

Alfalfa Leafcutting Bee Incubation Calendar - 2023

D.W. Goerzen
Research Scientist, SLA / SASPDC

Once alfalfa leafcutting bee cells have been placed into incubation trays and the incubation temperature is set at 30° C, count "Day 1" of incubation as the first full day at which the bee cells are held at 30° C. This alfalfa leafcutting bee incubation calendar assumes cold storage of bee cells at 5° C prior to incubation at 30° C, with use of dichlorvos resin strips for chalcid parasite control.

- Day 1 Alfalfa leafcutting bee cells are at 30° C with bees in the diapausing prepupal stage. UV light - water traps are in place, and a thermostatically-controlled incubator alarm system is operational.
- Day 3 Chalcid parasites undergo their final moult into the pupal stage.
- Day 7 Place dichlorvos resin strips in the incubator at the recommended rate (3/4 strip per 1000 cubic feet), utilizing fans to distribute dichlorvos vapour evenly throughout the incubator.
- Day 8 Leafcutting bees begin to undergo their final moult into the pupal stage. At this stage they are very sensitive to temperature fluctuation, so maintain an even temperature - do not cool at this time.
- Day 8 - 9 Chalcid parasites begin to emerge. While many parasites will die in the trays, some parasites will make it to the UV light - water traps.
- Day 9 - 12 Chalcid parasites continue to emerge.
- Day 10 Alfalfa leafcutting bee pupae begin to show some eye colour (the pink-eyed pupal stage).
- Day 12 Alfalfa leafcutting bee pupae continue to darken in colour, in the eyes and over the back.
- Day 13 Remove dichlorvos resin strips from the incubator. **Air the incubator thoroughly for 24 - 48 hours**, using an exhaust fan and circulating fans. Maintain the 30° C temperature if possible.
- Day 14 - 15 Leafcutting bee pupae continue to darken in colour. If cooling occurred during the airing period following removal of dichlorvos, bring the temperature back to 30° C for continued incubation.
- Day 14 - 15 Native leafcutting bees may emerge if present; it is normal for these wild leafcutting bee species to emerge several days earlier than the alfalfa leafcutting bees.
- Day 14 - 22 **At any time during this period, if incubation must be slowed due to weather or due to delayed alfalfa bloom, alfalfa leafcutting bee incubation temperature can be lowered to 10 - 15° C for up to two weeks to stop bee development. Once temperature is increased, bee development resumes until emergence is complete. Note: During the cooling period, bee cell temperature within the incubation trays must be 10 - 15° C.**
- Day 16 The most advanced alfalfa leafcutting bee pupae (primarily male bees) are completely dark in colour, while the more slowly developing female bee pupae continue to darken.
- Day 18 - 19 Male alfalfa leafcutting bees begin to emerge at this time. **Remember that the bees are very susceptible to high temperatures; make sure that your incubator alarm system is working.**
- Day 21 - 22 Female alfalfa leafcutting bees begin to emerge and male bee emergence peaks. **Second generation chalcid parasites may begin to emerge.**
- Day 23 - 24 Female alfalfa leafcutting bee emergence peaks.
- Day 23 - 24 Incubation trays are taken to the field for bee release once 75% of female bees have emerged.
- Day 28 Alfalfa leafcutting bee emergence is virtually complete at 30° C.