

MAXIMUM YIELD with rainfed soya beans

A wise farmer adapts his production methods to his farm's environment. **Gerhard Keeve**, an award-winning soya bean producer, shares his approach to obtaining the maximum yield under rainfed conditions with **Lloyd Phillips**.

Gerhard Keeve has continued building on the soya bean production knowledge his father, AP Keeve, and other soya bean pioneers in his area have built up and shared.

Gerhard's late father AP was among the first farmers to grow soya beans in the Scheepersnek area of northern KwaZulu-Natal. AP started farming alone on the farm Zaaifontein in 1980, until Gerhard joined him in 1991. At the time, AP was cropping maize and soya beans on an annual rotation.

He and about 10 other farmers in the Scheepersnek area were the first to grow soya

beans there, and had formed the Scheepersnek Soyabean Study Group.

When the annual Super Soya Competition was launched in 1992, AP and Gerhard were two of its first entrants.

'I PLANT 420 000 SEEDS/HA FOR A GERMINATION RATE OF 350 000 TO 380 000 PLANTS/HA.'

AP's forward thinking on the value of soya bean production and his approach to maximising soya bean profitability paid off in 2002 when he won the competition's award of Highest Gross

Margin – Dryland (North). Three years later, AP passed away, but would be proud to know that last year, Gerhard won Highest Yield Dryland (North) and was runner-up for Highest Gross Margin – Dryland (North).

FARM FACTS

Zaaifontein is 660ha with about 40ha irrigated and 200ha rainfed. White maize and soya bean crops are produced in summer on a 2:1 year rotation. Around 90ha is under black wattle timber, and 300ha is natural sourveld grazing for Gerhard's 130 commercial Simbra-type breeding cow herd and followers.

The farm's 20-year average annual rainfall is 850mm, with midsummer temperatures around 30°C, peaking at 37°C. Winter temperatures drop to -3°C, with about two weeks of intermittent frost. The western half of the land

is predominantly well-drained Avalon soil with a grey A horizon and a yellow B horizon, about 1m deep and overlying a soft plinthic layer. The organic matter content is low and the clay content is between 25% and 30%.

The eastern half is mainly red Hutton soil over 1,2m deep, well-drained with a 40% clay and low organic matter content.

TILLAGE AND STOVER USE

Gerhard uses conventional tillage, but neither rips nor ploughs and prefers the more conservation-orientated method of chisel ploughing and a tined implement to prepare the seedbed. With diesel prices sky-rocketing, he is considering changing to no-till production.

"I don't grow winter crops and leave the stover on the land for livestock to graze from June to August, until just before the first



BELOW: Pioneer Seeds' modern soya bean cultivar PHI 95Y20 RR was released commercially in South Africa last year. This 50-day-old crop on Zaaifontein farm indicates Gerhard's keenness to always have a small section of his land under a new soya bean cultivar trial.

PHOTOS: LLOYD PHILLIPS

FAST FACTS

- Gerhard's father, AP, was one of the first farmers in the Scheepersnek area to grow soya beans and form a soya bean study group.
- Gerhard is considering changing to no-till production because of sky-rocketing diesel prices.
- Zaaifontein is about 40ha irrigated and 200ha rainfed. White maize and soya bean crops are produced in summer.



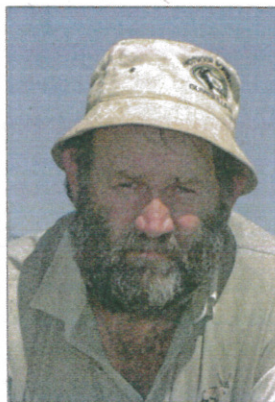


What innovation has affected your farming?

A cellphone is crucial to managing my farming operation effectively. I can't imagine how I got by before. Modern farming is very demanding of one's time, but my cellphone helps me keep in touch with workers, drivers, clients and agents. I can keep my finger on market trends. Should a vehicle break down, I can make a quick call to a mechanic, reducing downtime.

What is your biggest challenge?

Since commodity boards were phased out and replaced by free market principles, it has become a challenge to market my grain for least risk and most profit. I can make more money per ton by selling in smaller cash deals, but these are not guaranteed. I make less per ton by selling in bulk to large, established buyers, but it's pretty much guaranteed they'll take my grain.



GERHARD KEEVE

rain in mid-September," he explains. "Maize stover provides around 4t/ha dry matter (DM) and soya bean stover up to 1,5t/ha DM. I remove the cattle before the first rain to avoid hoof compaction on wet soil.

"If it rains earlier, I remove them and keep them off until after the next harvest. My average rainfed white maize yield is 6t/ha to 7t/ha and I sell the grain to a nearby mill. The long-term average rainfed soya bean yield varies from 2,3t/ha to 2,5t/ha."

After removing the cattle from the stover and before planting soya beans, Gerhard burns about 50% of the remaining maize stover. This is done land by land, on a rotational basis every four or eight seasons, depending on his needs. While he prefers

retaining stover on the land to boost the organic matter content in the soil before planting soya beans, fire prevents the germination of volunteer maize plants and makes soil preparation easier. After the first single rainfall of over 20mm, Gerhard works the land with a chisel plough at 200mm to loosen the soil for good penetration of rain ahead of planting. This ploughing also kills small weeds that germinated after the burning, or came through the unburnt stover.

TIME TO PLANT

"I plant the first maize in early to mid-October,



TOP: Gerhard follows conservation tillage methods. He plants all his crops with an 80cm inter-row spacing to eliminate the need to adjust implements.

ABOVE: Gerhard currently runs a 2:1 white maize to soya bean rotation, averaging a rainfed maize yield of 6t/ha to 7t/ha. To improve the soya bean yield, he is considering changing to a 1:1 maize to soya bean rotation.

RIGHT ABOVE: A stand of white maize. Cattle are grazed on maize and soya bean stover from June to August.



A Kongsilde prepares the soil for soya bean planting by breaking up compaction to promote rain penetration.



Why Gerhard participates in the Super Soya Competition

"I've participated in the Super Soya Competition since its inception. My father and I gained a great deal of information and knowledge on soya bean production from this competition.

"The results allow me to compare my production

methods and results with those of other producers in my area and the rest of the province. If my results are below those of most of the other participants, I know that I have to try other options to improve management and production."

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← and soya beans from late October to early November," Gerhard explains. "To plant soya beans, I put in a 3,4m-wide Vetsak seedbed preparator immediately ahead of the planter to create a level seedbed and kill small weeds.

"I then use a four-row John Deere 1750 conservation vacuum planter to plant 420 000 soya bean seeds/ha for a germination rate of 350 000 plants/ha to 380 000 plants/ha.

"Annually, I use about 10% newly bought seed, with the rest being my own retailed seed. About 50% is PAN 538 RR, 40% PAN 737 RR, and the 10% bought seed is PHI 95Y20 Roundup Ready."

For Gerhard, the appeal of PAN 538 RR and PAN 737 RR is that these tried and tested cultivars have high yields. A 140-day to 150-day growing season means that they are ready to harvest before the maize.

Research has found that medium-length growing season soya bean varieties are best suited to northern KwaZulu-Natal. These two varieties also have

good tolerance to soya bean rust. The PHI 95Y20 RR planting is Gerhard's trial to compare growth performance and yield with that of PAN 538 RR and PAN 737 RR. So far this newer cultivar is doing well and Gerhard is considering using more in the future.

He normally inoculates all of his soya bean seed with SoyGro, but is using both SoyGro and Stimuplant during the present (2011/12) season to compare the two in terms of yield.

Gerhard standardises an 80cm inter-row spacing in all his crops to eliminate adjusting his implements and harvester. While many other soya bean farmers prefer a 91cm spacing, his plants canopy lower at about 70cm, shading out many weeds and this also reduces competition for moisture and nutrients between the weeds and the soya beans.

NUTRIENTS & PEST CONTROL

"While many farmers don't apply fertiliser to their soya beans at planting, I apply Omnia 2:3:2

ABOVE: Gerhard's primary enterprises are soya beans (front), white maize (middle) and black wattle timber (rear), as well as commercial beef. He started farming on Zaaifontein in 1991 alongside his father, the late AP Keeve, who encouraged Gerhard's interest in commercial soya bean production.



ABOVE RIGHT: One of the maize stover lands, which have not been burnt, before planting to soya beans. Not burning half of such lands allows Gerhard to increase organic matter content in the soil, while burning the other half simplifies planting and weed control.

liquid fertiliser at 130ℓ/ha through the planter about 5cm-8cm to the side of, and about 25mm below, the seed planted at 50mm depth. This provides about 180kg/ha N:P:K, a valuable nutrient boost to the seedlings. They grow vigorously in the first three important weeks."

To cut production costs, and because of a clean, prepared seedbed, Gerhard does not apply a pre-emergence herbicide. But 30 to 40 days after planting, he goes through the lands with a 10m tractor-mounted boom sprayer, applying 2ℓ/ha Roundup and 15g/ha to 20g/ha Classic herbicide to address the persistent morning

glory and burr weeds. He knows from his study group and farmers' information days that even Roundup Ready soya bean varieties take a growth knock for about 10 days after a Roundup application, akin to a human's reaction to a vaccination. So, about seven to 10 days after applying Roundup, he applies MaxiBoost containing essential micro-nutrients as foliar feed at 1ℓ/ha to boost the soya bean crop, along with sodium molybdate at 70g/ha, and 200g/ha sodium borate to rejuvenate the crop growth. He says it is pointless applying these nutrients until seven days after the



Gerhard's Super Soya winning rainfed crop in a nutshell

Cultivar	PAN 538 RR
Yield	4,33t/ha
Grain income/ha at R3 200/t	R13 870,15
Total pre-harvest cost/ha	R2 982,05
Harvesting cost/ha	R1 000,08
Total allocated cost/ha	R3 982,13
Allocated cost/t	R918,72
Break even yield (t/ha)	1,24
Gross margin/ha	R9 888,02



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Roundup application, as the herbicide temporarily stunts the soya bean plants, making them unable to absorb the foliar feed.

"If I notice pests such as bollworm and looper worm in the crop just before the foliar feed application, I add a pyrethroid pesticide at 120ml/ha to the foliar feed. About 70 days post-planting, when the first pods are forming, I apply either Abacus at 1l/ha or Amistar Xtra at 300ml/ha to prevent fungal diseases, especially soya bean rust. If the season's rainfall has been average or above average, I spray either Abacus at 1l/ha or Punch Xtra at 600ml/ha 20 days later. If the rainfall has been below average, reducing the risk of soya bean rust, I take the chance of eliminating the second fungicide spray and hopefully save some money."

Gerhard harvests soya beans from mid-April to mid-May. To ensure

that the crop is ready, he sends samples to Afgri's Blood River silo for moisture testing. Once the in-field soya bean grain moisture level is below 13%, he uses a Klaas 86 combine harvester with wheat header to bring in the crop and 8t trucks to transport it to the silo.

FUTURE PLANS

As for the future, Gerhard says, "I look forward to an average 3t/ha yield soon. The technology to achieve this is available. I might start by moving to a one-year maize, one-year soya bean rotation within the next few years. Even the maize yields will benefit from this."

"I've heard of some very large soya bean processing plants in the pipeline in this country and this will create a sustainable national soya bean market."

• Contact Gerhard Kieve on 083 609 9190 or email erryk@pcconnect.co.za ■FW

ABOVE:

Gerhard enjoys the wildlife on his farm and concedes some crop loss to monkeys, bush pig, porcupine and duiker. The edge of this maize land took a hammering from vervet monkeys that broke off young plants or dug out emerging seedlings.



RIGHT FROM TOP:

• Gerhard and a four-row John Deere 1750 conservation vacuum planter which he uses to plant maize and soya beans.

• PAN 737 RR soya beans recently treated with the first post-emergent glyphosate application. While weaker weed species quickly die off, hardier weeds such as commelina turn yellow and allow soya bean plants to grow and canopy out the remaining weeds.

• Light looper worm damage in one of Gerhard's soya bean lands. To save input costs, he only applies pesticide if he finds the infestation starting to increase.

