

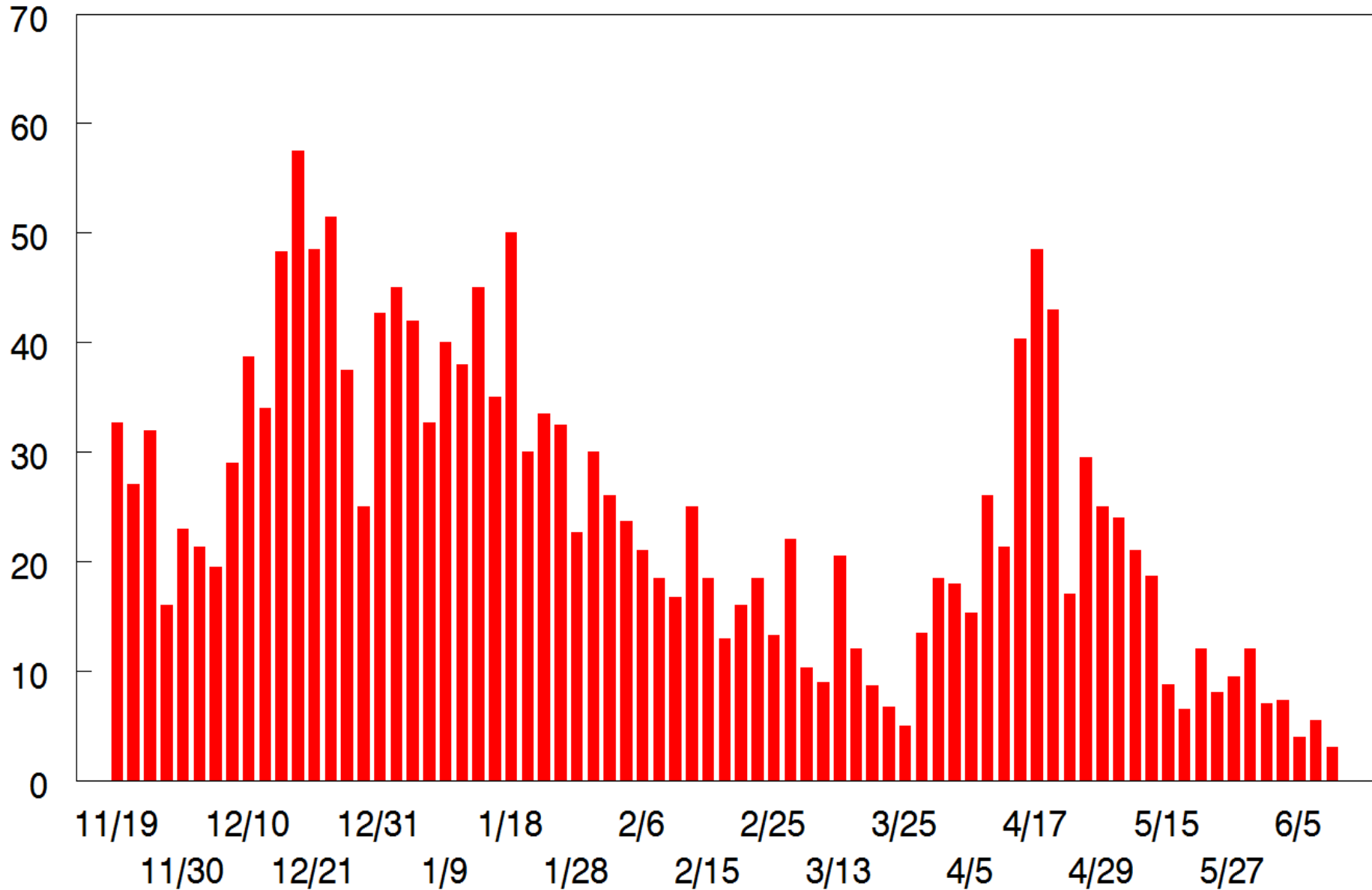
# BMSB Rearing: Knowledge Needed to Maintain Consistent Colony Production

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# Colony Production - Number of Egg Masses per Day



| Date | Stages | Colony size | Dead adults | Egg masses | Comments         |
|------|--------|-------------|-------------|------------|------------------|
| 3/1  | A      | 250         | —           | —          |                  |
| 3/7  | A      | 260         | —           | —          | W/B              |
| 3/11 | A      | 260         | —           | —          | W/B + 2pfts      |
| 3/15 | A      | 260         | —           | —          | W/B              |
| 3/19 | A      | 250         | —           | —          | W/B              |
| 3/22 | A      | 230         | 1           | 3          | W + 4pfts        |
| 3/25 | A      | 200         | 4           | 2          | W/B              |
| 3/27 | A      | 200         | 8           | 8          | W/B              |
| 3/29 | A      | 180         | 5           | 1          | W/B + 1pft       |
| 4/1  | A      | 180         | 2           | 4          | W/B + 1pft       |
| 4/3  | A      | 200         | —           | 3          | W/B + 1pft       |
| 4/5  | A      | 200         | 7           | 2          | W/B              |
| 4/8  | A      | 200         | 9           | 5          | W/B + 3pfts      |
| 4/10 | A      | 180         | 5           | 10         | W                |
| 4/12 | A      | 200         | —           | —          | W/B              |
| 4/15 | A      | 200         | 20          | 12         | W/B              |
| 4/17 | A      | 180         | 20          | 13         | W/B              |
| 4/19 | A      | 120         | 3           | 6          | W/B              |
| 4/22 | A      | 100         | —           | 10         | W/B              |
| 4/24 | A      | 120         | 6           | 9+14       | W/B              |
| 4/26 | A      | 100         | —           | 7          | W/B + seed paper |
| 4/29 | A      | 90          | 10          | 15         | W/B              |
| 5/1  | A      | 80          | 3           | 7          | W/B              |
| 5/3  | A      | 80          | —           | 6          | W/B              |
| 5/6  | A      | 60          | 12          | 6          | W/B + 2pfts      |
| 5/8  | A      | 60          | —           | 5          | W/B              |
| 5/10 | A      | 60          | 0           | 2          | W/B              |
| 5/13 | A      | 60          | 20          | 3          | W/B              |
| 5/15 | A      | 50          | —           | 1          | W/B              |
| 5/17 | A      | 50          | 5           | 2          | W/B              |
| 5/20 | A      | 40          | 3           | 1          | W/B + 2pfts      |
| 5-22 | A      | 40          | 20          | 0          | W/B              |
| 5/24 | A      | 40          | 2           | —          | W/B              |
| 5/24 | A      | 40          | 2           | 3          | W/B + 1pft       |
| 5/27 | A      | 40          | 4           | 1          | W/B              |
| 5/29 | A      | 40          | 5           | —          | W/B              |
| 5/31 | A      | 30          | 4           | —          | W/B              |

| Date | Stages | Colony size | Dead adults | Egg masses | Comments    |
|------|--------|-------------|-------------|------------|-------------|
| 2/8  | A      | 200         | —           | —          |             |
| 2/11 | A      | 150         | 16          | —          | W/B         |
| 2/13 | A      | 150         | 12          | —          | W/B + 2pfts |
| 2/15 | A      | "           | —           | —          | W/B + 2pfts |
| 2/18 | A      | 150         | —           | —          | W/B + 2pfts |
| 2/20 | A      | 150         | 2           | —          | W/B + 2pfts |
| 2/22 | A      | 120         | 8           | —          | W/B         |
| 2/25 | A      | 120         | 0           | 1          |             |
| 3/1  | A      | 120         | 0           | —          | W/B         |
| 3/4  | A      | 120         | 4           | 5          | W/B + 1pft  |
| 3/7  | A      | 100         | 2           | 5          | W/B + 1pft  |
| 3/11 | A      | 100         | 6           | 3          | W/B + 2pft  |
| 3/13 | A      | 100         | 5           | 5          | W/B + 3pfts |
| 3/15 | A      | 100         | 3           | 1          | W/B         |
| 3/19 | A      | 100         | 12          | 4          | W/B + 4pfts |
| 3/25 | A      | 75          | 38          | 0          | W/B + 6pfts |
| 3/27 | A      | 75          | 5           | 3+12       | W/B         |
| 3/29 | A      | 75          | 3           | 3          | W/B         |
| 4-1  | A      | 75          | 0           | 2          | W/B         |
| 4/3  | A      | 70          | 2           | 5          | W/B + 2pfts |
| 4/5  | A      | 70          | 5           | 3          | W/B         |
| 4/8  | A      | 70          | —           | 6          | W/B         |
| 4/10 | A      | 70          | 1           | 4          | W/B         |
| 4/12 | A      | 70          | 0           | 6          | W/B         |
| 4/15 | A      | 60          | 0           | 5          | W/B + 1pft  |
| 4/17 | A      | 40          | 4           | 3          | W/B + 2pfts |
| 4-19 | A      | 40          | 1           | 4          | W/B         |
| 4-22 | A      | 40          | 1           | 2          |             |
| 4-24 | A      | 40          | 0           | 0          | W/B         |
| 4/26 | A      | 30          | 5           | 1          |             |
|      | Closed |             |             |            | → 1/2       |

1 closed added frames to cage 19

| Date  | Stages    | Colony size | Dead adults | Egg masses | Comments                    |
|-------|-----------|-------------|-------------|------------|-----------------------------|
| 12/10 | 1st-2nd N | >200        | 40 EM       |            | NEW NURSERY - SEEDS/BEANS/F |
| 12/12 | N(2)      | 800         | —           | ♂          | Water, some beans           |
| 12/14 | N(2)      | 800         | —           | ♂          | Water                       |
| 12/17 | N(2/3)    | 800         | —           | ♂          | Water, Dattel (mites) bean  |
| 12/19 | N(2/3)    | 800         | —           | ♂          | Water, beans                |
| 12/21 | N(2/3)    | 200         | —           | ♂          | Water, beans, walnuts       |
| 12/24 | N(3/4)    | 200         | —           | 0          | W/B                         |
| 12/26 | N(3/4)    | 150         | ✓           | 0          | W/B potat                   |
| 12/28 | N(3/4)    | 150         | —           | —          | W/B F2P                     |
| 1/3   | N(4)      | 150         | —           | —          | W/B + 2 phts                |
| 1/4   | N(4)      | 150         | —           | —          | W/B + 2 phts                |
| 1/7   | N(4/5)    | 150         | —           | —          | Water                       |
| 1/11  | N(4/5)    | 150         | —           | —          | W/B                         |
| 1/14  | N(4/5)A   | 150         | —           | —          | W/B                         |
| 1/16  | N(5)A     | 120         | —           | 1          | W/B + 2 phts                |
| 1/18  | A         | 120         | —           | 2          | W/B                         |
| 1/21  | A         | 120         | 4           | 15         | W                           |
| 1/23  | A         | 100         | 6           | 9          | W/B + 2 phts                |
| 1/25  | A         | 100         | 4           | 21         | W/B + 1 pht                 |
| 1/28  | A         | 100         | 15          | 17         | W/B + 2 phts                |
| 1/30  | A         | 80          | 19          | 11         | W/B                         |
| 2/1   | A         | 40          | 11          | 4          | W/B                         |
| 2/4   | A         | 40          | 20          | 3          | W/B                         |
| 2/10  | A         | 20          | —           | 0          | 23 → 30                     |
|       | Empty     |             |             |            |                             |

| Date | Stages  | Colony size | Dead adults | Egg masses | Comments     |
|------|---------|-------------|-------------|------------|--------------|
| 1/8  | Nursery | ≈ 20 EM     | —           | —          |              |
| 1/9  | N(2)    | 200         | —           | —          | Water        |
|      |         | +100 N(2)   |             |            |              |
| 1/11 | N(2/3)  | 300         | —           | —          | W/F          |
| 1/14 | N(2/3)  | 300         | —           | —          | W/F          |
| 1/16 | N(2/3)  | 300         | —           | —          | W/F + 2 phts |
| 1/18 | N(2/3)  | 300         | —           | —          | W/F          |
| 1/21 | N(2/3)  | 300         | —           | —          | W/F          |
| 1/25 | N(2/3)  | 280         | —           | —          | W/F          |
| 1/30 | N(2/3)  | 300         | —           | —          | W/F          |
| 2/1  | N(3/4)  | 300         | —           | —          | W/B + 1 pht  |
| 2/4  | N(4)    | 300         | —           | —          |              |
| 2/6  | N(4)    | 250         | —           | —          | W/B          |
| 2/8  | N(4/5)  | 250         | —           | —          | W/B + 1 pht  |
| 2/11 | N(5)A   | 250         | —           | —          | W/B          |
| 2/13 | N(A)    | 250         | —           | —          | W/B + 1 pht  |
| 2/15 | N(A)    | "           | —           | —          | W/B          |
| 2/18 | N(5)A   | 250         | —           | —          | W/B          |
| 2/20 | N(5)A   | 250         | 6           | —          | W/+ 2 phts   |
| 2/22 | N(5)A   | 250         | 7           | 1          | W/B + 2 phts |
| 2/25 | A       | 200         | 10          | 5          | W/B          |
| 2/27 | A       | 150         | 8           | 2          |              |
| 3/1  | A       | 120         | 6           | 1          |              |
| 3/4  | A       | 20          | 7           | 1          |              |
| 3/7  | A       | 10          | 0           | 0          | W/B + 1 pht  |
|      |         | 10          |             |            | 31 → 15      |

## **Research Questions Relative to Colony Rearing:**

What are the optimum environmental conditions for rearing?

Is there an optimum population size per cage?

What food sources provide the nutritional requirements for maximum egg production?

Do colony populations need a periodic diapause break?

Do adults and nymphs require re-provisioning of gut symbionts?

What are the best methods to process and store adults collected in the fall?

