

## Spring 2020 Observations: Best Management Practices for Mason Bees *Weather Issues or "Can I put my bees out?"* From Rich Little

For the past couple of years, I have been seeing a growing mismatch between the temperatures, blooming and presence of pollinators. Because of this mismatch we should be asking ourselves, "Do we have a role here? Should we be doing things differently than in past springs?"

I have listed what I feel are modifications or changes of our past procedures that we should now follow in our management of our Mason Bees in the coming years. The Spring period now seems to have more extreme temperatures (highs and lows) followed by periods of cold temp and/or cold rain. We are seeing some flowers blooming earlier than past years. When there are no late season freezes or long periods of cold rains and the pollinators come out, it would seem like the beginning of a great spring. Unfortunately, that is not what we have been experiencing. Last spring for example, we got a warm period in March followed by a longer period of cold temp and rain. Many of the pollinators I observed did not survive this period, so we got fewer successful pollinations and fewer bees produced as many of them had died off.

Why did this happen? The more likely reason is the bees starved due to lack of food and/or got stuck out in the field due to the cold and could not fly back to their nest. For those bees that had nested outside and not in our refrigerator the winter conditions likely did not favor the bees. Let me explain. When the Mason Bee larva forms its cocoon in the fall of the prior year, the bee changes from a larva into a pupa and then into a fully developed adult within a cocoon. She now hibernates for the next 7-8 months in that cocoon. All this time she has not eaten any food since she was in a larva stage way back in the summer of the prior year. All the fat reserves she developed in the larva stage must carry her through each stage and through the spring of the coming year when she emerges. During the winter even though she is not 'doing' anything she is using some of her fat reserve to stay alive. Warmer temperatures cause the female to use more of her fat reserve. That means if the winter has warmer temperature periods than average, she will use more of her fat reserve not less. If she encounters colder periods in the spring after she emerges from her cocoon and finds no food, she will use more of her fat reserves to stay alive until warm weather produces the food she needs.

This is one of the major reasons why we keep the cocoons in our refrigerators at a low temperature. It is to protect her fat reserves. This need to protect her fat reserves is also why we are conservative on choosing when we will put out the bee cocoons in the spring. It is easier to put them out too early and hard to put them out too late. You might be thinking that in nature the bees are coming out days before we suggest you put them out and you are correct. As we have seen however, in the last couple of years the

survival of our released bees is higher than the naturalized bees because we have actively tried to protect their fat reserves.

Even with these efforts in the southern part of the Willamette Valley it was a poor year for many of our bees (not all but many areas this past year). An important way to deal with the weather changes we have been experiencing is a variation of the old saying about being careful not to put all your eggs in one basket. We do this by not putting all our cocoons out at the same time but rather put out only some of our cocoons in stages. That way if we do have a period of poor weather for the bees where they may not survive that stressful period, we have some more cocoons in reserve to get around this issue. This is why we tell you if you have 50 or more cocoons only put about half and then wait a week or 10 days and put the rest out. Each time you put out cocoons however, be sure you put out at least 20-25 cocoons so you have enough of males and females survive to mate and for the females to reproduce.

## **Food resources and the quality of that food**

In addition to some of the factors I listed above, the availability and the quality of the flora food resources is the other half of the equation that makes up the answer to the question "Can I put my bees out now? I see flowers."

In my yard I have several Big Leaf Maples, Oregon Grape and a small stand of willows 30 yards away that I check to see if enough food is out for the bees. None are yet producing much if any pollen. If you have these plants in your yard or nearby pay attention to these to get the answer to the 'big' question, "Can I put out my cocoons?". Just because flowers are blooming does not mean there is sufficient food resources for your bees. Some blooms produce no useful food (they are a green desert), while some only produce pollen and others only nectar.

## **Mighty Thoughts About Mites and Why Sanitation is so Critical to our Mason Bees Breeding**

In some areas pollen mites are becoming a bigger issue and are having a negative impact on our Mason Bees. What is happening, why and what should we do about this issue? First a couple of things about the pollen mites. The mites do not attack or harm the adult bee unless there are so many mites on the bees that they cannot fly. As the name suggest they eat pollen. When the female bee is provisioning her nest for her offspring, she does so by building pollen and nectar ball on which she lays one egg. When it hatches the larva that comes out will feed on the ball of pollen and nectar. If there are pollen mites in the cell that holds the egg and pollen ball, the mite will eat all the pollen starving the newly hatch bee larva. Worst yet for the bees, in the following

spring when the new surviving bees emerge from their nest, they have to crawl through some cells that are now completely filled with pollen mites. The newly emerged bee now has pollen mites on them. If they can fly, they will mate spreading the mites to their partners while both are feeding on flowers and thus spreading more mites to the flowers they visit. Last and worse, when the female bee creates her egg cell, she will leave mites in the cells and the mites then eat all the pollen starving the bee larva. The solution: Get rid of the mites. That is easy to say, but so far we have not found a way to do this in a way that will not also harm the bees.

We harvest the cocoons and then either wash the cocoons in a bleach/water bath or use a 'sand wash' to get rid of the mites. The bleach/water bath will not kill all of the mites, but most of them. The reason it works as well as it does is that the bleach will dissolve the outer surface of the cocoon. Cocoons are made out of silk. Yes, the same kind of silk that silk worms produce and bleach will dissolve silk. The bleach wash removes or dissolves most of those outer areas where the mites can hide and hold on to the cocoon. The mites that survive however can reproduce and re-infest that cocoon and the surrounding cocoons and nesting blocks/tubes.

The sand wash physically removes the mites. The cocoons infested with mites are put into a container with sand which is then shaken or tumbled to remove the mites. The biggest issue I have with this method is that if chalkbrood (a fungus) is in that nesting system, the sand wash will likely spread it to all cocoons that are run through the sand wash container also infesting other parts of the nesting system.

Regardless which system you use, we are now beginning to realize that these mites can survive on the tubes, blocks and houses we use to breed Mason Bees, compounding the problem.

Right now, I am using heat to sterilize my blocks, tubes, houses, and tools. The heat source is a propane heater where I can monitor the temperature. Do not use your kitchen stove to do this! Wood and paper are very flammable! So do not use your stove. A hair dryer on a high setting will be a safer way to heat up these items.

Another critical means to prevent the spread of pollen mites is looking at how we use nesting blocks/houses. To make it convenient for us, we tend to use large blocks (sometimes hundreds of holes) for the nesting bees to use. This is a classic way to spread pest and pathogens by "crowding them close together". When we do not practice sanitation measures or forget to clean, we spread trouble and get dead bees.

Smaller blocks with space between them are the solution to slowing or preventing the spread of pest or pathogens. Nature has been telling us this all along and we (I) just did

not see or hear that. Nature does not naturally produce a large number of perfect bee size hole in a very small space.

### **In Summary:**

- Do not put out all your bees at once. Release them in batches at least a week apart.
- Use smaller block system with 50 or fewer holes. If you have larger ones split the block into two smaller ones, if possible.
- Put out more of these smaller blocks.
- Space the blocks or tube holder so they are at least 6 feet apart.
- Bring your nesting system (the blocks or tubes) on June 1st.
- Good sanitation practice for all parts of your bee system is critical.

### **Now to the question of the day: Can I put out my bees?**

#### **For the Willamette Valley:**

- If you have fewer than 40 cocoons to put out, hold off on putting any cocoons out.
- If you have checked your plants and you see good pollen counts and you have enough cocoons to put out two or more batches of at least 25-30 cocoons, put out your first batch on Tuesday the 17th and another batch can go out about 7-10 days later if the weather is good for releases.
- If you have a bunch of cocoons and you can put numerous batches put out a batch this Tuesday the 17th and release a batch each week making sure all cocoons are out by mid-April.

#### **Outside of the Willamette Valley:**

Read the note above for guidance.

For additional resources to help you know which plants that are good for our bees check out the [Garden Ecology Lab](#).

Questions? [Let me know](#).

Rich