Insecticides and my *Osmia cornifrons* Nesting Container

Nesting Period
The *Osmia cornifrons* nesting period lasts approximately one month. As females age, they move slower, lose hair, and show visible wing damage. At this point in their lives, they lay fewer eggs, make smaller cells, and produce predominately male offspring. The end caps of nesting tubes made by older females are thin and weak, and they tend to break easily. In addition, near the end of the nesting period the numbers of parasites and predators, which can penetrate those weak caps, are more plentiful. Based on these declines, nesting boxes should be removed at this time. Monitor nesting containers and look for 'harried' females and a lack of male bees. There will also be a noticeable drop in flight activity and a reduction in newly capped tubes.

Moving nesting containers should be avoided during the nesting period. Even if nests are moved slightly (even inches!), females cannot relocate their nests and often leave the area.

Removal of Containers from Orchard
The nesting containers should be removed from the orchard when the above observations are noted. The containers should be placed in a storage area where they will remain for the rest of the season. DO NOT place them in a cooler, as larvae need to complete their development throughout the summer and fall. Take **caution** when moving nesting containers as young larvae are attached to their provisions at this time. If the container is handled roughly, these larvae can be detached from the food source; they rarely reattach and often die. We recommend that the containers be stored with nest entrances up, so if a larva disconnects with the food source, they have a better chance of reattaching.

Insecticides Sprays during Bloom
Insecticide applications should be avoided during bloom in orchards with *O. cornifrons*. If spraying is necessary, choose insecticides with low bee toxicity (which is based on honeybee data) and short-residual effects. Insecticides should be applied during evening hours to avoid peak bee activity times. Observations have reported decreased bee activity with sub-lethal insecticide applications as well as with certain fungicide sprays. If a female has an established nest, she will hide out in the nest for days after pesticide applications, even under good weather conditions. Females that do not have a nest underway will move out of the area. Overall nesting declines if females are subjected to pesticide sprays.

Nesting containers can be moved from the orchard before pesticide applications; they must be stored at cool temperatures (46° F). They should be moved in the evening, when females are more likely to be in the hive. The nesting container must be replaced AT THE EXACT LOCATION AND POSITION as it was prior to the spray. Remember, moving the container even a few inches can disorient the female and may cause her to 'split'.

Recommendations
1. Avoid all insecticide sprays during bloom.
2. In cherries, avoid insecticides until at shuck split, if possible.
3. In apples, avoid insecticides until at petal fall, if possible. If a spray needs to go on at pink, use an insecticide with a short residual.
4. Move nesting containers as last resort.
5. In small blocks, place nesting containers just outside the spray area.

Important Points to Remember
1. Moving the nesting containers while bees are active may be risky due to relocation problems.
2. Bees become less active (i.e. lay fewer eggs = less pollination activity) when pesticides are applied during the nesting period, even if the pesticide does not kill them outright.
3. *O. cornifrons* fly approximately 200m to forage, so placing them on the outside of orchard may not be an option in large blocks.
4. One hundred percent of the bees do not go back into the nesting site in the evening, so there may be mortality due to nighttime pesticide applications.
5. We have no hard and fast rules about these bees, so everything we learn from the first year will help us manage them in the future. Make sure to keep track of your observations.