



EUROPEAN UNION

Optimizing growth during first weeks of *Tenebrio molitor* rearing



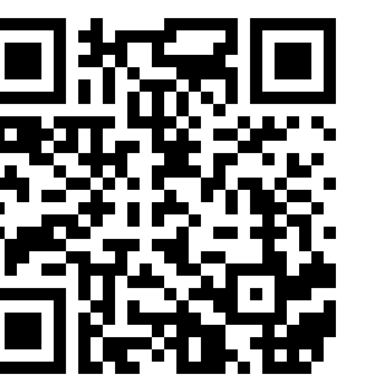
RESEARCH & ADVICE IN AGRICULTURE & HORTICULTURE

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Discover the infrastructure



Introduction

Efficient mealworm rearing is essential to make industrial mealworm production a viable sector. Understanding the needs of mealworm on a semi-industrial scale is therefore a key factor.

It is known that mealworm growth benefits from adding a moisture source (e.g. carrots) to their diet. However it is unknown when mealworm start to profit from the moisture source and especially how this interacts with the climate. Even professional breeders have varying opinions on this topic.

By determining the influence of moisture source timing, temperature (T), relative humidity (RH) and their interactions on early mealworm development, key insight can be attained to make rearing systems more efficient.

Material and methods

Tenebrio molitor on semi-industrial scale
Production trays (60x40 cm)

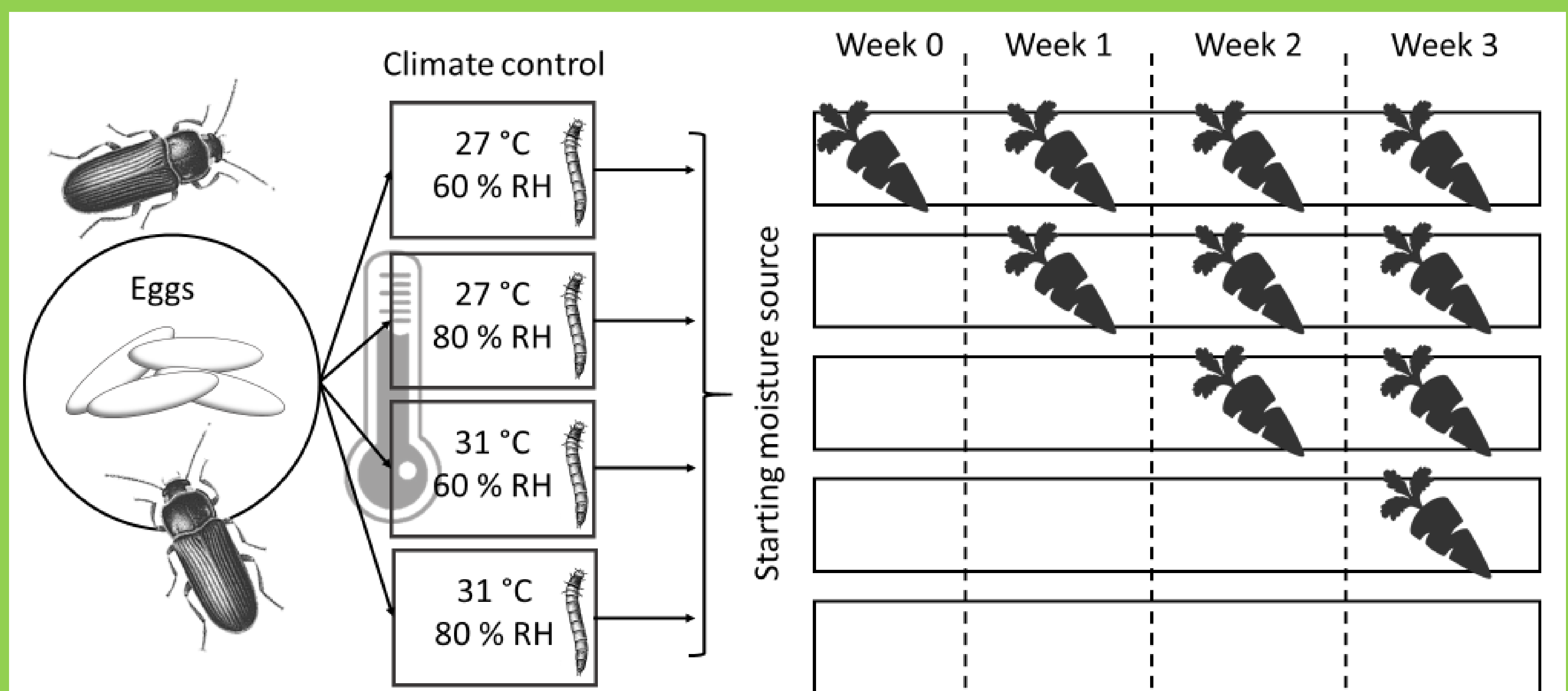
7 days of oviposition

20 objects (R=3)

- 4 climates
- 5 feeding regimes

Hatching and growth for 4 weeks

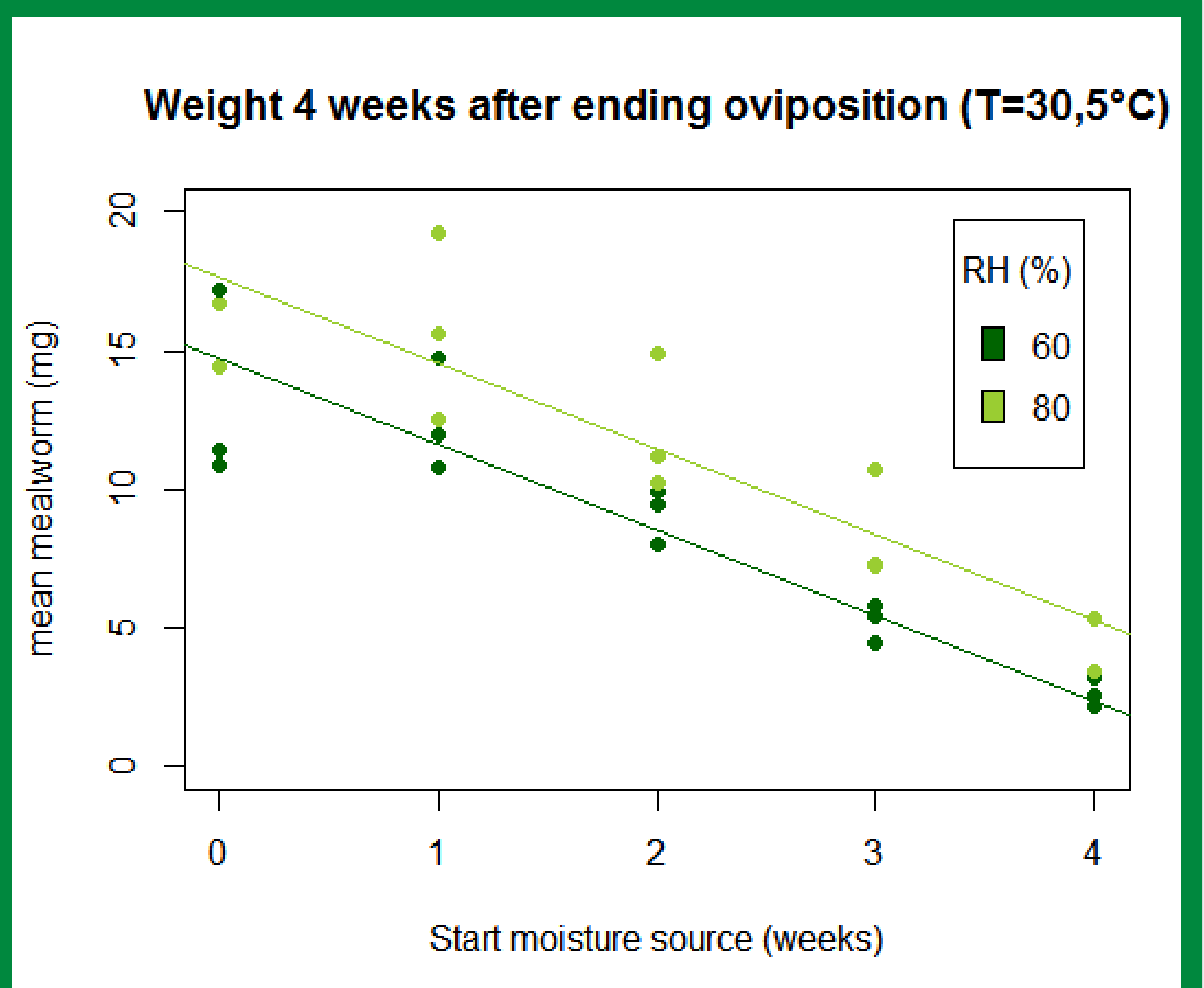
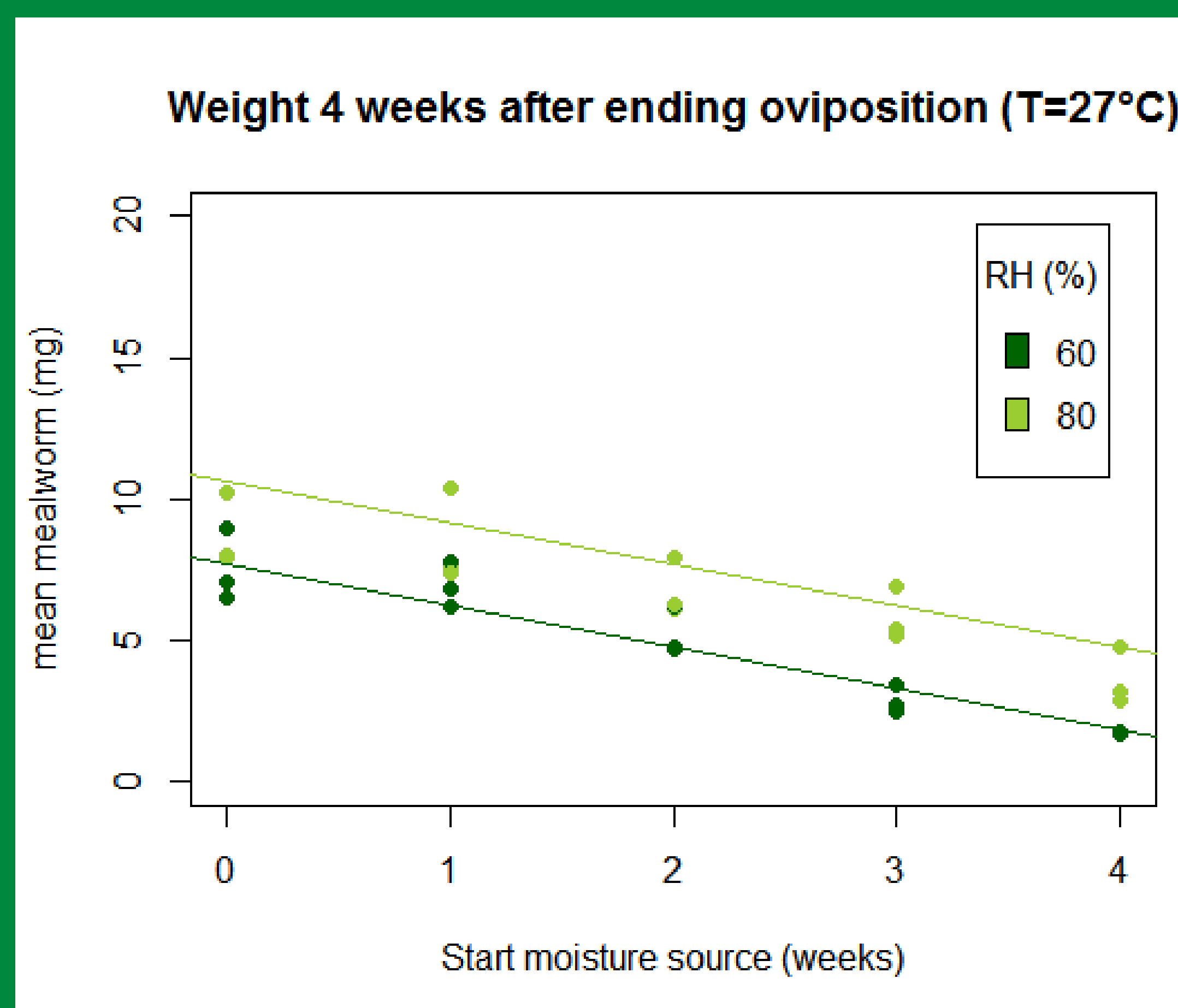
Daily moisture source supply ~ feeding regime and *Ad libitum* wheat bran



Results & Discussion

For growth:

- Higher T is **positive**
- Higher RH is **positive**
- Early access to moisture source is **positive**
- Important **interaction** between temperature and moisture source supply



Despite the significance of the model, there is no significant difference between starting moisture source right after oviposition or 1 week later (based on a Tukey test). Suggesting that during the first week moisture source is less urgent.

$$\text{Mean weight (mg)} = 11,14 * MS + 2,00 * T + 0,14 * RH - 0,46 * T * MS - 55,34 \quad (R^2 \text{ Adj.} = 0,85)$$

MS = start moisture source (weeks)

T = Temperature (°C)

RH = Relative humidity (%)

Conclusion

Mealworm growth can be increased significantly by increasing temperature (up to 31 °C), relative humidity and providing a moisture source during early development. The higher the temperature, the more benefit can be achieved by early moisture source supply. Further research is needed to determine the minimal amount of moisture source required.



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