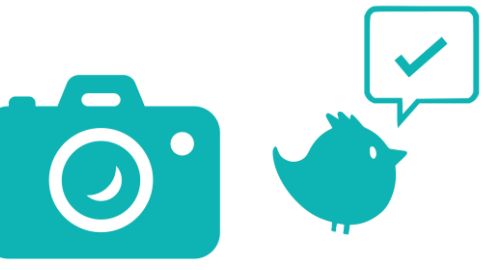


Soluble nitrogen fertilizers for spotted-wing *Drosophila* management on fruit and fruit waste



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INTRODUCTION

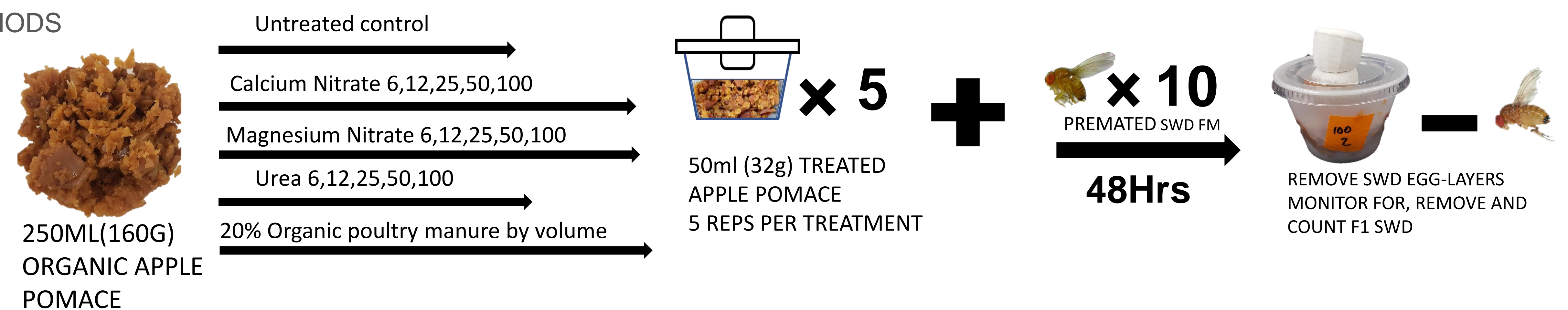
- SWD females will utilize fruit waste as reproductive habitat, including fruits such as apples and pears, which aren't normally targeted when fresh¹
- Incorporating $\geq 25\%$ poultry manure into apple pomace prevented SWD reproduction, possibly providing growers with a post-harvest crop sanitation strategy²
- Our previous work demonstrated that soluble nitrogen fertilizers limit SWD infestation of organic apple pomace³
- Nitrogen content of cherry waste can be easily manipulated with commonly available fertilizers. This could present cost-effective ways to manage SWD infestation of pre-harvest fruit and post-harvest fruit waste. Our **goal** was to investigate the impact of applied soluble nitrogen on SWD reproduction.

OBJECTIVES

- Determine if nitrogen fertilizers can be added to fruit waste to deter or prevent SWD infestation.
- Determine if nitrogen fertilizers can be applied to pre-harvest fruit to deter SWD infestation.

EXP 1: ADDING NITROGEN TO FRUIT WASTE

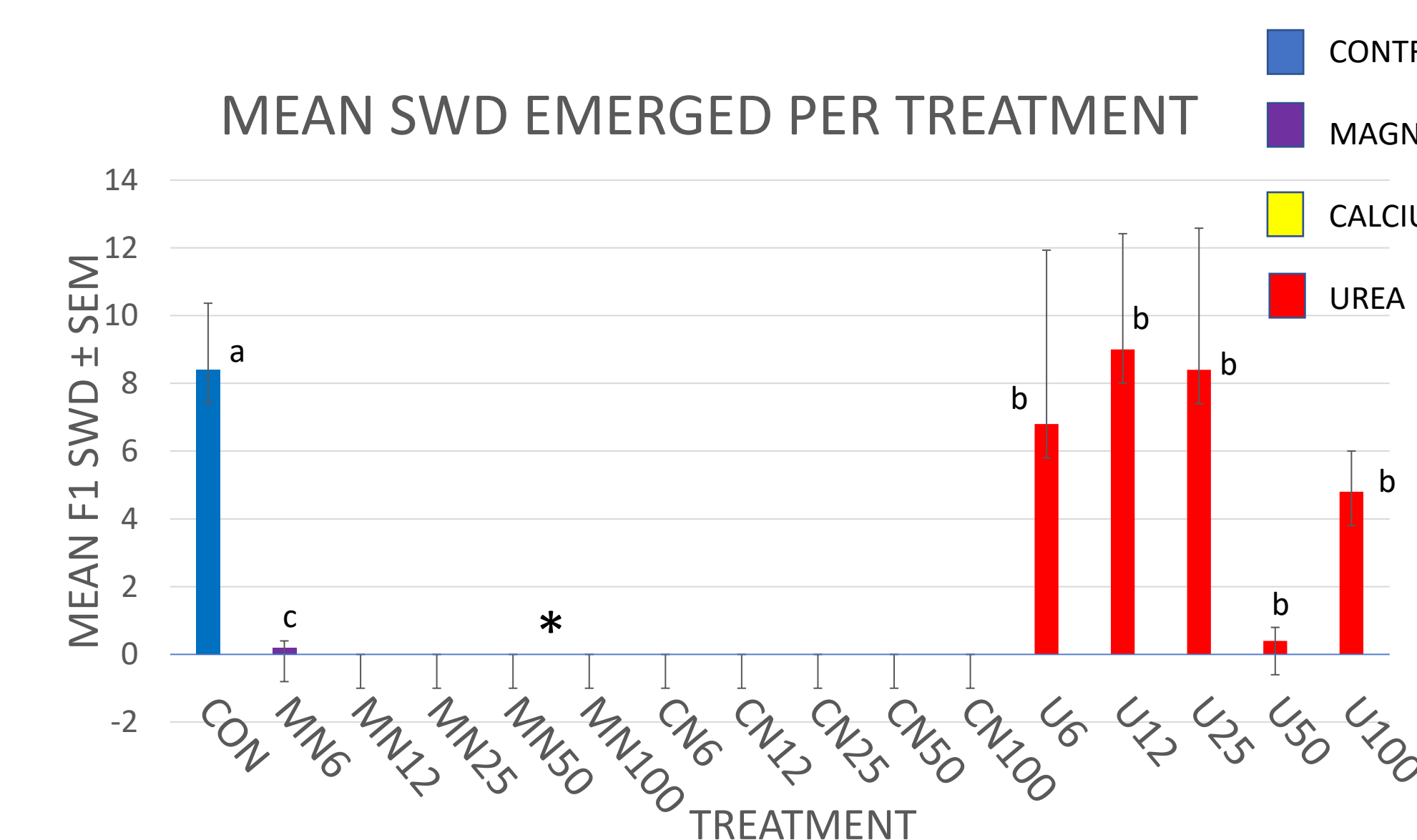
METHODS



Fertilizer	N,P,K (mg/L)	Grams fert used "6"	Grams fert used "12"	Grams fert used "25"	Grams fert used "50"	Grams fert used "100"
Urea	46,0,0	0.20	0.41	0.82	1.63	3.26
Calcium Nitrate	15.5,0,0	0.60	1.21	2.42	4.84	9.68
Magnesium Nitrate	11,0,0	0.85	1.70	3.41	6.82	13.64

Table 1. Amount of fertilizer used in grams where "100" contains 1.5gN per replicate, 20% manure by volume in 250ml apple pomace=1.2gN

RESULTS



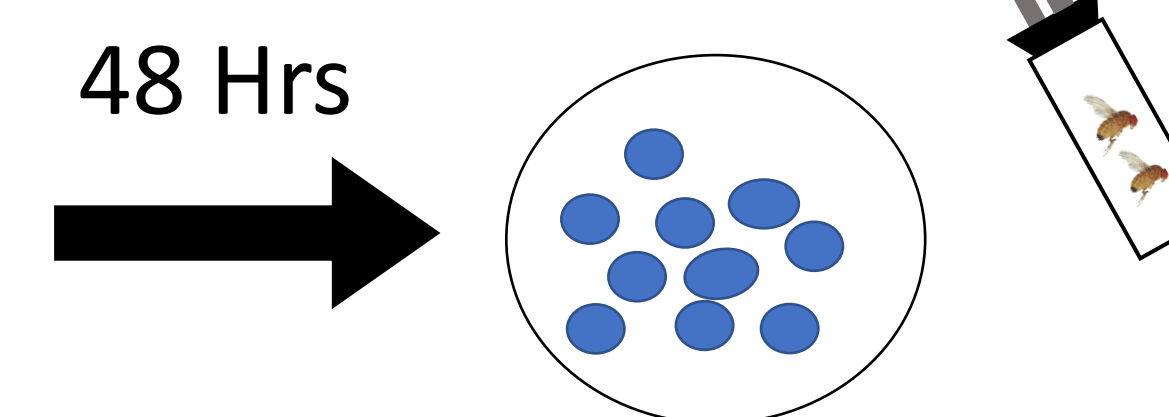
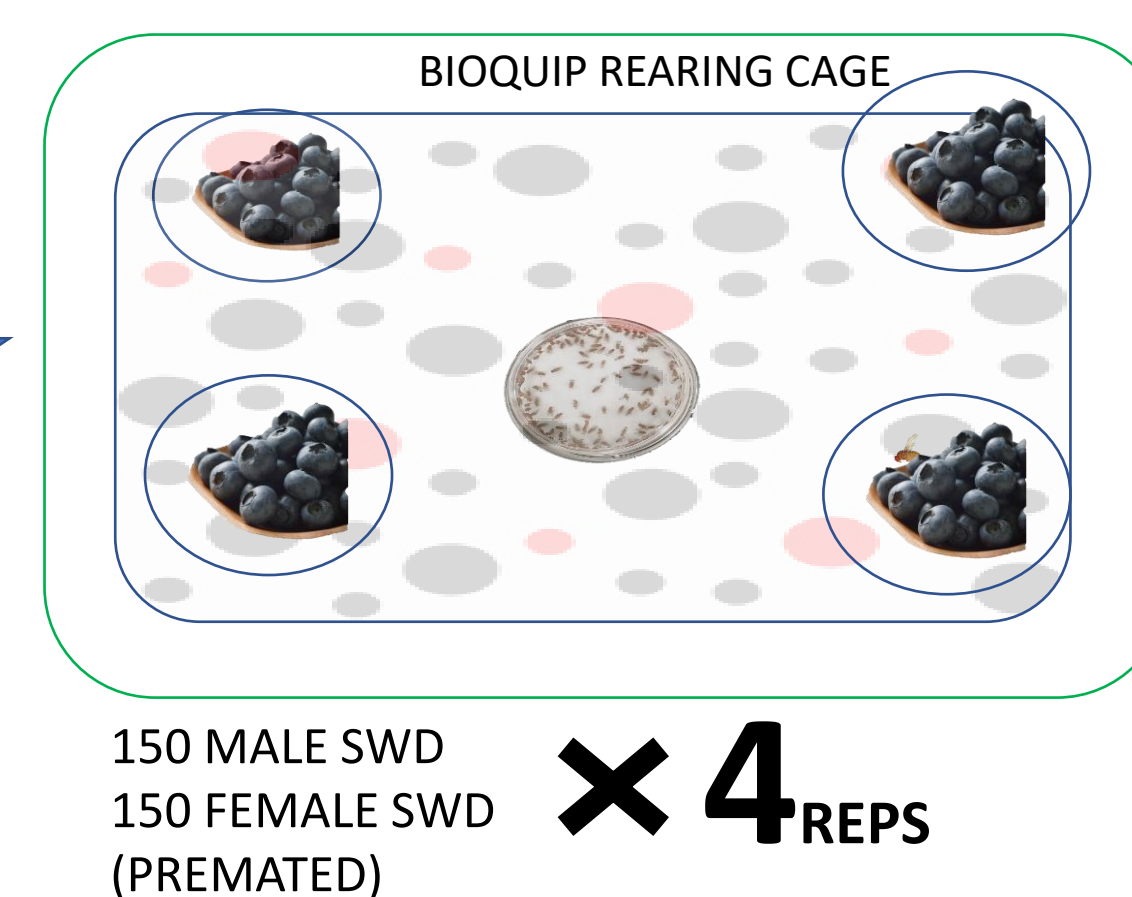
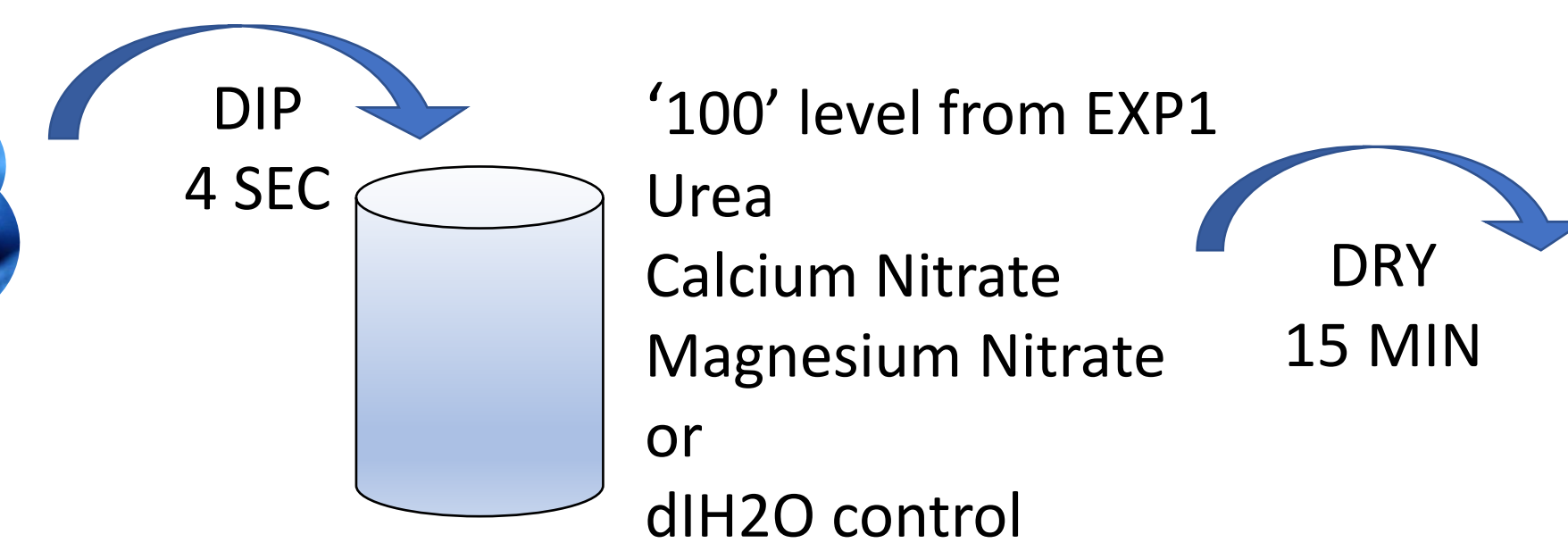
SIGNIFICANT EFFECT OF TREATMENT ($F_{10,40}=6.80, p < 0.001$) via mixed model ANOVA fitted to a logistic distribution (Proc GLIMMIX, SAS v.9.4)

CONTROL IS SIGNIFICANTLY DIFFERENT FROM ALL TREATMENTS

*We excluded treatments where nothing emerged from analysis because our 95% confidence interval is zero.

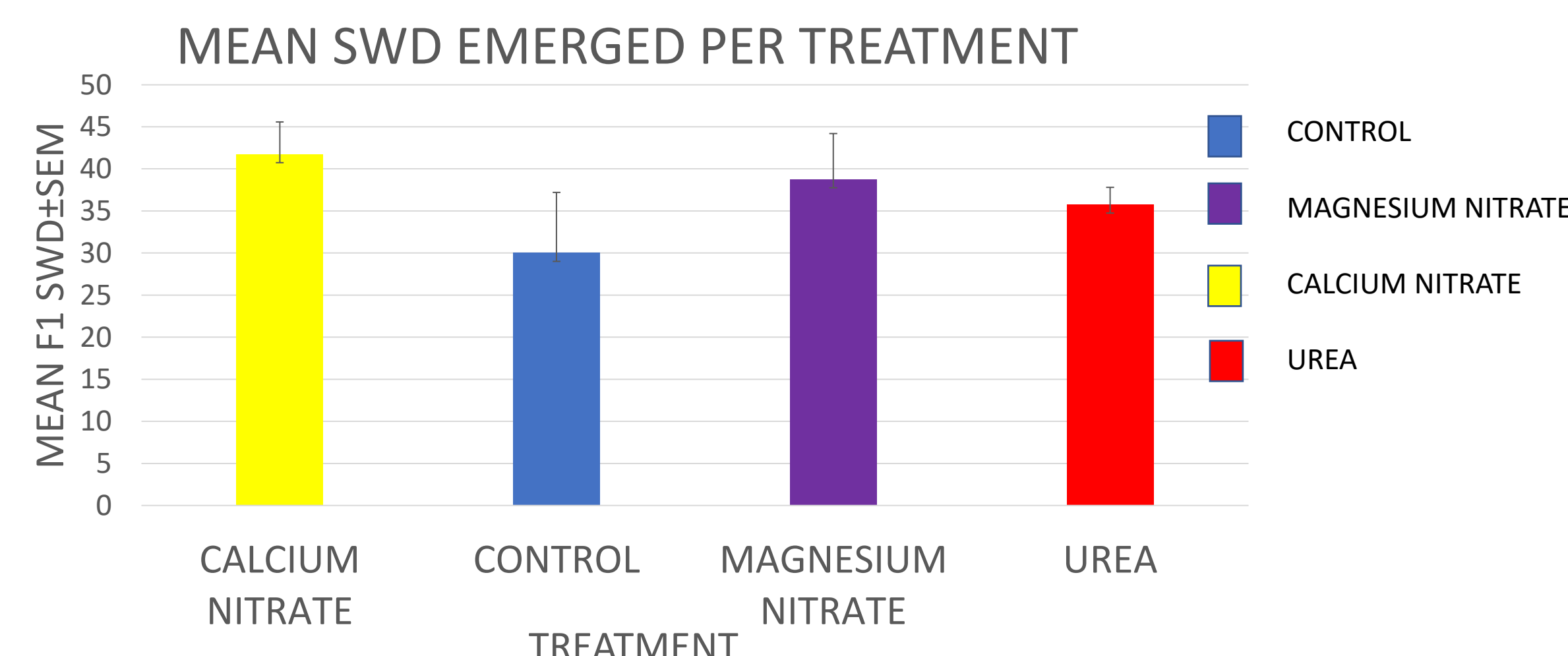
EXP 2: BLUEBERRY CHOICE ASSAYS

METHODS



- BLUEBERRIES REMOVED TO REARING CHAMBER
- F1 SWD COLLECTED OVER 8 DAYS ON 3 DATES VIA ASPIRATION AND COUNTED
- MONITORED UNTIL NO EMERGENCE

RESULTS



NO SIGNIFICANT DIFFERENCE BETWEEN TREATMENTS ($F_{3,9} = 1.58, p = 0.260$)

DISCUSSION & CONCLUSIONS

- Our controls were significantly different from fertilizer type.
- Our ratios of nitrogen were not significantly different within the same fertilizers.
- Our different fertilizers were not significantly different from each other.
- We can determine that fertilizer type is affecting SWD reproduction AND nitrogen manipulation alone is not enough to affect SWD reproduction.

FUTURE DIRECTIONS

- Further investigation of main fertilizer components (phosphorus, etc.) would provide management of post-harvest waste while utilizing readily available, cost-effective resources.
- Future research of fertilizers and manures which create a shortened SWD life-cycle could be used for targeted trap and spray

Literature Cited:

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- Hooper H., and Grieshop, M. (2021) Pest Mgmt Sci, 77(1) 202-207
- Schuttler, C. "Managing spotted-wing *Drosophila* on your post harvest fruit waste." GLEXPO. 2021. Poster presentation.

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