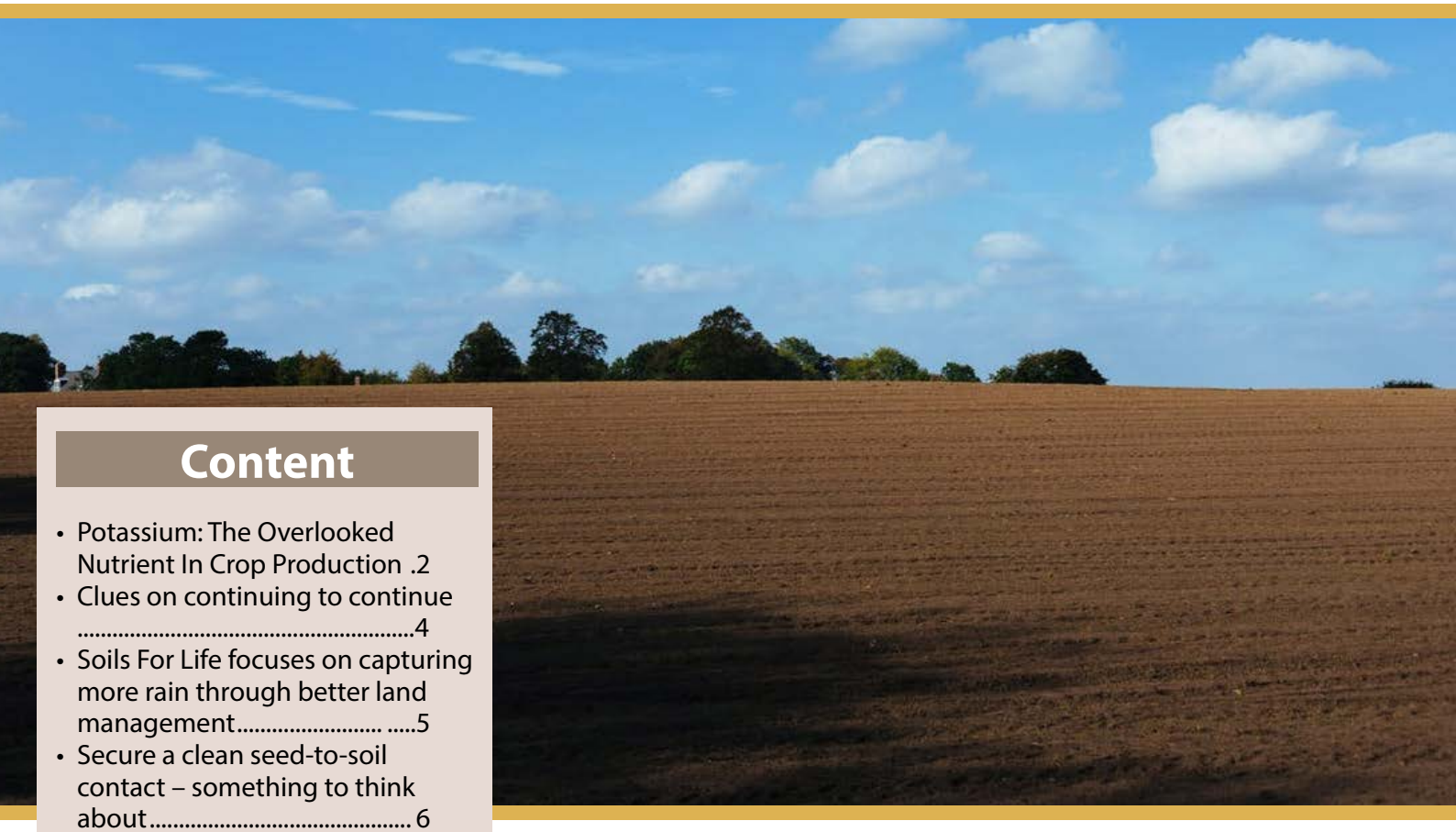
March 2017 Issue/Uitgawe 53

Newsletter

BLWK/CAWC: Your monthly guide



Content

Upcoming farmers' days and events:

» Langgewens Walk & Talk – 13 July 2017
» CAWC Lecture day – 1 August 2017
» CAWC Practical day – 3 August 2017

Hi Everybody

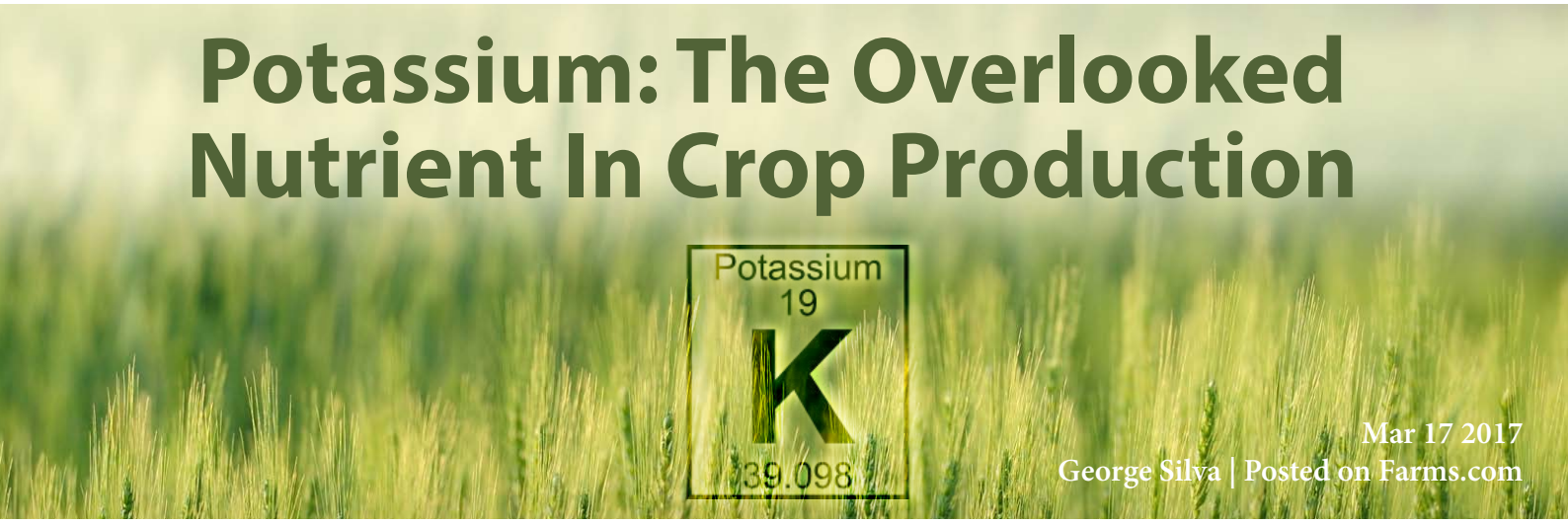
We are nearing planting season and are hopeful that the needed rain will come. The March newsletter contains some interesting pieces that might challenge our thinking.

Our first Brown tour of the season took place on the 9th of March and for those of you who could not attend we include the two short lectures presented on the day in this month's newsletter. We will also post the videos on the website once the it is up and running.

Happy planting season to all.

Regards
The editor

Potassium: The Overlooked Nutrient In Crop Production



Mar 17 2017
George Silva | Posted on Farms.com

Understanding potassium's role as an essential plant and animal nutrient is critical to alleviating some emerging crop production and human health issues.

Although potassium (K) is listed among the top three macronutrients (N-P-K) needed for crop production, nitrogen (N) and phosphorus (P) receive most of our attention. This is partly because N and P have potential to cause long-term environmental implications. Also, N and P get incorporated into key complex molecules within the cell such as DNA, proteins, enzymes, etc. In contrast, K rarely poses a threat to the environment. It remains in the plant and animal tissues in its ionic form K+. When crop and animal residues decompose on the soil surface, the soluble K will seep into the soil.

Soil minerals such as feldspars and micas are high in K and will release their K into the soil upon weathering. Some K is bonded in the interlayer position of clay particles. Many global K deposits for mining purposes were formed millions of years ago when early seas evaporated and marine salt was concentrated and covered with deep layers of sediment. Large reserves of buried K deposits occur around the world, with the largest reserves and fertilizer production coming from Canada, Belarus and Russia. Currently, the global supply of K remains stable.

Recently, K has received much needed awareness with the realization of its critical role in plant and human nutrition. In January 2017, the International Plant Nutrition Institute held a three-day conference devoted to K, titled "Frontiers of Potassium." Some of the recent advances on sustainable intensification, 4R stewardship practices and linking science and technology to frontier practices were highlighted. The current literature indicates that K, at a global level, is as limiting as N and P for plant productivity.

Role of K in plant nutrition

Potassium is associated with many metabolic processes and functions within the plant. It is known that K activates as many as 60 enzymatic and plant hormonal reactions. It is vital to photosynthesis and protein synthesis. It has a fundamental role in regulating leaf stomata openings and controlling water use, particularly under dry conditions (Read the Michigan State University Extension article "Drought and potassium deficiency in corn and soybeans" for more information.)

Foliar K deficiency symptoms were observed on many Michigan corn and soybean fields during the drought of 2016. When the potassium supply is limited, plants have reduced yields, poor quality and are more susceptible to pest damage. A local example would be the increased soybean aphid damage in K deficient fields. Potassium also helps in winter hardiness and overcoming stress situations, which may be vital in a changing climate.

Vegetables, fruits and legumes remove large qualities of K from soils. Harvesting 9 tons of alfalfa per acre will remove over 450 pounds K2O; a potato crop of 450 cwt per acre removes 500 pounds K2O; and harvesting 40 tons per acre of tomatoes will take over 450 pounds K2O/A. Read MSU Extension bulletin E2934, "Nutrient Recommendations for Vegetable Crops in Michigan," for vegetable K removal rates.

Maintenance of an adequate K supply has become essential for sustaining food production. Even though K is widespread in soil minerals and rocks, many soils need additional K fertilizer to meet the plant removal rates. In Michigan, about 65 to 70 percent of the soil samples tested in the past would indicate a need for supplemental K as fertilizer, whereas only about 35 percent of the soils would require supplemental P.

Role of K in human nutrition

Potassium is an essential nutrient in animal health. It is the most abundant cation in the intracellular fluid where it plays a key role in maintaining salt balance between cells and body fluids. Adequate K is essential for cardiovascular, nerve and renal functions and preventing muscle cramps. Potassium plays a role in the synthesis of proteins and in the biochemical transformations required for carbohydrate metabolism.

Government agencies dealing with human health state that diets high in potassium and low in sodium have shown to reduce the risk of high blood pressure and stroke. In the Dietary Approaches to Stop Hypertension (DASH) diet trials, participants with high blood pressure who consumed an average of eight to 10 total servings of fresh fruits and vegetables per day experienced significant drops in their blood pressure level.

Since potassium is not stored in the body, it is necessary to continually replace this nutrient on a regular basis with potassium-rich foods. K is routinely supplemented to animal feeds and rations. About 90 percent of the K consumed is lost in the urine fraction. Hence, it is important to combine the urine fraction with solid fraction of the manure to recover most of the K in livestock waste.

The recommended dietary allowance of K for adults is 4,700 milligrams a day. Only 2-3 percent of American population meets this requirement. The good news is that it's easy to get enough K by simply eating a healthy balanced diet. The U.S. Department of Agriculture lists good sources of K, which are all fruits, vegetables, fruit juices, legumes, fish, yogurt and milk. Surprisingly, bananas don't top the list—that spot goes to potatoes, which pack over 900 milligrams per serving.

Based on the critical role of K in plant and animal nutrition, MSU Extension recommends crop producers and nutrient managers pay more attention to the accuracy of K recommendations. Some of it can be achieved by frequent soil testing, using realistic yield goals and understanding the critical soil levels. In Michigan, K is certainly not a nutrient to discard in bad economic times.

Food consumers should pay more attention to K from a healthy diet point of view. Meeting the daily dietary K requirements by eating foods rich in K will go a long way in alleviating some of the emerging heath issues in our society.

Links of the month

Click on the button to visit the website.

Please note you will need an internet connection

VIEW PAGE
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Soil health frames low-input business vision

VIEW PAGE
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How will farmers feed the world's population 30 years from now?

VIEW PAGE
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This farmer made cover crops a dollar-and-cents decision

VIEW PAGE
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Understanding the role of biodiversity in our soils

VIEW PAGE
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Banking on the soil

VIEW PAGE
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We may live in a post-truth era, but nature does not

VIEW PAGE
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Wet winter puts Grant and Naomi Sims farming system to the test at Pine Grove near Echuca

VIEW PAGE
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Best practice cover crop destruction - Insights - FG Insight

VIEW PAGE
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When rain is scarce, farmers need to make every inch count

Clues on continuing to continue

THE CONTINUOUS cropping systems that have formed the bedrock of many cropping enterprises, particularly in low rainfall zones, over the past 20 years can be sustained, but farmers will have to plan meticulously to do so.

This was the finding of research conducted by CSIRO into the opportunities and challenges for continuous cropping headed up by agricultural systems agronomist John Kirkegaard.

Speaking at the Grains Research and Development Corporation (GRDC) advisor update in Bendigo in February, Dr Kirkegaard said continuous cropping would remain functional with careful management.

However, he said not incorporating a pasture phase would mean that farmers' nitrogen (N) costs would continue to rise, even when including a grain legume in the rotation.

"A larger proportion of plants' N supply will have to come from fertiliser," he said.

He said many of the cereal-heavy continuous cropping systems utilised in dry regions were taking N out of the soil at a rate not balanced by fertiliser application, showing a long-term decline in mineral N levels in the soil.

"This 'mining' may make sound economic sense in the short-term, particularly as farmers look to cut input costs after a tough year, but in the medium to long term it will not be sustainable."

Weed management is the other major long-term management issue continuous cropping throws up.

Dr Kirkegaard said herbicide resistance grew faster under continuous cropping while without a fallow or pasture phase, non-chemical control options are also at a premium.

He said legume crops could provide a valuable chemical rotation and also be cut for hay, which works well in cutting down weed numbers by not allowing them to set seed.

"The flexibility of the legume phase, allowing weed control and water conservation if required, combined with the N fixation they provide mean the phase can reduce production risk and provide a significant benefit to the overall crop sequence."

He said farmers could also look at ensuring their crop out-competed weed species through narrow rows and higher planting rates.

"Crops on narrow rows of less that 250mm cover the ground faster, let less light through the canopy and reduce weed seed set."

"Plant density is also important, the crop competes better when it is planted at a higher density."

Growers looking to get an additional advantage should look to sow east-west to get more effective shading than a north-south sowing.

Dr Kirkegaard also said continuous cropping needed to be weighed up in terms of risk management.

While research found the best earning cropping system at Karoonda, in the South Australian Mallee, in a good year with decile 9 rainfall was by far a mixed rotation continuous cropping system, losses in bad years were much lower with pasture or fallow in the system.

A continuous cereal cropping system needed a decile 5 or better season at Karoonda just to break even.

"The research clearly supports the value of maintaining diversity in species and the end-use of the crop.

"A more diverse cropping system can be as profitable with less cost and risk."

However, he acknowledged the logistics in broadacre farming could not be replicated in trial plots.

He said the best advice for growers was to focus on the old adage 'do what you do well'.

"Continuous cropping is better able to capture value in good years, but is at greater risk in poor seasons."

"If you are continuous cropping, however, the data shows clearly that being diverse in your crop choices and management is critical."

The story Clues on continuing to continue first appeared on Farm Online.

Soils For Life focuses on capturing more rain through better land management

How do you capture every rain drop from the sky, how is it possible and what difference would that make for our farmers?

The Soils For Life organisation is determined to work out how it can capture more rain for Australian farmers and the landscape.

Their work is based on the 100-drop scenario developed by a scientist called Walter Jehne, as explained by Soils For Life chief of staff Natalie Williams.

"For every 100 drops of rain that fall on Australian landscapes and soils, these drops can be divided up according to where they end up," Ms Williams said.

"Thirty-six drops go into the landscape itself, of that 30 go to vegetation, keeping grass green and trees growing and only six of those drops go into recharging the aquifers."

> ***"That can be done in various ways across the different agricultural sectors ... rotational grazing, planting grasses that allow root mass to go deep into soils.***

Another 14 drops of the 100 go into creeks and rivers and eventually out to sea or Lake Eyre, depending on where you are located.

Capturing the extra rain

However, the other 50 or so drops to land on Australian soil evaporate into the atmosphere and that is where the problems lie.

A UN report predicts that by 2030 world water demand might outrun supply by as much as 40 per cent.

When addressing a grazier forum in Mackay in North Queensland, Ms Williams said there needed to be more emphasis on how the drops were wasted and evaporated back into the atmosphere.

If there was better management of the rehydration of farming land to help capture the extra rain, Ms Williams believed the difference made to Australian agriculture could be exponential.

Photo: Soils For Life believe the rain drops that are evaporating can be used for things like extra vegetation. (ABC Rural: Emma Brown)

Noticeable and achievable results

In Ms William's own case, she has seen dramatic effects on her on Western Queensland cattle property from the improvement of her land management.

She said on her property, 150 years of damage from clearing and bad farming had be reversed in 15 years, with more vegetation and now a greater carrying capacity.

"We were able to change the carrying capacity from 100 head in 1994 to around 3,000 head over the course of about 15 years," Ms Williams said.

"By managing than landscape properly you also pick up profitability, environmental outcomes, resistance to disease, resilience after drought [and] being able to manage high rainfall events.

"It is actually a triple bottom line benefit to improving and rehydrating landscapes," she said.

Secure a clean seed-to-soil contact – something to think about

22 February 2017 ~ Thierry Stokkermans

All No-tillers know that establishing an efficient seed-to-soil contact is key to success. Agronomical presentations and manufacturer leaflets often say that it is important to create a "good seed-to-soil contact". But what does "good" exactly mean? And how efficient are seed firmers? In other words, which seed-to-soil contact is required in Conservation Agriculture?

In No-Tillage (NT), there is one element which can kill the germination process: the residues. They can enter the seed slot and take position between the seed and the soil. It is also known as hairpinning (figure 1). Therefore, the key of success in NT is a clean seed-to-soil contact. For this reason, it is crucial to handle well the residues at field level and at seed slot level. But, as a start point, it is interesting to know how hairpinning can kill crop establishment.

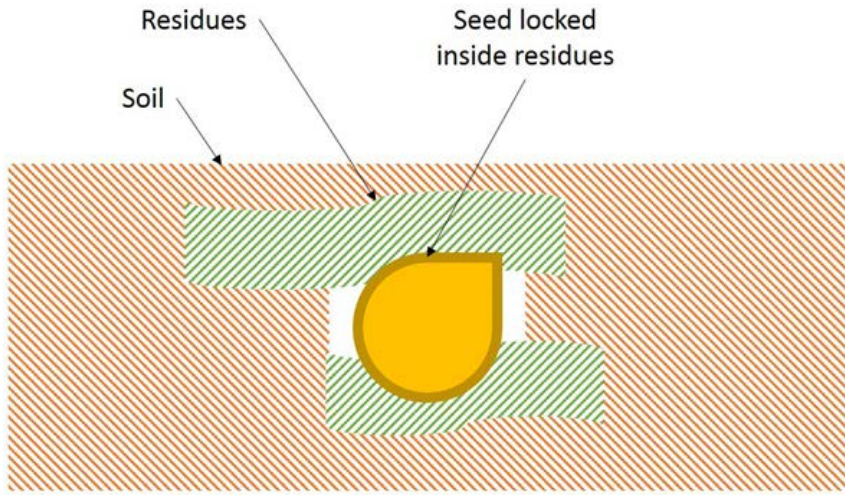

Figure 1: Hairpinning

©Thierry Stokkermans

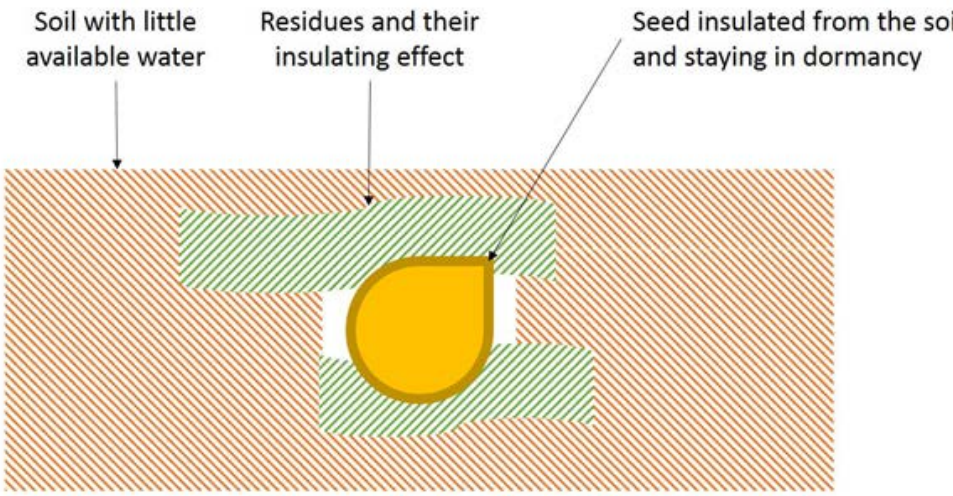

Figure 2: residues insulating a seed

©Thierry Stokkermans

It is important to distinguish 2 situations: "dry" soil and "wet" soil.
First of all: the "dry" soil. As explained in the soil-fog post, residues insolate. As a consequence, the seed becomes isolated from the rest of the soil and, in particular, from the scarce water it needs to germinate (figure 2). In these conditions, the seed does net germinate. It stays in dormancy and wait until there is enough to moisturize and germinate. In the meantime, it is a nice snack for the mice and other grain-eating animals.

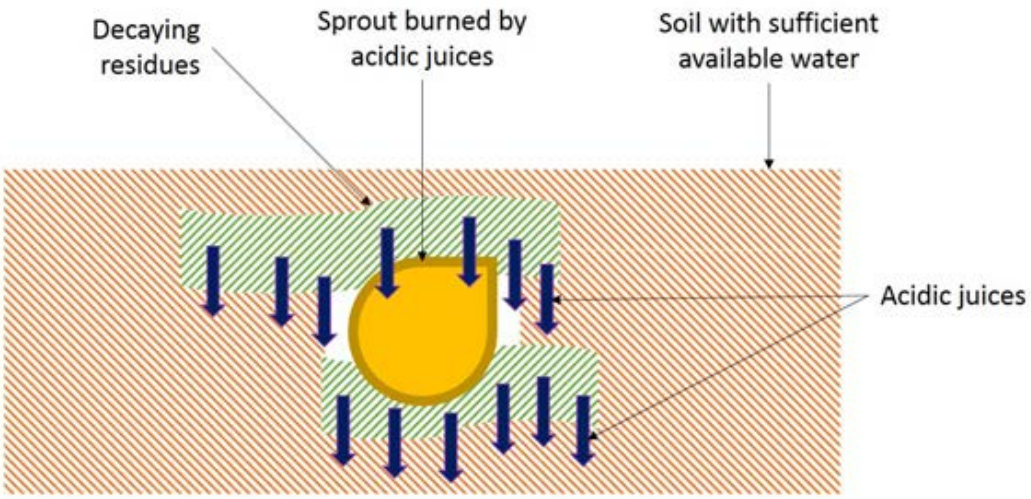

Figure 3: acidic juices killing the sprout

Then water finally arrives and the second situation happens: "wet" soil. Now, there is enough water in the soil to moisturize the seed and starts germination. It can be liquid water and/or soil-fog. It is a good news. However, the residues have enough water to decay now. And this is when the bad things happen. Decaying residues produce acidic juices which burn the sprout and kill the newly born plant (figure 3).

Hairpinning is a fixless problem. Once it had happened, it will inevitably reduce or kill germination. Hairpinning is a problem to avoid. It requires anticipation. Residues management at the field level and at the seed level are required. Field level residues management has been described in meetings and in publications. Therefore, I won't talk about it here and I will focus on seed level management.

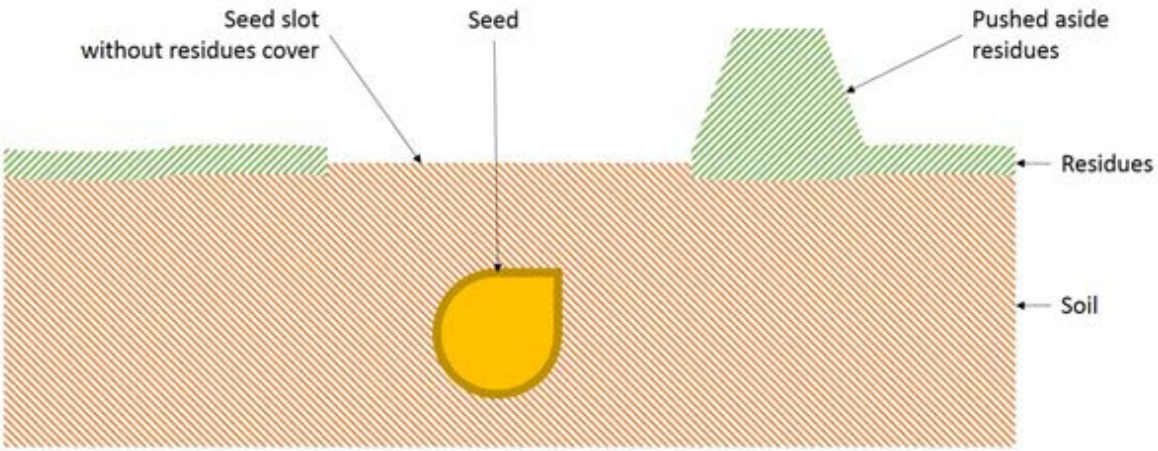

Figure 4: Residues pushed aside

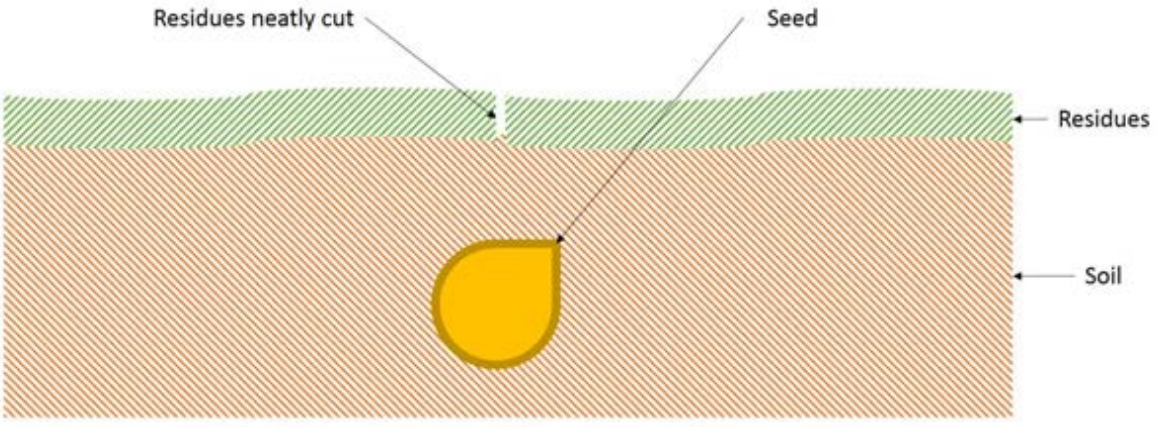

Figure 5: knife-cut in the residues

When seeding, it is critical to avoid hairpinning. Your success depends on 2 elements: a) use a seeder capable to handle well the residues and b) set it up well. The seeder can push the residues aside (figure 4) or cut them neatly before making the seed slot (figure 5). Push the residues aside is often done using trash-wheels. It is important to set them up in a way they follow the soil contour nicely without digging in it. It has to remove all residues without entering the soil. Else way, you might bring sticky soil to the surface or put weeds to germination. It can be tricky to set up properly. To cut neatly residues, the simplest solution is a flat coulter cutting the soil vertically in front of the opener. The working depth should be at least 3cm to make sure all residues are cut. This simple "knife cut" is sufficient to cut straight thru all residues. If you wish to benefit from the positive effects of soil fog, the "knife cut" is the best solution as it leaves the residues unmoved (figure 6). It is important that the coulter is sharp enough to cut easily. Checking the "knife cut" disc has to be part of the off-season maintenance plan.

Figure 6: planter with knife-cut creating soil-fog conditions

©Thierry Stokkermans

The worst hairpinning I have ever seen was an Oil Seed Rape (OSR) seeding into wheat stubbles with a double disc seeder. More than half of the OSR seeds had no soil contact. The farmer had rolled the stubbles previous to seeding. Then he ran the seeder on a 30 degree angle respect to the rolling. The problem here is that the roll pushed all the stubble towards the ground and the discs caught the straw at a bad angle. The seeder grabbed all the stubble it met and push it into the seed slot while folding it in 2. The OSR was seeded in the middle of the fold (figure 7). Seeds had straw on both side of the slot. They had no chances to find water to germinate. They were in trouble. For the rest, everything was fine. It only missed a clean seed-to-soil contact to get the OSR started.

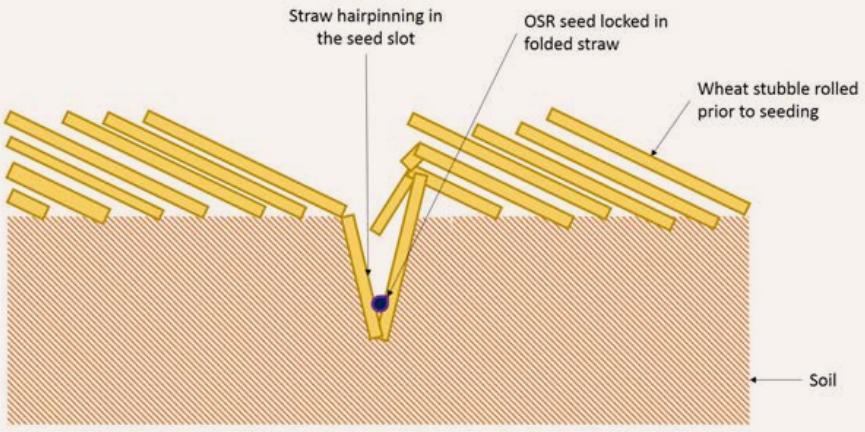

Figure 7: straw folded around the seed

©Thierry Stokkermans

In NT, it is important to have a clean seed-to-soil contact. A good contact is a clean contact. The seed needs to touch the soil on all sides. This is the best environment for it to moisturize and germinate. To get such result, it is important to use the correct seeder or the correct equipment capable to handle the residues and to set it up well.

BLWK Bruintoer 9 Maart – Witsand

Tema: Hoe benader ek ‘n droë jaar

Sprekers:

Peter Greeff - Fisiologie van die Ontkiemende Koringplant vs “Slaggate” in ‘n Droë Seisoen

Roelie Steyn - Bemesting in ‘n droë jaar

Fisiologie van die Ontkiemende Koringplant vs "Slaggate" in 'n Droë Seisoen.

Peter Greeff
ELFER e-pos: peter@orchman.com Tel: 082-9259136 / 021-9073015 (K)

Raamwerk van die bespreking:

1. **Beginsels binne Bewaringsboerdery**
2. **eënvalpatroen in die Wes-Kaap wintergraan gebiede**
3. **Kritiese suksesfaktore**
4. **Wat is goeie saad - saadgehalte?**
5. **Ontkieming**
6. **Groei tot opkoms**
7. **Wat bepaal die spoed van ontkieming en opkoms?**
8. **Slaggat**
9. **"Geld in die bank" - Waarom wen bewaringsboerdery praktyke?**
10. **Bestuursprestasie**

Nota:
Saad toets by Klein Karoo Saad op Oudtshoorn.

Ontkieming	R138.00
1000 Korrel Massa (TSW)	R 51.75
Groeikrag op 10 sade	R 34.50
Totaal (BTW uitgesluit)	R224.25 per monster

Verkieslik behandelde saadmonster van hoof cultivars wat u gaan plant.

Laat weet – ek neem monsters deur na lab,
- 29 Maart
- 20 April

1. Bewaringsboerdery

Geheel (Holisties) boerderystelsel waarby drie hoofbeginsels ge-integreer word;

a. Minimum versteuring van die grondoppervlakte deur meganiese bewerkings / saai praktyke – sg. "No-Till, Zero Till, Minimum bewerking / cultivation"
- Plantaksie behels oopmaak van snit waarin die saad op 'n bepaalde diepte geplaas word, met drukwiel wat snit agterna toemaak
- Chemiese onkruiddoders word gebruik vir beheer van grasse en ander ongewenste plantsoorte
- Waar van die weidingsfase oorgaan na afwisseling van gewasse, mag dit nodig wees om die vasgetrapte oppervlakte meganies los te maak.

b. Grondoppervlakte is ten alle tye bedek
- "Mulch" – koring / gars / hawer strooi wat versprei is of staande canola stoppel (vertikale mulch).

c. Wisselbou van gewasse wat ook peulplante insluit
- Waar lusern / medics as stikstof bindende gewas gebruik word, word die loof deur 'n vee faktor as weiding benut.

2. Verspreiding van winterreën in die hoof Wes-Kaapse produksie gebiede

Gemiddelde mm reënval gedurende die maande April tot Oktober (wintergraan groeiseisoen):

Swartland	300-350
Rooi Karoo	275-300
Hopefield	250-275
Caledon	300-350
Overberg	200-250
Gouerug, Napier	250-275
Suid-Kaap, S. van N2	250-300
Suid-Kaap, teen berg	300-350
Suid-Kaap, Kusstrook	300-350

Volgens klimaatsverandering voorspelling , sal gemiddelde jaarlikse reënval in die Wes-Kaap tot 10% afneem.

3. Kritiese suksesfaktore

VOGBEWARING
en
"Get the roots as deep and as wide, as fast as possible"

Grondvog is die dryfveer by droëland verbouingstelsels.
Dus, hoe groot is die reservoir van toeganklike vog by elke land in terme van millimeter plant beskikbare vog per meter diepte (mm/m)?

Plant beskikbare vog = Vog by Veldkapasiteit minus Vog by Permanente Verwelkpunt

VK – PWP mm/m

Daar is dus 'n hektaar vogresevoir, maar is daar 'n hektaar plantwortels in daardie reservoir?

Hoe gaan toeganklike vog verlore vanuit die grond?
i. Verdamping / Evaporation (E0)
ii. Opname deur die plant / Transpiration (T).

Voordeel van die mulch (plantmateriaal dekking / "cover") aan die oppervlakte
- Kapillêre vog beweging en verdamping (E0) word verminder
- Voorkoming van aansameling van brak soute
- Bevorder biologiese diversiteit.
- Beskerming teen water en wind erosie
- Temperatuur dag/nag variasie verminder
- Onderdruk onkruidsaad ontkieming.

4. Wat is goeie saad - saadgehalte?

(i) Genetiese suiwerheid
(ii) Ontkiemingspersentasie
  a. > 95%?
(iii) Groeikragtigheid
  a. Koue toets teen 7^{0}C, tot 2cm koleoptiel groei ≈ opkoms
  b. Swak resultaat = lae vlak van reserwes in saad / saadhuid erg gekraak
(iv) Fito-status
  a. Vry van siektes / insek (beskadig / besmet)
  b. Vry van virus
(v) Meganiese suiwerheid
  a. Onkruidsade
  b. Vreemde materiaal.

5. Ontkieming

Rustende saad
Begin van proses
- Opname van grondvog (tot 40% toename in gewig van die saad)
- Proses bekend as "Imbibisie"
- Saad kan ook vog opneem as daar hoë humiditeit rondom die saad heers
- Met vogopname, fisiologies proses van ontkieming skop in
- Buite protein-ryke laag stel ensieme vry wat inwerk op die stysel-ryke endosperm
- Vrystelling van aminosure en suikers vir ontwaak en groeikrag van die embrio
- Met swelling, saadhuid kraak
- Kiemwortel verskyn.

Einde van ontkieming.

Let wel: Weens tekort aan vog na begin van proses, saad kan weer rustend word indien die embrio nie geprikkel is om te ontwaak nie. Saad sal dus lewenskragtigheid behou.

6. Groei tot opkoms "Primêre groeifase"

- Kiemwortel
  - o Wortelmus
  - o Verlengingsone
  - o Wortelhare
- Koleoptiel

- o Skede wat die eerste blaar beskerm
- o Beur opwaarts na grondoppervalkte
- o Lengte van koleoptiel kan verskil tussen kultivars
  - kort vs lank, dus plantdiepte belangrik
  - kort skede kom moeilik deur kors aan oppervlakte
- o Sodra sonlig waargeneem word, eerste blaar verskyn.

Opkoms = eerste blaar sigbaar.

Let wel: Tot op hierdie punt, leef die saailing op reserwes binne die saad.

7. Wat bepaal die spoed van ontkieming en opkoms?

Ontkieming

a. Grondvog status
   Veldkapasiteit 5 dae vs Permanente Verwelkpunt 10 dae
   "in die stof saai" / dry sowing
b. Suurstof konsentrasie in plantsone
   <20% O2, ontkieming vertraag
c. Saadgehalte
d. Grondtemperatuur ; Optimum 12 tot 25^{0}C
   35 dag-grade benodig
   Som van gemiddelde daaglikse temperatuur
   Voorbeeld gem 7^{0}C – 5 dae tot sigbare ontkieming; gem 10^{0}C – 3.5 dae
e. Saadbehandeling
   Swamdoders van azole-groep kan ontkeiming vertraag.
   Lees produk etiket
   Vermei oordosis
f. Bemesting
   N >20 tot 25kg/ha indien naby saad geplaas brandeffek op saad en kiemwortel
   P Min beweging in grond
   Plaas naby onder saad – hoër behoefte by ontkieming.
   Opkoms (Groeitempo van koleoptiel)
g. Grondtemperatuur
   Optimum 10 tot 15^{0}C
   Te koud of te warm kort lengte koleoptiel
h. Saadgrootte - 1000 korrel massa
   Grootte saad het meer endosperm reserwes vir primêre groeifase
i. Saadbehandeling
   Vermei oordosis
j. Saaidiepte
   10 tot 15mm te vlak
   Australia 30 tot 35mm optimum vir >90% opkoms binne 14 dae na saai
k. Saaibed
   Grondklonte ongewens – koleoptiel sien sonlig en blaar ontvou onder oppervlakte
l. Voeding
   K, N, P makro en Mn, Zn, B, Cu mikro.

8. Slaggat: Kaalgrond

a. Blootstelling aan intensiewe bestraling
b. Oppervlakte tempertuur > 40^{0}C
c. Saailing sterftes hoog
d. Wortelgroei beperk
e. Inhibeer stoel / ontwikkeling van sy-are
f. Verlies aan koolstof (oksidasie)
g. Korsvorming
h. Droog weens vog verlies.

9. "Geld in die bank" - Waarom wen bewaringsboerdery praktyke?

"Bewaringsboerdery is 'n proses oor 'n tydperk wat vooruit beplanning verg"
Jack Human se woorde.

Met die toepassing van bewaringsboerdery praktyke, kom verskeie ekologiese voordele na vore, t.w.;

a. Opbou van organiese materiaal (koolstof) binne die wortelgebied
b. Poreus en stabiele grondstruktuur eenhede
c. Bevordering van biologiese / mikrobe diversiteit in die grond bolaag
d. Vogbewaring in die grond profiel
e. Goed gebufferde chemiese toestand in die wortelsone
f. Onderdrukking van grond- / wortelsiektes en plae
g. Verlaagde risiko t.o.v. water of wind erosie
h. Grondproduktiwiteit word verhoog.

10. Bestuursprestasie

Kg Koring opbrengs per mm reën in die groeiseisoen

"Top" = 20 tot 23kg koring / mm

Elementverbruik: Koring

Tyd na saai	Makro	Mikro
3 weke	K, N, P, Ca, Mg, S	Cu, Zn, B, Cu
6 weke	K, N, P, Ca, S≈Mg	Zn, Mn, B, Cu
9 weke	N, K, P, Ca, Mg, S	Mn, Fe, Zn, B, Cu
Aar verskyn	N, K, Ca, Mg, S, P	Fe, Mn, Zn, Cu, B
Blom	N≈K, Ca, P, Mg, S	Fe, Mn, Zn, Cu, B

Bydra van grondeienskappe

- Stabiele struktuur
  - Porositeit (lug, grondvog)
  - Infiltrasie
- Tekstuur
  - Waterhouvermoë
- Bulkdigtheid
  - 0.9 tot 1.3
- Koolstof inhoud (%C)
- KUV
- pH, EC
- P, K, Ca, Mg, S, Cu, Mn, Zn, Fe, B, Mo
- N (NH_4^+, NO_3^-, Mineraliseerbare N)
- Biologiese diversiteit

Roelie steyn
Bemesting in 'n droe jaar

Bemesting in 'n droë jaar

Roelie Steyn

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Hoe sien ons omstandighede?

- Is die plant 'n **produseerder**?
- Is die plant 'n **verbruiker**?

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Hoe sien ons omstandighede?

- Is die plant 'n **produseerder**?
  - Gebruik dit roustowwe effektief onder omstandighede om finale produkte te lewer?
  - Is dit *"inset sensitief"* of *"inset effektief"*?
  - Is dit ingestel op "*werksure*" en "*advies*" of volg dit die populêre aanvaarding?
- Is die plant 'n **verbruiker**?
  - Is die plant totaal afhanlik van ons insette in die droogte?
  - Het die plant enige voorkeure aan ons insette in die droogte?
  - Besluite moet net geneem word rondom die goedkoopste prys, ongeag die toepassing?

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Waarvan leef plante?

- Suurstof
- Water
- Voeding
- Gemak

VERBRUIKER

PRODUSEERDER *(sonlig, CO_2 en grondmikrobes is die "werkers")*

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Definisies

- Droë somer
- Droë plantseisoen
- Droogte in die seisoen

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Droë somer (2016/2017)

- Baie goeie oes in 2016
  - Baie stoppel wat moet komposteer.
  - Onttrekking van voedingstowwe
- Lae vogreserwes sover
  - Kan droë planttyd wees vir vroeë gesaaides.
  - Laer aktiwiteite van arbiskulêre michorriza – invloed op P, Zn en Cu (*hoë afhaklikheid: fababone, laer afhaklikheid: wintergrane*)
  - Onkruidbeheer?

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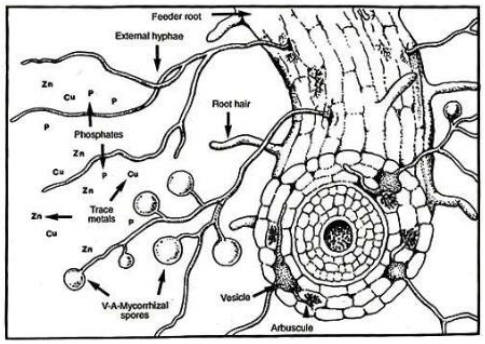

Figure 3. Structure and appearance of microscopic VAM and active root hairs. Hyphae that protrude enhance the absorption of nutrients, especially P and Zn [from Wildermuth *et al.* (1997)].

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Droë planttyd (2017)

- Verwag hoër nitrate in grond – gunstiger omskakeling – loging (Dr George Rayment, 2016)
- Indien nie vooraf, kom vroeg in met 'n N-bobemesting.
- Inkorporeer ureum vir hoogste effektiwiteit!
- Indien baie reën en koue tydens ontkieming, oorweeg AN-bobemesting.
- Gars bobemesting – AN verkieslik.
- Maak voorsiening vir vorige oes se onttrekking.
- Moniteer deur die seisoen – weefsel, sap en SPAD

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Droë planttyd (2017) *vervolg*

- Waak teen te veel N in die band, veral ureum!

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Droogte in seisoen (na plant)

- Vermy grondtoedienings
- Akkumulasie van reserwes voor blom gaan opbrengs en kwaliteit beinvloed tydens stress (Saini & Aspinall 1981)..
- Plante onder stress – fotosintese verswak en respirasie verhoog – druk op substrate in plant. Oorweeg bladbespuitings (Saini & Aspinall 1981).
- Onthou: bladbespuitings kan nie droogte ophef nie. In droogte tydens bestuiwing kan 35-75% verlies in opbrengs voorkom a.g.v. steriele stuifmeel (Saini & Aspinall 1981).
- Raadpleeg kundiges!!!
- Oorweeg middels wat P, K en Mg insluit as bladbespuiting.

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Waarde van Ca in die grond

- Ca flokkuleer klei en breek organiese materiaal af. Meer poreuse grond en goeie deurlugtingIng – beter wortelgroei en waterindringing.
- Grondlewe speel die grootste rol in volhoubare landbou. M.o.s. is direk afhaklik van Ca en funksioneer slegs in aerobiese toestande.
- Plante het 'n spesifieke behoefte vir Ca vir sterk selwande, selvermeerdering en selverlengning..
- Ca speel 'n rol in grondsuurheid opheffing ($CaCO_3$) en vermindering van verbrakking ($CaSO_4$).
- Ca help om die plant te beskerm teen hitte stress deurdat dit werking van die huidmondjies verbeter en die afskeiding van proteiene na hittetoestande.

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Waarde van Ca in die grond

- Sterker selwande veroorsaak dat plante 'n beter weerstand kan bied teen swam- en bakteriese infeksies op
- Effek op vrug/saad kwaliteit.
- Ca beweeg slegs deur die xileem opwaarts, ma.w. waar dit land, stop dit! Kan nie weer gemobiliseer word nie.
- Al ontleed daar genoeg Ca in die grond, kan Ca tekorte steeds in die plant voorkom agv die immobiliteit (dink aan bitterpit)

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Tekortsimptome van Ca by canola

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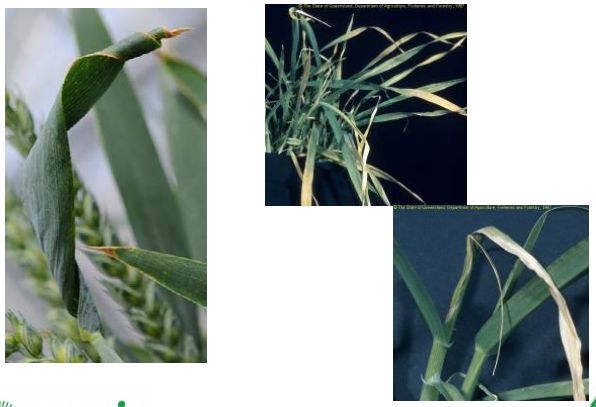

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Wat is die waarde van bewaringslandbou onder droogtetoestande?

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1 acre = 43 560 vt/acre	1 acre = 0.404 ha
Volumetries	Volumetries
43 560 vt/acre X 6 duim	0.404 ha X 150 mm
21 780 kub vt/acre	
616.74 kub m/acre	1 526.5 kub m/ha
Massa	Massa
616.74 X 1.33 g/cm³ (digtheid)	1 526.5 X 1.33 g/cm³ (digtheid)
=820 264 kg grond/acre	=2 030 225 kg grond/ha
Effek	Effek
1% OM = 8 202.6 kg/acre OM	1% OM = 20 302.25 kg/haOM
Indien OM 10keer meer water hou:	Indien OM 10keer meer water hou:
82 026 kg water per acre	203 022.5 kg water per ha

https://www.nrdc.org

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Moet asseblief nie brand nie!!!

- "Sukkel" deur die stoppel, asb!
- Sleep dit…!
- Hark dit…!
- Sny dit in…!
- Bewei dit…! (?)

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Dankie

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