



Let It Bean:

Bean type preference for egg laying in *Callosobruchus maculatus*

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SCAN ME

1. Background on bean beetles

Bean beetles (*Callosobruchus maculatus*) are a pest insect species, whose short life cycle revolves around legume seeds.

Adult bean beetles lay their eggs on various types of beans, where the larvae can develop into adulthood¹.

Previous research has indicated that adults show a preference for the **Californian black-eyed beans** when laying their eggs², and the present research sets out to test this hypothesis.

2. Do bean beetles prefer the Californian black-eyed bean over the adzuki red bean?

Setup of experiment:



We pitted **black-eyed beans** against **red adzuki beans** to see whether the beetles would lay their eggs to the most readily available bean type (i.e the side they were placed on) or if they would cross the barrier to reach the other bean type.

x4

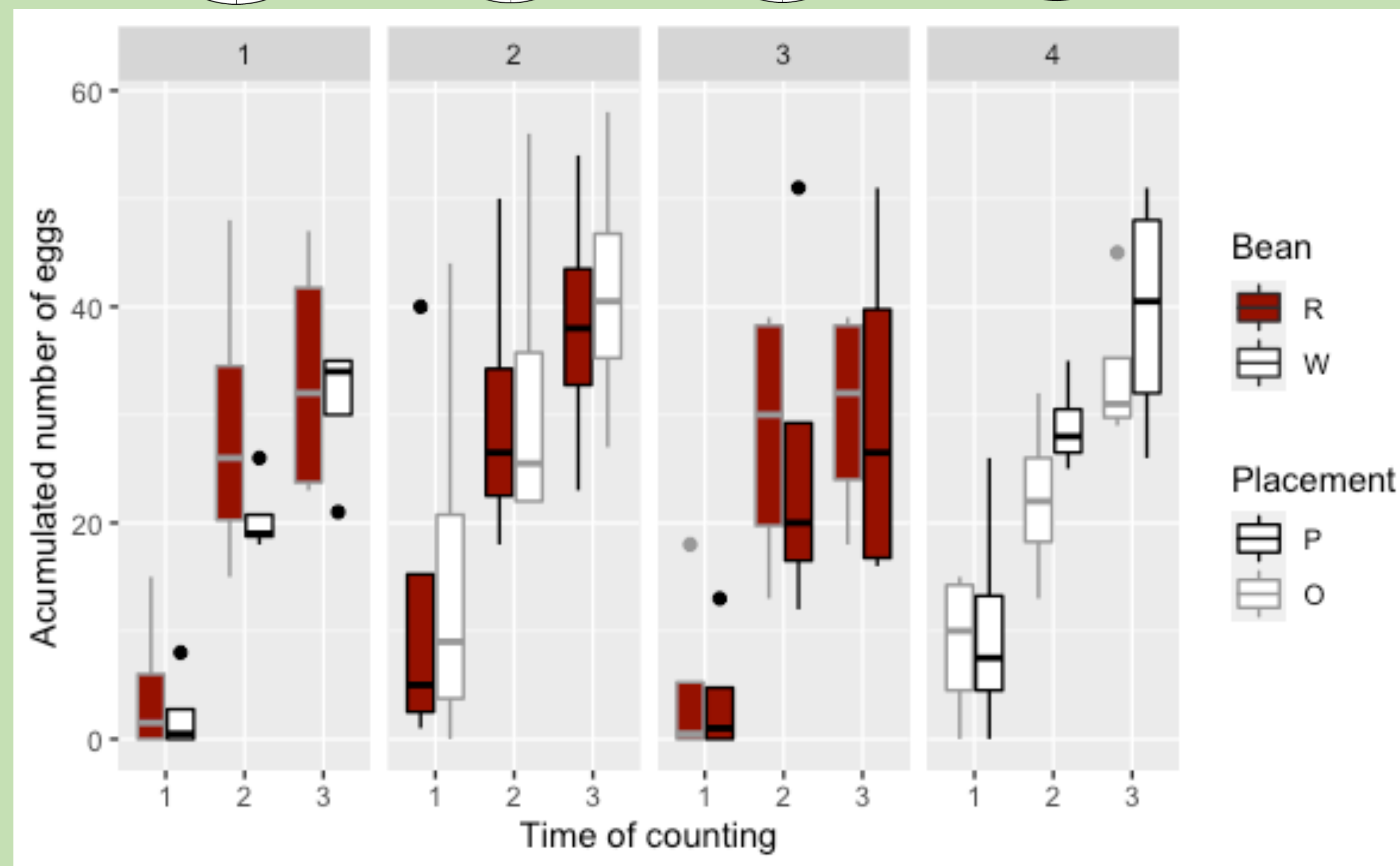
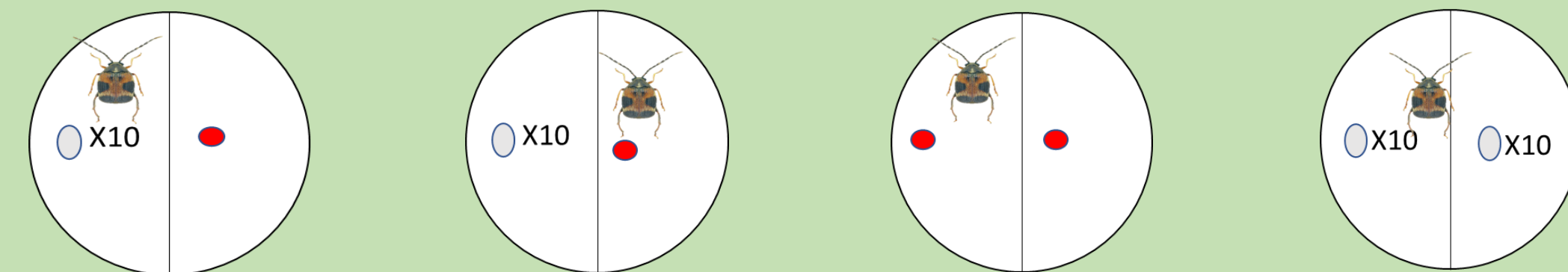


Figure 1. Box plot graph illustrating the results of the experiment. Bean (bean type of host for eggs) R = red beans; W = black-eyed beans. Placement (side of petri dish in relation to original placement of adults) P = side of original placement; O = opposite side. Time of counting (The day after the start of the experiment that the eggs were counted) 1 = day 5; 2 = day 8; 3 = day 12.

3. Results

P-values for bean type preference were not significant.

There was a small preference for moving over from where they were originally placed, except in setup 4.

With more time available, the egg number equalised on each side (fig.1).

4. Discussion and conclusion

Bean beetles are a widespread threat in the agricultural world. Grain producers often use **powerful pesticides** to protect crops and stored grains, which have **adverse health effects** on agricultural workers³. Therefore, it is vital to find alternative ways to reduce damage caused by bean beetles. Understanding which grains are more vulnerable to bean beetles is an integral part of the solution.

The results of the experiment (fig. 1) show that rather than bean type, **mobility** may play a bigger role in oviposition host choice, as the beetles tended to lay more eggs on the side opposite to where they were originally placed.

References:

1. Beck, C. W. and Blumer, L. S. (2014) A Handbook on Bean Beetles, *Callosobruchus maculatus*. National Science Foundation.
2. Boeke, S.J., van Loon, J.J.A., van Huis, A. and Dicke, M. (2004). Host preference of *Callosobruchus maculatus*: a comparison of life history characteristics for three strains of beetles on two varieties of cowpea. *Journal of Applied Entomology*.
3. Kalpna, Hajam, Y.A. and Kumar, R. (2022). Management of stored grain pest with special reference to *Callosobruchus maculatus*, a major pest of cowpea: A review. *Heliyon*.