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Editorial

Agriculture is built on resilience, adaptation, and forward thinking. In this May 2025 edition of *AgriAbout*, we celebrate the new generation of farmers shaping the industry's future while exploring the innovations set to redefine how we farm in the years ahead.

At the heart of this issue is the **Young Farmer of the Year** competition, spotlighting five Free State Agriculture regional finalists who exemplify passion, ingenuity, and commitment to sustainable farming. Their stories remind us that agriculture is not merely a livelihood—it is a calling.

We also turn our focus to **education and training**, essential pillars of agricultural success. With evolving technology and shifting environmental challenges, equipping farmers **and their employees** with the right skills and knowledge is more critical than ever. A well-trained workforce strengthens agricultural operations, ensuring efficiency, sustainability, and long-term success.

Speaking of the future—imagine a world where pollination isn't solely dependent on declining bee populations. The rise of **robotic bees** presents a fascinating potential solution, ensuring food security in an era where natural pollinators are under increasing pressure. While still in development, this innovation sparks important conversations about sustainability, technology, and ecological balance.

Finally, we explore **modified atmospheric packaging**, a game-changer in food preservation and distribution. As global food security remains an ever-pressing issue, advancements in packaging can significantly extend shelf life and reduce waste—ensuring food reaches consumers in optimal condition.

Until next time

Chris

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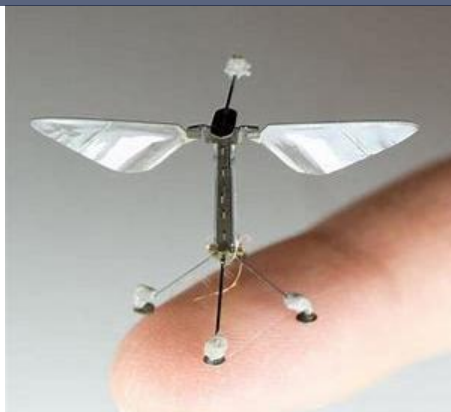
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VRYSTAAT LANDBOU
FREE STATE AGRICULTURE

Jongboer van die Jaar Kompetisie 2025

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Die landbousektor in Suid-Afrika floreer danksy toegewyde, vooruit denkende jong boere. Met die aankondiging van die vyf finaliste vir Vrystaat Landbou se Jongboer van die Jaar 2025-kompetisie, word die belang van volhoubare boerdery, innovasie en gemeenskapsbetrokkenheid beklemtoon.

Die kompetisie erken jaarliks uitnemendheid in landbou. Die finaliste, gekies vir hul bestuursvernuf en verbintenis tot volhoubare praktyke, staan as voorbeelde van entrepreneurskap en aanpasbaarheid te midde van uitdagings soos klimaatverandering, ekonomiese wisselvalligheid en infrastruktuurprobleme.

Die vyf finaliste vir 2025 is:

- **DJ Meades** – Petrusburg
- **Junior Ferreira** – Bethlehem
- **JW Dercksen** – Hertzogville
- **Morné Kleynhans** – Hertzogville
- **Tienie Prinsloo** – Hoopstad

Die wenner word tydens Vrystaat Landbou se jaarkongres aangekondig en kry die geleentheid om op 'n nasionale vlak mee te ding. Hierdie platform bevorder kennisdeling en gemeenskapsontwikkeling, terwyl dit jong boere inspireer om die sektor se toekoms te vorm.

Die AgriAbout-span spreek hul dank uit teenoor elkeen wat tot hierdie berigging bygedra het, veral Elana Bester van Vrystaat Landbou, vir haar ondersteuning as sentrale skakel in die proses.

Sterkte aan elke finalis vir die pad wat voorlê!
AgriAbout Redaksie



DJ Meades: Landbou, Passie en Volhoubaarheid in die Vrystaat

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Met 12 jaar se boerdery-ervaring in die Petrusburg-omgewing, is DJ Meades 'n boer met 'n duidelike visie vir sy toekoms -maar as jy hom vra waar dit alles begin het, is sy antwoord eenvoudig: *"Ek het nie landbou self gekies nie, ek dink landbou het my gekies."*

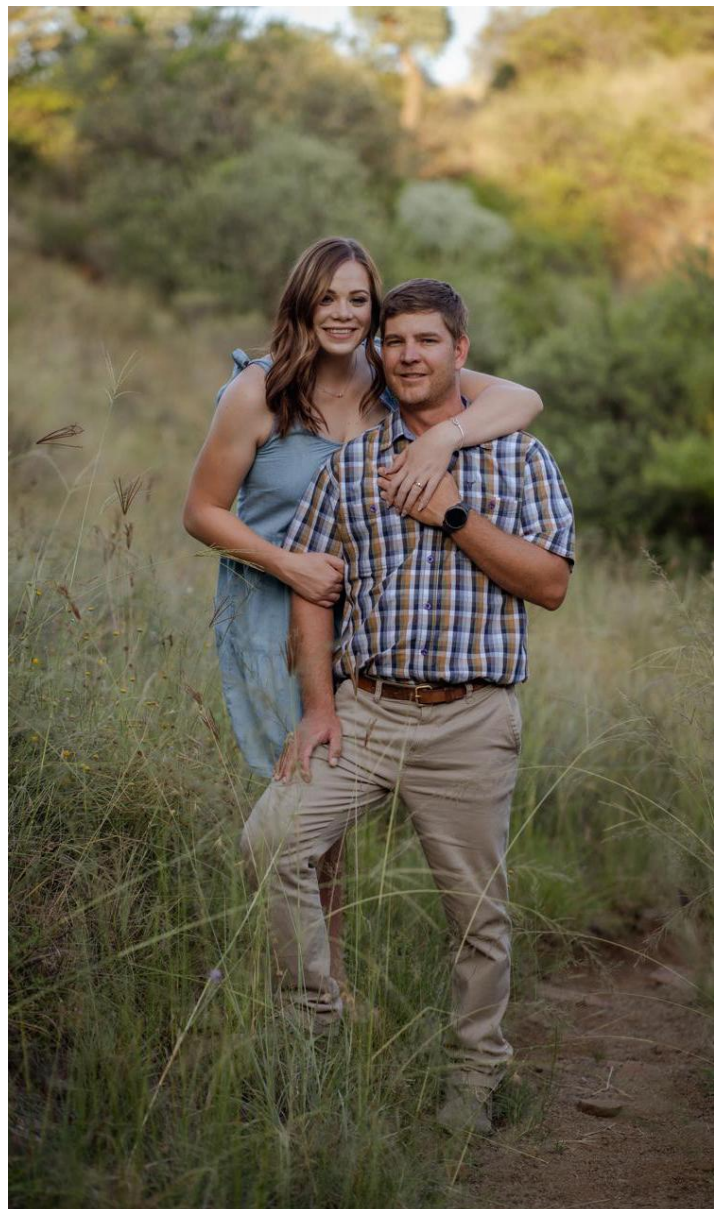
DJ (33) se paadjie na voltydse boerdery was nie voorafbeplan nie, maar eerder 'n natuurlike roeping. Hy het op die plaas grootgeword, hy het die grond leer ken, en hy het oor die jare die diepte van landbou besef—nie net as 'n manier van bestaan nie, maar as 'n lewenswyse.

Vandag is hy een van vyf finaliste in Vrystaat Landbou se Jongboer van die Jaar-kompetisie, en sy boerdery staan as 'n getuigenis van sy deursettingsvermoë en innovasie.

'n Boerdery met 'n Breë Fondament

DJ se plaas is 'n gediversifiseerde onderneming. Hy verbou uie, kool, botterskorsies, en beplan slim wisselbou met mielies, saadkoring en saad sonneblom. Maar sy groot trots lê in sy pekanneut-kwekery—iets wat hy van nuuts af opgebou het.

"Ek is baie trots op my kwekery," vertel DJ. "Ons kweek klein boompies vir die uitbreiding van die boord, en ek weet dit is 'n belegging vir die langtermyn."



Hy is 'n praktiese boer wat persoonlik betrokke is by elke besluit—van beplanning tot uitvoer, en hoewel hy nie alles mikrobestuur nie, sorg hy dat alles verloop soos dit moet.

"Ek probeer nie alles self doen nie, maar ek hou 'n vinger op die pols," sê hy. "Ek weet wat aangaan op my plaas, en ek sorg dat dinge werk."

Die Belangrikheid van Opleiding en Gemeenskapsbetrokkenheid

Vir DJ is 'n sterk span net so belangrik soos 'n gesonde oes. Hy gryp elke geleentheid aan om sy werknemers op te lei, omdat hy weet dit maak sy boerdery sterker.

"Hoe beter jou mense opgelei is, hoe sterker staan jou boerdery. Ek glo jy moet mense die kans gee om te leer—hulle groei, en jou boerdery groei saam met hulle."

Maar sy betrokkenheid strek verder as sy plaas. Hy is 'n lid van die Perdeberg Boerevereniging, en speel 'n aktiewe rol in plaaslike veiligheid. Hy neem gereeld deel aan patrollies, help met die instandhouding van paaie, en werk saam met ander boere om sekuriteit te verbeter.

"Landbou is nie 'n eenman-operasie nie," sê DJ. "Jy bou 'n span, jy bou 'n gemeenskap, en jy maak seker dat almal saam sterker staan."



Sukses in Boerdery: Wat Werk?

Vir DJ is sukses nie net 'n kwessie van hard werk nie—dit gaan oor slim beplanning en langtermyn strategieë. Hy identifiseer drie sleutelemente wat 'n boerdery lewendig en volhoubaar hou:

- **Slim Beplanning en Marknavorsing** *“Baie boere plant 'n produk sonder dat hulle weet wat hulle daarmee gaan doen. Jy moet 'n plan hê -'n idee van waar jou produk gaan beland.”*
- **Goeie Kommunikasie en Bestuur** *“As almal op die plaas weet wat aangaan en ons kommunikeer reg, dan werk dinge makliker en meer effektief.”*
- **Produk kwaliteit bo Kwantiteit** *“Ek sal eerder 'n verlies maak as om swak produkte op die mark te sit. Jou naam is alles—mense koop kwaliteit.”*

Die Grootste Uitdagings van Moderne Boerdery

Moderne boerdery bring heelwat uitdagings, en DJ is eerlik oor wat hom die meeste hoofbrekens gee.

- **Elektrisiteitskoste en Beurtkrag** *“Ons het swaar gely onder beurtkrag, en die koste van elektrisiteit bly 'n groot probleem. Sonkrag lyk soos die beste oplossing op die lang duur.”*



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Hartlik geluk, DJ Meads.

Jy is 'n waardige finalis in die Agri Vrystaat Jongboer van die jaar kompetisie.

Ons is trots daarop om met jou boerdery geassosieer te word.

- **Stygende Insetkoste** *“Elke jaar gaan ons kostes op, maar ons produkprys bly laag of sak. Dit dwing my om aanpassings te maak en slimmer te werk.”*
- **Arbeidsbestuur** *“Ek boer met baie arbeidsintensiewe gewasse. Dit is 'n uitdaging, maar as jy die regte mense in die regte posisies het, maak dit dinge makliker.”*

Gesinslewe & Toekomsvisie

DJ is getroud met Mirelle (22), en hulle verwag hul eerste baba in Augustus. Dit is vir hom 'n spesiale tyd, en hy sien uit daarna om sy gesinslewe saam met sy boerdery te laat groei. *“Ek het baie geleer die afgelope 12 jaar, maar jy raak nooit klaar met leer in landbou nie. Jy bly aanpas, leer by ander boere, en hou altyd 'n tweede en derde plan gereed.”*

Hy sien sy boerdery as 'n langtermyn belegging, iets wat vir die volgende geslag volhoubaar sal wees.

“Ek bou aan iets wat eendag vir my kinders kan werk. Dis hoe ek boerdery sien—jy beplan nie net vir vandag nie, maar vir jare wat kom.”

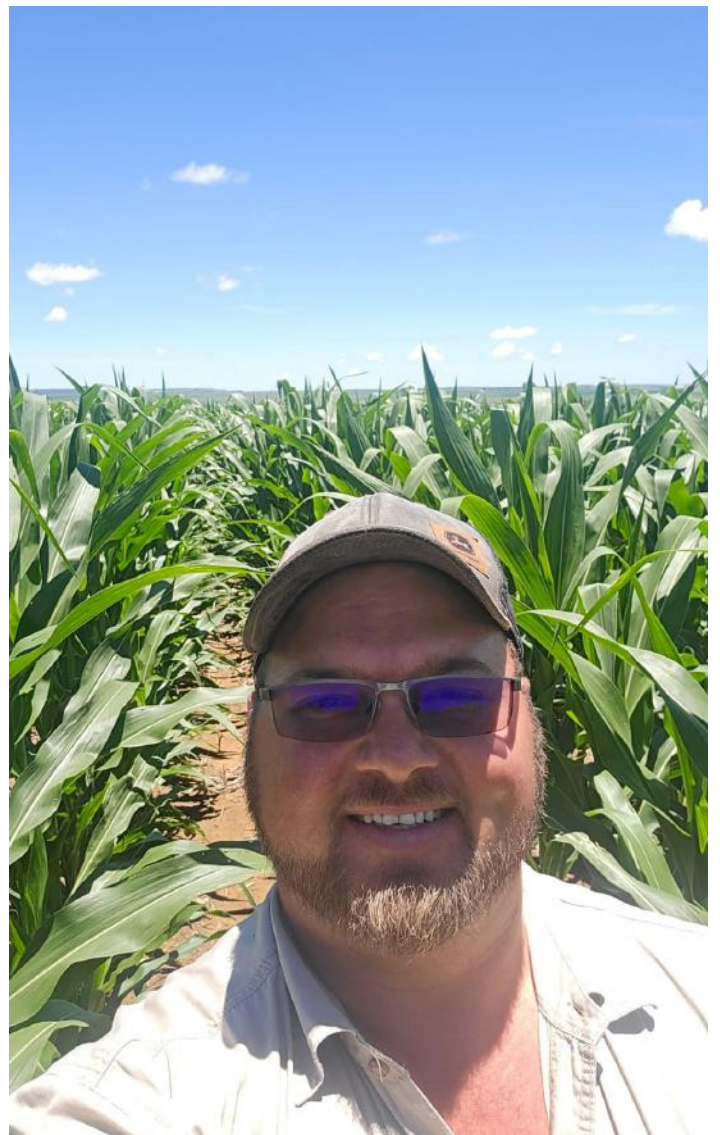
Junior Ferreira: 'n Jong Boer Met 'n Nalatenskap in Gedagte

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Tussen die wuiwende graanlande van die Bethlehem-distrik bou Junior Ferreira (35) aan 'n boerdery waarin volhoubaarheid en vooruitgang hand aan hand gaan. As 'n enkel lopende jonboer, het hy die vryheid om sy volledige fokus op sy onderneming te plaas, en benut hy elke geleentheid om sy praktyke te verfyn.

Boerdery was nog altyd in Junior se bloed. Sedert kleintyd het hy 'n natuurlike aanvoeling vir die grond gehad. Daardie instinkte het net sterker geword toe hy nege jaar lank bevoorreg was om saam met sy pa te kon boer. Ná sy pa se afsterwe het hy die boerdery alleen voortgesit en begin bou aan 'n plaas wat nie net 'n bron van inkomste is nie, maar ook 'n voorbeeld van volhoubaarheid.

Junior boer met mielies, sojabone en 'n gesonde kudde Bovelder beeste. Hy is verantwoordelik vir elke aspek van dié onderneming. Sy visie strek egter verder as sy eie plaasgrense. Hy is reeds 12 jaar lid van Sonop Boerevereniging, 'n aktiewe lid van Graan SA en voorsitter van die Bethlehem Veediefstal Inligtingsentrum, 'n rol waarin hy sy plaaslike landbougemeenskap help om uitdagings te hanteer en saam sterker te staan.



Baie geluk aan Junior Ferreira!

Boer van die Bethlehem-omgewing



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BAIE GELUK



As die kaliber
jongboere van
vandag 'n
aanduiding is van
landbou se
toekoms, lyk die
toekoms blink.
Geluk, Junior! Jy
hou ons naam
hoog.

**2025 Jongboer van die Jaar-
kompetisie finalis:**

Junior Ferreira, jongboer van
Bethlehem omgewing

vk^b
BETHLEHEM

Die Boustene van 'n Suksesvolle Boer

Junior glo dat drie kernaspekte 'n boerdery laat floreer:

- **Aanpasbaarheid.** Hy weet dat die natuur en klimaat buite 'n mens se beheer is, en dat boere moet leer om hul praktyke dinamies aan te pas. "Die uitdagings kan oorwin word deur goed te beplan en saam met die natuur te boer," sê hy.
- **Finansiële Bestuur.** Hy beklemtoon dat slim ekonomiese besluite die verskil maak tussen 'n volhoubare boerdery en een wat sukkel om kop bo water te hou. "Goeie finansiële bestuur in boerdery maak die verskil tussen sukses of mislukking."
- **Arbeids Bestuur.** 'n Boer kan nie alleen boer nie, goeie bestuur van werkers is 'n sleutel tot 'n produktiewe plaas.

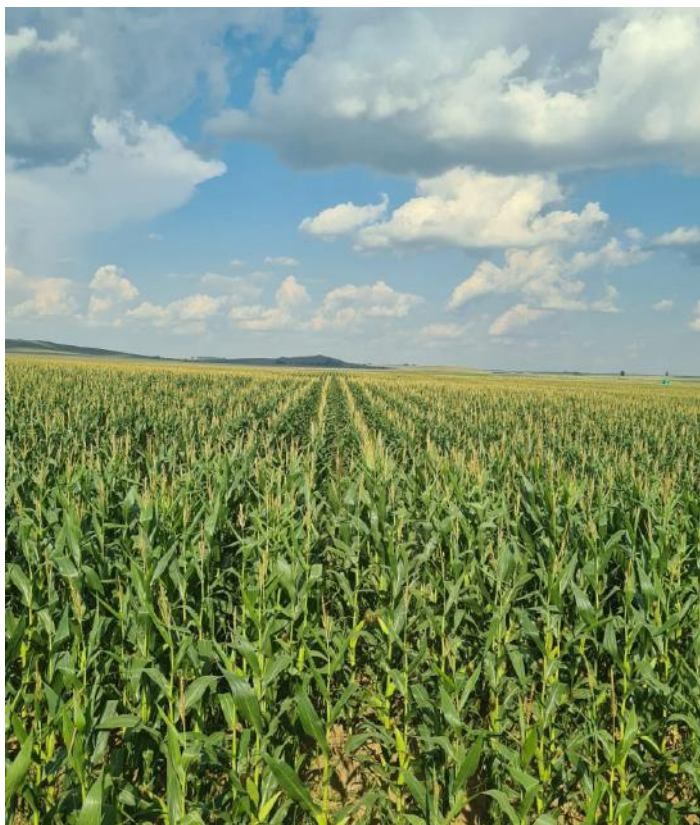
Uitdagings en Oplossings in Landbou

Die pad na sukses is vol slaggate, en Junior is baie bewus van die struikelblokke waarmee boere te kampe het. Hy identifiseer drie groot uitdagings:

1. Die wisselvalligheid van klimaat en natuur.
2. Politieke onsekerheid en beleid.
3. Die verval van landbou-infrastruktuur.

In plaas daarvan om hierdie probleme net te aanvaar, glo hy in aksie en betrokkenheid. Hy is deel van georganiseerde landbou-





strukture en glo dat boere self hulle kant kan en moet bring. “Om betrokke te wees by georganiseerde landbou strukture help om ingelig te bly,” verduidelik hy.

‘n Jong Boer Wat Leer en Groei

Toe ‘n vriend hom nomineer vir die Jongboer van die Jaar kompetisie, het Junior dit gesien as

‘n geleentheid om te leer, nie om noodwendig te wen nie. Hy wou homself meet teen ander vooruitstrewende boere en insigte kry oor sy eie boerdery se sterk en swak punte.

Sy raad aan jong boere?

- Doen wat werk in jou area— maar moenie bloot ander se metodes kopieer nie, ondersoek dit deeglik en kyk wat vir jou die beste werk.
- Verstaan die basiese beginsels van boerdery voordat jy jou in ingewikkelde projekte waag, “Doen die basiese goed reg voordat jy tyd en geld mors op meer ingewikkelde goed.”
- Leer sommer vroeg die finansiële aspekte van boerdery—dit bepaal jou toekomstige sukses.

As daar een ding is wat hy vir medeboere wil sê, is dit: bly positief en bly oop vir nuwe idees. “Daar het nog nooit iets goeds uit negatiewe denke gekom nie,” sê Junior. “Moenie te vas wees in wat jy dink moet of gaan werk nie. Wees oop vir nuwe idees en ondersoek dit deeglik.”

Met sy duidelike visie, sterk gemeenskaps-betrokkenheid en volhoubare boerdery benadering, is Junior Ferreira ‘n jong boer wie se invloed nog ver in die toekoms gaan strek.

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JW Dercksen: 'n Jongboer wat weet wat hy wil hê

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Op die vlaktes van Hertzogville in die Vrystaat, waar die graan die horison streel en die wind waai oor die gesaaide lande, vind jy JW Dercksen, 'n jong boer met 'n praktiese kop en 'n harde werksetiek. Op 28-jarige ouderdom is hierdie jongboerfinalis reeds vier jaar saam met sy pa besig om hul familieboerdery vorentoe te neem—'n reis wat hom van Amerika terugbring het na die land waar sy hart lê.

Maar JW is nie alleen op hierdie pad nie. Sy vrou, Ruchelle, en hul dogter, Mienke, ondersteun hom elke treë van die pad. "Jy kan nie boer sonder 'n sterk ondersteuningsnetwerk nie, en ek is gelukkig om my gesin agter my te hê," sê hy. Wanneer hy ná 'n lang dag op die plaas by die huis instap, is daar vir hom niks beter as om sy dogter se stem te hoor nie.

"Ek is lief vir landbou, dis so eenvoudig soos dit," sê JW met 'n glimlag. Hy is saai-georiënteerd, werk aktief op die plaas, bestuur operasies saam met sy pa, en help self met die bou en herstel van implemente. "Ons maak ons eie toerusting reg—nie net omdat dit geld spaar nie, maar omdat dit tyd spaar en ons laat werk soos ons wil."

Visie: Maksimale opbrengs, minimale hektare

JW verstaan dat moderne boerdery nie net oor harde werk gaan nie, maar oor strategiese denke. "Jy moet jouself ken, jy moet jou





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**Morne Kleynhans,
Tienie Prinsloo &
JW Derksen**

**Baie geluk met jul aanwysing as Finaliste in die
Vrystaat Landbou Jongboer van die Jaar Kompetisie.**

ALS VS Lugbespuiting is baie trots op julle.

**Ons sien uit daarna om die pad na
verdere sukses
saam met julle te loop.**

tekortkominge erken en jy moet slim besluite neem. Boerdery is nie net plant en oes nie—dis 'n bedryf waar jy aanhoudend moet leer en aanpas.”

Sy langtermyn visie is duidelik: maksimum opbrengs op die minimum hektare. Dit is nie net 'n finansiële strategie nie, maar ook 'n manier om volhoubaar te boer in 'n wêreld waar hulpbronne beperk is.

Uitdagings en slim bestuur

Hy glo dat boere moet fokus op wat hulle kan beheer, en nie verlore raak in die faktore buite hul beheer nie. “Jy moet alles doen wat jy kan om suksesvol te wees, maar onthou, sommige dinge gaan buite jou beheer wees—so, fokus op wat jy kan bestuur en doen dit goed.”

Sommige van die grootste uitdagings in landbou vir hom sluit in:

- **Hoë insetkoste en mark-onsekerheid**, wat slim besluitneming en aanpassing vereis.
- **Weersomstandighede**, wat altyd 'n risiko bly, ongeag die beplanning.
- **Die druk van volhoubaarheid**, waar boere moet leer om op lang termyn te dink.





Gemeenskap en betrokkenheid

JW is nie net 'n boer nie—hy is betrokke. Hy is 'n lid van Agri Hertzogville, aktief in die buurtwag patrolie, en ondersteun sy gemeenskap deur sy betrokkenheid by die brandvereniging. "'n Boer werk nie alleen nie, jy moet deel wees van die groter prentjie, die groter gemeenskap. Dit is hoe ons mekaar help en vorentoe beweeg."

Waarom die kompetisie?

Vir JW was sy inskrywing vir die Jongboer van die Jaar-kompetisie 'n kans om homself bloot te stel aan iets buite sy gemakzone. "Jy groei nie as jy altyd net doen wat jy gemaklik mee is nie. Dis hoekom ek ingeskryf het - om myself te toets, om te leer, en om te sien hoe ek as boer kan verbeter."

Raad vir jong boere

Hy beskou homself as iemand wat nog leer en is nederig oor sy kennis, maar as daar een les is wat hy glo vir alle jongboere relevant is, is dit harde werk het nog nooit iemand doodgemaak nie. "Ek het nie al die antwoorde nie, maar ek weet—jy moet werk, jy moet leer, en jy moet aanhou probeer."

Die boer van môre

JW se boerdery en sy benadering is 'n bewys van hoe jong boere hul plek inneem in 'n veranderende bedryf. "Jy kan nie agterraak nie, jy moet modern bly, jy moet uit jou foute leer. Dit is hoe jy groei."

In 'n wêreld waar niks gewaarborg is nie, bou JW sy toekoms met harde werk en volgehoue leer. Hy is 'n jong boer wat weet dat jy nie net vir vandag boer nie—jy boer vir môre.

Morné Kleynhans: Landbou het hom gekies - dit is nie net 'n beroep nie, maar 'n roeping

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Met 'n diepgewortelde liefde vir boerdery, het Charl Morné Kleynhans die afgelope vier jaar voltyds saam met sy pa in Hertzogville geboer. Op 29-jarige ouderdom speel hy 'n sleutelrol in die familieboerdery, waar hy die presisie-boerdery en praktiese uitvoer van gewas- en veeproduksie bestuur.

'n Familie wat saam boer

Morné is getroud met Melene, en saam het hulle 'n 10-maande-oue dogtertjie, Marné. Sy pa, met wie hy die boerdery bestuur, is 'n ervare landbouer wat sy kennis en wysheid aan Morné oordra.

Hy integreer tradisionele boerderypraktyke met moderne tegnologie, wat verbeterde beheer en opbrengs optimalisering moontlik maak.

'n Gediversifiseerde boerdery

Die Kleynhans-boerdery verbou mielies, sojabone en sonneblom, met 'n kommersiële bees- en skaapvertakking en 'n wilddedryf. Morné speel 'n leidende rol in die presisie-boerdery, tegnologiese innovasies en personeelbestuur.

Landbou: 'n roeping, nie net 'n beroep

Morné het van jongs af die boerdery-pad geloop en later 'n B.Agric-graad voltooi. Hy vind sy energie en vreugde in die landbou en



sien dit as 'n manier om sy geloof en sy beroep te verbind. "Om te boer is my passie. Dit is waar ek my energie vandaan kry en ook waar ek naby aan God voel."

Die boustene van sukses

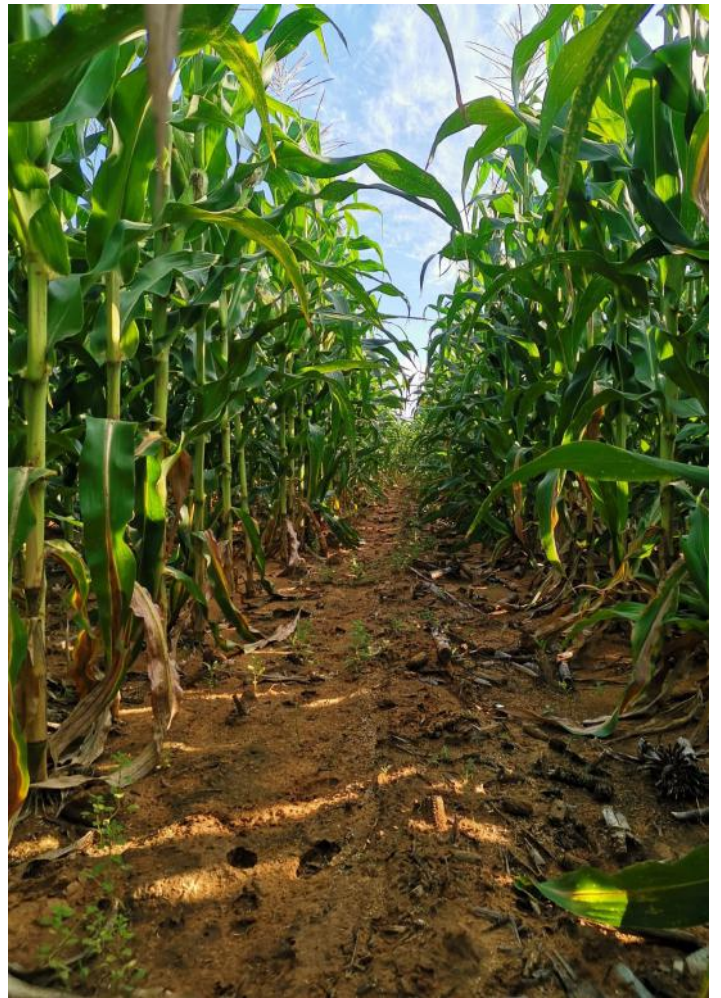
Volgens Morné is daar drie kernaspekte vir 'n florerende boerdery:

1. **Beplanning** – Die regte besluite oor gewas keuse en produksie.
2. **Bestuur** – Effektiewe inset- en kontantvloei-bestuur.
3. **Aanpasbaarheid** – Om vinnig te reageer op klimaatsverandering en markaanpassings.

Uitdagings en oplossings

Hy beskou weersomstandighede, hoë insetkoste en kommoditeitspryse as die drie grootste uitdagings. Hy en sy pa pas strategieë toe soos:

- **Oorlêstelsels** om klimaatsvariasies te hanteer.
- **Wisselbou** om insetkoste te bestuur.
- **Presisie-gewastoediening** om maksimum opbrengs te verseker.



Grainvest wens Morné Kleynhans hartlik geluk met sy aanwysing as finalis in die 2025 Jongboer van die Jaar-kompetisie.

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"Tonne klop swak pryse." sê hy oor die belangrikheid van opbrengs optimalisering.

Gemeenskapsbetrokkenheid en nalatenskap

Morné is 'n lid van Agri Hertzogville, betrokke by plaasveiligheid en die brandvereniging. Sy betrokkenheid versterk gemeenskaplike samewerking onder boere.

Groei gees en mentor-mentaliteit

Morné het ingeskryf vir die Jongboer van die Jaar-kompetisie om by mede-boere te leer. Hy glo dat ervaring nie gekoop kan word nie, en jongboere nooit moet ophou leer nie. *"Moet nooit bang wees om raad te vra nie—ervaring kan nie gekoop word nie."* – Morné Kleynhans



Baie geluk, Morné Kleynhans.
Vrystaat Landbou
Jongboer Finalis
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geassosieer te word



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*Ons beste wense aan Mornè Kleynhans,
‘n hardwerkende doelgerigte jongboer
finalis van ons kontrei.*

*Auto Sentrum vorm graag deel van ‘n
wenspan met ‘n toekomsvisie en deurd-
agte besigheidsin.*



‘n Erfenis wat voortleef

Morné sien sy rol as meer as net ‘n boer—hy bou aan ‘n volhoubare nalatenskap vir toekomstige geslagte. Deur innovasie en gemeenskapsbetrokkenheid wil hy ‘n blywende verskil maak in die landbou. Soos hy dit stel: “Ek wil weet dat ek nie net ‘n goeie boerdery bestuur het nie, maar dat ek iets agterlaat wat vir die volgende geslag ‘n verskil maak.” –

Tienie Prinsloo: 'n Jongboer met 'n visie vir die toekoms

[CLICK HERE
to read article
in English](#)

Toe Tienie Prinsloo vir die eerste keer as jong seun saam met sy pa deur die pekanneutboorde van Loomar Boerdery, Hoopstad distrik gestap het, het hy geweet: hierdie is sy toekoms. Vandag, 15 jaar later, is hy steeds op daardie grond, maar die bome is meer, die visie groter en die boerdery sterker as ooit.

Van klein begin tot groot drome

Met sy pa as sy mentor en sy hande diep in die grond, het Tienie sy plaasgemeenskap en

boerdery met strategiese groei en volhoubare praktyke opgebou. "Ek het van jongs af geleer dat as jy iets plant, moet jy dit oppas. Jy kan nie vandag 'n boom plant en môre vrugte verwag nie—jy moet beplan, geduldig wees en jouself op die lang termyn instel," sê hy. Dit is hoekom sy pekanneutboorde so spesiaal vir hom is. Sedert 2023 het hy 8 600 bome bygeplant, en in 2024 kom daar nóg 7 500 by—nie net vir homself nie, maar vir sy kinders, Martiens (9) en Karlien (6), wat dalk eendag in sy voetspore sal volg. "Elke nuwe





Baie geluk aan **Tienie Prinsloo** van Triple S Beefmasters met jou aanwysing as Vrystaat Jongboer Finalis 2025. Dankie vir jou volgehoue ondersteuning en verbintenis met Agricol deur die jare. Ons is trots op jou met die prestasie. Doen so voort!



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boom is 'n belegging, nie net in my boerdery nie, maar in die toekoms van landbou."

Diversifikasie en rentmeesterskap

Sy boerdery is nie beperk tot net pekanneute nie—hy het 'n Beefmaster-stoet en suikerbone tot die onderneming toegevoeg. "Dit gaan oor aanpasbaarheid. Jy kan nie net op een ding staatmaak nie. As jy jou risiko's versprei, bou jy iets wat kan bly staan, ongeag die mark of die klimaat," verduidelik hy.

Hy glo in rentmeesterskap—die idee dat jy die grond beter moet laat as wat jy dit gekry het. "Ons het 'n verantwoordelikheid om slim en volhoubaar te boer. Jy moet dink aan hoe jou besluite vandag die land en jou boerdery oor twintig jaar gaan beïnvloed."

'n Gemeenskapsboer met 'n breër visie

Tienie is nie net op sy plaas aktief nie, maar speel 'n belangrike rol in sy dorp. As voorsitter van die Hoopstad Landbou Genootskap, lid van Graan SA, en direkteur van die Hoopstad Sport Academy, help hy om sy gemeenskap te bou en sy mede-boere te ondersteun.



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Baie geluk, Tienie Prinsloo, met hierdie welverdiende benoeming. As 'n leier in die landboubedryf, beliggaam jy die waardes waarin ons glo—harde werk, volhoubaarheid en 'n diep verbintenis tot die gemeenskap. Ons is trots om jou te ondersteun en stap elke tree van die pad saam met jou.



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BAIE GELUK!



Tienie Prinsloo

2025
Jongboer van die Jaar
finalis!

Tienie, namens die hele Nut Link span, wens ons jou geluk met hierdie besondere prestasie! Ons is trots om met jou geassosieer te word en sien uit om nog 'n lang pad saam met jou te stap.

Nut Link – die pekanneutboer se vennoot vir vertroue en kwaliteit.



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Hy glo in georganiseerde landbou: “Jy kan nie alleen boer nie. Ons moet saamstaan, mekaar help, kennis deel. Dit is hoe ons sterker word.” Die uitdagings is groot—hoë insetkoste, infrastruktuur wat nie in landbou se guns werk nie, en vervangingskoste wat bly styg. Maar eerder as om te kla, dink hy aan oplossings. “Ons moet onafhanklik raak van die staat. As jy

net wag vir dinge om beter te raak, gaan jy wag tot jy niks oor het nie.”

‘n Oorweging vir die toekoms

Tienie het ‘n duidelike boodskap vir jong boere: “Wat ons vandag doen, bepaal waar ons oor 20 jaar gaan wees. Ons moet slim werk, ons gemeenskap ondersteun, en verantwoordelikheid aanvaar vir die toekoms.”

Hartlik geluk met die benoeming as
finalis

Tienie Prinsloo **Vrystaat Landbou 2025** **Jongboer van die Jaar**

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**Baie geluk, Tienie Prinsloo
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JRT Machinery, Hoopstad is baie
trots daarop om met jou en jou
boerdery geassosieer te word.
Ons wens jou sterkte toe vir die
kompetisie en sien uit na nog baie
jare van voorspoedig saam werk.**



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Hy weet landbou in Suid-Afrika is nie maklik nie, maar hy glo in die veerkragtigheid van sy kollegas. “Ons is van die beste boere ter wêreld—ons het dit nie maklik nie, maar ons maak altyd ’n plan. Ons het geleer om saam te staan, mekaar te help, en deur te druk, maak nie saak hoe moeilik dit raak nie.”

Die toekoms van landbou lê nie net in ervaring nie, maar in visie. Tienie Prinsloo boer nie net vir vandag nie—hy boer vir môre.

Agricultural Training: The Backbone of Sustainable Farming

Agriculture is not just about planting and harvesting—it is about knowledge, innovation, and adaptability. Whether you're a farm labourer aiming to sharpen your skills, a farmer looking to enhance sustainability, or an agribusiness professional navigating market changes, education is the cornerstone of success.

As Nelson Mandela famously said, *"Education is the most powerful weapon which you can use to change the world."* This rings especially true in agriculture, where informed and skilled farmers can transform their operations and communities.

The Skills Farmers and Agricultural Workers Need

From soil health to smart technology, training programs across South Africa equip workers with essential skills to improve productivity, efficiency, and resilience.

1. Hands-On Farming Skills for Farm Workers

For those working the land every day, practical skills can make all the difference:

- **Soil & Water Conservation** – Techniques to prevent erosion and manage resources effectively.
- **Crop Production & Livestock Care** – Best practices for healthy, high-yield farming.



- **Farm Safety & Machinery Use** – Training in safe equipment handling and chemical application.

Echoing the wisdom of Masanobu Fukuoka, *“The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings.”* Equipping farm workers with practical skills ensures both personal and professional growth.

2. Advanced Skills for Farmers & Agribusiness Professionals

Farm owners and managers benefit from specialized training that improves efficiency and long-term sustainability:

- **Precision Farming & Technology** – GPS-guided machinery, drones, and climate monitoring systems optimize production.
- **Climate-Smart Agriculture** – Strategies to counter droughts and extreme weather.
- **Agri-Business Management** – Financial planning, supply chain strategies, and market positioning.

Agriculture continues to evolve, and as Arthur Keith put it, *“The discovery of agriculture was the first big step toward a civilized life.”* Modern farmers must stay informed and adaptable to remain competitive in a changing global economy.

3. Sector-Specific Training for Agricultural Businesses

Keeping up with industry trends means tapping into specialized knowledge:

- **Market Access & Trade Relations** – Strategies for selling produce locally and internationally.
- **Smart Contracts & Blockchain** – Digital solutions for secure and efficient transactions.
- **Agricultural Extension Services** – Training initiatives that empower small-scale farmers with best practices.

Farm Workers Achieving Growth

In Limpopo, *Agri Skills Transfer* has helped thousands of farm workers develop expertise in soil management, pest control, and irrigation techniques. Many trainees have used their new skills to secure better jobs or start small-scale farms, strengthening local food security.

Reflecting on the value of farming, Will Rogers once said, *“The farmer has to be an optimist, or he wouldn’t still be a farmer.”* Training gives farm workers the confidence to improve their livelihoods despite industry challenges.

Women Leading in Agriculture

A pioneering initiative by *Africa Skills Training College* has empowered female farmers through mentorship programs focused on agribusiness, livestock nutrition, and crop rotation. As a result, women-led farms are growing in rural South Africa, creating jobs, and boosting agricultural diversity.

Smart Farming Revolution in Citrus

Several citrus farms in the Western Cape have reduced water usage by **30%** after adopting precision farming techniques taught at Stellenbosch University. By using drone monitoring and climate data analysis, farmers have improved fruit yields while conserving natural resources.

Dwight D. Eisenhower famously remarked, *“Farming looks mighty easy when your plow is a pencil and you’re a thousand miles from the cornfield.”* This sentiment highlights the value of hands-on experience and specialized education in modern farming.

Where Farmers Can Find Training Universities & Diploma Programs

For those pursuing formal studies in agriculture:

- **University of Pretoria & Stellenbosch University** – Specializing in agronomy, soil science, and agricultural economics.
- **University of the Free State & KwaZulu-Natal** – Advanced coursework in crop production, animal science, and agribusiness.

Vocational & Technical Training (TVET Colleges)

Hands-on agricultural training for farm workers and managers:

- **Central Johannesburg TVET College** – Courses in farm management and agribusiness operations.
- **Ekurhuleni TVET Colleges** – Specializing in sustainable farming and crop production.

Private Agricultural Training Providers

Practical courses tailored to industry needs:



- **Africa Skills Training College** – SETA-accredited programs for farm labourers.
- **Agri Skills Transfer** – Training in soil conservation, livestock farming, and agribusiness.
- **Toutele Agriculture College** – Offering hands-on education for farm managers.
- **AgricultSURE** – Providing mentorship for emerging farmers and agribusiness professionals.

Opportunities for Farmers & Workers Funding for Agricultural Education

Farmers and agricultural workers seeking training can explore funding opportunities, including:

- **AgriSETA Learnership Grants** – Workplace-based training programs supported by the agricultural sector.
- **Department of Agriculture Bursaries** – Financial assistance for students pursuing agricultural studies.
- **Private Sector Sponsorships** – Agribusinesses investing in workforce skills development.

How Farmers Can Support Skills Growth

Agricultural expertise thrives when knowledge is shared. Farmers can actively contribute by:

- **Hosting On-Farm Training** – Sharing techniques with workers and neighbouring farmers.

- **Mentorship Programs** – Helping young farmers build confidence and knowledge.
- **Partnering with Training Providers** – Offering practical experience to students and trainees.

Samuel Johnson once stated, *“Agriculture not only gives riches to a nation, but the only riches she can call her own.”* Investing in skills development ensures that farming remains a thriving and sustainable industry for future generations.

Conclusion

Investing in education and skills development ensures that South African farmers, agribusiness owners, and agricultural workers remain adaptable, competitive, and prepared for the challenges of modern farming. As the industry evolves, training will be the key to sustainability and prosperity.

Sources

- AgriSETA
- Africa Skills Training College
- Stellenbosch University
- Agri Skills Transfer
- South African Agricultural Business Guide
- Trade and Agriculture in South Africa
- Department of Agriculture Bursaries

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Thinking creatively about a strategy for the Karoo sheep industry

Wandile Sihlobo
Johann Kirsten

How can we promote agricultural growth in the Karoo region by unlocking its natural assets and heritage? There are opportunities to pursue this path through food heritage, high end fashion and agritourism. These are essential interventions to ensure that the farmers in the Karoo can diversify and improve their revenue streams by not solely depending on export markets of wool and exposed to global supply chain challenges

such as when China temporarily banned the exports of South African wool leading to a 22% y/y decline in South Africa's wool export earnings.

So, what to do? At the very basic level, we eat to live, and food carries the smells and tastes of places, families and histories. It matters to people what they eat, when, and how they eat. Thus, food heritage is linked to ecology, sustainability, health and landscape





questions. Exploring food in the context of heritage can raise interesting questions about identity, people's relationship to the land, the availability and quality of local produce, poverty and health. This would not be a first time such is done. Various countries in Europe continue to benefit from their food heritage. For example, France is the first country to acknowledge food as part of the country's heritage. In 2010, Spain, Greece, Italy, Morocco, France and Mexico successfully nominated the Mediterranean Diet, Mexican Cuisine and the Gastronomical Meal of the French as part of the Intangible Cultural Heritage of Humanity under the UNESCO Convention.

Therefore, food heritage also offers obvious spin-offs in the form of product development and economic value and development. We see elements of these foreign food heritage products on the shelves of our leading supermarkets but somehow these same retailers ignore our own heritage. The Karoo is South Africa's hinterland and one of the "assets" of the Northern, Eastern and Western Cape because of its pristine natural beauty, clean air, peace and quiet. It, therefore, has a strong commercial and marketing value which farmers can utilise. Still, the name "Karoo" has been widely misappropriated by various individuals and businesses, misrepresenting products such as "Karoo Lamb". Or even worse our large retailers such Woolworths, Pick 'n Pay and Checkers are sourcing large volumes of lamb from the Karoo without acknowledging the origin and heritage of the product. Our Agribusiness colleagues in the region in some way play along and ignore

all the effort the Karoo farmers are doing to bring a superior product to the table of our consumers.

So, the Karoo region farmers should (1) claw back the Karoo name through protecting the name and identity through the registration of a Geographical Indication (GI) (I can confirm that they have the government/DALRRD support on this), (2) Lift Karoo Lamb out of meat commodity mark and create its own pricing and distribution structure, (3) Create a different 'price point' for Karoo Lamb, (4) Enforce quality and food safety standards, (5) Ensure producer control of supply chain and form strategic partnerships with abattoirs, packers and wholesalers, (6) Prevent overdominance by major retail chains, (7) Educate consumers about quality and value of Karoo Lamb.

South African consumers are already buying European GI products in our supermarkets – many cheeses, hams carry the famous EU GI logo, and the retailers are happily selling these famous names that are protected by EU legislation. South Africa also introduced similar regulations in 2019 and enabled Rooibos and now very soon Karoo Lamb as South Africa's first GI products.

The ongoing efforts to promote Karoo Lamb as a GI has also brought about interesting spin offs in relation to the fashion industry, which can add tremendous value to the Karoo. The global fashion industry especially the luxury goods and clothing industry is now demanding wool, mohair and leather from the Karoo because of the Karoo quality, reputation and story.

Do you know where your food comes from?

Knowing the backstory does improve the experience!

Prof Johann Kirsten

A meal, dinner event or food shopping experience gains significance when you hear the story about how, and where the food was produced and how the region, and culture, shaped the identity of the product. In our minds these backstories enhance, and nuance, the shopping or tasting experiences. Think about drinking an ice-cold glass of 'real' Champagne or the satisfaction of serving your dinner guests 'Parma Ham' or 'Parmigiano Reggiano' cheese or 'Jamon Iberico'. Food stories are always a conversation starter, and knowing the backstory, or the story about what makes the food 'unique' does improve the tasting experience!

Let's start with the (back)story of Mont Saint-Michel lamb, also known as *Agneau de Pré-salé du Mont-Saint-Michel* (Salt Meadow Lamb). The story of Mont Saint-Michel lamb begins with the vast salt marshes that surround the iconic Mont Saint-Michel abbey, a UNESCO World Heritage Site in Normandy, France. These marshes are flooded twice daily by the tides of the English Channel. The sheep that

roams these salt meadows feed on a variety of grasses and herbs that impart a distinctive flavour to their meat. The high saline content of the vegetation, combined with the coastal climate, results in lamb that is tender, succulent, and imbued with the essence of the sea. For centuries the farmers move their livestock between different grazing areas seasonally, and during spring and summer the sheep are brought to the salt marshes to graze on the lush vegetation. In 1986, Mont Saint-Michel lamb was granted official recognition as a Protected Geographical Indication (PGI) under European Union law. This designation acknowledges the unique characteristics of the lamb produced in the bay area and provides legal protection against imitation or misuse of the name. The PGI status ensures that Mont Saint-Michel lamb can only be produced within the designated geographical area and according to specific production criteria outlined in the official regulations.

Similar backstories are linked to products such as Gruyere Cheese, Parmigiano Reggiano cheese, Roquefort Cheese, Jamon Iberico, Prosciutto di Parma (Parma Ham), Camembert de Normandie, Brie de Meaux, Pecorino Romano, Gorgonzola, Mozzarella di Bufala Campana, Aceto Balsamico di Modena and many more. All these European products are embedded in traditions linked to specific regions and links back to decrees made centuries ago.

Trading these authentic products outside the region of origin and beyond national borders bring into play many problems in terms of traceability, labelling and misleading of consumers in retail markets and in the



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catering and hospitality industries. Protecting the reputation and authenticity of these products need to be done with great care and precision to avoid the destruction of the reputational value of the product.

The World Trade Organisation's 1994 agreement on intellectual property (TRIPS) contains a section on Geographical Indication which enhances their protection and extends it to more countries than previous international agreements. The TRIPS Agreement requires all Members of the WTO to provide the "legal means" to provide these minimum standards of GI protection in their territories.

With the global recognition of the principle of Geographical Indications, most countries, realised that they also have food products with unique (back) stories. Let's list a few famous examples:

- Basmati rice (India and Pakistan)
- Phu Quoc (Vietnam)
- Darjeeling tea (India)
- Café de Colombia (Colombia)
- Poivre de Penja (Penja Pepper) (Cameroon)

South Africa has also joined the global GI

family with the registration of Rooibos as a Geographical Indication in 2021 and more recently Karoo Lamb in 2023.

So, next time you serve Karoo Lamb to your dinner guests, you will be able to corroborate your geographical claims, since Karoo lamb now has its own Geographical Indication protection with its own unique story! So, this is what you tell your culinary friends, to assure them Karoo lamb GI can now be traced to its own 'salt marshes', in this case the Karoo's unique herbal shrubs and grasses. "It is only Karoo Lamb when it is a lamb which was born and raised on Karoo veld in the defined Karoo region. It has never been in a feedlot and never grazed on planted pastures". The checks and balances build on a rigorous traceability system, internal controls implemented by the regional collective organisation, the Karoo Lamb Consortium and integrity and honesty of all role payers – from the farmer to the retailer to the restaurateur.

The unique story of Karoo Lamb is embedded in the images of windmills, sheep, farm homesteads, endless vistas, home-baked bread, hospitable evenings. These images are engrained in the minds of many South Africans

when they think of the Karoo. Because of these images, and the tranquillity and honesty of the Karoo way of life, the “Karoo” concept has become synonymous with quality, tradition, and wholesomeness. The reputation for quality which is embedded in words such as ‘Karoo’ has significant marketing potential and is as such already sought after by producers often with little or no link to the region.

The Karoo covers almost 50% of the total area of South Africa and is sparsely populated, far away from major urban and distribution centres. This lonely corner of the earth is home to one of South Africa’s living treasures: flocks of sheep, grazing freely among the scattered shrubs. Their meat is spiced on the hoof and described as “mouth-wateringly succulent, imbued with the subtle, fragrant flavours of the Karoo bush”. It’s not surprising - they feed on wild herbs, thousands of different species of them, where normally sheep live on one type of grass. It’s a most exquisite lamb, and it is the world-renowned free-range Karoo lamb.

While there is a unique back story and because there is intrinsic reputational value and brand value in the name “Karoo Lamb”, there are many opportunities for opportunistic behaviour, dishonesty, shirking and plain food fraud. These include:

- The farmers who market the lamb as Karoo Lamb from a feed lot or let the animals graze on planted pastures.
- The abattoir that source from farms outside the region and label them as Karoo lamb.
- The butcher that source lamb without confirming the origin and then claiming it is from the Karoo and selling to customers.
- The restaurateur or the chef that tells the naive tourist that the lamb on the plate is from the Karoo. It is portrayed like that on the menu, but it is sourced from a feedlot in Riebeeck-Kasteel.

Fortunately, science has evolved to be able to (just as we can taste the difference) detect the origin of lamb through analysis of the volatile fingerprints of lamb meat and fat. Dr Sara Erasmus and co-authors showed in a 2017 paper that it is possible through the application of proton-transfer mass spectrometry (PTR-MS) to authenticate the origin of the lamb. Their results showed clearly that the volatile composition of the fat from Karoo Lamb had a higher concentration of

key terpenes, validating the direct link with the herbaceous plant samples. Overall, the analysis shows considerable differences between the Karoo and Non-Karoo samples indicating the typicality of Karoo lamb.

This research was followed-up by an extensive exercise to develop a database of volatile fingerprints for more regions and sub regions in the Karoo. With this in hand scientists can now very easily analyse samples from retail shelves and confirm the authenticity of the Karoo origin claims on their labels. These techniques have been successfully applied to protect the authenticity of Welsh Lamb and New Zealand lamb.

In summary the story of GIs, such as Karoo Lamb, is one of preserving and celebrating the unique qualities and traditions associated with regional food and drink specialities, while also providing economic opportunities for producers and promoting consumer trust and transparency in the marketplace. Food with a backstory can significantly enhance its appeal and value for several reasons:

- It has a cultural connection.
- It serves as powerful expression of identity.
- It provides transparency about sourcing practices and production methods.
- It evokes emotions, memories, and sensory experiences.
- It stands out from the competition and commands higher value among consumers.

Food with a backstory enriches the dining experience by deepening our understanding of culture, identity, sustainability, and human connection. By sharing stories about the origins and traditions behind food, we celebrate diversity, foster appreciation for culinary heritage, and create meaningful connections that transcend borders and cultures.

Karoo Lamb provides this unique experience for South Africans and should be embraced by our retailers, restaurateurs, dinner clubs, and our culinary hero’s and should be jealously guarded against misappropriation.

*** Prof Kirsten is a Director of the Karoo Lamb Consortium, the Not-for-Profit Company representing farmers, abattoirs and retailers in the Karoo. Prof Kirsten was the leader of the 20-year effort by the Consortium to get official protected status for Karoo Lamb as South Africa’s first Geographical Indication*

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SA Agricultural Scientist Champions Insect Research for Food Security

Anelisa Gusha

While most people might flinch at the sight of a bug, Dr Astrid Jankielsohn sees a world of possibility. For this 57-year-old agricultural entomologist at ARC–Small Grain, insects aren’t just tiny creatures, they are the key to understanding, preserving, and protecting South Africa’s food supply. The seasoned researcher completed her undergraduate studies with a Bachelor of Science degree, followed by a BSc Honours in Entomology, a Master of Science (MSc) in Entomology, and a PhD in Entomology.

“There aren’t many entomologists left, especially in agriculture,” she says, her voice a blend of concern and passion. As one of South Africa’s few experts in this fading field, Dr Astrid has dedicated her life to studying aphids and other pests that threaten crops especially wheat.

Her journey began in the early 2000s at the Agricultural Research Council (ARC), where she quickly became a cornerstone of the organisation’s pest research initiatives. But her love for insects? That dates all the way back to age six, when family trips to the mountains sparked an early fascination with the wonders of nature.

Born and bred in Bloemfontein, she knew from a young age where her fate lay. “I am still not sure where my fascination comes from, but my family always supported me in what I was interested in. I come from a very



academic family. My dad was a professor in art history, and my mom was a librarian who studied philosophy. My brother is a business psychologist, my oldest sister studied law and my other sister is an educational psychologist and I am the only one who went into natural sciences. But for holidays, our parents took us to the mountains, we went camping, and I think that exposed me to nature,” she said.

Dr Astrid said this early exposure sparked her interest in insects. “As a child, I used to be absolutely fascinated by insects. I was about six years old when I decided this is what I wanted to do. Not everyone is that lucky, some people finish school and still don’t know what they want. I was interested in entomology. I found it fascinating because it’s more complex. It’s easy to see a bird and learn about it, but with insects, I realised it was more difficult,” she said.

She was drawn to the tiny details most people missed, the flutter of wings, the way insects move. It was like discovering a secret world. Now, decades later, Dr Astrid is using that childhood wonder to make a real-world impact. Her research helps farmers across the country monitor and manage pest populations more effectively, ensuring healthier crops and more secure food systems. “Monitoring is the most important thing when dealing with pests in your crops,” she explained.

“You need to know the insect, where it comes from, and how it spreads. Only then can you act effectively. We found that with resistance in wheat cultivars, insects are very good at surviving. The moment you put pressure on them, they start adapting, eventually they evolve and overcome the resistance,” she said. Dr Astrid, who monitors aphids in production areas across South Africa, says her job is fascinating. “I go to wheat fields and collect samples, then come back and analyse them. Most of the aphids are parthenogenic females, that’s why they’re so successful. You only need one aphid, and it can produce and establish a clone population. It spreads very quickly. From the samples I collect, I take one aphid and create a plant population. I then screen those populations to determine their the biotype,” she said.

She’s also passionate about educating farmers and agricultural chemical agents.

“The first step is identification. If you don’t know the enemy, you can’t fight it properly,” she emphasised. According to Dr Astrid, understanding the life cycle of an insect is just as critical as applying any chemical treatment. “If farmers know when and how an insect

develops, they can intervene at the right time and with the right methods. The reason I’m still here is because I’m passionate about insects and research. I enjoy doing the work, and I feel it’s important. What I’ve realised, working in agriculture and in the field, is that I love it. I enjoy being out there. I’ve seen that we need most insects to produce food. We can, up to a point, replace insects with artificial fertilisers and chemicals, but only up to a point. I think in the last decade, we’ve lost 50% of our insect biodiversity, and agriculture is the cause. We plant monocultures, which isn’t natural. We plant one genetic crop across the same area. This excludes many insects. Agriculture ends up favouring certain species, and because the others are excluded, there’s no competition, no predation, no parasitism, so the pests just multiply,” she said.

With her boots firmly planted in the soil and her eyes always scanning for signs of life, Dr Astrid continues to be a quiet but powerful force in South African agriculture. She has over the past two decades proven that sometimes, the smallest creatures can make the biggest difference.



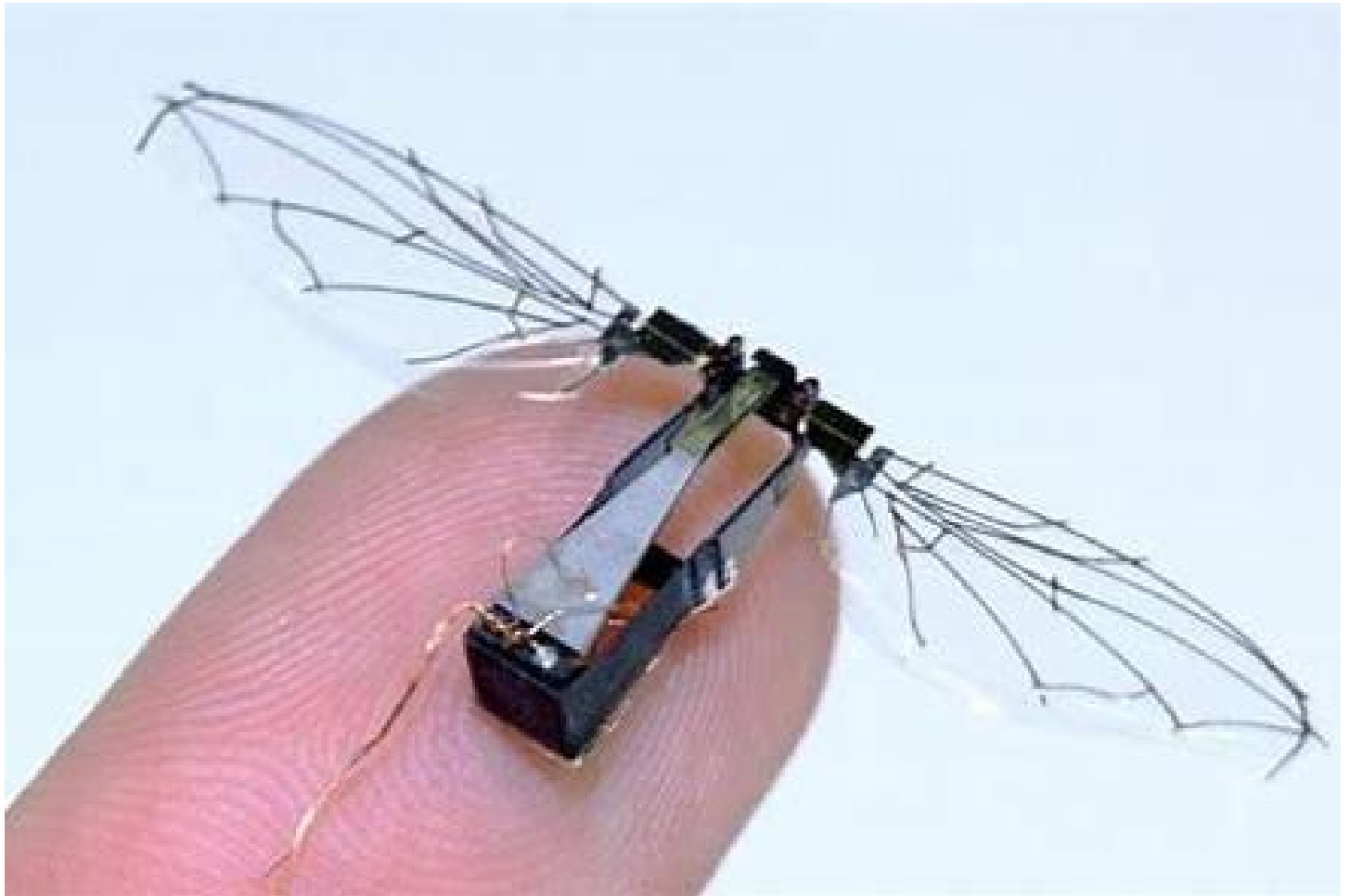
Robotic Bees:

A Promising Solution to the Pollination Crisis

The decline in global bee populations has raised alarm bells across the agricultural and environmental sectors. Bees, as vital pollinators, play a crucial role in ensuring food security and biodiversity. However, factors such as pesticide use, habitat loss, diseases, and climate change have led to a significant reduction in their numbers. In response to this crisis, researchers and engineers have developed an innovative solution: robotic bees.

The Importance of Pollination

Pollination is a fundamental process in agriculture, enabling the reproduction of plants and the production of fruits, vegetables, nuts, and seeds. Bees and other pollinators facilitate this process by transferring pollen between flowers, ensuring fertilization. Without efficient pollination, crop yields would decline, leading to food insecurity and economic losses.



The Decline of Bee Populations

Over recent decades, bee populations have faced mounting pressures. Urbanization and agricultural expansion have resulted in habitat loss, while pesticide exposure has harmed their health. Additionally, climate change has disrupted their natural behaviours and ecosystems. These challenges have left farmers struggling to ensure adequate pollination for their crops.

Introducing Robotic Bees

Robotic bees, also known as “robobees” or “pollinator drones,” are small, insect-sized robots designed to mimic the behaviour of real bees. Equipped with advanced sensors, actuators, and artificial intelligence (AI), these robots can autonomously navigate their environment, identify flowers, collect pollen, and transfer it between flowers.

Technological Advancements in Robotic Bees

The development of robotic bees has seen remarkable technological advancements, particularly in their design, functionality, and efficiency. Key innovations include:

- 1. Enhanced Flight Capabilities:** Robotic bees, also referred to as micro-aerial vehicles (MAVs), have achieved significant improvements in flight precision and agility. For instance, some designs now enable robots to hover for extended periods, perform acrobatic manoeuvres, and navigate complex environments with remarkable accuracy.
- 2. Energy Efficiency:** Researchers have focused on creating lightweight and energy-efficient models. This involves minimizing mechanical stress on artificial wing structures, resulting in increased endurance and longer operational lifespans.
- 3. Artificial Intelligence (AI) Integration:** AI is central to the functionality of robotic bees. Machine learning algorithms enable them to identify flowers, optimize pollination routes, and adapt to changing environmental conditions. Over time, these systems can refine their performance, making them highly effective in various agricultural settings.
- 4. Applications in Vertical Farming:** Robotic bees are particularly suited for indoor environments like greenhouses and vertical farms, where natural pollinators often face challenges. They simulate natural pollination processes and ensure efficient crop fertilization.

- 5. Future Prospects:** As research progresses, robotic bees are expected to become even more efficient and versatile. The integration of advanced sensors for environmental awareness and the use of sustainable energy sources are among the exciting avenues being explored.

Real-World Applications of Robotic Bees

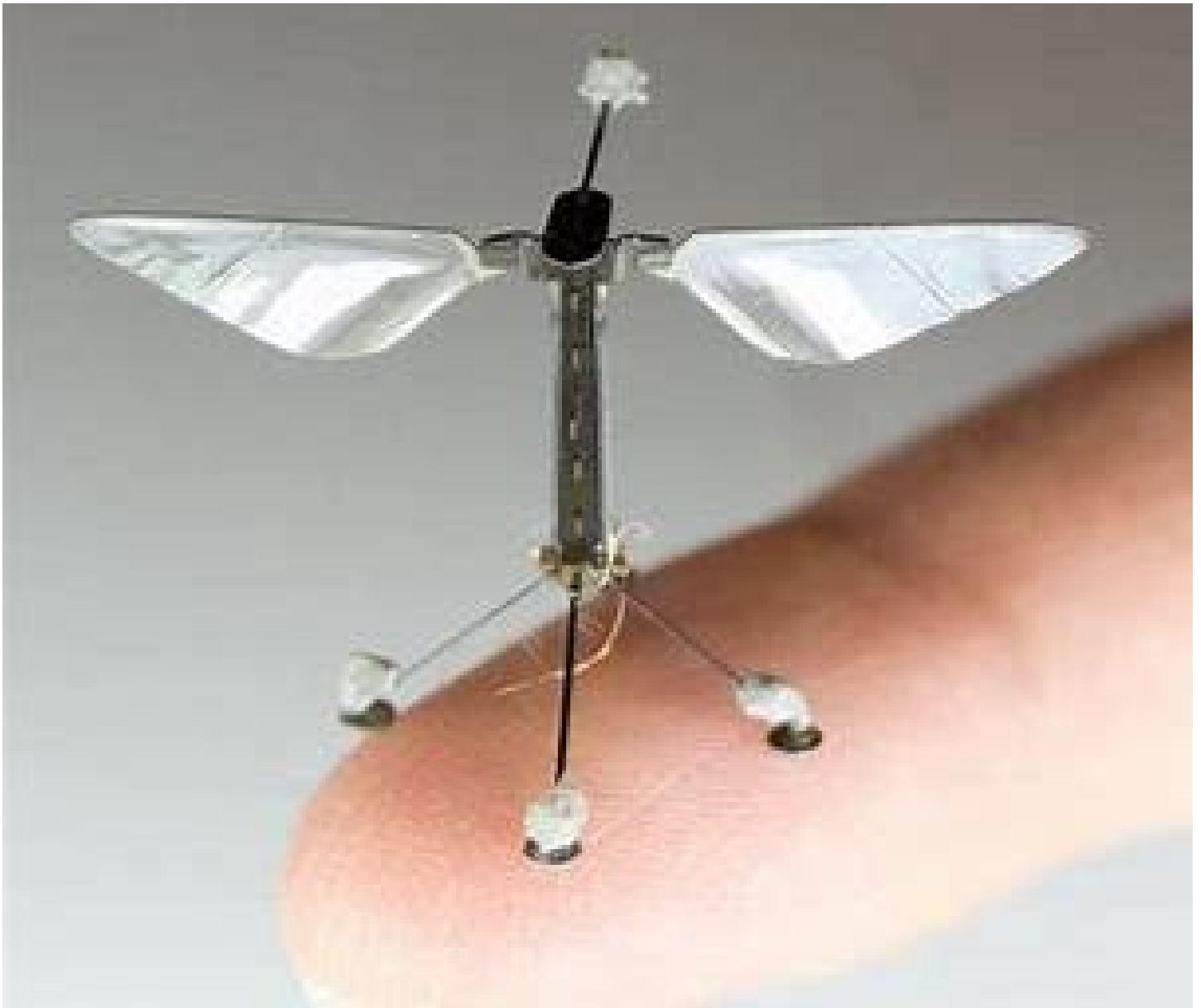
Robotic bees are not just theoretical concepts; they are being actively developed and tested for practical applications. Some of the most promising uses include:

- 1. Greenhouse Pollination:** Robotic bees are ideal for controlled environments like greenhouses, where they can efficiently pollinate crops without relying on natural pollinators.
- 2. Vertical Farming:** In urban areas, vertical farms are becoming increasingly popular. Robotic bees can navigate these multi-level structures to ensure effective pollination, boosting crop yields.
- 3. Assisted Pollination in Agriculture:** In regions where bee populations have drastically declined, robotic bees can step in to perform pollination tasks, ensuring food security.
- 4. Environmental Monitoring:** Equipped with sensors, robotic bees can also be used to monitor environmental conditions, such as air quality and temperature, providing valuable data for agricultural planning.
- 5. Research and Conservation:** Robotic bees can assist in studying natural pollinators and their behaviours, contributing to conservation efforts.

Economic Viability of Robotic Bees in Agriculture

The economic viability of robotic bees is a critical factor in determining their adoption in agriculture. Here are some key considerations:

- 1. Cost of Development and Deployment:** The initial costs of developing and deploying robotic bees are high due to the advanced technology involved. However, as production scales up and technology matures, these costs are expected to decrease.
- 2. Reduction in Crop Losses:** By ensuring efficient pollination, robotic bees can help reduce crop losses caused by insufficient pollination. This can lead to increased yields and higher profits for farmers.
- 3. Long-Term Savings:** While the upfront investment in robotic bees may be



significant, their ability to operate in controlled environments and regions with scarce natural pollinators can result in long-term savings for farmers.

- 4. Market Potential:** The growing demand for sustainable agricultural solutions and the decline in natural pollinators creates a strong market potential for robotic bees. This could drive further investment and innovation in the field.
- 5. Challenges:** Despite their potential, the prohibitive costs and technical complexities of robotic bees may limit their accessibility to small-scale farmers. Efforts to make the technology more affordable and user-friendly are essential for widespread adoption.

Environmental Impact of Robotic Bees vs. Real Bees

The environmental impact of robotic bees versus real bees highlights the balance

between technological innovation and ecological sustainability.

1. Real Bees:

- **Pollination and Ecosystem Services:** Real bees are indispensable for pollination, enabling the reproduction of approximately 75% of crops grown for human consumption. They also support the health of ecosystems by ensuring plant reproduction, which sustains other wildlife.
- **Sustainability:** Bees rely on natural resources like nectar and pollen, operating without external energy inputs. Their activities are inherently sustainable and regenerative.
- **Challenges:** Declining populations due to pesticides, habitat destruction, and climate change pose significant risks to ecosystems and agriculture.

2. Robotic Bees:

- **Energy Use and Material Footprint:** Robotic bees require energy to operate, often sourced from batteries or external power supplies, which raises concerns about energy efficiency and carbon footprints. Additionally, their production involves plastics and metals, contributing to environmental impacts.
- **Pollination Efficiency:** While they replicate the function of pollination, robotic bees lack the broader ecological benefits provided by real bees, such as sustaining biodiversity and supporting ecosystems.
- **Benefits:** They can mitigate challenges in areas lacking natural pollinators, ensuring food security in critical regions.

Timeline for Commercial Viability of Robotic Bees

The widespread commercial use of robotic bees depends on overcoming various technical and economic challenges. Here's a projected timeline for their development:

- 1. Short-Term (5–10 Years):** Robotic bees are expected to be deployed in controlled environments like greenhouses and vertical farms, where they can be tested and refined under stable conditions.
- 2. Medium-Term (10–20 Years):** As advancements in energy efficiency, navigation systems, and cost reduction occur, robotic bees could be adopted in broader agricultural settings, particularly in regions facing acute pollinator shortages.
- 3. Long-Term (20+ Years):** Full-scale commercial deployment in open-field agriculture may become feasible in the distant future. By this stage, robotic bees may complement natural pollinators while addressing critical food security challenges.

Challenges and Considerations

While robotic bees present exciting possibilities, several challenges remain. Developing lightweight and energy-efficient designs is crucial for their practical use. Ensuring robust navigation and communication systems is also essential. Furthermore, ethical considerations regarding the replacement of natural pollinators must be addressed.

A Vision for the Future

As technology continues to advance, robotic bees may become an integral part of sustainable agriculture. By complementing natural pollinators, they can help mitigate the impact of the pollination crisis and contribute to a more resilient food system. However, it is important to prioritize conservation efforts to protect and restore natural bee populations alongside technological solutions.

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Modified Atmosphere Packaging (MAP) for Fruit and Vegetable Preservation

Perm Mthethwa and Dr Sipho Sibanda
ARC-Natural Resources and Engineering

Packaging is one of the main driving forces in food marketing in developed countries. Packaging plays an important role in the preservation and extension of the shelf life of both fruits and vegetables from the time of harvest up to consumption by consumers. Packaging helps to reduce the incidence of pest infestation, disease progression and microbial infestation. With the correct packaging and labelling, food can be safely stored, protected and adequately marketed. One of the best ways to package food is called Modified Atmosphere Packaging

(MAP), which helps keep food fresh for a longer time compared to other packaging methods.

What is MAP and how MAP works?

Modified Atmosphere Packaging is a packaging technique used to extend the shelf life of fresh produce by changing the air composition around the fresh produce through injecting gases such as nitrogen and carbon dioxide as seen in Figure 1. During this process, nitrogen and carbon dioxide are injected into a package container, increasing

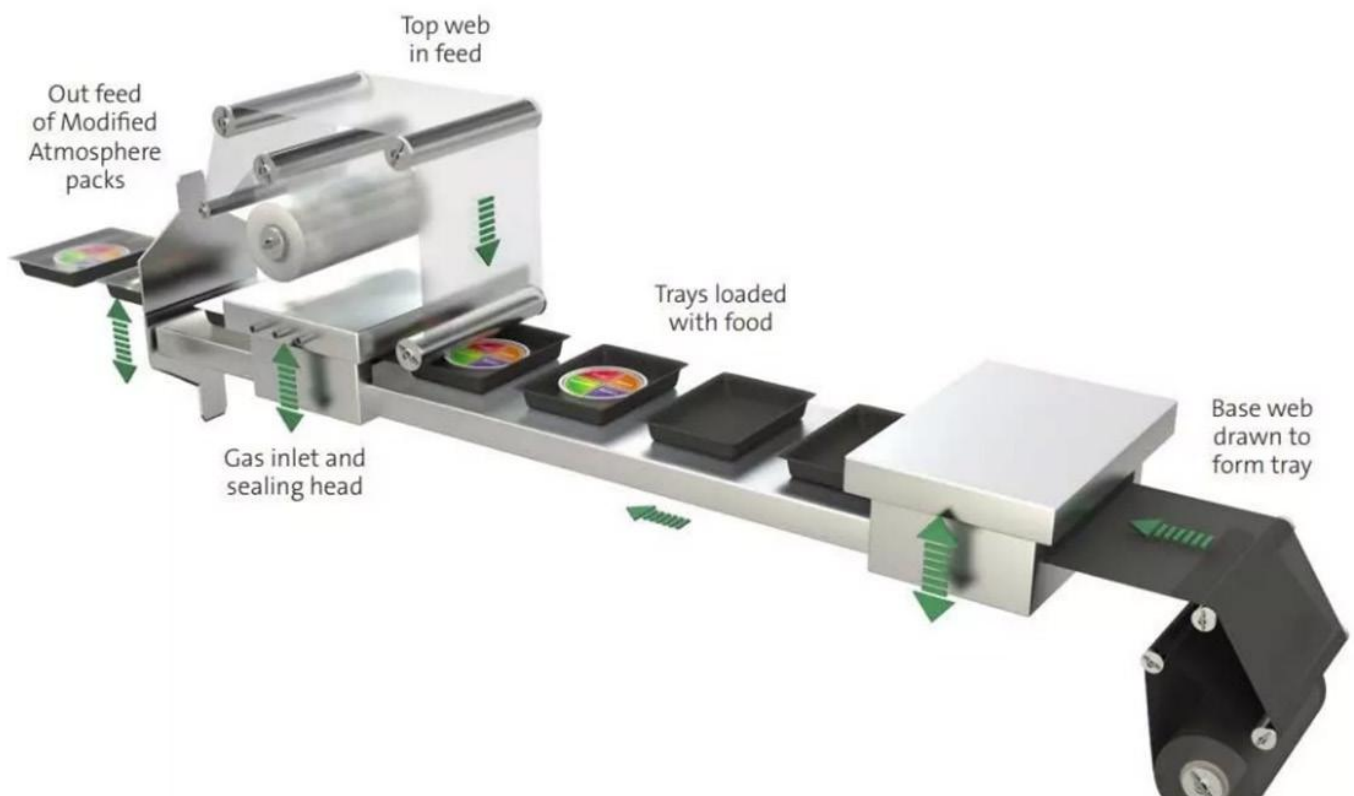


Figure 1: Modified atmosphere packaging process (Source: Wenzhou Mwellpack Machinery)



Figure 2: Vegetables preserved through modified atmosphere packaging (Source: internet)

their levels and reducing that of oxygen. Since oxygen plays a critical role in lipid oxidation reactions, reduced oxygen helps to slow down the product respiration rate, microbial activity, and ripening, while increased carbon dioxide levels act as an antimicrobial agent to inhibit fungal and bacterial growth. The goal is to keep food fresh by slowing down its natural decay process, so that it stays fresh and safe to eat for a longer time and maintains the product quality without preservatives. Maintaining low-temperature or dark storage conditions is crucial to inhibit microbial activities in MAP.

Benefits and drawbacks of MAP

Modified atmosphere packaging offers several benefits, including extended shelf life, reduced retail waste, minimal or no need for chemical preservation, and overall good food appearance. Modified atmosphere packaging also has some drawbacks, such as high initial costs for the equipment, environmental concerns related to plastic use, the potential growth of food-borne pathogens due to temperature non-compliance by retailers and consumers, and the loss of MAP benefits once the packaging is opened or leaks.

Ideal gas composition

A certain gas mixture must be met and strictly followed for food preservation. There are three main classifications of gas mixtures used in MAP, including inert blanketing (N_2), semi-reactive blanketing (CO_2/N_2 or $O_2/CO_2/N_2$) and fully-reactive blanketing (CO_2 or CO_2/O_2). For MAP, the ideal gas composition is 5-10% CO_2 and 1-5% O_2 , differing significantly from atmospheric air, which is approximately 78.1% N_2 , 20.9% O_2 , and 0.03% CO_2 . The gas mixture and injection levels used in MAP vary depending on the specific produce being

preserved. It's crucial to maintain optimal oxygen levels, as excessive reduction can lead to anaerobic respiration, causing unwanted flavours and odours. For example, low oxygen levels can cause potatoes to develop black heart symptoms. The complication with the use of MAP is establishing a stable atmosphere within the packaging. Inert gases are preferred for use in MAP due to their non-reactive properties to food.

Besides the commonly used gases, like nitrogen and carbon dioxide, others like argon, carbon monoxide, and sulphur dioxide are also used in MAP, although their benefits are limited and some pose toxicity risks. Additionally, argon is expensive due to its scarcity. Manufacturers must label MAP-packaged products and list ingredients. While MAP helps preserve food, it can also cause chilling injury to some vegetables, but adjusting the gas composition can be used to mitigate. Nitrogen is a popular choice for MAP due to its inert, odourless, and tasteless properties, which make it an ideal oxygen replacement to prevent spoilage. Carbon dioxide, another commonly used gas, also inhibits oxidation and growth of aerobic organisms, but excessive use can cause food to become sour. Unlike nitrogen, carbon dioxide can easily diffuse through plastic film, be absorbed by food products, and cause packaging collapse and deterioration.

Packaging materials used for MAP

Packaging material is one of the most important considerations in MAP. The packaging material must have low gas permeability to prevent leakage. Polymeric films are used to wrap food products in MAP to confine the modified gases. The key characteristics to consider when selecting

packaging material for MAP foods include resistance to puncture, sealing reliability, antifogging properties, carbon dioxide and oxygen permeability, and water transmission rate. The common polymeric/plastic films used are polyvinyl chloride (PVC), polyethylene terephthalate (PET), polypropylene (PP), polyethylene (PE), biaxially oriented polystyrene (BOPS), polystyrene (PS) shrink film amongst others.

Initial and running costs of MAP

Modified atmosphere packaging comes with high initial costs due to the expensive equipment and materials required. Additionally, operators need training, and the packaging film is costly due to its high-quality properties. Maintenance and gas costs also add to the overall expense. However, using MAP can help expand one's market reach, potentially leading to increased sales and profitability.

Vegetables considered for MAP and shelf-life extension

Modified atmosphere packaging has been successfully applied to various vegetables, including broccoli, cauliflower, carrots, garlic, and mushrooms, with other research also exploring its use for onions, sweet corn, and snow pea pods, using high water vapor permeable films as seen on Figure 2. The maximum shelf-life extension occurs at the lowest oxygen concentration before anaerobic respiration begins, but this also poses the greatest risk of spoilage. Most products achieve a longer shelf life with MAP than with vacuum packaging. On average MAP can extend the shelf life of vegetables from days to weeks. For leafy vegetables, not much significant shelf-life extension can be achieved through MAP. The cabbage lifespan can be extended by 21 days at $4 \pm 0.5^{\circ}\text{C}$ storage temperature and 90-95% relative humidity (RH), spinach shelf life extended by 7 days at 7°C and 97% RH, and lettuce life expectancy extended by 8 days at 5°C . The tomatoes' life expectancy can be extended by 21-35 days at $2-10^{\circ}\text{C}$, cucumber by 15 days at 4°C , cauliflower by 12-30 days at $1-5^{\circ}\text{C}$ and 90-96% RH, broccoli by 21-25 days at $1-10^{\circ}\text{C}$ and 90-95% RH, and 27 days for mushrooms at $4 \pm 1^{\circ}\text{C}$. As a guideline for atmosphere storage, fruit and vegetables with high moisture content may be stored at 90-99% RH, $0-5^{\circ}\text{C}$, whereas fruit and vegetables with lower moisture content may be stored at lower RH of 60-70% and a temperature of $4-9^{\circ}\text{C}$.

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The First South African Preserve Championships

Entries have opened for the first South African Preservation Championships, giving local producers the opportunity to showcase their best preserved products.

The championships are open to manufacturers and small businesses across the country, focusing on preserved fruit and vegetable products in nearly 200 classes,

including jams, marmalades, chutneys, pickles, pestos and more.

An expert panel of judges led by culinary education specialist Susina Jooste as head judge will judge the entries through a blind review process, followed by an independent audit.



Entries are now open for the first South African Preserve Championships.



Agri-Expo's latest initiative, the South African Preserve Championships, was launched at Soetmelksvlei. From left: Chris Fourie, President of Agri-Expo, Stephanie le Roux, Board member of Agri-Expo, Dr Mogale Sebopetsa, Head of the Western Cape Department of Agriculture, Susina Jooste, Chief Judge of the SA Preserve Championships, Dr Ivan Meyer, Western Cape Minister of Agriculture, Economic Development and Tourism, and Adele Johnson, General Manager of Soetmelksvlei. Photo: Natalie Gabriels Photography.

"This is an excellent opportunity for South African manufacturers to receive national recognition, network with industry players and celebrate the art of preservation," says Breyton Milford, General Manager of Agri-Expo, organiser of the competition.

"With our many years of experience in hosting the South African Dairy Championships, we are excited to extend our commitment to excellence in agricultural processing to this creative and dynamic sector," says Milford. "This new competition will honor exceptional products and encourage continuous improvement and innovation in the preservation industry."

HOW TO ENTER

Any product entered must be available in its respective market by the time of entry and

must be obtainable to the public, for example in shops, roadside stalls or markets.

Entries open on May 5 and close on June 25, with late entries accepted through July 1. Products must be delivered on 21 or 22 July, with judging taking place on 23 July at Eensgezind outside Durbanville. The awards ceremony will take place on August 6.

The entry fee is R150 (excluding VAT) per entry, and the late entry fee after 25 June is R250 (excluding VAT) per entry. To enter, participants must complete an online form at <http://www.sapreservechamps.co.za>.

For more information, send an email to charlotte@agriexpo.co.za. Follow @AgriExpo1 on Facebook, X, Instagram, and LinkedIn and chat with #AgriExpo #SAPreserveChamps together on social media.

Mushroom Bread

Ina Paarman

Something new and more delicious than garlic bread! Try it, you will love it. Makes a perfect gift to take to a braai.

Serves: 4

You Will Need:

100 g butter, softened

1 x 125 g Ina Paarman's Mushroom Pesto

1 French loaf



Method:

Mash the softened butter and Mushroom Pesto together.

Slice the bread (not right through) into 1½ cm thick slices.

Spread mushroom butter between the slices.

Spread any remaining mixture over the top of the bread.

Wrap bread into baking paper or foil, twist the ends, cracker style.

Bake at 180 °C for 20 - 25 minutes.

Serve hot with our Creamy Mushroom Soup.



It Starts At Home



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Pork Chops with Lentils

Ina Paarman

Pork is an economical cut to use for a family meal, the lentils extend the protein component of the dish. Chickpeas are an excellent substitute for lentils.

Serves: 4

You Will Need:

4 pork loin chops
Ina Paarman's Garlic Pepper Seasoning
olive oil
2 large onions, chopped
1 t (5 ml) Ina Paarman's Green Onion Seasoning
3 - 4 cloves garlic, chopped
400 g tinned lentils, drained
1 x 125 g Ina Paarman's Mushroom Pesto
1 x 25 g Ina Paarman's Liquid Chicken Stock (undiluted)



Method:

Slash into the fat layer of the chops to prevent them from curling when cooking.

Season chops with Garlic Pepper Seasoning, coat with olive oil and leave on one side to come to room temperature.

Line the chops up, fat sides down.

Skewer with two sosatie sticks, one through the meaty eye and the other through the tail end of the chops.

Heat 1 T (15 ml) oil in a heavy-based frying pan and cook chops standing up with the fat side down until fat is crisp.

Turn and similarly cook the insides until brown.

Remove the chops from the sticks and lay them flat in the pan.

Brown one side only, turn and remove from heat.

Leave to stand in the hot pan for 5 minutes.

This gentle one side only method guards against overcooking and resultant dryness.

Remove chops. Pour surplus fat out of pan. Brown onions pre-seasoned with Green Onion Seasoning in the same pan, add garlic.

Add drained lentils, Mushroom Pesto and undiluted Liquid Chicken Stock.

Stir-fry for 3 - 5 minutes.

Add chops brown side up and any liquid that may have leaked out, to the lentils.

Cover with a lid.

Switch off the heat after 3 minutes.

Serve with fresh fine green beans or lightly sauteed green cabbage.



It Starts At Home



Flavour bombs!



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