



# The Bee Line

Newsletter of the Oregon State Beekeepers Association

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**Image above:** Agrivoltaics in practice. Here the “agriculture in and around large-scale photovoltaic solar farms” involves honey bees and pollinator habitat, as described in the front story.

2020 OSBA memberships are set to expire December 31. Consider renewing with the form on page 17 or online at: [orsba.org/membership!](http://orsba.org/membership!)

## AGRIVOLTAICS: A POWERFUL SWEET SYNERGY: Part I

*John Jacob with contributions from Rob Davis*

The rapidly emerging practice and study of agrivoltaics has a tremendous potential to positively impact our industry and pollinator habitat. Agrivoltaics is the practice of agriculture in and around large-scale photovoltaic (PV) solar farms. Unlike “concentrated solar,” which uses heat and mirrors, PV solar is the most common kind—you see it in camping equipment and on rooftops. Photovoltaic solar directly converts sunlight to electricity and is cool to the touch. Agrivoltaics was initially pioneered by Adolf Goetzberger and Armin Zastrow as early as 1981 (A). Since that time, the price of solar power has plummeted—more than 99.9 percent—and, along with the cost of batteries, the cost of PV solar continues to fall. We all like cheaper and better, and in more and more states that accurately describes solar energy. The significance of this trend is that solar power is rapidly becoming one of the most popular sources of electricity. In fact, it is projected by many that solar will dominate the supply of electricity by 2050 (B).

Aside from helping their church, local government, or school district save money with solar, why should beekeepers care? Hint: It’s all about the seed mix under and around the panels. An alarming study was recently published in the journal *Biological Conservation*. Without exaggeration, media carried the headline, “Plummeting insect numbers ‘threaten collapse of nature,’” summarizing the study’s findings that 40 percent of insects are threatened with extinction.

Pollinator habitat is rapidly disappearing because of changes to conservation acres in the Farm Bill, suburban and exurban development, and fencepost-to-fencepost farming practices. In my 22 years as a commercial beekeeper here in Southern Oregon, I have witnessed many of my best bee yards slowly become devoured by neighborhoods and monocultures such as grapes and hemp. Literally thousands of acres of what once was prime honey bee forage have disappeared over the last two decades directly because of development. This pattern has resulted in up to a 75 percent loss in insect populations in some studies (C).

This is where agrivoltaics—solar systems designed and managed with pollinator-friendly ground cover—enters the picture. Widespread adoption of agrivoltaic models designed to establish and maintain pollinator forage offers us a mechanism to realize even more benefits from the transition to a modern electricity system. Harnessing these trends to create thousands of acres of long-term quality forage for our bees is a win-win situation. This is especially exciting given that the expected lifespan of a large-scale solar site is 20–40 years.

And science is already showing that plants thrive on solar farms. On 10 acres of dry unirrigated farmland at Oregon State University–Corvallis, scientists noticed the green plants growing in the shade of the solar panels. The site wasn’t intentionally planted to have a thriving seed mix, but after launching a formal study, the researchers found the area under the solar array was producing double the amount of plant material and had consistently higher soil moisture. For nectar- and pollen-bearing plants the

*Continued on page 13*

## 2020 FALL CONFERENCE: TENTATIVE AGENDA

The 2020 OSBA Fall Conference shifted to the virtual realm due to COVID-19. Online registration remains open now, as registrants can view and review all conference sessions for 30 days following the event. This Tentative Agenda indicates the sessions and presenters; moderators are Carolyn Breece, Paul Stromberg, and Cheryl Wright. Thanks to everyone who is making this happen. We look forward to seeing you *there!*

### ~ Saturday, October 24 ~

8:45 AM Opening Announcements | Silent Auction Begins

9:00 AM A Tough Nut To Crack: Pollination Requirements of Self-Fertile Almond Varieties

Elina L. Niño, University of California, Davis

10:00 AM Sugar Water Is Not Honey: Making a Better Bee Feed

Nick Naeger, Washington State University

11:00 AM *Demonstration*: Encaustic Painting

George Hansen, Foothills Honey Company

12:10 PM Break

1:00 PM OSBA General Membership Meeting

### ~ Sunday, October 25 ~

9:00 AM Pollen Trapping: What You Should Be Thinking About Before You Start

Shelley Hoover, University of Lethbridge, Alberta

10:00 AM Life of a Canadian Beekeeper

Ian Stepler, Stepler Farms Ltd

11:05 AM Updates on Bee Nutrition Research from the OSU Honey Bee Lab

Priyadarshini Chakrabarti, Oregon State University

12:10 PM Break

1:00 PM *Demonstration*: Candle Making

Matt Allen & Liz Lovelock, Apricot Apiaries

### ~ Wednesday, October 28 ~

6:30 PM *Panel*: Questions for Beginners, Oregon Master Beekeeper Program | Jen Holt, Moderator  
Anna Ashby, Max Kuhn, Naomi Price, & Judy Scher

7:05 PM Update from UC Davis E. L. Niño Bee Lab

Elina L. Niño, University of California, Davis

8:05 PM Promoting a Sweet Industry through the American Honey Queen Program and ABF

Mary Reisinger, 2020 American Honey Queen

8:35 PM *Demonstration*: Honey Show Judging

Marjie Ehry, Happy Bee Apiaries

9:05 PM The Bee Informed Partnership: Programs & Colony Health Trends

Ben Sallman, Bee Informed Partnership

### ~ Wednesday, November 4 ~

6:30 PM *Panel*: Questions for Beginners, Oregon Master Beekeeper Program | Jen Holt, Moderator

Anna Ashby, Max Kuhn, Naomi Price, & Judy Scher

7:05 PM Are Honey Bees Like Chickens and Bumble Bees Like Polar Bears?

Andony Melathopoulos, Oregon State University

8:05 PM Report on Current Research Funded by Project Apis m.

George Hansen, Foothills Honey Company

9:00 PM *Exploration*: Fun Facts About Bees

Morris Ostrofsky, Washington Master Beekeeper

### ~ Wednesday, November 11 ~

6:30 PM *Panel*: Questions for Beginners, Oregon Master Beekeeper Program | Jen Holt, Moderator

Anna Ashby, Max Kuhn, Naomi Price, & Judy Scher

7:00 PM Raising Quality Queens in Pollination

Shelley Hoover, University of Lethbridge, Alberta, Canada

8:00 PM Pesticide Exposure in Context

Emily Carlson, Oregon State University

8:32½ PM Evaluating Altruistic Behaviors in Honey Bees

(*Apis mellifera* L.) Infected with Gut Microsporidian *Nosema ceranae* | Ellie Chapkin, Oregon State University

9:00 PM *Demonstration*: Under-Appreciated Products of the Hive with an Emphasis on Propolis

Judy Scher, Urban Beekeeper

### ~ Saturday, November 14 ~

9:00 AM Varroa and Pesticides Research Update from OSU Honey Bee Lab | Ramesh Sagili, Oregon State University

10:05 AM Using Fungal Spores To Kill Varroa

Nick Naeger, Washington State University

11:00 AM *Panel*: Current & Future Outlook on Varroa Mite Control | Ellen Topitzhofer, Oregon State University

Todd Balsiger, Hood To Coast Honey

Matt Hansen, Foothills Honey Company

Jan Lohman, Vazza Farms, Inc (retired)

Ramesh Sagili, Oregon State University

12:05 PM Donations to OSU Honey Bee Lab, Announcements, and Closing

**Note:** Full schedule at [orsba.org](https://orsba.org).

## MESSAGE FROM THE PRESIDENT

### In the Moment

Greetings, fellow beekeepers.

With 2020 nearly fully in the rearview mirror, it is a good time to reflect on yet another beekeeping season behind us. To say that 2020 was a challenge would be an understatement of gargantuan proportions. As I write this in early October, I am keenly aware that Fall Conference and the election will be well under way. I hope they both go as smoothly as possible and the rest of the year is smooth sailing. On that note, please don't forget to bid in our online auction here: [www.biddingforgood.com/auction/auctionhome.action?vhost=orbeekeepersassoc](http://www.biddingforgood.com/auction/auctionhome.action?vhost=orbeekeepersassoc) or here: [m.biddingforgood.com/auctions/341696552](http://m.biddingforgood.com/auctions/341696552). Proceeds will be donated for honey bee research, and this is a great opportunity for all of us to make a difference.

The year 2020 certainly has had more than its fair share of strife and struggle with the pandemic, massive wildfires, civil unrest, and smoke-filled skies, just to name a few. These experiences compel me to be ever more present in the moment. If there is anything this year has taught me, it is that anything can happen and to savor every moment that we have with the people we love and doing the things we love. Our communities have experienced so much loss this year, and it is with great sadness I must report that we have also recently lost a friend of the bees and beekeepers in Tim King. I cannot imagine the grief that Bonnie King and Marjie Ehry must be experiencing. Please keep this family in your thoughts and prayers and consider donating to the Tim King Memorial Fund here: [www.gofundme.com/f/please-help-tim-and-his-family-recover](http://www.gofundme.com/f/please-help-tim-and-his-family-recover). There is no challenge we can not overcome if we pull together and look out for each other.

Speaking of pulling together, I would also like to thank Joe Maresh and the hard-working team of volunteers that helped pull together this year's virtual conference. This is an entirely new process for us, and it has been a lot of work, with a lot to learn at every turn. We could not have done it without your care and diligent efforts. In addition to this, the team has already begun planning our 2021 Centennial Conference and fundraising. We are hoping to meet in person next October in Florence, but, in the event we cannot, we will be drawing on the things we learned with this year's virtual conference. A centennial is a very special milestone for our group, or any group for that matter. As such, we have some very exciting things in the works that will provide us a great opportunity to yet again pull together and leverage our collective social networks to potentially make a positive impact for the bee

lab and hopefully have some fun doing it. Stay tuned for more information on this project.

2020 has taken so much from us, but we still have each other, and the world still needs bees and beekeepers. I firmly believe that every beekeeper and every bee hive makes the world just a little bit sweeter. It will be impossible to predict what trials and tribulations 2021 will bring us, but I am one hundred percent certain that, come what may, we will be stronger and better off by working together. It is such a privilege and an honor to be a part of such an amazing community of beekeepers. Thank you all so much for what you do and bring to the table. Beekeepers are such a tough, creative, and diverse lot that together there is almost nothing we cannot accomplish. I look forward to working together to help this organization thrive for another one hundred years in our mission to serve beekeepers, bees, and the communities in which we reside.

I sincerely hope this message finds your bees cozily tucked away for the winter with fat stores and low mite counts. Remember to take every opportunity you can to be present in the moment to look for some beauty around you, show loved ones how you feel, and embrace your passions.

May your 2021 bee gardens come up strong, the nectar flows be ample, and your days be full of cherishable moments.

*John Jacob*

## STATE OF THE OSU HONEY BEE RESEARCH AND EXTENSION PROGRAM

Hope you all are doing well and staying safe in these uncertain times. I would like to provide a quick update and future outlook on our honey bee research and extension program. I would also like to extend our heartfelt thanks to all for you for your continued and unwavering support for the past ten years.

It has been a pleasure and great satisfaction to serve you all through our research and extension program. Despite COVID-19 restrictions, we were able to complete most of our planned research projects this spring and summer that include research projects on Varroa and nutrition. We will provide research updates at the upcoming OSBA virtual conference, so please stay tuned.

Due to COVID-19, like many other organizations and agencies, Oregon State University is also facing significant budget cuts and we are anticipating a significant negative financial impact on our program, too. We are trying hard to secure as much funding as possible to sustain our research and extension programs in these challenging times to serve your needs by submitting grant proposals



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to several funding agencies. We are confident and hopeful that with your support and our efforts we will get through these difficult times. We wish you and your bees good health.

*Ramesh Sagili*



Thank you for all that OSU Honey Bee Lab does for our Pacific Northwest Beekeepers, Ramesh. As Grant and Foundation Chair for the Oregon State Beekeepers Association, I would like to encourage all of our members to help support Ramesh and the wonderful worker bees at the Honey Bee Lab.

Many of our members have made donating to OSU a priority for the past several years, and we thank you for your help. If you have not, please consider sending a donation during these tough times.

There are many ways that you are able to help honey bees! Four choices are listed in the column to the right. The OSBA Research Fund and the Agricultural Research Fund both send collected funds to the OSU Honey Bee Lab for current use, whereas the Northwest Apiculture Fund is more like a savings account . . . we are accumulating funds to eventually pay the salary of an apiculturist. The Scullen Fund is providing grants to OSU grad students. All are very important to the future of honey bees, but with the funding shortfall for 2021 the OSU Honey Bee Lab may need operating funds today.

*Jan Lohman*

**OSBA Research Fund:** All auction receipts are currently given to research as well as any donations specified as research to the OSBA.

To donate to the OSBA Research Fund by credit card or PayPal, visit [orsba.org/donations](https://orsba.org/donations) or mail your donation to OSBA Treasurer, PO Box 10, Aurora OR 97002 and place *Research Fund* on the memo line.

**Northwest Apiculture Fund for Honey Bee Research, Extension, and Education:** This fund was created by the Oregon State Beekeepers Association in 2007 as a long-term investment in the apiculture program at OSU.

Mail checks with cover letter to: The OSU Foundation, 4238 SW Research Way, Corvallis OR 97333. Please write *Northwest Apiculture Fund for Honey Bee Research, Extension and Education* on the memo line.

**Agricultural Research Foundation:** The Agricultural Research Foundation donates directly to the support of Dr. Ramesh Sagili's research.

Mail checks with *Honey Bee Program* on the memo line and a cover letter to: Agricultural Research Foundation, 1600 SW Western Blvd, Suite 320, Corvallis OR 97333.

**Herman A. Scullen Memorial Fellowship Fund:** This fund, established around 1981, supports OSU graduate students studying honey bees.

Mail checks to: The OSU Foundation, 4238 SW Research Way, Corvallis OR 97333, with a cover letter, and write *Herman A. Scullen* on the memo line please.

## From Oregon Prison Beekeepers

I have been carrying something with me, most of it unknown. Until recent the source of all in each blessed flower as bees dance and drink in the golden – glow of flower upon flowers, bees turn luminosity to a form by a form of hidden grace, wisdom gathered crystallized and embedded, is love fulfilled.

Loves eternal dance in the hive of our eternal home.

To belong what an amazing feeling to belong to something great, good, whole with a purpose and place in your hive.

*J. Hall-Rodgers*

### The Amazing Bee

As I sit and enjoy the gentle breeze  
I come to notice the many bees  
They are everywhere  
Flying here and there  
But watch more closely  
They are doing what they are supposed to be  
They are not acts of random buzzing  
One flower...two flower...three...four...a dozen

The bees are collecting, gathering and sorting  
They will be at this all of the morning  
Working diligently  
To ensure their security  
The growth and prosperity of the entire hive  
Is why these bees know they're alive  
There is no me, there is not mine  
There is the hive, the queen and the collective mind  
There are 3 kinds of bees if you please  
Workers, drones and the queen  
Which by the way won't be seen  
Because she stays at home making the babies  
Some are boys, but mostly ladies  
For ladies are the hardest of workers  
The foragers, the protectors and the nurtures  
The drones on the other hand  
Those are the boys  
Are only good for one thing  
Besides making noise  
Yep, you guessed it, impregnate the queen  
Then drop from the sky never to be seen  
No, I swear it's not a lie

*Continued on page 15*



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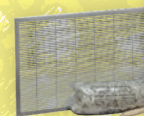
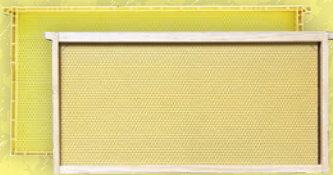


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## KEEPING BEES in NOVEMBER–DECEMBER

*Morris Ostrofsky*

As we approach late fall and early winter there are a number of management tasks we should consider. By this time you have done your fall inspection and the bees are settling in for the winter. Combining weak colonies is preferable to trying to keep each one going through winter. Joining two weak colonies versus adding a weak colony to strong is preferred. My suggestion is to use the newspaper method to do this. Don't forget that both colonies need ventilation while being combined.

If you have not already done so, remove queen excluders and add mouse guards.

While counter intuitive, it is not the cold but moisture that should concern us. As Rusty Burlew of *Honey Bee Suite* ([honeybeesuite.com](http://honeybeesuite.com)) says, there is a big difference experiencing a cold day with dry gloves versus wet. Wet gloves can lead to frostbite, while dry gloves keep you comfortable. The temperature is the same; the moisture is the difference.

With that being said, think about this as you prepare your hives for winter. There are various ways to absorb excess moisture from the hive. I have found the use of an insulated/moisture box containing burlap or other absorbent material, such as old towels, to be very effective. The insulated/moisture box serves a dual purpose: It keeps the bees dry as well as warm.

Start with a box that has the same footprint as a standard box. Then add 1/8-inch screened ventilation holes on the sides, and cover the bottom with 1/8-inch hardware cloth to keep the absorbent materials in place. Position the box just under the outer cover. Check the absorbent materials once or twice over the winter, and replace them as needed. It is fun to see what you find in the insulation box in spring. I have found mushrooms, worms, and even a frog. Early spring is when I remove the insulation box.

There is not a 100 percent agreement on the value of an upper winter entrance. However, I no longer recommend an upper entrance due to the chimney effect and heat loss. Warm air is lost through the upper entrance and is replaced by cooler air coming in from below. The sticky board can also be used for additional moisture control. The objective is to provide ventilation while at the same time help to block cold winter winds. Push it in roughly half way under the screened bottom board. This position is similar to what would be done for a mite count except it is

pushed in half way rather than all the way. In addition, the insulated/moisture box is not 100 percent air tight. It also allows some air flow in addition to absorbing moisture and keeping the bees dry.

By November, the bees should have stored approximately 80–100 pounds of honey. Less than this amount signals that continued feeding is necessary. According to Ann Harman, when day time temperatures are consistently lower than 57 degrees F, we should switch from a liquid to a solid feed. At this temperature, the bees have a more difficult time metabolizing sugar water and evaporating off excess moisture in the syrup. This is the time for solid feed. I like to use no-cook candy. Rusty's *Honey Bee Suite* site has a recipe for no-cook candy. I find it a simple and effective way to feed the bees during winter.

During fall/winter, the temperature occasionally reaches 50 degrees F or more. You should see your bees out doing cleansing flights. On these days, if you notice that a hive is inactive, it warrants closer examination. Lightly tap the side of hive and listen for a response. If you find the hive is a dead out, a necropsy is in order. Try to determine why it failed. If you have any doubts, see if you can get a more experienced beekeeper to help. Bee Labs such as OSU and Beltsville, Maryland, can also be used to diagnose American foulbrood and other diseases.

Hive entrances should be reduced this time of year to prevent robbing. You can either purchase a mouse guard or make many out of old queen excluders. The spacing allows the bees to pass through but stops mice. The entrance should also be periodically checked to make sure it is not plugged with dead bees. The undertaker bees don't carry bodies out very far when it is cold; they can pile up at the entrance. A mouse guard will prevent mice from using your hive as a warm, winter hide out.

November and December provide a late-season window of opportunity to deal with Varroa mites. After Thanksgiving, the colony should be broodless. If your mite counts are still above 1 percent, this is when you can use oxalic acid because there is no brood that it can harm. This can be your final safety net for the year. For the last several years, I have used oxalic acid resulting in mite counts at almost zero percent the following spring. Please keep in mind that, while oxalic acid is a great tool, it must be used at the appropriate time of year and safely. I suggest visiting Randy Oliver's website [www.scientificbeekeeping.com](http://www.scientificbeekeeping.com) for the latest application updates. Whatever method you choose, follow the directions exactly.



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Once the bees are tucked in for the winter, it is a good time to evaluate what you learned this year and make plans for next. Winter is also the time to build bee equipment and gizmos/gadgets. It is also a great time to read about bees and beekeeping. A great source of winter reading is Tom Seeley's newest book, *The Lives of Bees: The Untold Story of the Honey Bee in the Wild*. I have also found "Beekeeping Your First Three Years," a newer publication from A.I. Root, to include valuable information even for someone like me with 50 plus years of beekeeping experience.

## BEE EVENTS

### — 2020 —

**November 4, 11, and 14.** Remaining half of the Oregon State Beekeepers Association Fall Conference. Information: [orsba.org](http://orsba.org). See conference agenda on page 2. Online registration is open; all conference sessions will be available for 30 days after the event.

**November 17–19:** California State Beekeepers Association Convention. Information: [www.californiastatebeekeepers.com/annual-convention](http://www.californiastatebeekeepers.com/annual-convention).

**December 3–4:** American Honey Producers Association Video Conference. Information: [www.ahpanet.com/ahpa-2020-december-virtual](http://www.ahpanet.com/ahpa-2020-december-virtual).

### — 2021 —

ABF Conference & Tradeshow. Postponed until 2022.

**July 8–10:** Annual Western Apicultural Society Conference, and **July 11 & 12–13:** Technology Demonstration Field Camp & 4th International Conference on Bee and Hive Monitoring. Missoula, Montana. Information and updates: [westernapiculturalsociety.org](http://westernapiculturalsociety.org).

## REGIONAL NEWS

### Regional Representatives

#### North Coast

Pretty rainy on the coast right now, but I don't think any of us will be complaining about rain for a while. The smoke is gone, but the cleanup has just begun. Central Coast has been holding Zoom meetings for their members and Tillamook has started having socially distanced member meetings at their new honey house. Bees are undoubtedly using this down time to clean house (bye-bye drones), and beekeepers are taking a breath before planning winter hive maintenance. It was disappointing this year to miss out on the county and state fairs as well as so many other state and local activities, and we are so grateful to OSBA and to the speakers and other participants for making the effort to produce a fall conference under COVID-19 conditions. *Kathy Cope*

### Regional Associations

#### Central Oregon Beekeepers

Our hives are all buttoned up. There were end of season feeding and mite treatments going on in October. Hopefully, by now the honey is all extracted and processed. We'll be working on the "products of the hive" projects (candles, lotions, and other wax- and honey-related items) prior to the holidays. We're hearing about a La Niña forecast for the winter, which for our side of the mountains indicates more moisture. Our main hope is that the temperatures are low enough that most of it falls as snow in the mountains. We've had quite a drought intermittently over the last several years, and we need to refill the reservoirs and aquifers for people and agriculture.

Generally, other than the obvious issues of not enough stores and weak colonies starting the winter, the causes of winter loss in central Oregon center around three primary issues: Mite loads, starvation after a warm spell, and heavy snows—all of which may interact with one another. Our members have worked a lot on education about reducing mite loads as well as improving the overall stores of their hives and various methods of emergency feeding. The one issue which still vexes beekeepers in the high desert is losses after we have a 3- or 4-foot snow where the hives don't show obvious symptoms of starvation, but just lots of dead bees on the bottom board. The suspicion is that it's a combination of the other two

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issues as well as suffocation, but the jury is still out.

With the COVID-19 issues, we haven't had any in-person meetings since last March and are really missing the social aspect. We are finding a great need for a beginner's bee school next spring to help out many of our newer beekeepers. We'll be watching to see how others are able to conduct these and would like to coordinate ideas if possible.

Our meetings continue to be on the 4th Tuesday of each month, virtually. Please feel free to join us, the invitation is on our website at [www.cobeekeeping.org](http://www.cobeekeeping.org). *Allen Engle*

### Columbia Gorge Beekeepers

The 2020 season is rapidly coming to a close. What a year! February, typically a continuation of winter weather, found 2020 with warmth the entire month. In fact, February could be relied on to bring one week of sunshine bringing one to think the cold days were behind. But alas 2020 changed to pleasantness. But then March arrived with typical Columbia Gorge weather of cold and damp conditions. For the bees, this translates into a rapid ramp up of population only to find a lack of foraging weather to feed the tribe. The nectar flow west of Mosier comprises blackberries, which made their show in late May. East of Mosier found improved opportunities with an abundance of flowers decorating the landscape. The rains ceased in May to bring about a typical drought lasting into September.



The dry spell unfortunately opens the door to fires caused by lightning and careless humans. Here in the Columbia Gorge, we were fortunate to have a splattering of fires which consumed few acres and were extinguished in short order. But the fires to the south blanketed the entire area with dense smoke. CO<sub>2</sub> levels rose dramatically.

The poor bees were unable to forage. Precious winter stores were consumed. Varroa mite infestation became a constant challenge. The result was a number of hives with poor spotted brood patterns with open brood evident in cells lacking bee bread. For many reasons, we will all be looking forward to New Year's Eve singing, "Should auld acquaintance be forgot, And never brought to mind?" It will be a time to reflect on the year's tragedies, hives lost in fires, to Varroa, to poor nutrition, and possibly some distracted by the plethora of stressors failed to recognize the signs of demanding stewardship. *Jerry Frazier*

### Lane County Beekeepers

The Oregon Bee Project, through Oregon State University Extension, maintains the official collaborative website to assist beekeepers, citizen scientists, educators, gardeners, growers, landscapers, conservationists, and land managers to support the nearly 500 species of bees in our state. These pollinator species are vital to our food supply and the natural environment.

Their valuable work has been recognized by the Lane County Beekeepers, and to help support them we were given an original watercolor painting by one of our members, Janine Piersey. The painting shows honey bees gathering pollen from golden coneflowers. We held a drawing for the opportunity to win this 21 x 27 framed artwork. Our membership certainly stepped up to buy/sell tickets. The grand total donated to the OBP is \$735!

We are pleased that Andony Melathopoulos was able to draw the winning ticket at our October Zoom meeting. Congratulations, Lynn Hellwege, Eugene! *Pam Leavitt*

### Oregon Central Coast Beekeepers

It appears that the central coast has had a good honey year in comparison to other areas, which may actually be because we generally have a much lower yield than those whose weather is warmer, drier, and less windy than ours. Because of the lack of rainfall this year and warmer than usual weather, our average yield was up about a couple of gallons. This has provided us with enough excess to participate in the Florence Farmers Market "Fill Your Pantry" event, where the association is selling honey to raise funds for honey bee research and the OSU Honey Bee Lab. We hope that this will become an annual event that will boost our donations as it grows.

Association members are experiencing Zoom fatigue, and the participation in online association meetings has dropped to the point that we have decided to cancel the last two meetings of the year and focus on getting 2021 going with a bang. We hope to have good participation in the OSBA virtual conference as the topics are compelling and the lineup of speakers should provide an excellent opportunity to increase knowledge and see some demonstrations.

Regarding the fire season, the central coast was virtually untouched by actual fires except for two small ones in Mapleton and in the Lincoln City area. A few hives were damaged in the Lincoln City area, but the smoke and fire in Mapleton did not appear to deter the bees, who produced a bumper crop of Japanese knotweed honey. *Becca Fain*

### Portland Metro Beekeepers

It is early October as I write this. The Oregon wildfires and

ensuing smoke that made many of us anxious and our bees confused have abated. Much needed moisture has returned and is likely to come again soon to our area. Meanwhile, we have had some glorious clear and warm days. With later sunrises and cooler morning temperatures, the ladies may not start flying as early as they have in past months, but foragers are still busy bringing in needed resources and making visits to the last of the borage blossoms and English ivy, among other late-blooming plants.

Mid-summer Varroa mite numbers seemed low and quite manageable. Hives were taking feed and brood numbers were going up. All was looking well for healthy hives in fall and preparing for winter. Rechecking hives in late summer, a few of us were surprised and alarmed at how quickly mite levels spiked up. On went the treatments to quickly knock down the numbers and get Varroa mites in check. As stewards of our honey bees, we do what is necessary to help our colonies stay healthy and build their numbers.

Our October association meeting included an informative presentation by Emily Carlson, a graduate student at Oregon State University working in the Honey Bee Lab. Emily gave a presentation on research she and the Honey Bee Lab have started to look at pesticide exposure and risk to bees (native and honey bees). The research is scheduled to continue for two years, and we hope it will shed some light on what bees are experiencing and provide recommendations for keeping our colonies as healthy as possible.

Also, at the October meeting, we were excited to be able to provide four PMBA members with registrations for the upcoming OSBA fall conference. The agenda looks great and is packed with many renowned and knowledgeable presenters with a full spectrum of topics for beekeepers at any level of experience. And, because it is virtual, it will be convenient and easily accessible.

As you read this, our bees will be tucked away for the season. With skill, diligence, and some good luck, they are healthy, mite free (as mite free as possible), and have plenty of honey and pollen to sustain them through the

fall and winter months. Now we start planning for the next phase of our beekeeping hobby, passion, or business: Maintenance of equipment, organization, and planning for the upcoming year. Oh, and maybe just a little down time to recharge our batteries for 2021. Happy beekeeping!

*David Schwartz*

### Portland Urban Beekeepers

Where did the year go?! It's hard to believe it traveled at the same pace as last year and the year before. In such a chaotic year, it's nice to contemplate the simplicity of the bees: Their daily lives guided by the movement of the sun and the drum of the rain, all of which come and go. For many people, bee stewardship is a meditative and peaceful part of their lives and in winter we must let our thoughts go to spring where we can start again in a fresh new year. Fall, too, is marked by new blooms which herald the transition into cooler weather—sunflowers, asters, sedums are all coming into their time as are fall crops such as broccoli, squash, and radishes.

There is ongoing chatter about mites (is there ever NOT chatter about mites?) and that they may be particularly bad this year. Several PUB members treated their hives, only to still encounter high mite loads. This may require extra attention this winter to ensure survival, and it will be interesting to see how PUB colonies fare come spring 2021.

We were fortunate to have Dr. Andony Melathopoulos of the Oregon Bee Project at OSU join us for our October meeting. He gave us a preview of his talk at the OSBA conference on native bees. His focus was on the relationship between native bees and honey bees and whether honey bees have a negative effect on native bees. One of these areas is forage competition, and whether honey bees crowd out native bees from flowers they would typically visit. Studies are still ongoing, but one of the ways people can support native bee populations is by having a variety of flower forms because different bees frequent different shaped flowers. The Oregon Bee Project website is full of great information and highlights ways to get involved in the preservation of native species—check it out!

PUB wishes all the Oregon beekeepers and bee lovers a wonderful holiday season, and we'll see you again in 2021.

*Jessica Anderson*



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### Swarm Call

The swarm call list will be “reset” at the end of the year to ensure that those who use the list are able to reach someone interested and available to help. Members will receive a notice when the 2021 list is open.



**Agrivoltaics—Continued from page 1**

beneficial microclimate under the panels can also mean a much longer blooming period.

Colocating solar farms and honey bee apiaries was pioneered in England around 2010, then jumped the pond to Canada and New England (Mike Kiernan of Bee the Change), to Minnesota and the Midwest (Dustin and

**First-Hand Experience**

As an advocate and early adopter of agrivoltaics for bees, my business Old Sol Enterprises has forged collaborations with a half dozen different solar companies in Oregon and beyond. The fruit of these endeavors has exceeded our expectations. One such collaboration with Pine Gate Renewables, a solar developer, and Fresh Energy, an independent nonprofit, has resulted in Old Sol operating the largest solar bee farm in North America and possibly the world; this will soon be surpassed by other projects we are working on and some new installations going in (D). The 40-acre Pine Gate site located near Medford has a nameplate capacity of 10 megawatts, has been planted with native species selected for nectar and pollen production, and scored more than 90 points on a pollinator-friendly solar scorecard. The surrounding area includes a stream, orchards, and open grassland. Coming to the site midway through the season, I was pleased with the harvest and look forward to continuing on the site.

**Pollinator-Friendly Solar Scorecards**

Vetted by entomologists including Drs. Marla Spivak, May Berenbaum, Dennis VanEngelsorp, Scott McArt, Harland Patch, and Adam Dolezol, pollinator-friendly solar scorecards tell you whether a solar farm provides beneficial habitat — whether the benefits are real, or something else. Fresh Energy publishes links to regional pollinator-friendly solar scorecards on its website at BeesLoveSolar.org (see page 14).

Solar arrays are first and foremost energy generation facilities, but, outside of the desert Southwest, every project has to use some kind of ground cover to stabilize the soil. The seed mix for ground cover can be specially designed to create a low-growing meadow that is resilient to droughts and downpours — and also beneficial to honey bees and native bees. The forage won't result in huge hundred-plus pound hauls of honey — the ground cover needs to be diverse in order to mitigate risk of any one species failing — but it will provide a healthy source of honey bee nutrition and also benefit the broader ecosystem. Ellen Topitzhofer's work (D) at Oregon State University reinforces the importance of a diversity of pollen sources to overall honey bee health.

Whatever the ground cover, make sure you're only placing hives on or near solar farms that meet these pollinator-friendly solar standards. Selling honey from apiaries on a solar farm covered in turfgrass or gravel hurts us all. We all need acres of healthy forage for our bees, and the public loves rewarding companies that help "save the bees" with repeat business and positive word-of-mouth marketing.

Grace Vanasse of Bare Honey), and onward to the Pacific Coast. Pollinator-friendly solar has been highlighted in a webinar by the US Department of Interior's National Conservation Training Service in two *Scientific American* articles, a recent mainstage talk at the American Beekeeping Federation conference, and is being actively studied by the National Renewable Energy Laboratory, a division of the US Department of Energy. The Pine Gate solar array near Medford is one of the sites included in a study, called *InSPIRE*, which is looking at co-location of solar and agriculture, as well as vegetation performance on more than 20 solar sites nationwide.

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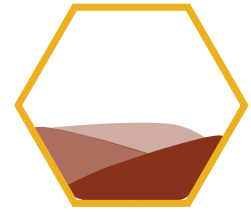
**Queen Bee Economics**

| References  | Item                                     | Yield per queen | Average retail value                  |             |
|---|--|-----------------|---------------------------------------|-------------|
| Old Sol Enterprises LLC   | Queen                                    | 3               | \$34.00                               | \$102.00    |
| Old Sol Enterprises LLC   | colony produced/split                    | 3               | \$180.00                              | \$180.00    |
| Old Sol Enterprises LLC   | almond pollination service               | 1               | \$200.00                              | \$200.00    |
| Old Sol Enterprises LLC   | Pear pollination service                 | 1               | \$50.00                               | \$50.00     |
| Old Sol Enterprises LLC   | blueberry pollination service            | 1               | \$85.00                               | \$85.00     |
| Old Sol Enterprises LLC   | lbs honey crop                           | 40              | \$8.00                                | \$320.00    |
| Sansoni Agri Enterprises, personal communication  | lbs almonds/queen*                       | 1400            | \$7.00                                | \$9,800.00  |
| <a href="http://arec.oregonstate.edu/oaeb/files/pdf/EM8822-E.pdf">http://arec.oregonstate.edu/oaeb/files/pdf/EM8822-E.pdf</a>   | Lbs pears/queen*                         | 2,100           | \$1.40                                | \$2,940.00  |
| <a href="https://blueberries.ces.ncsu.edu/wp-content/uploads/2012/10/evaluating-the-profitability-of-blueberry-production.pdf? fwd=no">https://blueberries.ces.ncsu.edu/wp-content/uploads/2012/10/evaluating-the-profitability-of-blueberry-production.pdf? fwd=no</a> | Lbs other pollination/queen (blueberry)* | 4,000           | \$3.88                                | \$15,520.00 |
| *Assume 2 hives/acre for pollination service  |  |                 |                                       |             |
|   |  |                 | Direct \$ impact per queen Sub Totals | \$29,197.00 |



# Solar Site Pollinator Habitat Assessment Form for Project Planning

For solar companies and local governments to meet pollinator/wildlife  
habitat certification



**1. PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY WILDFLOWERS**

- 31-45 % +5 points
- 46-60 % +10 points
- 61+ % +15 points

Total points

*Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds (from all seed mixes) to be planted.*

**2. PLANNED % OF SITE DOMINATED BY NATIVE SPECIES COVER**

- 26-50% +5 points
- 51-75%. +10 points
- 76-100% +15 points

Total points

**3. PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and wetland mixes can be combined)**

- 10-19 species +5 points
- 20-25 species +10 points
- 26 or more species +15 points

Total points

*Exclude invasives from species totals.*

**4. PLANNED SEASONS WITH AT LEAST 3 BLOOMING SPECIES PRESENT (check/add all that apply)**

- Spring (April-May) +5 points
- Summer (June-August) +5 points
- Fall (September-October) +5 points

Total points

*See BWSR [Pollinator Toolbox](#) about bloom seasons*

**5. AVAILABLE HABITAT COMPONENTS WITHIN .25 MILES (check/add all that apply)**

- Native bunch grasses for nesting +2 points
- Native trees/shrubs for nesting +2 points
- Clean, perennial water sources +2 points
- Created nesting feature/s (bee blocks, etc.) +2 points

Total points

**6. SITE PLANNING AND MANAGEMENT**

- Detailed establishment and management plan developed (see [example plan](#)) with funding/contract to implement +15 points
- Signage legible at forty or more feet stating pollinator friendly solar habitat (at least 1 every 20ac.) +5 points

Total points

**7. SEED MIXES**

- Mixes are composed of at least 40 seeds per square foot +5 points
- All seed genetic origin within 175 miles of site ([pg.7-8 of Guidance](#)) +5 points
- At least 2% milkweed cover to be established from seed/plants +10 points

Total points

**8. INSECTICIDE RISK**

- Planned on-site insecticide use or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.) -40 points
- Communication/registration with local chemical applicators about need to prevent drift from adjacent areas. +10 points

Total points

Grand Total

**Provides Exceptional Habitat >85**  
**Meets Pollinator Standards 70-84**

Project Name: \_\_\_\_\_  
 Vegetation Consultant: \_\_\_\_\_  
 Project County: \_\_\_\_\_  
 Project Size: \_\_\_\_\_  
 Projected Seeding Date: \_\_\_\_\_

*Send completed forms, project plans, seed mixes and any communication with pesticide applicators to [dan.shaw@state.mn.us](mailto:dan.shaw@state.mn.us)*

*Note: Measurements of percent "cover" should be based on "absolute cover" defined as the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above. To measure cover diversity it is recommended to use plots, and/or transects in addition to meander searches for accurate measurements. Wildflowers in question 1 refer to "forbs" which are flowering plants that are not woody, and are not graminoids (grasses, sedges, etc) and can include introduced clovers and other non-native species beneficial to pollinators.*



It's not all serious though—the success of this site and apiary led to a fun collaboration with award-winning Caldera Brewing of Ashland, Oregon. Using some of the solar farm honey, Caldera created “Let's Bee Friends Honey IPA” to help bring farm, beekeeper, and energy folks together. The beer was created as a delicious way to spread awareness about pollinator-centric agrivoltaics and is available on draft and will be canned for distribution beyond Oregon. Public support for solar may be high, but public support for beer is nearly universal—especially a beer that celebrates clean energy and environmental stewardship.

### Some Roses, Some Thorns

Replicating this success is not as easy as one would think despite the dire need for pollinator habitat and clean energy. Resistance to solar projects comes from many corners, including farm conservation groups, NIMBYs (Not In My Back Yards), and some farm organizations. Unfortunately, there are a lot of solar systems with bare ground or gravel and surrounded by prison-style chain link fences. However, there are also a growing number of pollinator-friendly solar projects and designs. Beekeepers, as an industry, would be wise to address these various groups' concerns to help the dual-use solar movement create many thousands of acres of pollinator habitat.

There are several sticking points that come up when trying to get a solar/pollinator agrivoltaic project approved. One simply is getting local authorities and other stakeholders to recognize honey bees as livestock and a high-value farm use. This can be addressed by educating people about the role and economic value pollinators have in our agricultural system. According to Cornell University, insect pollination contributes more than \$29 billion to the US agricultural economy (E). Another impressive number is the value of crops pollinated by a colony headed by a single industrious queen bee (see Queen Bee Economics table, page 13). In one year, a single queen can be the linchpin in the production of at least \$29,000 in agricultural production annually by a commercial beekeeper. Never let it be said that beekeepers are not performing high-value farming with our tiny and hard-working livestock.

*To be continued*

(A) <https://en.wikipedia.org/wiki/Agrioltaic>

(B) <https://uk.reuters.com/article/us-solar-iea-electricity/solar-energy-could-dominate-electricity-by-2050-iea-idUKKCN0HO11K20140929>

(C) <https://www.theguardian.com/environment/2017/dec/14/a-different-dimension-of-loss-great-insect-die-off-sixth-extinction>

(D) “Effects of pollen collected by honey bees from pollination dependent agricultural cropping systems on honey bee nutrition” Oregon State University. <https://ir.library.oregonstate.edu/downloads/v979v637n>

(E) <http://news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income>

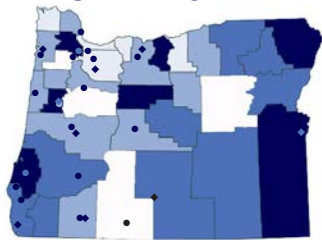
### Oregon Prison Beekeepers—Continued from page 5

They only hang out with other drones in the sky  
 And wait patiently for the queen to fly by  
 Then they give her their gift and immediately die  
 So the queen comes home now ready to lay  
 Thousands of eggs day after day  
 Yes, I said thousands every day  
 For making these babies is the only way  
 To stay strong and flourish  
 With bees always working to feed and nourish  
 They are a team, they're a unit  
 Never asking who's gonna do it  
 They're born out of the comb  
 And they immediately know  
 Their first task is upon them  
 As they continue to grow  
 As they age they enter a new stage  
 Of dedication and devotion  
 These bees I tell you are always in motion  
 They live short lives, but get a lot done  
 Here for a few weeks and they are gone  
 There's nurse bees to get rid of the crazies  
 The tender taker bees get rid of the dead  
 And clean up the mess  
 The filler bees deliver food to renew zest  
 There's a waggle dance these bees do  
 To let their sisters know where to find food  
 Some bees fan their wings to send a message  
 Just one way they communicate and leave a vestige  
 Others know their job indeed  
 Is to surround the queen and meet her every need  
 Yet others still find other things  
 To do with those amazing wings  
 Like warming the air to a perfect 95  
 To keep the brood nest warm and alive  
 The brood nest is the nursery region  
 Where hopefully bees will be borne by the legion  
 Oops, I almost forgot  
 About the bees wax and honey  
 Not only is it yummy  
 It brings in good money  
 So let's recap from the top, you see  
 Bees are amazing! Wouldn't you agree?  
 They pollinate flowers  
 They pollinate fruits  
 They stay busier than business men  
 Do in their suits  
 Is that line from Dr. Seuss?  
 No, I guess not. It's just me  
 Sharing my love for these clever little bees  
 Oh, one more tip I'd like to share  
 When bees are around, please take care  
 Don't act a fool, swat and flail  
 Calmly turn around and simply bail  
 They don't want to sting  
 They truly are busy, doing other things  
 But if they do, then get away  
 Cause the scent they emit  
 May send more your way ☺

*C. Finch*

## Oregon State Beekeepers Association

### EXECUTIVE COMMITTEE



#### OSBA OFFICERS

##### President

John Jacob—541.582.2337; oldsolbees@gmail.com

##### Vice President

Joe Maresh—503.703.5060; joemaresh@bctonline.com

##### Secretary

Karen Finley—541.753.4120; osba.secretary@gmail.com

##### Treasurer

Joe Hansen—503.824.2265; osba.treasurer@gmail.com

##### Past President

Harry Vanderpool—503.399.3675; shallotman@yahoo.com

#### ♦ OSBA REGIONAL REPRESENTATIVES

##### North Coast

Kathy Cope—541.264.9222; beachwalkinlady@hotmail.com

##### South Coast

Mureen Walker—541.425.0535; mureen.walker.111@gmail.com

##### Columbia Basin

Bill Edwards—541.354.2223

##### Eastern Oregon

Jordan Dimock—541.372.2726

##### Portland Metro

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##### South Central Oregon

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##### Southwestern Oregon

Eric McEwen—541.415.5171; beetruhoneybees@gmail.com

##### North Willamette Valley

Steven Coffman—503.838.2981

##### South Willamette Valley

Tim Wydronek—541.740.4127; timwydronek@comcast.net

#### • AFFILIATED REGIONAL ASSOCIATIONS

##### Central Coast Beekeepers

Meets 6:00 PM, fourth Wednesday, Newport  
President: Becca Fain—rfain18@gmail.com  
Website: www.ccbaor.org

##### Central Oregon Beekeepers

Meets 6:00–7:30 PM, fourth Tuesday, Bend  
President: Allen Engle—aengle@bendbroadband.com  
Website: www.cobeekeeping.org

##### Columbia County Oregon Beekeepers

Meets 6:00 PM, first Thursday, Deer Island  
President: Linda Zahl—503.799.7073  
Facebook Page: ColumbiaCountyOregonBeekeepers

##### Columbia Gorge Beekeepers

Meets 6:15–8:15 PM, third Wednesday, Hood River  
President: Jerry Frazier—jerry1.frazier@gmail.com  
Website: gorgebeekeepers.org

##### Coos County Beekeepers

Meets 6:30 PM, third Saturday, Myrtle Point  
President: Randy Sturgill—541.430.4095; randys@rfpc.com

##### Douglas County Bees

Meets 7:00–8:30 PM, first Wednesday, Roseburg  
President: Jack Reilly—douglascountybees@gmail.com  
Website: www.douglascountybees.org

##### Klamath Basin Beekeepers

Meets 9:00 AM, third/fourth Saturday, Klamath Falls  
President: Paul Davitt—president@klamathbeekeepers.org  
Website: www.klamathbeekeepers.org

##### Lane County Beekeepers

Meets 7:30 PM, third Tuesday, Eugene  
President: Mike France—michaelj62@gmail.com  
Website: www.lcbaor.org

##### Linn Benton Beekeepers

Meets 6:30 PM, third Wednesday, Corvallis  
President: Everett Kaser—everett@lbba.us  
Website: www.lbba.us

##### Oregon Prison Beekeepers

Program Manager: Chad.E.Naugle@doc.state.or.us

##### Oregon South Coast Beekeepers

Meets 6:00 PM, third Tuesday, Gold Beach  
President: Jesse Fletcher—jesse.l.fletcher@gmail.com

##### Portland Metro Beekeepers

Meets 7:00 PM, second Thursday, Gladstone  
President: Doug Sieckmann—503.804.5417  
Website: portlandmetrobeekeepers.org

##### Portland Urban Beekeepers

Meets 7:00–9:00 PM, first Wednesday, Portland  
President: Cheryl Wright—cwright80@hotmail.com  
Website: portlandurbanbeekeepers.org

##### Southern Oregon Beekeepers

Meets 6:30–9:00 PM, first Monday, Central Point  
President: Risa Halpin—rhalpin906@gmail.com  
Website: southernoregonbeekeepers.org

##### Tillamook Beekeepers

Meets 6:30–8:00 PM, second Tuesday, Tillamook  
President: Brad York—dbradleyork@gmail.com  
Website: www.tillamookbeekeepers.org

##### Tualatin Valley Beekeepers

Meets 6:00 PM, last Tuesday, North Plains  
President: Debby Garman—debbygarman@gmail.com  
Website: tvbabees.org

##### Willamette Valley Beekeepers

Meets 7:00 PM, fourth Monday, Salem  
President: Richard Farrier—rfarrierfarms@gmail.com  
Website: wvbahive.org



## Oregon State Beekeepers Association Membership Form

The **Oregon State Beekeepers Association** is a nonprofit organization representing and supporting all who have an interest in honey bees and beekeeping. Membership is open to anyone with an interest in bees and beekeeping. You do not need to own bees or reside in Oregon to join. Membership includes the ongoing work of the organization on behalf of the honey bee and beekeeping, a vote in OSBA elections, swarm call listing, four free online classified ads per year, discounts on publications, and an annual directory and subscription to *The Bee Line*.

Please send check made payable to OSBA with a **completed form for each individual to:**

**Oregon State Beekeepers Association, Membership**  
4207 SE Woodstock Blvd, Ste 517, Portland, Oregon 97206

**Date:** \_\_\_\_\_  New Member  Membership Renewal

**First Name:** \_\_\_\_\_ **MI:** \_\_\_\_\_ **Last Name:** \_\_\_\_\_

**Company name:** \_\_\_\_\_

**Type:**  Small scale (less than 25)  Sideliner (25–300)  Commercial (more than 300)

**Mailing address:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

**Telephone number:** \_\_\_\_\_ **e-mail address:** \_\_\_\_\_

**Newsletter:** Please select version:  Digital  Print **County:** \_\_\_\_\_

**Membership Directory:** The OSBA respects the privacy of members. Please indicate contact information to be included in a directory mailed to OSBA members only:

Do not include contact information

Share all information *OR* Share:  mailing address  phone number  e-mail address

**Local group, if member:** \_\_\_\_\_

**Membership dues:** \$40 per person (\$50 per person outside the US) \$ \_\_\_\_\_

**Voluntary contribution(s):**

General Fund \$ \_\_\_\_\_

Research Fund \$ \_\_\_\_\_

**Total amount enclosed:** \$ \_\_\_\_\_

**Note:** To renew or join online, please visit:  
[orsba.org/membership](http://orsba.org/membership)

*Thank you!*

**New memberships entered through the end of 2020 extend throughout 2021.**





Oregon State Beekeepers Association  
 4207 SE Woodstock Blvd Ste 517  
 Portland OR 97206  
 orsba.org

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|---|
| Non-Profit Org.<br>U.S. Postage<br>PAID<br>Permit No. 460<br>Portland, OR |
|---|

— Peace on Earth —

Best Wishes of the Season and for the New Year to One and All

**The Bee Line**

*The Bee Line* is the official publication of the Oregon State Beekeepers Association. Annual subscriptions to the newsletter are included with membership.

Please send news about your bees and your experiences in keeping them, as well as events, corrections, comments, questions, photographs and stories, interviews, recipes, points of view—and ads/ advertising—to: Rosanna Mattingly, *The Bee Line*, 4207 SE Woodstock Blvd Ste 517, Portland OR 97206; e-mail: [osba.newsletter@gmail.com](mailto:osba.newsletter@gmail.com). It's *your* newsletter—we want to hear from you!

The next issue to be printed will be the **January-February** issue, 2021. The deadline for submitting copy is **December 10, 2020**. Please let me know if you find difficulties with the deadline so we can work out the space and timing for the material.

*May all be well!*

**Advertising**

**Per Issue**

|  |                |
|--|----------------|
| <b>Event</b>   | <b>Listing</b> |
| All events, space permitting (15 words)  | <b>Free</b>    |
| <b>For a nonprofit group event</b> , an additional 30 words (total of 45) in the listing or an article | <b>Free</b>    |
| <b>Advertising</b>   |                |
| Business card  | \$10.00        |
| Quarter page   | \$25.00        |
| Half page  | \$50.00        |
| Full page  | \$100.00       |
| <b>Classified Ad</b> (30 words)  |                |
| Members  | \$3.00         |
| Nonmembers   | \$5.00         |