



# Conventional and organic farming methods alter ant activity during the Michigan growing season

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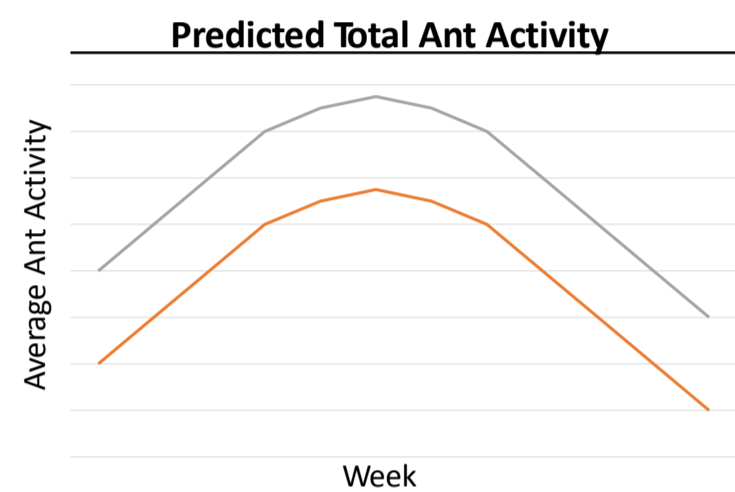


## Farming Practice Hypothesis

Compared to organic plots, conventional plots receive chemical fertilizer and pesticide treatments that suppress ant activity

## Predictions

Ant activity will be higher in organic plots compared to conventional plots throughout the growing season



## Optimal Temperature Hypothesis

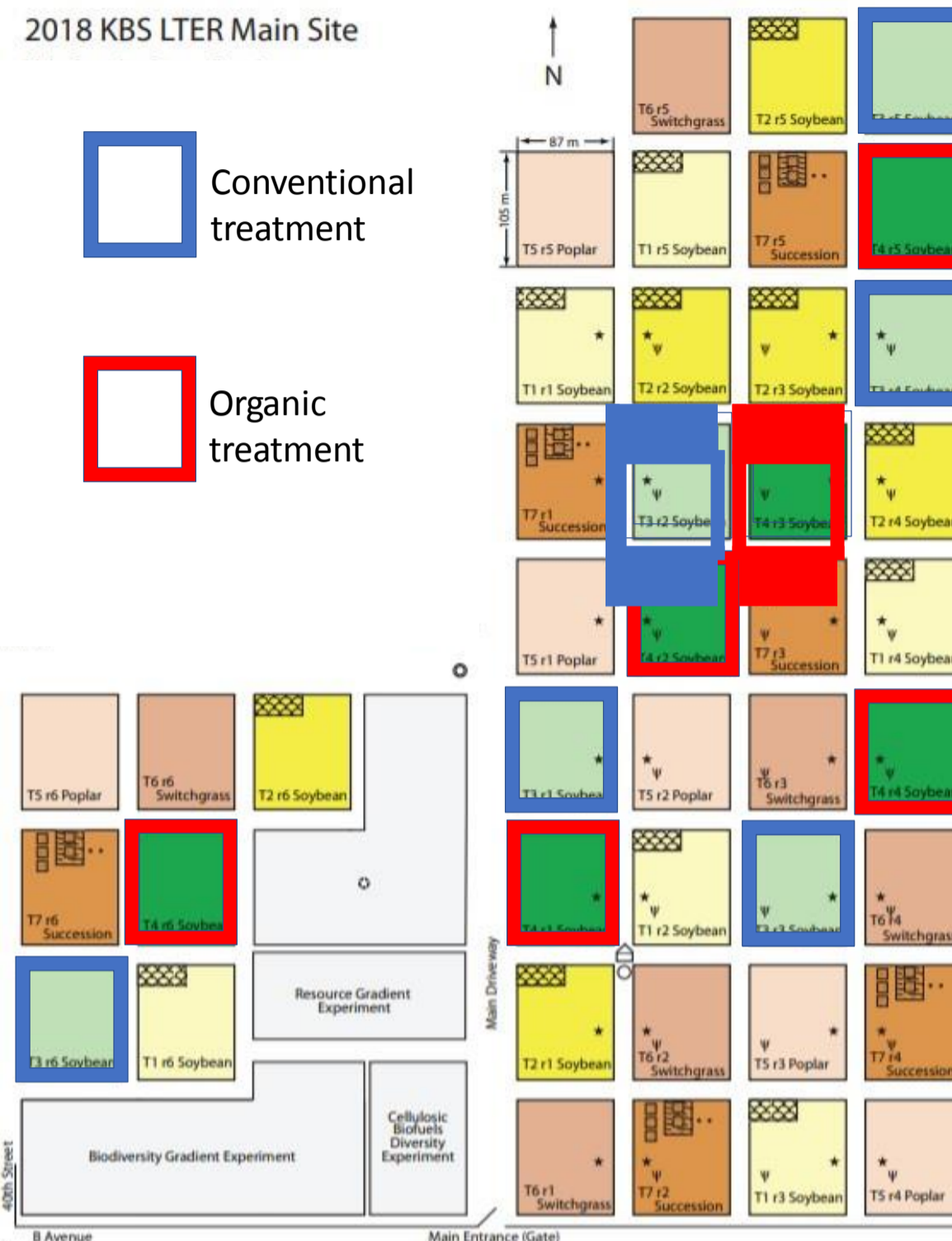
Species specific ant activity reflects seasonal temperature changes throughout the sampling period

## Predictions

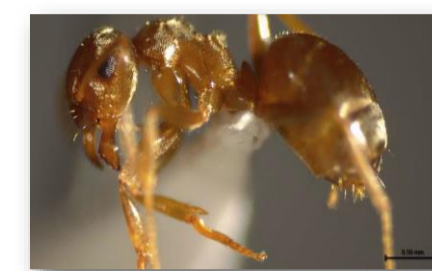
Ant species will be most active when their optimal temperature range occurs during the growing season

## Methods

- 1) Sample ants in conventional and organic plots with pitfall traps
- 2) Separate ants from other insects and spiders
- 3) Identify and record species and trap information of all ants
- 4) Count nonreproductive (worker) ants



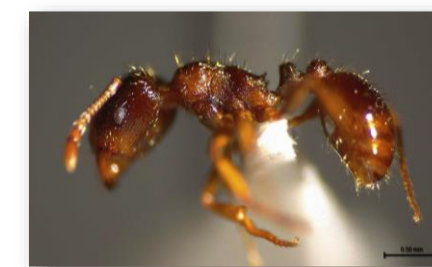
*L. neoniger*, *T. immigrans*, and *P. imparis* account for 68% of all ant occurrences in pitfall traps



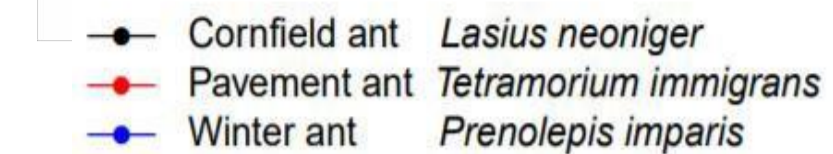
*Lasius neoniger*  
Heat-tolerant honeydew forager



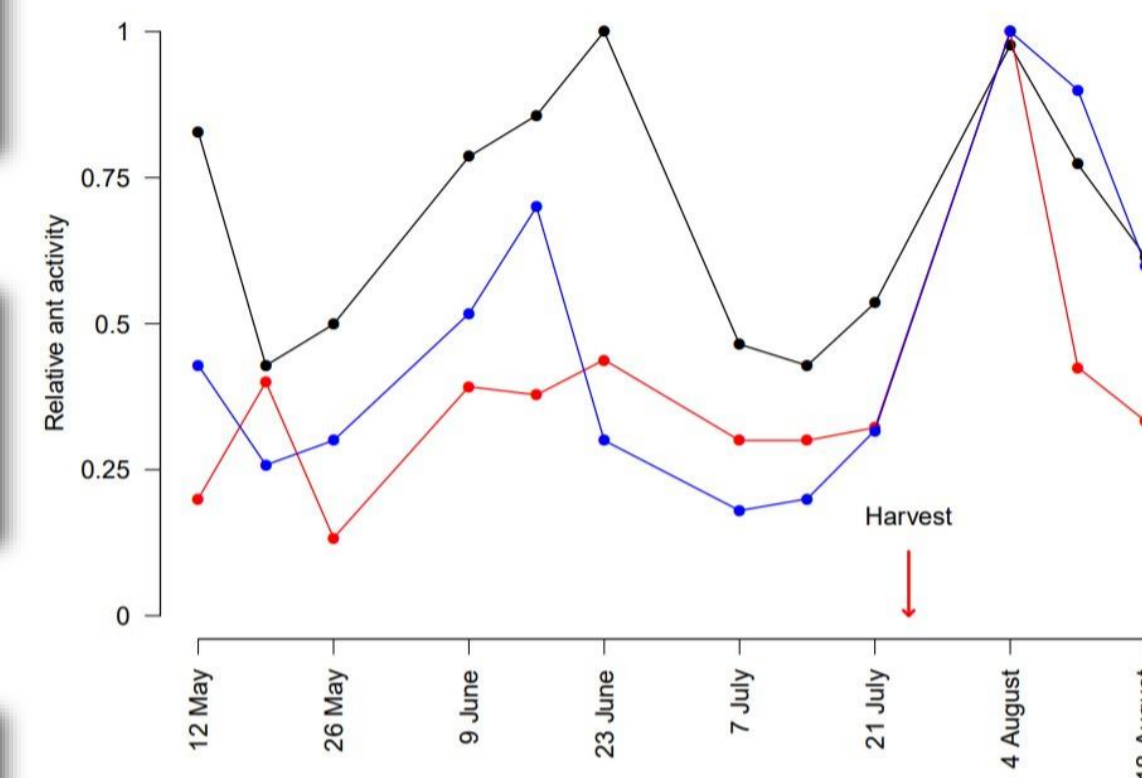
*Prenolepis imparis*  
Cold-tolerant honeydew forager



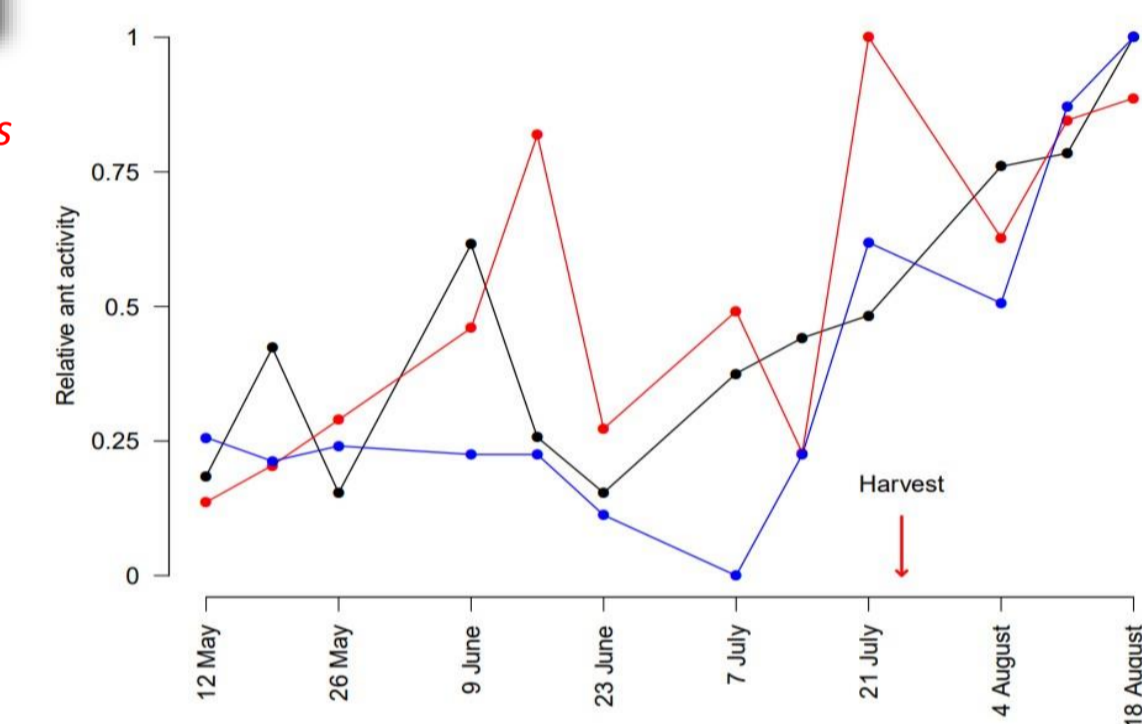
*Tetramorium immigrans*  
Invasive generalist



## Species Specific Ant Activity – Organic

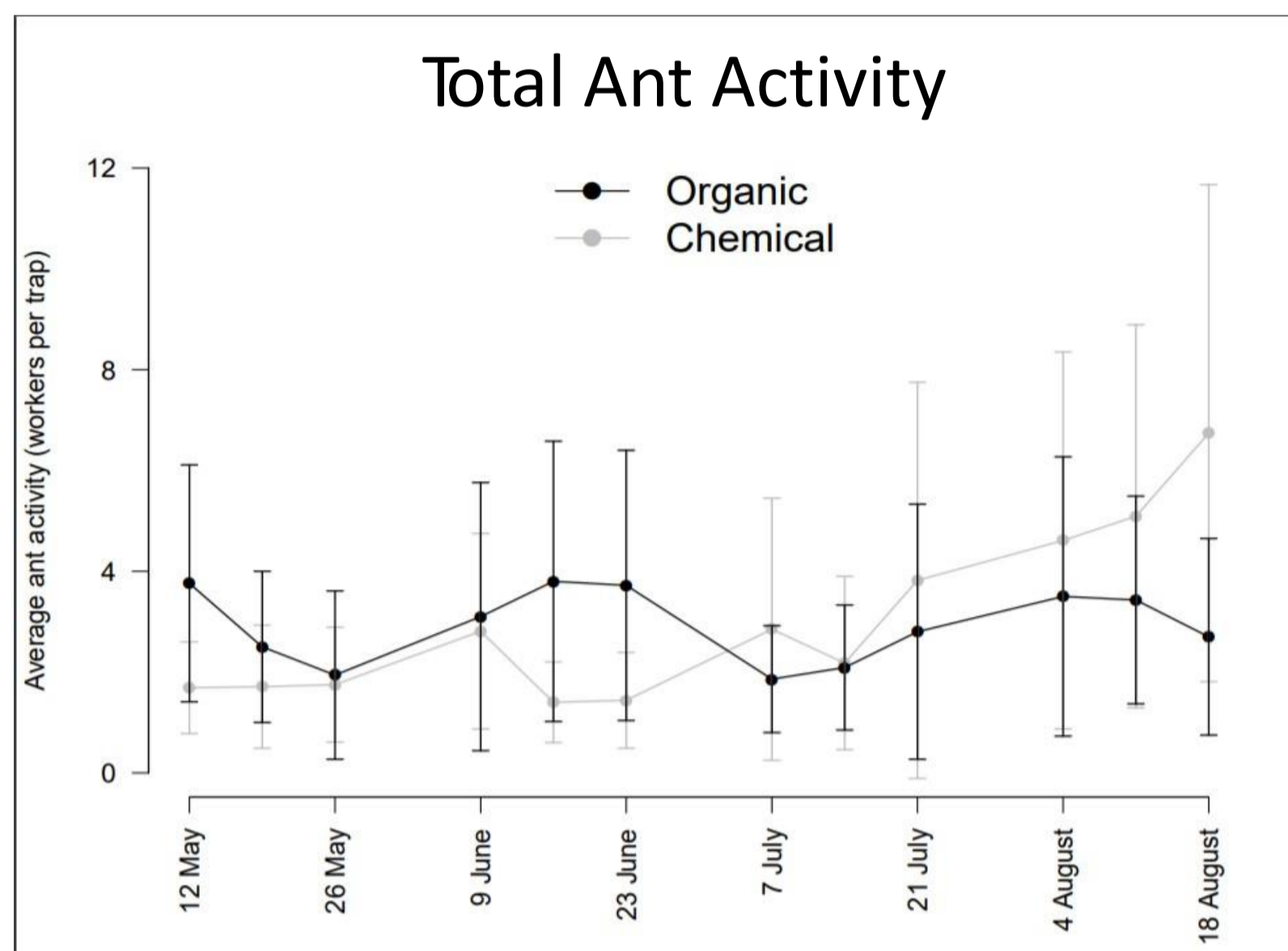


## Species Specific Ant Activity – Conventional



## Conclusions

- 1) Total ant activity does not differ significantly between organic and conventional plots ( $P = 0.155$ )
- 2) Ant activity varies throughout the season ( $P < 0.001$ )
- 3) The pattern of seasonal variation is different for conventional and organic plots ( $P < 0.001$ )
- 4) Ants in organic plots respond to seasonal temperature patterns with decreased activity in the hot and dry period of mid-summer
- 5) Ants in conventional plots have an erratic pattern with an increasing general trend
- 6) Ants suppress agricultural pests
  - a) Organic plot activity peaks early in season – potentially **greater** pest suppression
  - b) Conventional plot activity peaks late in the season – potentially **less** pest suppression



## Acknowledgments

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