SA·Pecan

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South African Pecan Nut Producers Association NPC
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South African Pecan Nut Producers Association NPC Magazine | 2024 | Volume 99

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is ons visie vir die toekoms, met u as ons vennoot. **Ons sien uit na 2025 en eindelose moontlikhede.**

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Editorial

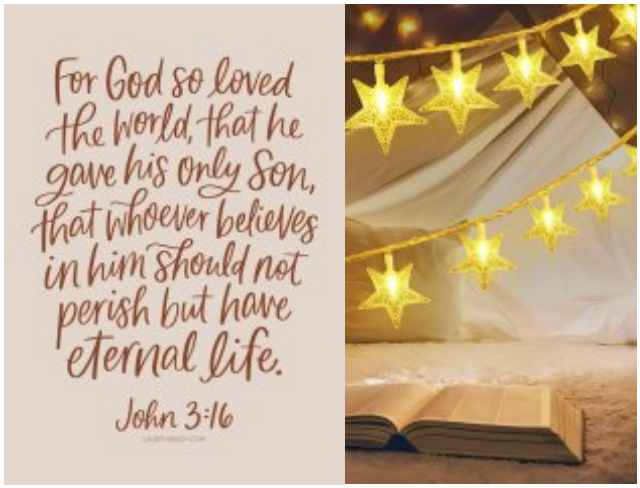
Dear Readers, as we approach the close of 2024, it's a fitting time to reflect on a year filled with both triumphs and challenges. We have countless reasons to be thankful, as we count the blessings we've received. However, this year has also brought its share of sorrow, worries, and disappointments. May this December grant us all the chance to pause, recharge, and renew our commitment to a positive and purposeful 2025.

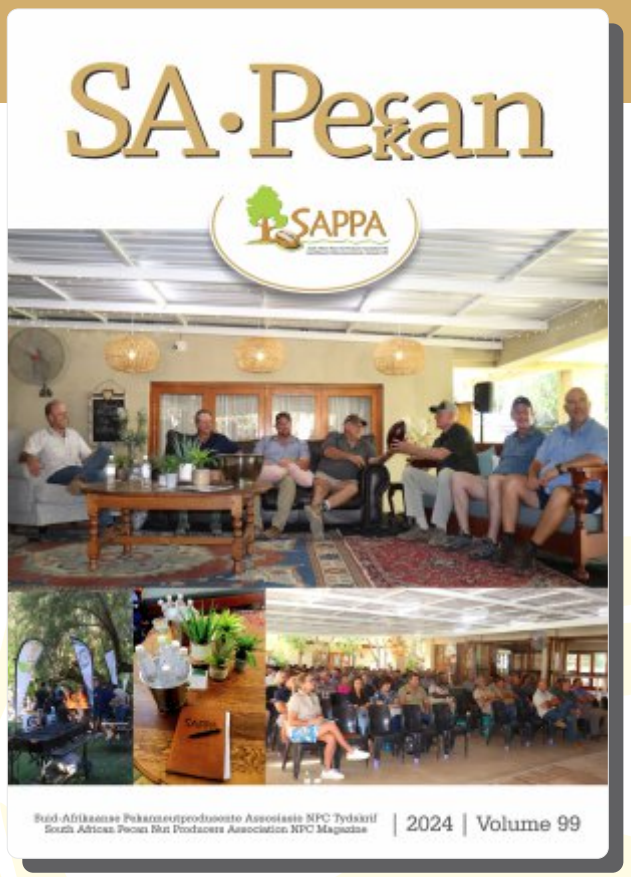
Reflections on the Annual General Meeting in Douglas. On November 1, 2024, the Annual General Meeting took place in Douglas, and we would like to express our heartfelt gratitude to everyone who contributed to its success. The knowledge shared and the connections built during the event will leave a lasting impact on the pecan industry. Thank you to all who participated and made this gathering meaningful. For a detailed recap of the event, please see Page 6.

SA Pecan Magazine: Transitioning to Two Annual Issues. As we publish the final edition of *SA Pecan* for 2024, we want to extend our deepest thanks to our writers, advertisers, and members for their invaluable support throughout the year.

After careful consideration, the SAPPA Board and the *SA Pecan* editorial team have decided to reduce the publication schedule from three issues to two annually, starting in 2025. We are excited to continue collaborating with advertisers, researchers, and authors who bring a uniquely South African pecan perspective to our pages.

A Season of Gratitude and Reflection. As we celebrate the close of the year and the birth of Christ, we are reminded of His love for us—even in times when His presence feels distant. The words of John 3:16 resonate deeply during this season:





In this ISSUE

Director's SAPPA AGM REPORT

1 November 2024

***By Ivan Otto,** SAPPA Director*

Welcome to SAPPA's AGM & Information Day. I welcome all role players and guests. I trust you will find the day interesting and insightful.

We live in an increasingly fast paced and changing environment. If we consider the development of technology, outbreak of wars, insecurities in markets, increasing input costs, vulnerabilities in the exchange rate, droughts in areas and hurricanes in other, with this being said we are still blessed with a continued and increasing demand for our Pecans.
Firstly, our condolences to the American Pecan producers affected by the recent hurricanes, losing a high percentage of trees just before harvesting. As Pecan producers one can hardly imagine the devastating effect of losing mature trees.

Getting back to South-Africa, there is much to be excited about. This year's record harvest of just over 37 000 tons nut in-shell, were mostly exported without major glitches. Although the first predictions were spot on, expectations were lowered due to a variety of reasons including hail damage and lower than expected yield on Wichita's in certain areas. This only to find us back at 37 000 tons in the end.

Exports to China started out slowly but progressed well and concluded successfully. We foresee that as production increases the Chinese market will become more finicky. Single variety supply is becoming a necessity with an emphasis on quality.

The South-African Pecan industry is distinguishing itself by producing and supplying exemplar quality nuts. Sustaining and then improving on this can only be achieved through collaboration of role players and a tight knit relationship between producers and processors. I would like to take the opportunity to thank processors for their part in marketing our pecan nuts and doing a stellar job.

This year saw significant strides in raising awareness for Pecans from South Africa. Efforts included exhibitions in Hefei China, participation at INC, the launch of a new website dedicated to Pecans from South Africa, and engagement on TikTok and Instagram.

In our research efforts, we have established strong frameworks and received excellent support from local universities to conduct thorough investigations. Research requires time, and we must be patient to ensure it is done correctly. Over the past few years, we have made significant strides in various areas. Our goal is to undertake long-term, repeatable research that we can confidently share with the industry.

There is scope for extending the South-African pecan industry. Latest figures on tree sales indicate the stabilization on new plantings with 290 000 trees sold locally this year. South-Africa's unique competitive advantage with Timing of harvest, Quality and Lower production costs is of extreme importance to our industry. The biggest barrier to entry remains the waiting period from planting till harvest, managing cash flow during this time.

If we look at Pecan nut prices over the past years, we see a slight and steady drop after peaking in 2017 in terms of dollar price. I do however believe prices are sustainable where they currently are. Lower prices will reduce the ability for some producers to be profitable especially in countries where production costs are higher. The recent drop in Macadamia prices posed a threat to Pecans but looking back Pecan prices and demand kept steady. There was however a slight shift in the market, buyers are looking for smaller nuts and are buying on kernel percentage. China is shifting to a kernel market, this being said they still prefer to buy Nut in-Shell and process the nuts in China.

Increased consumption of nuts is being driven worldwide by health-conscious consumers. According to INC 2,21% of the total nuts produced worldwide is Pecan nuts.

I share Larry Don Womack chair of the American pecan board's sentiment that :

Marlow Landbouskool Matrieks

SAPPA BORG SEUNS

SAPPA verander seuns se lewens deur hulle ten volle te borg vir hul hoërskool loopbaan. Hulle is baie dankbaar vir die geleentheid.

Wat het die SAPPA borgskap vir jou beteken?

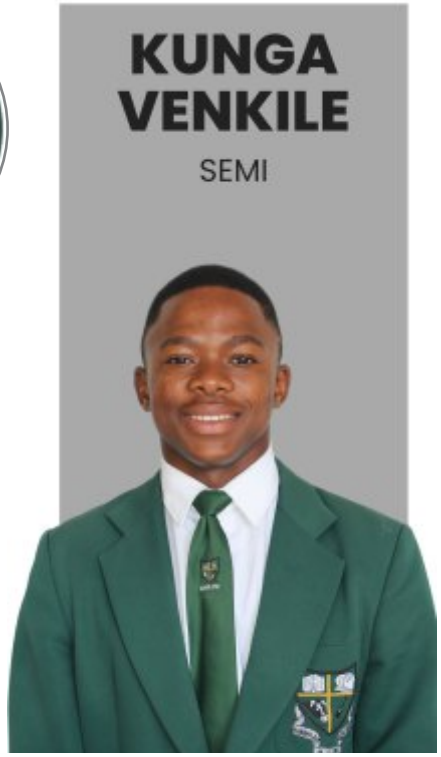
Sonder die borgskap sou ek nie Marlow toe kon kom nie, en dit was my droom.

Wat was vir jou die hoogtepunt van jou skoolloopbaan op Marlow?

Om Marlow by die Wildeklawer toernooi te gaan verteenwoordig.

Wat is jou toekomsplanne?

Ek het aansoek gedoen by 'n paar Universiteite – en gaan moontlik Kovsies toe. Ek wil graag 'n Sportwetenskap graad doen en dan 'n kondisioneerder by 'n skool word.



Wat het die SAPPA borgskap vir jou beteken?

Ek wou baie graag Marlow toe kom en sonder die borgskap sou dit nie moontlik gewees het.

Wat was vir jou die hoogtepunt van jou skoolloopbaan op Marlow?

Om die voorreg te he om die eerste rugbyspan vir twee jaar in 'n ry te kan verteenwoordig.

Wat is jou toekomsplanne?

Ek het aansoek gedoen by 'n paar Universiteite – en gaan moontlik Sharks akademie toe. Ek wil graag 'n Sportwetenskap graad behaal en dan 'n kondisioneerder by 'n skool word.

AGM 2024

The Annual General Meeting (AGM) and Information Day at Douglas was held on 1 November to provide an overview on financials of the past year, progress of the organization's research activities, as well as to engage with the industry and stakeholders.

The day was a raging success with a record attendance. We would like to thank everyone that attended the day and helped to make it successful. We look forward to hosting this event next year again.

The AGM session, which was the minor component of the day, featured the directors report and an overview of the previous audited financial year figures.

• **Financial Overview:** André presented a detailed report on the organization's financial performance for the past year. Revenues and expenditures were carefully reviewed, with a focus on financial sustainability.

• **Election of New Board Members:** The AGM included elections for several board positions. A total of 6 board members were elected, with Werner van der Westhuizen joining the district directors. Lourens Maass and Herlu Smith re-elected as district directors. Alvin Archer appointed as Research director, David van der Merwe appointed as Market development director and Dumisani Ndebele appointed as Transformation director. Broodryk Kotzé was appointed as financial auditors for 2025.

• **Q&A Session:** The AGM concluded with a Q&A session, where attendees were able to ask questions regarding the organization.

Following the AGM, the Information Day followed to provide industry with more detailed insights into specific areas of interest and an overview on current research.

• **Presentations:** A series of presentations were held, with topics such as: Overview of China's market, Macadamias current position. Various research studies including Mapping of SA hectares, Pollination, Polyphagous shot hole borer, Post harvest practices, and a panel discussion on practical production practices. Each session was tailored to inform attendees about specific initiatives that could have a direct impact on the industry.

• **Networking Opportunities:** The day also provided many opportunities for networking. Representatives from various areas engaged in lively discussions throughout the day.

• **Exhibits & Demonstrations:** Several interactive exhibits showcased the industries equipment and services. Attendees were able to view a demonstration where a drone simulated a biological drop. We like to thank all our sponsors and exhibiters for contributing to the day, this day won't be possible without your support.

Conclusion. The AGM and Information Day at Douglas was an informative and productive event that brought together various stakeholders and laid the groundwork for future growth. Attendees left the event with a deeper understanding of SAPPA's activities and were encouraged to remain involved and engaged in the coming year.

This event has certainly set the stage for continued success, we trust we will set a new attendance record in 2025.


Wishing you and
your family
peace, health,
happiness, and
prosperity in the
coming year.
Merry Christmas.
From the SAPPA team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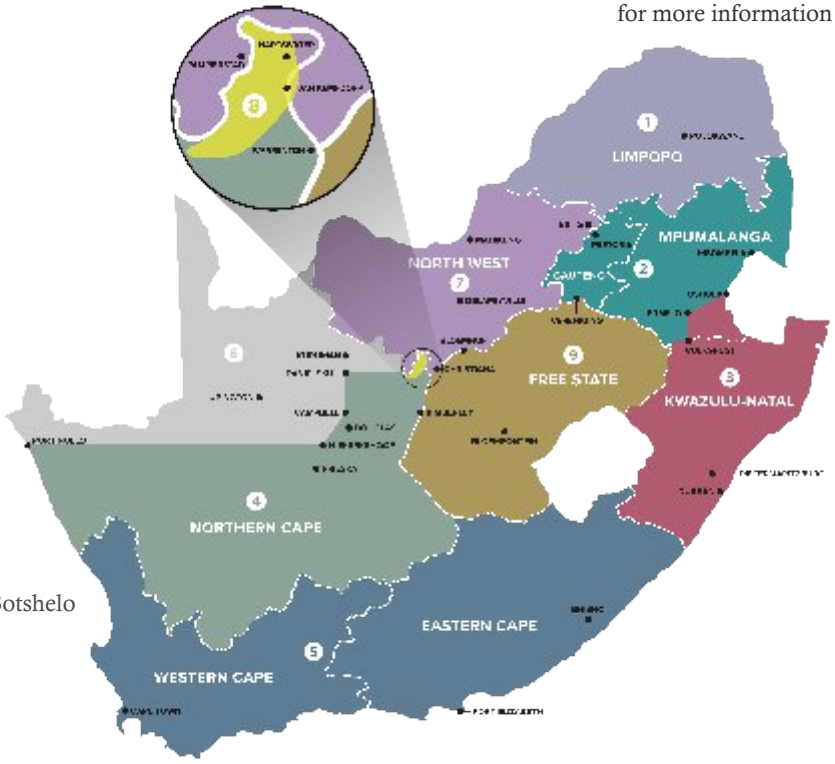

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SPEDO

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Polyphagous Shot-hole Borer

Biological Control Research

Stompneuskewer

Biologiese Beheer Navorsing

By Steffan Hansen, *Postdoctoral Fellow, Department of Conservation Ecology and Entomology, Stellenbosch University/ Na-doctorale navorser, Departement van Bewaringsekologie en Entomologie, Stellenbosch Universiteit*

Afrikaans. Die stompkopkewer (*Euwallaceae fornicatus*) is baskewer oorsprongklik van Suidoos Asie afkomstig. Wyfies van dié klein pes boor gaatjies van ongeveer 1 mm in deursnee in n verskeidenheid bome. Hierdie insek 'boer' met ‘n plantpatogeniese swam, *Fusarium euwallaceae,* waarop dit en sy nageslag voed, en waarvan hulle heeltemal afhanklik is. Die kombinasie van die kewer se boorskade, en die groei van die *Fusarium* in die vaskulere sisteem van die boom, verhinder effektiewe watertoevoer, en kan vinnige dood van vatbare bome veroorsaak. Bonop is daar ‘n groeiende lys van meer as ‘n 100 spesies bome wat vatbaar is, insluitende pekans, verskeie sagtevrugsoorte, makadamias en avokados.

‘n Besef van die enorme ekonomiese skade wat hierdie insek en sy swam vir hierdie industrieë kan beteken het tot die skep van ‘n taamlike 'buite die boks' navorsingsprojek gelei. Chemiese beheer is nie baie effektief nie, en ook nie prakties op ‘n kommersiele skaal nie. Selfs biologiese beheer (wat gebruik maak van swamme soos *Beauveria bassiana*, wat insekte aanval, en *Trichoderma*, wat plantpatogeniese swamme aanval) lei aan die tekortkoming van hoe om dit toe te pas, aangesien die kewer en *Fusarium* diep in tonnels in die boom sit. So, hoe nou gemaak?

Dieselfde vraag het navorsers by die Universiteit van Florida, waar baskewers avokado bome aanval, geteister. Hulle het met die **idee voorendag gekom om na myte van wat saam met die kewers in hulle tonnels te bly te kyk as 'voertuie' vir biologiese beheer agente**. Myte is klein agpotiges (naby verwant aan skerpioene en spinnekoppe) wat ‘n verskeidenheid funksies in ekosisteme vervul. Pes myte trek gewoonlik die aandag van die van ons wat in landbou werk trek, maar is daar ook baie neutrale of selfs nuttige spesies. Alle baskewer spesies is met ‘n paar myt spesies geassoseer, wat baie keer die kewers gebruik om op rond te trek na nuwe omgewings, en in die kewers se tonnels op swamme, aalwurms, ander myte of selfs die kewer larwes of eiers voed. Die swamvoedende spesies is oor die algemeen maklik om in die labrotorium aan te teel, en baie myt spesies is goed daarmee om die spore van swamme rond te dra en in nuwe omgewings te vestig.

Ons het ‘n soortgelyke navorsingsprojek aan die Universiteit van Stellenbosch begin, waar ons spesifiek na die myte op die stompkopkewer kyk. Die projek word deur myself as n nadoktorale navorser gedryf, onder die leiding van Prof. Francois Roets (n prominente kenner op baskewers), met meewerking van Dr. Davina Saccaggi (CRI) en Prof. Edward Ueckermann (NWU) wat die nodige kennis op myte verskaf. Die navorsing word befonds deur SAPPA, Hortgro Science, en SAMAC. Die eerste stap was om myte geassoseer met die stompkopkewer te identifiseer, en dan hulle in kultuur te kry. Hierdie stap was ‘n sukses: ons het n verskeidenheid myte verkry van kewers in infesteerde plantmateriaal, waarvan ons drie spesies in kultuur het. Die volgende stappe sal wees om te sien of hierdie kanidate biobeheer swamme soos *Beauveria* en *Trichoderma* kan eet (en daarop aangeteel word). Na dit sal ons toets of hulle suksesvol spore van hierdie voordelige swamme tot by kewers en kewerkolonies kan dra onder labrotorium omstandighede, om so getalle van die stomneuskewer te help beheer. Indien hierdie projek sukses toon in die labrotorium, behoort toekomstige navorsing te fokus op die veldeffektiwiteit van hierdie metode, en potentiele kommersialiseering van die myte/voordelige swam kombinasie.

Engels. The polyphagous shot-hole borer (*Euwallaceae fornicatus*), or PSHB, is a bark beetle originally from South-East Asia. Females of this small pest bore holes and galleries of approximately 1 mm in diameter in a variety of trees. This insect 'farms' a plant-pathogenic fungus, *Fusarium euwallaceae*, on which it and its progeny depends on as a food source. The combination of the boring by the beetle, and the growth of the *Fusarium* in the

vascular tissue, hinders the water supply of the tree, and can cause rapid dieback and death in susceptible trees. There is a growing list of more than a 100 species of tree that are susceptible to varying degrees, including pecan and macadamia nuts, avocadoes and various types of deciduous fruit.

A realization of the immense economic damage this insect and fungus can cause these industries led to the creation of an 'out of the box' research project. Chemical control is not very effective, and not feasible on a commercial scale. Even biological control (using insect killing fungi like *Beauveria bassiana*, or plant pathogen killing fungi, like *Trichoderma*) suffers from the same limitations in how to apply the product, since the beetle and *Fusarium* are located deep in galleries inside the wood. So, where to go from here?

Researchers at the University of Florida (a state where bark beetles are attacking avocado trees) had the same difficulty. They came up with the **idea of looking at the mites sharing the beetles' galleries as 'vehicles' for transmitting biological control agents**. Mites are small arachnids (closely related to spiders and scorpions) which play a variety of roles in ecosystems. Although agricultural pest mites generally draw our attention, there are many species that are neutral or even beneficial to humanity. All bark beetles are associated with a few mite species, which often use the beetles as transport, and feed on fungi, nematodes, other mites or even the beetle egg and larvae in the galleries created by the beetles. The fungi feeding species are usually easy to culture in the laboratory, and many mites are good at transporting the spores of fungi and inoculating these in new environments.

We started a similar project at Stellenbosch University, where we are specifically looking at mites associated with PSHB. I am the day to day researcher in my capacity as postdoctoral fellow, supervised by Prof. Francois Roets (a prominent expert of bark beetles), with Dr. Davina Saccaggi (CRI) and Prof. Edward Ueckermann (NWU) providing the necessary info on the mites. The research is funded by SAPPA, Hortgro Science and SAMAC. The first objective of the project was identifying mites associated with PSHB, and to try establishing some of these in culture. This objective was a success: we found a variety of mites from infested material and the beetles themselves, and have three species currently in culture. The next objectives are to investigate whether these mites can feed and reproduce on biocontrol fungi like *Beauveria* and *Trichoderma*. From there we will test of they can successfully carry the spores of these beneficial fungi to beetles and beetle colonies under laboratory conditions. If this project shows the success we are hoping for in the lab, future projects should focus on the field efficacy of this method, and potential commer-cialization of the mite/beneficial fungi combination.

Foto 1. *Stompkopkewer wyfie met twee spesies myte (groot Proctolaelaps sp. regs bo, klein Astigmata myte op vlerkdoppe agter) van Vietnam. / Polyphagous shot-hole borer with two species mites (big Proctolaelaps sp. right top, small Astigmatan mites on bottom end of wingcovers) from Vietnam. (Foto by/deur Amy Collop, FABI Quarantine Facility, Pretoria)*

Foto 2. *Stompkopkewer boorskade op n makadamia sytak./ Polypahous shot-hole borer damage on a macadamia side branch.*

Foto 3. *Die op en afwaards verspreiding van Fusarium rondom die kewer tonnel in 'n ornamentele boom./ The up and downwards spread of Fusarium around the beetle gallery in an ornamental tree.*

Foto 4. *Fusarium euwallaceae, die plantpatogeniese swam waarmee die kewer 'boer' , en wat dit benodig as n voedselbron. / Fusarium euwallaceae, the plant pathogenic fungus that the beetle 'farms' with, and upon which it depens as a foodsource.*

Foto 5. *Opsoek na myte in 'n kewer tonnel. /Looking for mites in a beetle gallery*

Foto 6. *'n Trichoderma kolonie (groen spore, links) wat 'n Fusarium euwall-aceae kolonie (regs) heeltemal oorgroei en doodgemaak het/ A Trichoderma colony (green spores, left) which has completely overgrown and killed a Fusarium euwallaceae colony (right).*

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Nut Link wil graag elkeen van ons boere bedank vir u waardevolle ondersteuning gedurende die 2024-seisoen.

Ons het die jaar afgeskop met Victor Matfield en ons boere, waar ons waardevolle inligting ontvang en heerlik saam gekuier het.
Ons boere was bevoorreg om na Dr. Angelique Kritzinger (PhD) se aanbieding oor die waterbehoeftes, bestuiwing en alternatiewe drag van pekanneutbome te luister.
Ons span het na China gereis vir die "National Tree Nuts" konferensie en belangrike inligting vir Suid-Afrikaanse pekanneut boere terug gebring.

Ons is baie opgewonde vir die 2025-seisoen, met nuwe uitdagings en geleenthede wat voorlê. Rob Lüders en die Nut Link span wens u 'n geseënde Kersfees en voorspoedige nuwe jaar toe!

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Evaluation of PACLOBUTRAZOL in Pecan Nut Trees

2024 Report on Growth, Yield and Residue Measurements

This report was compiled by Dr Elsje Joubert.

INTRODUCTION. Paclobutrazol, a registered plant growth regulator, is used on pecan nut trees in South Africa. While the growth-retarding effects of paclobutrazol are well-documented on pecan nuts (Wood 1988; Andersen 1988; Worley et al., 1996), its impact on pecan yield and other parameters such as the time shoot growth is impacted and nut quality remains unclear (Zhu & Stafne 2019).

Some studies reported a decline in yield following single paclobutrazol applications (Andersen 1988; Worley et al., 1996). Work was conducted to better understand the long-term effects of a single or repeated application of paclobutrazol on pecan nuts in South Africa. The repeated application is part of an ongoing trial.

Paclobutrazol is commercially available for use on pecan nuts as 'Cultar' (Act 36 of 1947 registration no. L3693) and 'Avocet' (Act 36 of 1947 registration no. L7368). In this research report, the 250 g/L formulation of paclobutrazol in 'Cultar' was applied at different dosages on younger and more mature pecan trees to assess the effects of these applications on shoot growth, stem radius, stem circumference, yield, sticktights, quality, and residues. The effects after repeated (year-on-year) applications were also investigated.

METHODS. Treatments were applied as a drench around the tree stems in October 2020, with the desired concentration diluted in 5L water per tree, repeated on ten data trees per treatment, tree age and farm. Organic material was removed from the application area prior to drenching. The effects of single applications were evaluated on three farms on the cultivar 'Wichita' while the effects of multiple (year-on-year) applications were evaluated on 'Western Schley' and 'Wichita' from one farm, from the 2023 season, in the Hartswater pecan nut production region, Northern Cape, South Africa.

Single applications. Single applications were done in October 2020 according to registration label recommendations on young trees (8-10 years old) and mature trees (15+ years). The dosages evaluated on young trees were: 0, 5, and 10 ml/tree while the dosages evaluated on mature trees were 0, 20 and 40 ml/tree.

Repeated applications. The effects of multiple applications repeated most seasons from 2015 up to 2022 were evaluated on 'Western Schley' and 'Wichita'. The repeated applications were 8-10 ml/tree. Applications were not done in the 2018-2019 season on 'Western Schley' and not done on any of the two evaluated cultivars during the 2019-2020 season.

Measurements. During February of 2021, 3 months after the application, shoot lengths were measured from 4 replicated shoots for reproductive and vegetative shoot from four replicated wind directions (North, East, South, and West) per tree at the top and bottom of each tree. Shoots were again measured separately during February 2022, 2023 and 2024. Stem diameters and circumferences were also measured at this time.

Yields were measured during July 2021, 2022, 2023 and 2024. The weight of dropped nuts per tree, and weight and number (count) of sticktights per tree were determined per tree. Yield quality parameters were evaluated at a processor from three grouped samples per treatment, age group and farm. Kernel quality parameters evaluated against paclobutrazol treatment outcomes included sound edible kernel and nut sizes: OS1, OS2, J, XL, L, M, and S. Paclobutrazol residue analysis included 54 replicated pecan nut samples and 6 replicated soil samples (two samples from the 40 ml/tree treatments per farm) during the 2021 harvesting season and 42 pecan nut samples and 10 soil samples in July 2022.

CONCLUSIONS. Growth measurements after a single paclobutrazol application confirmed the growth inhibiting effect of paclobutrazol in young and mature trees. Reproductive shoots were generally shorter after applications of paclobutrazol, and this effect lasted for 3 seasons after the applications were done on young trees, and 4 seasons on the highest dosage applied on mature trees. Vegetative shoots were also generally shorted after the application, however there were some initial observation exceptions on mature trees. Repeated applications of paclobutrazol on Western-Schley did not show significant shoot length differences during February 2024 while vegetative shoots were longer on Wichita.

Stem circumferences and diameters were not influenced by the single applications, while the repeated applications significantly increased the stem circumference and diameter of Western-Shley while the stem diameters were significantly smaller after repeated treatments on Wichita.

There were no significant yield effects on young or mature trees following a single application, however the total yield was higher during July 2021 on mature trees treated with 40 ml/tree paclobutrazol in October 2020.

This effect was however not observed in consecutive seasons. The affect of the single treatment on the cumulative yield over the 4 seasons can be seen in the graph below (Figure 1), which shows a significantly lower cumulative yield on young trees. Repeated applications had a negative total yield outcomes on Wichita thus far but the repeated applications are part of an ongoing study. Nut quality analysis did not show significant differences between treatments that were noteworthy.

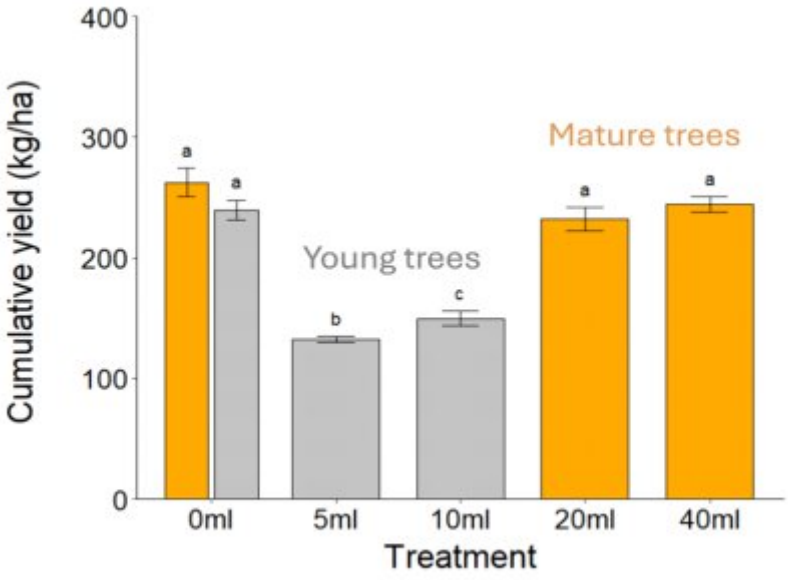

Figure 1. Average yield results for the 10 trees per treatment over the 4 seasons from young and mature trees showing a reduction in yield on young trees compared to the untreated control.

For the full report please visit the SAPPA website.

ACKNOWLEDGEMENTS.
Hardus du Toit, Kelebogile Botshelo and Ivan Schubach provided significant support throughout the trial. The following pecan nut growers assisted and hosted the trials: Stefan Smith and Albert Smit, Danie Grové, Wimpie du Toit and Dries Duvenhage. Grading reports were provided by Pekanhoek BK and residue analysis were conducted by Hortec and Hearshaw and Kinnes Analytical Laboratory.

REFERENCES

Ahlmann-Eltze, C. & Patil, I. (2021). ggsignif: R Package for Displaying Significance Brackets for 'ggplot2'. PsyArxiv. doi:10.31234/osf.io/ 7awm6.

Andersen, P.C. (1988), Vegetative and reproductive effects of Cultar applied to 'Cape Fear' and 'Desirable' pecan trees. Proc. Flo. State. Hort. Soc. 101: 254-256.

Hope, R.M. (2022). _Rmisc: Ryan Miscellaneous_. R package version 1.5.1, <https://CRAN.R-project.org/package=Rmisc>.

Kassambara, A. (2020). _ggpubr: 'ggplot2' Based Publication Ready Plots_. R package version 0.4.0, <https://CRAN.R-project.org/package=ggpubr>.

Kassambara, A. (2021). _rstatix: Pipe-Friendly Framework for Basic Statistical Tests_. R package version 0.7.0, <https://CRAN.R-project.org/package=rstatix>.

Patil, I. (2021). Visualizations with statistical details: The 'ggstatsplot' approach. Journal of Open-Source Software, 6(61), 3167, doi:10.21105/joss.03167.

R Core Team (2015). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Wickham, H. (2016). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York.

Wood, B.W. (1988). Paclobutrazol suppresses vegetative growth of large pecan trees. HortScience 23: 341-343.

Zhu, H. & Stafne, E.T. (2019). Influence of paclobutrazol on shoot growth and flowering in a high-density pecan orchard. HortTechnology 29: 210-212.

EVALUATE your EXPENSES

to help REDUCE your COSTS

by Charles Rohla *(Manager of the Center of Pecan and Specialty Agriculture at the Noble Research Institute, Ardmore, Oklahoma. ctrohla@noble.org).* *Pecan South, Vol 57, No.2 April 2024*

Having a variety of species of forages growing in the orchard help feed the microbes in the soil resulting in healthier soils. (Photo by Lauren Jones, Noble Research Institute)

The last several years have been tough for pecan growers with lower prices and higher input costs, and I know most growers are looking for ways to reduce their input costs. To determine where to make the best cuts in your expenses, it helps to understand where you are spending money entirely. For example, do you know what it costs to mow (fuel, repairs, and labor) or operate your sprayer each time you run it through the orchard, not just the cost of the chemicals or fertilizer you apply? If you irrigate your orchard, how much does it cost you each time you use your irrigation? Knowing this information can be very informative when saving money or adjusting your management plan.

I have had the opportunity to visit with several growers who have been managing their orchards with a focus on soil health and regenerative principles. Most of these growers talk about the savings they have seen in fewer trips through the orchard, lower cost of irrigation, and reduced fertilizer and chemicals. So, I wanted to challenge you to start thinking about how you spend money and whether your current management practices are returning the best value for your money.

We have preached for years that the best money a manager can spend is taking your leaf samples each year to determine your trees' nutritional needs. But do not just go off the recommendations from the leaf samples; there are other observations that you should consider before pulling the trigger to spend that money on a fertilizer. I have written about observing last year's growth to determine if your past fertilizer program was significant. Larry Stein also wrote about this same topic the previous month. The other thing we have discussed in past articles is using the Haney soil test to evaluate what nutrients are available in the soil for the trees (Refer to Dr. Graham's article from March 2024). As discussed in previous articles, we have not determined if the Haney test and leaf samples are correlated. Still, using the Haney test in other crops can reduce fertilizer needs.

How many of you believe in the golf course management strategy for your orchard floor management? A well-managed orchard must have a manicured appearance. My question to you is, what are the real benefits of this practice? Each time you mow, especially if you are mowing short, you are reducing the root system of those plants and causing them to use more nutrients and water from the soil, taking these away from our trees. You are also impacting your microbial populations that give you free nutrients. The shorter the grass is, the higher the soil temperature is, the higher the water evaporation is, and the slower the water infiltration is.

When you have taller ground cover and a rainfall or irrigation event occurs, the residue helps slow the water runoff and increases the soil infiltration. The soil water holding capacity will increase with more residue and higher organic matter. This increase will help both irrigated and non-irrigated orchards. We know that water management is critical to produce high-quality crops. Management of your groundcovers and improving your soil health can have a dramatic impact on your water management.

Several growers managing their soils following the soil health principles have shared that they do not have to irrigate as much as they once did and sufficiently less than their neighbors. Water moisture sensors allow them to see when an irrigation event is needed, and they only water when required instead of watering on a schedule. I have had growers managing soil health tell me that their irrigation amounts are about 20 to 50% less than others in their area without impacting quality or quantity. Irrigation is costly, and saving 20% on your water cost would significantly impact your expenses. Since you would be mowing less, you can add those savings on top of that. Now, think about the total you would save on input costs.

Another note that producers allowing their ground cover to grow in their orchards have shared with me is that they have less need for pesticides (especially aphid control). Allowing the ground covers to flower attracts beneficial insects that help control some of the pests in your orchards. The USDA has been researching other beneficial microorganisms that show promise in helping control pecan weevils, and having a healthy soil will aid in maintaining a population of these beneficial microorganisms.

Furthermore, increasing monitoring across your orchard and using the gathered data to make informed decisions can significantly reduce your input costs. So, as the new pecan season starts, before you start spending money on the typical management things you always do, I encourage you to think, "Why am I doing this? What is the actual benefit? And is there an alternative management practice that could save me money?"

To be successful, businesspeople must stop worrying about what others think and do what works best for them.

Suppose you are trying to be as profitable as possible. In that case, your management may be dramatically different than that of other growers, and your orchards may look different (not a nicely manicured mowed orchard). We must start looking at things differently and doing the right thing for the business, not just doing things because we have always done them this way.

Results of deer browsing on low limbs. (Photo by Larry Stein)

It's Crunch Time

***By Larry A. Stein**. Professor and Extension Specialist for Department of Horticultural Sciences at Texas A&M University. larry.stein@ag.tamu.edu.* *Pecan South, Vol 57, No. 7, September 2024*

It's crunch time. The "crunch" is on for both varmints and getting tasks done to ensure a bountiful harvest this fall. Obviously, "ensure" means we have to make sure that specific things happen, and it is a tall order to fulfill, as we all know that we can do everything right, but the outcome may not quite be what we want it to be. However, by watering, checking fertility, managing crop load, and controlling varmints, you have a greater chance of success than if not. So we do what we can, but please remember that sometimes things happen just because—not because of something you did or did not do!

Many of you have received very beneficial rain—some too much and others with severe hurricane damage. Here is hoping that the damage is not too bad. In my experience, the damage can appear far worse than it really is. Others are still waiting for some help from Mother Nature. We are in the midst of shell hardening, and once the shell hardens, the nut size has been determined. Trees lacking water will obviously have smaller nut size, but this may not be such a bad thing as smaller nuts are easier to fill than super large ones.

Regardless, water will be the key to kernel fill. The kernel fills from the outside to the inside and will continue to fill as long as the shell is white. If the shuck turns black or is inhabited by shuckworm or casebearer, the nut fill on those pecans will be less than ideal and typically darkened. Water is needed not only to fill the kernel but also to cause the shuck to open. Water stress can lead to poor shuck opening and quality issues. Many of you recall how shucksplit was hampered by the lack of rain in 2023. In addition, as the nuts begin to fill, the trees will need nitrogen.

The trees will get this nitrogen from the soil if available, or if not, they will rob the leaves. If the leaves are robbed, they will turn yellow and not photosynthesize as well as we would like and again hinder nut fill. We encourage folks who have big crops on their trees to give their trees a bit of nitrogen—20 to 30 units per acre—in both July and August. Remember, this nitrogen can only help the trees if watered into the soil or injected with the irrigation water. Again, this fertilizer application is only for heavily loaded trees. Trees without a crop should not be fertilized.

The greatest challenge most growers face when growing pecans is knowing what kind of crop their trees have and whether the trees can carry that load and produce excellent kernel quality. Kernel quality is a must to ensure sales and repeat customers. The simple truth is that over-cropped trees will not produce quality kernels. So, it is best to err on the side of having less as opposed to more pecans. Experience and your management program will dictate how many pecans you leave on specific varieties. The nuts have to have sufficient volume for you to dislodge them from the tree. If the nuts are too small when you shake, you will potentially not remove enough pecans. The key is to not look at the ground when you shake. You will have done no good if you shake the trees but do not remove enough pecans.

The late-season insect pests that can wreak havoc on your crop include shuckworm, pecan nut casebearer, stink bugs, weevils, and aphids. You must be on your A game to manage and control these pests. Other varmints include squirrels, crows, raccoons, hogs, deer, turkeys, and others, which you also need a plan to address. Some growers incorporate hunting as part of their overall economic plan. Whatever strategy you choose, just remember that the crop always gets shorter in a low-crop year. The wildlife is going to get their share, so you must be proactive to stay ahead of them.

Here is hoping that as crunch time continues to heat up, you will be well prepared to address whatever Mother Nature brings so that you can ensure you have not just pecans but quality pecan kernels.

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PPI

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Skudder

Boordblasers 2 modele

Mobiele pre clean rolsiwwe met blaar blaser.

Aandrywings:

- enkel fase
- drie fase
- pto 540rpm

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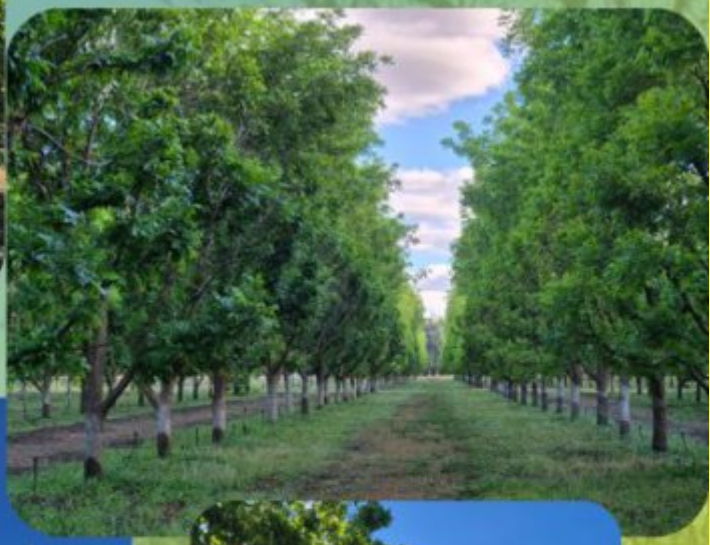

Insects associated with Pecan Trees :

Carya illinoinensis

Characterisation, Impact and Control

By Dr Justin Hatting, Andermatt-PHP, Dargle, KZN
(Technical and logistical support by Mr Hardus Du Toit and Mr Ivan Shubach, SAPPA)

Fig. 5. A size-range of 'boomtoktokkies' (Strongelium sp.). Such variation in size can be ascribed to differences in food quality/availability, as well as environmental conditions, during the larval stage; generally, stressed individuals being smaller in size (Photo: JL Hatting).

Project overview (1 October 2023 – 30 September 2024). During this fiscal year, four principal objectives were pursued: (1) continue with insect surveys in the Hartswater, Prieska, Modimolle and Muden areas; (2) continue pheromone-based surveillance and damage-correlation of African bollworm (ABW), *Helicoverpa armigera*, and false codling moth (FCM), *Thaumatotibia leucotreta*, at the Hartswater, Prieska, Jacobsdal and Muden sites; (3) initiate surveillance of leafhopper (Cicadellidae) activity in the Vaalharts, Prieska and Groblershoop regions and (4) investigate Carob moth and FCM damage/larval presence in nuts (old versus mottled) from Thabazimbi and Vaalharts. Following, a brief overview of each of the four research areas.

1. Insect surveys

The ongoing insect surveys serve as pre-emptive approach in alerting the local industry of new incursions and/or changes to the pest status of insects associated with pecan cultivation. Concurrently, grower awareness of beneficial insects is stimulated; an insect grouping which renders a valuable ecosystem service by suppressing pestiferous species.

During the 2023/24 reporting period, a total of 5 919 insects were collected at Hartswater, Prieska, Modimolle and Muden. The overall ratio (%) of potentially pestiferous : beneficial : neutral insects was 37 : 33 : 39. The site-specific insect numbers (n) and ratios are visually depicted in Figures 1-4. Note, above data exclude all ants and flies, recovered in large numbers during some months at most sites. Also, although a large number of "boomtoktokkies" (Tenebrionidae: *Strongylium* sp.) were recovered from the Modimolle (n = 2 042) and Muden (n = 667) sites during October 2023, these beetles (Fig. 5) were categorised as neutral; being generalist saprophages feeding on dead/decaying vegetation.

Fig. 1-4. Comparative number of specimen 'types' recorded in each of the four regions from 1 October 2023 to 30 September 2024. Red = potentially pestiferous, Green = beneficial and Blue = Neutral (characterised as those species of which the activity/role on pecan trees remain uncertain).

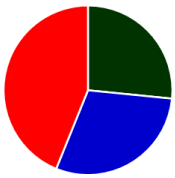

Fig. 1. Hartswater (n = 301)

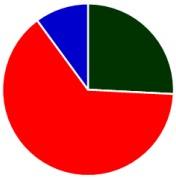

Fig. 2. Prieska (n = 705)

Fig. 3. Modimolle (n = 3 060)

Fig. 4. Muden (n = 1 853)

During the 2023/24 cycle, the Hartswater site was characterised by low insect activity (total recovered = 301), compared to the >3 000 insect specimens from Modimolle. Pestiferous insects at Hartswater included mainly the yellow pecan aphid, *Monellioipsis pecanis*, green citrus leafhopper, *Empoasca distinguenda,* and bark stinkbug, *Coenomorpha nervosa* (although this stinkbug is not considered injurious on pecan); all insects with piercing-sucking mouthparts. At the Prieska site, the (potentially) pestiferous insects comprised around 65% of all samples collected. The largest component was leafhoppers, notably *E. distinguenda*, followed by leaf beetles (Chrysomelidae), mottled stinkbug, *Pseudatelus raptoria*, and African bollworm, *Helicoverpa armigera*. The Modimolle site yielded several bark stinkbugs, mottled stinkbug, leafhoppers and grasshoppers. Last mentioned may be feeding on pecan vegetation, but may also be using trees primarily as resting sites and feeding on ground-covering broadleaf weeds/grasses. Although generally low in terms of the number of pestiferous insects, Muden samples revealed some aphids, leaf beetles, leafhoppers and grasshoppers. Fortunately, no (new) exotic incursions were noted during this reporting period.

Beneficials at the four sites comprised mainly spiders (Araneae), ladybird beetles (Coccinellidae), hoverflies (Syrphidae), praying mantises (Mantidae), lacewings (brown and green; Chrysopidae), assassin bugs (Reduviidae) and several parasitic wasps (various families). Spiders (various species) were prominent at the Modimolle and Muden sites, often outnumbering all other predators 3:1. Indeed, a very valuable natural enemy component in these pecan orchards. The two most prevalent ladybird species collected were *Harmonia axyridis* and *Hippodamia variegata*; both very active from October (especially at Muden) to April. Late-summer predator activity is most likely linked to the yellow pecan aphid, serving as prey and typically associated with pecan trees during February/March each year. As was seen during the previous cycle (2022/23), the Muden site again revealed a very strong beneficial component, comprising 34% of all speci-mens collected (compared to 27%, 26% and 13% recorded at Hartswater, Prieska and Modimolle, respectively.

2. Pheromone-based surveillance and damage-correlation of African bollworm (ABW), *Helicoverpa armigera*, and false codling moth (FCM), *Thaumatotibia leucotreta*

Background. Both pests have an adult moth stage, enabling monitoring of male moths by pheromone trapping. Monitoring of moth flights (using bucket funnel traps and yellow sticky traps, loaded with a sex pheromone) was initiated during October 2020 at the farm level. During 2023/24 (Year 4) a total of 18 FCM traps (Fig. 6a & b) were serviced in the Vaalharts (11 traps), Prieska (3), Jacobsdal (2) and Muden (2) regions. Traps are being serviced every two weeks for sorting and counting (ongoing during 2024/25; Year 5). Moth flights have showed an annual spike in activity around June and again September/October, with fewer moths being captured during January to March every year (Fig. 7).

African bollworm flights show a strong seasonal pattern, with clear activity from August to October every year (Fig. 8). Early-season moth flights may result in bollworm damage to flower buds and/or developing nutlets. Flower buds are high in nutritional value and hence attractive to ABW. Likewise, developing nutlets are also targeted (see Fig. 48c in the *Pecan Insect Guide*).

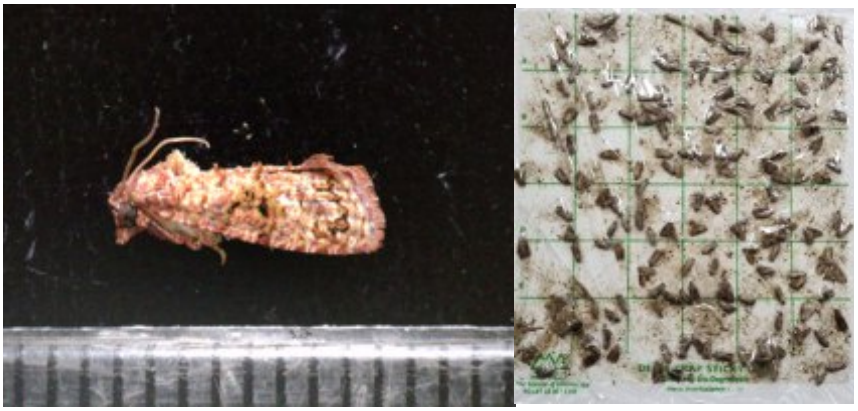

Fig. 6a. Adult false codling moth (1mm increment scale) and 6b (right), sticky liner trap with FCM males

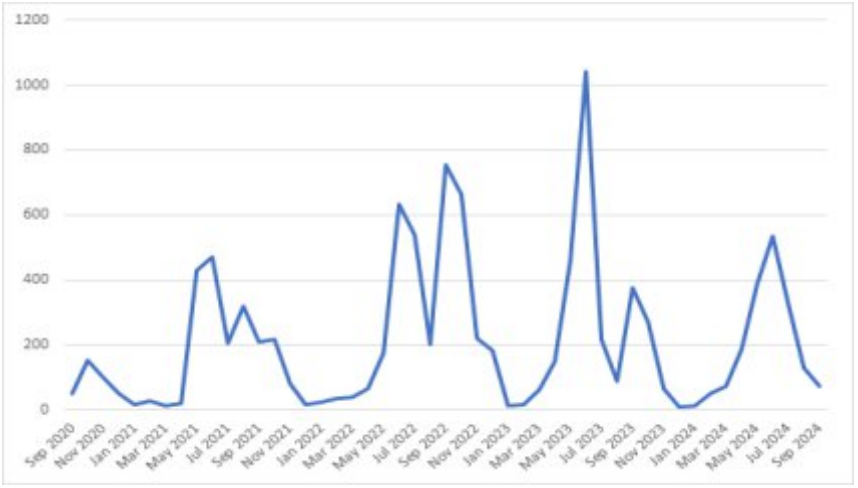

Fig. 7. FCM flights (pooled totals) in the Vaalharts region from 1 October 2020 to 30 September 2024.

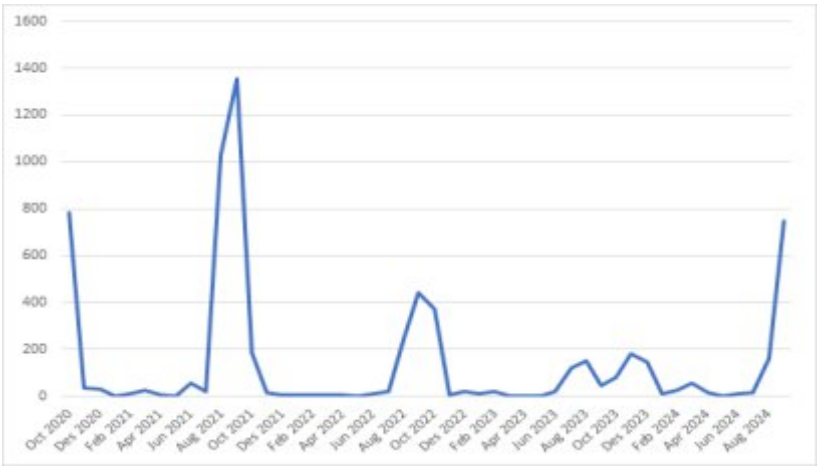

Fig. 8. Bollworm flights (pooled totals) in the Vaalharts region from 1 October 2020 to 30 September 2024.

To investigate a possible link between nutlet-feeding and abortion of such nuts by the tree, all aborted nutlets are being collected from the soil surface within a 2m radius around selected trees during December every year (initiated 2021). A total of 32 trees (*i.e.*, 11 Wichita, 7 Choctaw, 3 Western, 4 Pawnee, 1 Mohawk, 2 Ukulinga, 1 Navaho, 1 Nocono and 2 Barton) were inspected in the Vaalharts (18 trees), Prieska (3), Jacobsdal (6) and Muden (5) regions during 2023. Nutlets were sorted according to size (3 categories: small [<10mm], medium [>10 – 15mm], large [>15mm]) and inspected for bollworm feeding damage (Fig. 9). These data will later be used to investigate possible correlations/interactions among the parameters: flight patterns, nut abortion, nut size, cultivar, % damage and/or area.

Year 4 observations show nutlet abortion ranging from 14 to 894 nutlets per tree. From a total of 4 616 nutlets collected, 6% showed feeding damage associated with bollworm. This was a considerably higher proportion compared to <1% recorded during the 2022/23 cycle. The data also suggest relatively high abortion by the cultivars Choctaw and Pawnee. However, amalgamated data over 5 years will enable a more representative average for interpretation and, hence, a better understanding of *H. armigera* and its impact on pecan production.

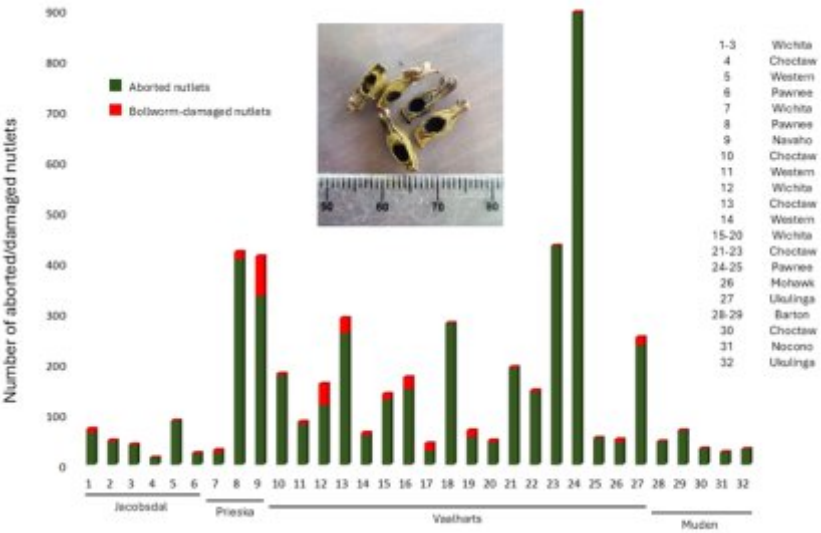

Fig. 9. Number (Y-axis) of aborted and bollworm-damaged nutlets across regions and cultivars in 2023 (insert: bollworm feeding damage to nutlets)

3. Initiate surveillance of leafhopper (Cica-dellidae) activity in the Vaalharts, Prieska and Groblershoop regions . This is a new initiative started during the 2023/24 cycle. As mentioned above, leafhoppers are sap-sucking insects, but also have the ability to vector plant-viruses leading to leaf yellowing/curling. To date, the most prevalent leafhopper, associated with pecan cultivation, is the green citrus leafhopper, *E. distinguenda*. As in the case of ABW and FCM, SAPPA wishes to secure more data on the phenology of this and other leafhopper species associated with pecan cultivation in Prieska and Groblershoop. Two trap types (yellow delta versus yellow sticky traps) were compared during the September-November period of 2023 (in Prieska), showing a similar pattern of activity; although higher numbers were recovered on the yellow sticky traps. Henceforth, monitoring will be performed using Delta traps as they present 'cleaner' catches without missing peak activity. Additional data will also be gathered by counting the number of leafhoppers from FCM traps at sites in Magogong, Hartswater and Bull Hill. More comprehensive feedback will be presented in the 2024/25 report.

4. Presence of Carob and FCM in mottled and out-of-season nuts . The recurring phenomenon of mottled nuts prompted a closer investigation into the presence of FCM and Carob moth, *Ectomyelois ceratoniae* (Lepidoptera: Pyralidae; Fig. 10). Initially, nuts were sourced from Vaalharts, Thabazimbi and Upington. Additional samples, received from pecan processors in Groblershoop during October 2023, were also incubated under favourable conditions to facilitate larval/pupal development and moth eclosure. The results of these exercises showed a ratio of 10:1 for Carob moth:FCM. These findings, together with information on moth/larvae identification and development, were communicated in the popular article "Karobmot en valskodlingmot, wat is die verskil?", published during 2024 in SA Pecan/Pekan Vol 97; see https://www.sappa.za.org/sa-pecan/#flipbook-df_18199/31/

Fig. 10. Adult carob moth, Ectomyelois ceratoniae (Lepidoptera: Pyralidae) (Photo: JL Hatting)

Acknowledgements. The South African Pecan Nut Producers Association NPC for funding. Dr Colleen Hepburn (Andermatt-Madumbi), Noxolo Mlotshwa & Hesta Hatting (Andermatt-PHP) for techhnical assistance.

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Carbohydrates Build Robust Pecan Trees

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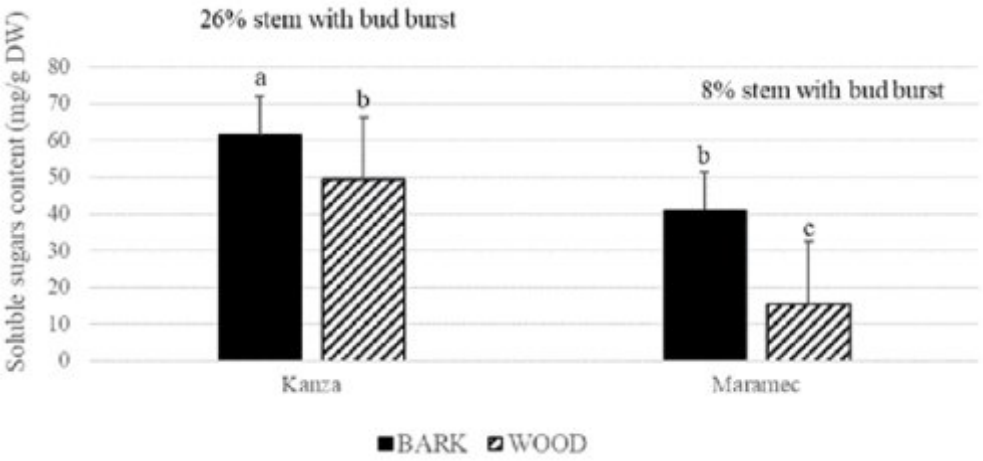

Figure 1—Secondary bud burst rates and soluble sugar levels in vascular tissues in pecan one-year-old stems cultivated in growth chambers.

Leaves produce carbohydrates using two simple ingredients: water and carbon dioxide. The water is mainly absorbed by the roots, while the carbon dioxide is obtained by the leaves. Plants are the most amazing chemists, using these simple materials to feed the world. Nonstructural carbohydrates, especially soluble sugars and starch, play a critical role in transport, energy metabolism, and osmosis and serve as building blocks for pecan trees' growth and structural development.

Recent research on nut trees, including pecans, almonds, pistachios, and walnuts, indicates that the seasonal dynamics of carbohydrates are characterized by high carbohydrate reserves in late autumn and winter. These reserves are depleted during spring growth, remain low throughout the summer, and recover to high levels near harvest. High carbohydrate levels before budbreak in spring are indeed associated with high yield, and the amount of carbohydrates is recognized as a strong factor in the phenomenon of alternate bearing in pecans and other tree crops (Zwieniecki et al., 2022; Zhang et al., 2021).

A resource budget model initially proposed by researchers studying the 'masting' phenomenon provides a reasonable explanation for why carbohydrates regulate production (Prasad and Sakai, 2015). According to this model, plants prioritize using carbohydrates for maintenance and growth; flowering and fruiting occur only when the remaining carbohydrates exceed a certain threshold. In other words, crops need time to accumulate enough energy for flowering and fruiting, which could take one or more years to enter an "on" year (large production). Therefore, it is unsurprising that pecan trees sometimes have multiple consecutive "off" years (small production).

Carbohydrates also help trees to better survive in disadvantaged environments. Pulling from my team's six years of research, I discussed pecan carbohydrates in a presentation at this year's Oklahoma Pecan Growers Association Annual Convention and Trade Show. In this talk, I presented evidence showing that the concentration of soluble sugars in stems positively correlates with the secondary bud burst rate in pecans (Figure 1).

When dealing with spring freeze, pecan trees usually have a Plan B: the lateral secondary buds can develop into flowers and shoots if the primary compound buds are killed.

We conducted research to observe the secondary bud burst after primary buds were damaged or removed. One-year-old stems of 'Kanza' and 'Maramec' cultivars were collected when the primary buds were at the outer-bud-scale-shed stage in early spring. The primary buds were removed, and the stems were cultivated in growth chambers for two to three weeks.

The soluble sugar contents in the stems were quantified, and the percentages of stems with bud burst during cultivation were calculated. The results showed that 'Kanza' had a higher bud burst rate and higher soluble sugar levels than 'Maramec.' This finding suggests that a stronger sink demand from a higher bud burst rate drives higher soluble sugar content in the stems.

In our current published paper— "Dormant carbohydrate reserves enhance pecan tree spring freeze tolerance: controlled environment observations" with *Frontiers in Plant Science* —we explored how different pecan scion and rootstock combinations respond to low temperatures at various growth stages in spring. This study focused on three pecan scion/rootstock combinations: 'Pawnee' / 'Peruque,' 'Kanza' / 'Giles,' and 'Maramec'/ 'Colby,' grown at the Cimarron Valley Research Station in Perkins, Oklahoma.

Branches at three different growth stages—outer bud scale shed, one week after budbreak, and early bloom stages—were collected and held in a Conviron E8 freezing unit at four temperatures (28.4, 32, 35.6, and 39.2 degrees F) for four and eight hours, resulting in a total of eight treatments. One sample set was kept as an untreated control. After two to three weeks, branch samples from all the temperature treatments were observed and categorized into two groups: those with healthy buds and the formation of healthy leaves/flowers, and those with dead branches.

Visual observations and carbohydrate analyses revealed differences in damage and carbohydrate content among the scion/rootstock combinations, low-temperature treatments, and growth stages. The 'Maramec'/ 'Colby' combination had the minimum visual damage to leaves, buds, and flowers, along with significantly lower soluble sugars and starch in the bark phloem and significantly lower soluble sugars in the woody tissue xylem. Conversely, the 'Kanza' / 'Giles' combination had the maximum visual damage and significantly higher soluble sugars and starches in the bark and soluble sugars in the woody tissues.

These results indicate that the 'Maramec'/ 'Colby' combination is more tolerant to spring freeze damage at all three growth stages than the other two pecan scion/rootstock combinations. The results also demonstrate that the 'Maramec'/ 'Colby' combination might use more soluble sugars and starches (compared across cultivars and controls), suggesting this as a possible mechanism for its freeze tolerance.

We assisted some of our growers in diagnosing tree performance, and it was evident that weak and unhealthy trees had significantly lower carbohydrate levels in their stems compared to robust ones. Similar to humans, stronger trees are better equipped to resist diseases. There appears to be a virtuous cycle where more robust trees have a higher capacity to produce carbohydrates, thereby supporting overall tree health.

However, while carbohydrates play a crucial role in pecan production, they are not the sole determinant. Plant hormones also play significant roles. For instance, Wood et al. (2003) suggested that maintaining proper hormone balance is essential for initiating and maturing female flowers into a marketable crop in pecans.

Research in other tree crops has similarly indicated that endogenous gibberellic acid inhibits flower bud formation, while auxins and abscisic acid promote it.

Moreover, the balance between gibberellic acid and abscisic acid serves as a key regulator of floral development and alternate bearing in trees. For example, a higher abscisic acid to gibberellic acid ratio increases flower bud formation, while the reverse promotes vegetative growth. Further research is needed to fully understand these mechanisms, and our lab aims to investigate this aspect for pecan trees in the coming years.

Reference Cited

Kaur A., Zhang L., Maness N., Ferguson L., Graham C., Sun Y., Panta S., Pokhrel N., Yang M., Moss J. 2024. Dormant carbohydrate reserves enhance pecan tree spring freeze tolerance: controlled environment observation. Frontiers in Plant Science. 15:1393305.

Prasad A. and Sakai K. 2015. Understanding the alternate bearing phenomenon: Resource budget model. Chaos, 25(12). 123102.

Wood B.W., Conner P.J., Worley R.E. 2003. Relationship of alternate bearing intensity in pecan to fruit and canopy characteristics. HortScience 38(3): 361–366.

Zhang L., Panta S., Maness N., Heerema R. 2021.Insight into Alternate Bearing: Do Carbohydrates drive it? Pecan South. 54: 6–12.

Zwieniecki M.A., Davidson A.M., Orozco J., Cooper K.B., Guzman-Delgado P. 2022. The impact of nonstructural carbohydrates (NSC) concentration on yield in Prunus dulcis, Pistacia vera, and Juglans regia. Scientific Reports. 4360.

Pecan Ice-cream Cake

1 caramel or jam Swiss roll
3 cups (750 ml) cream
½ cup castor sugar
1 teaspoon vanilla essence
½ cup glacé cherries, chopped
½ cup pecan nuts, finely chopped
1 slab (80 g) milk chocolate, chopped into shards
12 marshmallows, quartered

For the sauce
2 big bars (80 g each) whole-nut chocolate, chopped
2 tablespoons butter
⅓ cup milk

1 Spray a 2,2 ℓ container with cooking spray and line with cling wrap.
2 Cut the Swiss roll into 1 cm slices and line the container with it – pack the slices tightly.
3 Whisk the cream, castor sugar and vanilla essence together until it forms soft peaks. Carefully fold in the cherries, nuts, chocolate shards and marshmallows.
4 Spoon the cream mixture on top of the Swiss roll and cover with cling wrap. Freeze overnight.
5 Put all the sauce ingredients in a microwave-able bowl and melt on a low heat setting. Stir every 20 seconds to make sure it doesn't burn. (You can also melt it on the stove over a pot of hot water.)
6 Remove the ice-cream cake from the freezer 10 minutes before serving. Turn it out onto a pretty serving plate. Spoon the chocolate sauce over and serve immediately.

TIP Dip strawberries into the warm chocolate and serve with the ice-cream cake.

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