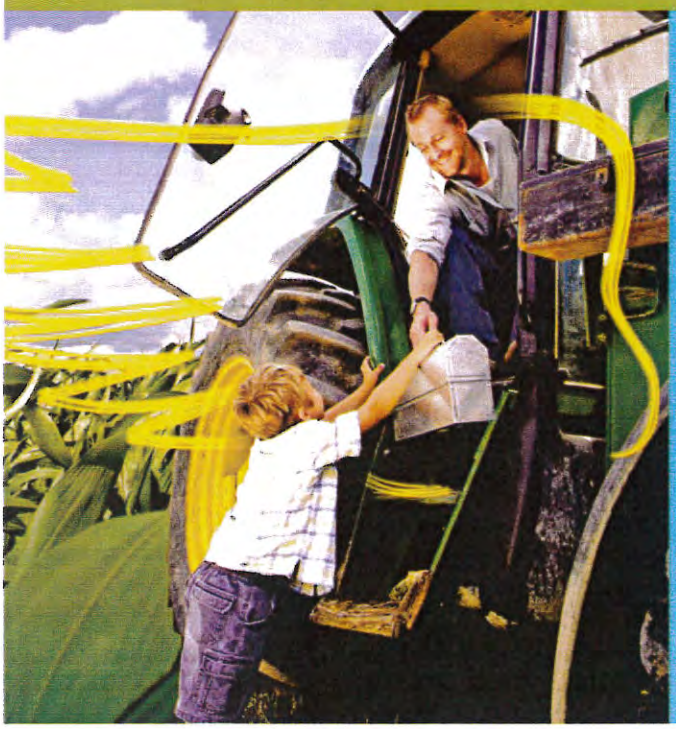
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