Mint Industry Research Council

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Insight

IN THIS ISSUE

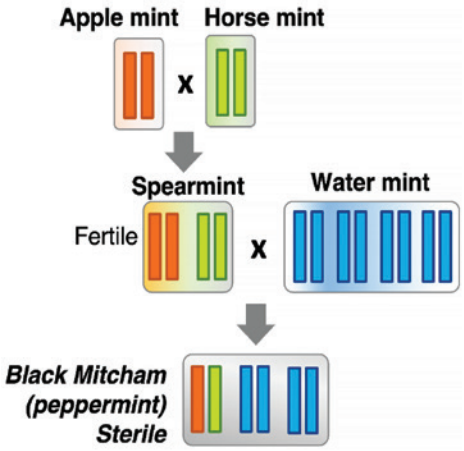
Mint Clones and Genomes

Isabelle Henry, Project Scientist, UC Davis Genome Center

Last April, the MIRC awarded us, the Comai laboratory at UC Davis, significant funding to develop genomic resources for faster and more efficient mint breeding. We are pleased to report on our progress thus far and touch on what we hope to accomplish in the upcoming year.

Our first objective was to develop a genome reference for water mint. Water mint is one of the parents of peppermints, and the one that contributes most to the peppermint genome (see figure). A genomic reference is similar to a book that explains all the instructions for making a given organism. In a genome, the sequence corresponds to all the words in the book. The annotation tells us where the genes are and corresponds to structural information that is also critical to understanding the narrative, such as chapter order, paragraphs, punctuation, etc. In our case, we selected one particular clone of water mint because it was genetically close to Black Mitcham peppermint. We sequenced the DNA of this clone (PI 617488), organized the sequences together (approximately 500 million letters) and determined where the genes are (annotation). The genome reference is not 100 percent accurate or complete (no genome reference ever is), but it is close and serves its purposes well. The water mint genome was recently finalized and, this month, the information was made publicly available on our laboratory website (https://comailab.org/plant-genomes). The MIRC website will soon include this information as well.

Similar methods have been used to develop the apple mint and horse mint genomes (see figure) in the last few years. This means that we now have information from all three of the



The orgins of the peppermint genome

parents of peppermint and are able to ask specific questions about what is important in the genome of peppermint, such as what determines oil content or disease resistance. This enabled us to initiate our second objective: to investigate why some peppermints are

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more resistant to *Verticillium* wilt than others. Several years ago, the MIRC developed many derivatives of Black Mitcham through gamma irradiation. Gamma irradiation is a mutagen which causes breaks in the DNA and results in small changes in the DNA sequence after repair of these breaks. Out of thousands of clones, a handful were selected for their increased resistance to *Verticillium* in field trials. Using our newly developed genome references, we compared the sequence of these more resistant clones to that of the original Black Mitcham, identifying the regions that are different. Our presumption is that those regions harbor genes that can influence disease resistance. We now have a list of these regions, enabling us to further investigate their functions and the mechanism underlying the increased resistance.

Once we better understand what parts of the genome are important for a particular trait, we will be able to select for this trait much faster. This is done by developing genetic markers for those specific regions of the genome, so that we can identify whether or not they are present in young seedlings. Based on the assumption that they will develop into clones that will behave as expected, we can then select the seedlings that carry those pieces of DNA and discard the others. By only testing a smaller number of clones with promising genetic patterns, we can do so more thoroughly in the field. This is the principle of marker-assisted breeding, which allows for faster and cheaper selection of promising clones.

Of course, marker-assisted breeding can only be applied if new clones are actually produced. In peppermint, this is very difficult to achieve because, typically, Black Mitcham and other peppermints are sterile. This brings us to our third objective, which is to develop a fertile peppermint. There can be many different reasons for sterility. One possibility is because its genome contains uneven numbers of copies from its three parents

The water mint clone that was sequenced

(see figure on page 1); when peppermint clones try to produce gametes (eggs and pollen), it is unable to divide its genome into two equal parts because some of the elements are only present once. As a result, the gametes are typically

Committee Members Pleased with UC Davis Progress

Members of MIRC's Varietal Improvement Committee and its Research and Regulatory Coordinator Steve Salisbury spoke highly of the progress being made in the short time the MIRC has funded research from Isabelle Henry and the UC Davis Genome Center.

"I think it is going well," Salisbury said. "They are a very focused group with a clear plan of attack and they're basically checking all the boxes."

"I believe UC Davis has developed a solid foundation to creating superior mint cultivars," said Greg Biza, chair of the Varietal Improvement Committee. "Their previous experience in mint and access to genome data generated by Oregon State University creates a platform on which the MIRC can and will build upon."

Specifically, Biza said, UC Davis has developed a rapid-screening process to filter through the many variants under development, which can dramatically expedite the breeding process.

"Dr. Luca Comai's lab and Dr. Isabelle Henry are leading a strong team that is making significant progress toward our MIRC priorities of disease resistance and improved yields," Biza said. "In combination with the Intermountain Research and Extension Center in Tulelake (led by Rob Wilson), UC Davis has the tools necessary to bring the MIRC and the mint industry the results we've long awaited.

"I'm looking forward to great things in the coming months and years ahead," Biza said.

Salisbury added that Henry and Comai are executing the plan they proposed to the MIRC "pretty much to a T."

"We are excited to see where it is going to go," Salisbury said.

Grower Scott Setniker, another member of the Varietal Improvement Committee, said that he, too, is pleased with the progress.

"I am excited to see some of the plants in trial plots in the upcoming years," Setniker said.

not viable or not functional. If that is the case, it may be possible to restore fertility in peppermint by changing the number of parental contributions, while still keeping the same three parental genomes. This would mean that peppermint could produce new clones through seed, which is a much faster way to produce new clones than mutagenesis. We would then expect these new clones to be peppermint-like but not identical to Black Mitcham, much like human children are not identical to their siblings.

In short, we embarked on this multiple-step process one year ago and have already made significant progress. We have produced new peppermint clones with double the genome content of Black Mitcham, and have begun characterizing them in the greenhouse. We have also started propagating these doubled plants in order to document their field behavior this summer. In parallel, we have produced seeds from these clones and are about to germinate them, to determine how variable they are as clones. The next step will then be to cross these doubled plants to specific spearmint plants with documented resistance to *Verticillium*, in the hope that we can produce clones that are genetically very close to Black Mitcham but exhibiting higher wilt resistance. We initiated this last step this month, and we are excited to see if we will be able to germinate and characterize these new clones in the upcoming months.

A clone of Black Mitcham with doubled genome

Field Man, Flavorist Among Honorees at 2023 Meeting

Devin Dekker, who retired recently as a field man for RCB International, has been coming to MIRC meetings for more than 30 years and served on the Council's Board of Directors and committees for nearly as long.

"I'm a supporter of the MIRC," Dekker said. "I think it provides benefits for the whole gamut of the mint industry, from the growers to the end users."

For this commitment, Dekker received the MIRC's Service to the Industry Award at the MIRC's 2023 Annual Meeting, January 25 and 26 in Charleston, South Carolina. Others to be awarded include Bob Vogt, Senior Flavorist and Fellow at Colgate-Palmolive; Midwest grower Randy Matthys; University of Idaho Nematologist Saad Hafez; and Karla Farina of Labbeemint.

Vogt and Matthys received the organization's Lifetime Achievement Award. Farina and Hafez joined Dekker in receiving the MIRC's Service to the Industry Award.

Dekker, who retired March 31 as field operations manager for RCB, has a history of working in mint that exceeds even the 30-plus years of his involvement in the MIRC.

"I've been in the mint industry since I was a kid," Dekker said. "My family grew mint on our farm, and I've just stayed with it – through a farm sale and then into working with RCB as a field man."

Dekker's history includes running his family farm in the lower Yakima Valley with his father, Bruce, for 30 years. After the family sold the farm, he worked for several years at Green Acre Farms, also in the Yakima Valley. In January of 2016, Dekker, who holds a bachelor's degree from Washington State University, joined RCB International as Field Operations Manager.

He attended his first MIRC meeting in 1989 and in the mid-1990s, started serving on MIRC committees and on the Board of Directors, which he did off and on until this year.

Devin Dekker honored by Steve Salisbury at the 2023 MIRC Annual Meeting

His involvement in the MIRC has provided him a perspective of participating as both a grower and later as a representative of RCB International.

"The MIRC is very beneficial to growers, end-users and everybody in between," Dekker said. "It is very beneficial to growers in terms of helping with

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regulatory issues and the availability of plant protection products. And it benefits others in the supply chain in multiple ways, as well."

Bob Vogt, Colgate-Palmolive

Bob Vogt

Bob Vogt has spent nearly 40 years as a flavorist, including the last 21 years with Colgate-Palmolive, and he has represented Colgate-Palmolive in the MIRC for many years, first as a member of the Scientific Affairs Committee and then as a member of the Board of Directors.

"Mint is very important in the flavors I make in trying to provide the best consumer experience," he said.

"And I've always tried to find the highest quality mint," he said. "I've been on many farms where we looked at crops. I've held town hall meetings and gotten to know dealers personally.

"And I've always felt the MIRC is a key part of the industry in the way it accelerates research and brings together different parts of the industry," he said. "I've also always enjoyed the camaraderie at the MIRC, and I've enjoyed attending meetings over the years. The people are very personable and it's kind of like a family.

"And getting this award was a huge surprise for me and I really appreciate it," he said.

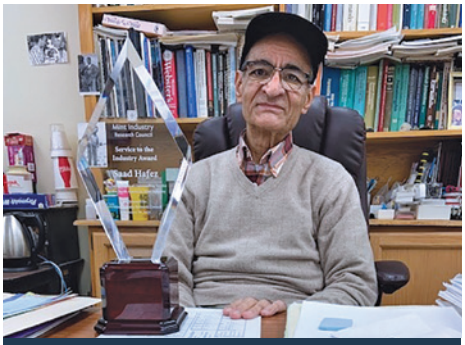
Vogt is expected to leave the MIRC when he retires later this year.

Saad Hafez

During a distinguished career that includes induction into the Idaho Mint Hall of Fame in 2020, the publishing of more than 85 research articles and presentations at more than 400 national meetings, Saad Hafez has provided significant contributions to nematode management in agricultural production systems.

While most of his work has been concentrated on potato and sugar beet production systems, he has spent the past 15 years working in mint. During that time, he has helped growers gain a better understanding of what it takes to manage nematodes in mint, and his award is well deserved, according to Steve Salisbury, research and regulatory coordinator for the MIRC.

"He is an incredible resource," Salisbury said. "He even has a nematode named after him."



Saad Hafez

Hafez, 77, said he was honored when he learned he had received the Service to the Industry Award. "Getting the award from the Mint Council was a great honor," he said. "I appreciate it."

Looking ahead, Hafez said he hopes others take up research into nematode management in mint, noting the issue will undoubtedly be an ongoing concern long after he retires.

"To manage the nematode on any crop, especially a perennial crop like mint, we need a lot more work to be done," Hafez said.

Randy Matthys

Other Winners

Randy Matthys is the fourth generation of his family to grow mint. His contributions to mint are substantial, said Salisbury, including as a grower-cooperator for multiple research projects, his participation in the Indiana Mint Council, the Midwest Mint Growers and the Mint Market Development and Research Council, and his long-standing work as a grower representative for Indiana on the MIRC's Board of Directors.

Karla Farina, who is leaving the mint industry this year after working for the past dozen years as Chief Financial Officer for Labbeemint, served on the MIRC's Board of Directors for six years, including for one as chair.

She, too, said she was honored to receive the MIRC's Service to the Industry Award. "It was such an honor," Farina said. "I truly enjoyed my years serving the MIRC and wish the organization much success in the future."

Asiatic Garden Beetle Increasingly Problematic in Indiana Mint

A Purdue University research project into the Asiatic Garden Beetle is showing that the pest is causing significant damage to some Indiana mint stands.

"We have gone back to the same three fields twice a year for the last two years, and we have seen some significant reduction in above ground biomass," said Elizabeth Long, an assistant professor in Purdue University's Department of Entomology.

Elizabeth Long

"The damage is kind of patchy," she added. "There are definitely hot spots in the fields."

The project, funded by a USDA Specialty Crop Research Initiative Grant, is assessing the damage caused by the pest, as well as looking into the biology of the beetle, its dispersal areas, treatment threshold levels and control options. Control options are targeting the beetle's larvae, which damages crops by feeding on roots.

The beetle has been an issue in Midwest corn and soybean production systems since 2014 and was first discovered in a mint field in Indiana in 2016. Indiana grower Dan Gumz, who is president of the Indiana Mint Development and Research Council, noted the beetle has now become a major pest in mint. "Asiatic Garden Beetle is a major new pest of Indiana mint. It's a very aggressive white grub species that will feed on mint roots, and we don't have good control options.

"Elizabeth Long at Purdue has been great to work with on this new pest," Gumz added. "She has been able to study its life cycle as to when it is most effective for treatment. This insight is beneficial for Indiana growers. She brings a lot of knowledge and enthusiasm about the project. I'm excited to be working with her."

A scarab, the Asiatic Garden Beetle is in the same group of insects as the more well-known Japanese Beetle, Long said, but it is more aggressive.

"They are very aggressive," Long said. "If you have the two in your hands, the Japanese Beetle grubs would just sit there and the Asiatic Garden Beetle grubs would be crawling around, trying to bite you and trying to get back into the soil.

"So, that aggressive nature is one of the reasons it is such a problem," she said. "And the insect remains in its larval stage for a year, far longer than most insects."

So far, the research is showing that Asiatic Garden Beetle larvae, or grubs, are present, sometimes in high numbers mostly in sandy loam and moderately muck soils.

"These soils are well drained," Long said. "They are not dense like a clay soil, and these grubs do really well in those soil types."

At population densities of 5.5 larvae per square foot, the beetle has shown a capacity to inflict significant damage to mint crops. "We're at the beginning of trying to understand what is going on, and we will continue to move our understanding forward and try to develop an economic threshold, but that is our conservative estimate right now," she said. "That is where we're seeing the cutoff."

The Asiatic Garden Beetle grub is difficult to control, Long said, in part because only one soil-applied systemic insecticide is registered in mint for the

Research is showing that Asiatic Garden Beetle larvae are present, sometimes in high numbers, in Indiana mint fields.

grubs, and foliar insecticides provide no activity against the most damaging larval stage. Also, because grubs move up and down the soil profile to between depths of six to twelve inches, it can survive extreme weather conditions.

"They are buffered from the cold weather and they just kind of sit there in a kind of hibernation-like state, and then as the temperature warms in the spring, they get that cue and start to move up in the soil column," she said. "They are not like other insects. The cold weather doesn't directly affect them because they are not exposed to it. They have some insulation down in the soil."

In greenhouse trials, Long has found that the diamide insecticide Coragen, which is registered for use in mint, has provided good efficacy against the pest.

"The work we've done in the greenhouse doing drenches with this product shows that, interestingly, it doesn't necessarily kill the grubs, but it makes them so

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The Asiatic Garden Beetle has caused some significant reduction in above ground biomass in some Indiana mint fields.

sick, so intoxicated that they can't crawl, they can't roll over and they can't feed. And that protects the plant," she said.

"That is a huge benefit," she added.

The diamide is especially effective on the small instars of the grub, she added.

"We anticipate that the best application timing is right after harvest," she said. "At that point the ground is exposed, the grubs are small and more vulnerable and there's no place for the grub to hide," she added.

The downside to the treatment is its expense, she said, potentially costing up to $60 an acre.

Another potential control option being studied involves use of insect-parasitic nematodes that specifically target soil-dwelling insects. "They get into the body openings of the grub and basically regurgitate a toxin that liquifies the inside of the insect and turns it into soup, and they breed in there until the insect literally explodes," Long said.

"Obviously they don't work as quickly as an insecticide, but they are persistent and they actively search out these insects to eat," she said.

The nematodes work particularly well when combined with a Coragen treatment, Long said. "After exposure to Coragen, they are sick and can't defend themselves from the nematodes so the nematodes can get into their bodies much more easily."

Bacterial pathogens also could be effective against the grub. "We haven't done any testing with these products, but, in theory, you would apply them to soil, they would move through water and contact the grub and kill them.

"That is really exciting, because they are much less expensive than the other alternative," she added.

To date, the pathogens have not been labeled for use in mint, however.

AdvanceMint Winners Announced

Mars Wrigley is awarding grants for five projects this year as part of its AdvanceMint program. The program, which encourages sustainable farming, has awarded more than 40 projects over the past six years.

The 2023 awardees are Bowers Distillery of South Dakota; Keudell Farms, Inc. of Oregon; Shady Lane Farms of Indiana; Scott Setniker Farms of Oregon; and Dave and Clay Christensen of Idaho. Individual award amounts and projects funded include:

- Bowers Distillery, $25,000 for irrigation water conditioning;
- Keudell Farms Inc., $12,420.96 for biotime treatment;
- Shady Lane Farms, $25,000 for mint still solar panel upgrades;
- Scott Setniker Farms, $24,000 for variable rate fertilizer injection system;
- Dave and Clay Christensen, $25,000 for drag line pivot irrigation upgrade.

"These are well deserved award winners and great examples of grower creativity and commitment to implement these ideas to improve their farms," said Steve Salisbury, research and regulatory coordinator for the MIRC.

According to Mars Wrigley, qualifying practices include distillation efficiency improvements, general water-use reduction, irrigation-efficiency improvements, cover crop, no-till vs. till, water-conservation plans, natural gas-line installation, liquid propane vs. diesel fuel, improved soil testing, and pesticide- and fertilizer-management plans.

As part of the eligibility requirements, award recipients agree to report on the impacts of farming practices within one year after the practice has been implemented.

Among other criteria, a team of judges will evaluate applications based on the proposed project's environmental, social or economic impact, ability of the practice to be adopted, and whether the entry provides sound methods for achieving tangible results.

Only farms located in the U.S. and Canada are eligible for the awards.

For more information, contact the MIRC.

New Secretary/Treasurer a Former State Trooper

Marcus Smith, MIRC's new Secretary/Treasurer, took an unusual route to his position as Sales Representative with Norwest Ingredients.

Smith spent the first 27 years of his professional life as a State Trooper for Washington State Patrol.

Smith, along with Jeff Johnson (Chair) and AJ Todd (Vice Chair), are the new executive team for the MIRC's Board of Directors.

After retiring from the State Patrol in 2019, Smith took up an offer from his brother-in-law Terry Cochran, the founder and co-owner of Norwest Ingredients, and started at the essential oil company in Royal City, Washington.

"Terry knew that I was reaching that age of retirement for the agency, and he said, 'Mark, if you ever want to keep working, come see me and I'll find something for you to do,'" Smith said.

"So, basically, I walked out of the Washington State Patrol on a Friday the last day of February of 2019, and three days later I was working for Norwest Ingredients," Smith said.

Smith started as a fieldman and within a few months became the company's Sales Representative after Sales Manager Jason Stromme retired.

Smith said he initially was hesitant to take over as Sales Representative. "I said I really don't know anything about the industry, and I don't know if I'm going to benefit the company by being put in this role," Smith said. "And Terry reassured me. He basically said, 'Hey Marcus, many of our contracts and relationships are established. I just want you to keep on top of things and reach out to folks.' And I said, I can do that. I'm not a car salesman, but I can fit in that role.

"In law enforcement, I retired as a frontline supervisor, which in State Patrol is a Sergeant," Smith said. "So, I was scheduling. I was managing training. There are a lot of elements in that role that include decision making, being self-reliant and being accountable. And I think that kind of led Terry to trusting that I would do okay in this role."

Smith said he quickly learned that Norwest Ingredients had a reputation for integrity among its customers, a fact that helped him fit in and be comfortable with their buyers.


Marcus Smith

"Terry has made it a point to be transparent and honest and straightforward, so that made it easier for me," Smith said.

Earlier this year, Cochran asked Smith to represent Norwest Ingredients on the MIRC Executive Committee, and Smith said it was something he was happy to do.

"I think the MIRC is a good organization," Smith said. "It is a place that growers, buyers and end users can get together and all have a vested interest in the betterment of the industry."

Smith, 52, said he plans to work for at least another decade at Norwest Ingredients before retiring. "I've still got a freshman and a sophomore at home that we need to push through school," he said. "After that, I kind of hope to live the quiet life."

Chair's Report

Jeff Johnson, Chair of the Board

I'd like to start my first column as Chair by pointing out how honored I am to be heading this organization and how excited I am about the current climate at the MIRC, our Board of Directors and the mint industry, in general.

As most of you know, we've had some retirements lately. People like Bob Vogt, who will retire from Colgate-Palmolive later this year, and Karla Farina, who will be leaving the industry, can't be replaced. However, with Marcus Smith joining the Board as Secretary-Treasurer, and AJ Todd serving as Vice Chair, we have the makeup of what I believe is a very solid Executive Team.

I'm also thrilled to see the level of commitment to the MIRC of our new member, Haleon. Ben Thornton-Jones, who represented Haleon at our meeting in Charleston, appears willing to jump in with both feet and really get engaged and involved.

I believe the current makeup of the MIRC will bring new ways of looking at things and a refreshing new energy to the organization, and I'm sensing a lot of interest and enthusiasm in the organization at this point. I'm also encouraged by what I'm seeing out of the researchers we have recently gotten involved with. The UC Davis researchers are meeting the goals we set for them in our varietal improvement project, which is very encouraging.

And it is good to see that we are focusing in on our message now with the formation of the Sustainability Committee. Within today's environment, I believe it is important that we control our messaging. We do a lot of good work and putting some framework around that and then working on how to release that to the public is important.

That said, I see some significant challenges for our industry in the months ahead. First off, we don't know what the future is in terms of the COVID environment. We've seen some real positive rebounding in the markets, particularly the oral care and confectionery markets. But the question I see is whether the supply chain is robust enough to meet our needs.

I used to think that our industry was relatively recession proof, because people will always need confectionery and oral care items regardless of the economic outlook. But we've learned that we are not COVID proof. And neither were our customers. It affected everyone.

Another issue I see going forward is the fact that interest rates have skyrocketed recently. We've gone from 3 to 4 percent to 8½ percent in just a few months. Dealing with these rates is a massive challenge for the growers. And then you couple that with the high input costs we are seeing now and that represents some real challenges. Also, we are seeing that the credit availability has not kept up with the amount of credit the growers need for their crops. And getting labor can be a challenge.

Jeff Johnson

Still, there have been some solid rebounds on the consumer side: People are going back to work; they're brushing their teeth; they are commuting to work, going to meetings and worried about fresh breath so consuming more gum and breath mints. The consumption part of the mint industry is up. Everyone is kind of coming out of COVID and getting back to work.

So, I am very optimistic about the future of our industry.

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Research & Regulatory Update

Steve Salisbury

The 2023 annual MIRC meeting was productive and certainly considered a success. It was very refreshing to finally be able to meet in person, and it seemed that everyone truly enjoyed getting reacquainted and picking up where we all left off. I'd like to share an update on a few research program items as well as provide some notes on our pesticide pipeline.

The MIRC approved funding for a healthy slate of research projects of which some are continuations and progressions of current projects while there are some new for 2023. The industry continues to remain focused on *Verticillium* wilt and discovering and developing means to address it. Research has developed economic action thresholds for *Verticillium* and development of a practical and reliable in-field soil testing technique is in progress now. This is a pragmatic concept that would allow growers to assess the level of *Verticillium* in the soil prior to planting, thus giving a grower the confidence in planting mint in a specific field or to suggest that it may not be a viable option prior to investing their resources.

Other efforts focused on *Verticillium* wilt are to evaluate the use of phosphite material and assess the response of the pathogen. Phosphites are an interesting material in agronomy. First, phosphite is an anionic salt of phosphate, which you are familiar with as common fertilizer. Phosphites are not fertilizer and they do not act chemically the same way within plants as phosphates. Science has suggested that phosphites work in potentially one of two ways, or both; they have a direct inhibitory effect on certain fungal pathogens and/or they stimulate a natural host defense within the plants. There has been research that indicates the direct inhibition of plant pathogens and *Verticillium* was recently added to that list. Dr. Jeremiah Dung at Oregon State University will be looking into the response of *Verticillium* to phoshite treatments. This concept has merit and is worthy of an investigative evaluation.

Outside of the *Verticillium* scope, the MIRC was pleased to receive interest in a new distillation project. Kudos to the distillation subcommittee to spend some time working with Dr. Troy Peters, Washington State University, to develop a project that could not only provide value to the industry but also has potential to lead to more meaningful distillation research. Distillation projects and concepts oftentimes can spiral out of control due to complexities and numerous variables that go into the process. Simplifying the distillation discussion may seem counterproductive, but this may very well be a perspective that is needed here. This project will be carried out on farms to characterize distillation processes and practices while considering energy inputs and costs as well as the oil output. The thought is to help lead to optimal use of energy used in distillation for the output that is produced. We look forward to how this project develops, what it brings us and where it leads to.

Progress in all research priority areas continues to be made. Overall, the Scientific Affairs Committee and Board of Directors are pleased with the direction of the MIRC research. 2023 should bring us another round of quality results. As always, if anyone has thoughts, comments or suggestions on current or needed work to be done on mint, then please let me or your MIRC representative know. The group is always open to hearing our members' thoughts.

Another topic that was discussed during the Board meeting in January was the interests and concerns regarding sustainability topics. I mentioned this at all the annual state meetings that I attended and presented at. And as I reported, this topic would be and was discussed at the Board meeting. In summary, all member facets of our industry are continually being asked questions pertaining to sustainability. There is not any one of our member segments driving these concerns. It is truly coming from the consumer groups. This, of course, trickles all the way down through the value chain. The topics that are being asked about include things like energy and water use and conservation, carbon emissions and consumption, traceability, land use, biodegradability and others. The questions presented to the MIRC are, do we want to come together and address it, and if so, then how? The Board elected to form a group of members to discuss this issue, review the concerns and provide suggestions on how to proceed. The key is that if the MIRC were to provide a voice for the industry that it truly needs to benefit all members.

Steve Salisbury

To finish, we are closely watching a few of our pesticide compounds work their way through the regulatory process. The closest to the finish line is fluopyram, Vellum Prime from Bayer Crop Science. This will be a new nematicide material and we are hoping to see it approved for registration this spring.

As for herbicides, there is still some waiting time before a new material sees the light of day. However, saflufenacil,

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Sharpen from BASF, has been submitted to the EPA through IR-4. This means we are closer to a new registration (hopefully within 18 months). I know several folks have been anxiously awaiting this herbicide for quite some time.

The MIRC weeds scientist group continues to work on tiafenacil, with the current focus on use between cuttings. The 2022 results were somewhat inconsistent between and within regions, not leading to great confidence by the registrant. Treatments will be evaluated again in 2023. The dormant application appears to be on solid ground.

Fluroxypyr, Starane from Corteva, looked good in MIRC trials and IR-4 will conduct the residue trials in 2023. Corteva is supportive moving forward. The exciting news here is that there is promise that an early post-emergence timing may be included on the label. Time will tell as the process plays out.

If you're interested in insecticides, cyantraniliprole, Exirel or Verimark from Corteva, has also been submitted to the EPA for registration review. So, it's working its way through the process. As for our candidate pyrethroid lambda-cyhalothrin, Warrior from Syngenta, unfortunately we continue to be on hold until the EPA's review of the pyrethroid class is completed.

Certainly, contact me if you have any questions or comments. I hope you all have an enjoyable, safe and profitable 2023.

The IR-4 Project

Jerry Baron, Executive Director, The IR-4 Project, North Carolina State University

This year, The IR-4 Project commemorates 60 years of operation. Since its establishment by land grant universities and the U.S. Department of Agriculture in 1963, IR-4 has championed specialty crop growers by facilitating the registration of safe, effective pest management solutions to meet their unique needs.

Mint, along with other specialty crops (which include fruits, vegetables, nuts, herbs and horticulture crops) are not typically served by agrochemical companies' registration efforts. Larger acreage, "major crops" (like corn and soybeans), typically yield higher returns on investment. This "minor use problem" spurred the founding of IR-4.

IR-4 upholds specialty crops as essential components of a healthy diet, a thriving landscape and a robust U.S. economy. Since its founding, IR-4 has secured over 23,000 pest management product registrations for food crops and countless others for ornamental crops. IR-4 has been involved in most registrations on mint, numbering over 60 uses approved. IR-4 evaluates a range of tools – including reduced-risk chemical and bio-based products.

According to an economic impact study by Michigan State University in 2022, IR-4 contributes $8.97 billion annually to the gross domestic product. Additionally, seven jobs today can be attributed to every $1,000 of public investment in IR-4.

Federally funded through USDA, IR-4 works closely with the USDA National Institute for Food and Agriculture (NIFA), USDA Agricultural Research Service (ARS), EPA and international partners to conduct research, facilitate registrations and harmonize global regulations. IR-4 also depends on partnership with the specialty crop growers, commodity associations, food processors and others in the food value chain. The Mint Industry Research Council has been a partner for decades, dating back to the 1990s. MIRC helps identify data gaps and co-fund the necessary research. MIRC is also part of the larger effort by the IR-4 Commodity Liaison Committee to advocate for additional funds for IR-4.

Not many government-funded organizations survive for 60 years on a year-to-year funding basis. But because of our relevance to stakeholders in the farming community, they continue to support us in many ways, including letting the decision-makers in Washington, D.C., know the importance of the organization – why this program should continue to exist now and into the future.

Jerry Baron

As the future of pest management and its regulation grows increasingly complex, IR-4 has the expertise to guide the specialty crop community forward with innovative, pragmatic solutions. While commemorating 60 years of impact through 2023, IR-4 invites the mint industry to follow along, learn more about the project, and take part in its evolving, multifaceted work. Visit the IR-4 website at www.ir4project.org to connect via email, newsletter or social media.

View the 60 Years of IR-4 video via IR-4's homepage at ir4project.org.

Haleon: 'We Want to be an Active Part of MIRC'

If first impressions are meaningful, the MIRC will have strong support from its newest company member.

Ben Thornton-Jones, Director of Sustainable Supply for Haleon, a world-leading consumer health company and the Council's newest member, said he was impressed by his first experiences at an MIRC Annual Meeting last January in Charleston, South Carolina.

"I was hugely impressed by the level of research that is being conducted through the MIRC and the results that will help support the U.S. mint value chain," Thornton-Jones said. "Multi-stakeholder collaboration is critical in the mint value chain. Convening farmers, brokers, the flavor houses and consumer health companies like Haleon, as well as scientists and researchers, together in the same room is where I see the unique value of MIRC.

"We set this commitment and called out mint as one of the key supply chains that we want to sustainably source. And so being part of the MIRC from a North American mint-sourcing point of view means that we are engaging in the industry and investing in its sustainability."

Ben Thornton-Jones,
Director of Sustainable Supply, Haleon

"I just sort of thought to myself, 'Where else does this happen?'" he said.

Haleon, headquartered in London, is a global leader in consumer health. The company joined the MIRC late last year, shortly after its demerger from GSK. Haleon's product portfolio spans five major categories - Oral Health, Pain Relief, Respiratory Health, Digestive Health and Other, and Vitamins, Minerals and Supplements (VMS). Its long-standing brands - such as Advil, Sensodyne, Panadol, Voltaren, Theraflu, Otrivin, Polident, Parodontax and Centrum - are built on trusted science, innovation and deep human understanding.

"Mint is a flavor that our oral health consumers experience twice a day when they brush their teeth," Thornton-Jones said. "So, mint is incredibly important for us as a material and flavor, therefore, we must be active in the industry."

Haleon, with revenues of £10.9 billion, is expecting to increase its use of mint, in large part because of the company's ambition to grow between four and six percent each year.

Thornton-Jones also noted that Haleon aims for all of its key agricultural, forest and marine-derived materials used in their ingredients and packaging to be sustainably sourced and deforestation free by 2030, another driver to join and invest in the MIRC. "We set this commitment and called out mint as one of the key supply chains that we want to sustainably source," he said. "And so being part of the MIRC from a North American mint-sourcing point of view means that we are engaging in the industry and investing in its sustainability."

Ben Thornton-Jones

Thornton-Jones said that the company plans to regularly attend MIRC meetings and participate in committees and other organizational functions.

"We want to be an active part of MIRC, rather than just pay membership and sit back and not really have a voice in it," he said. The benefits of doing so, he believes, can be substantial.

"At the MIRC meeting in January, I was able to sit next to and talk to a mint grower, talk to brokers, flavor houses and, of course, talk to people from Mars Wrigley and Colgate-Palmolive, as well. And everyone is focusing on bettering the mint industry," he said. "I was really energized coming away from the meeting, and really impressed, and look forward to Haleon's continued participation."

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