



“Can you imagine all of that research being done with the black soldier fly?”

Aaron Tarone- Genetics Conference, Chicago, IL, USA

# The Insect Revolution: Engaging Diverse Scientific Disciplines

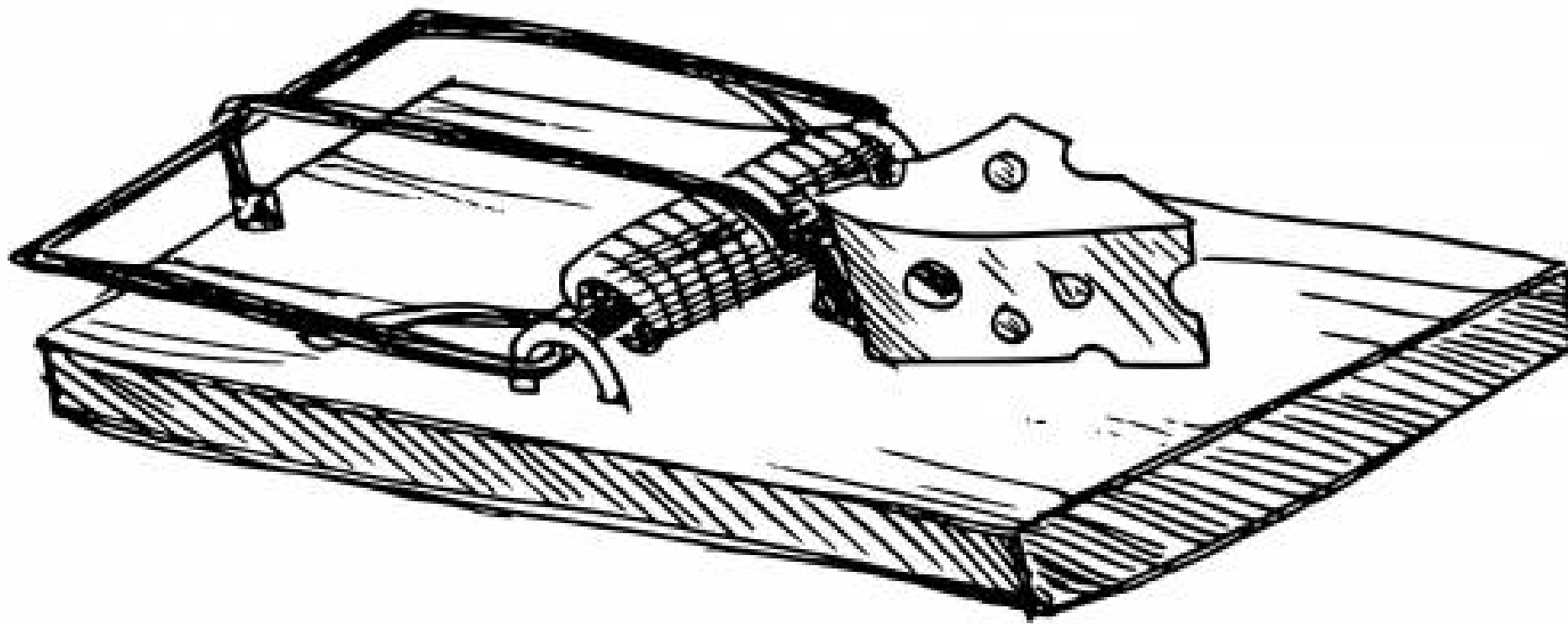
Jeffery K. Tomberlin

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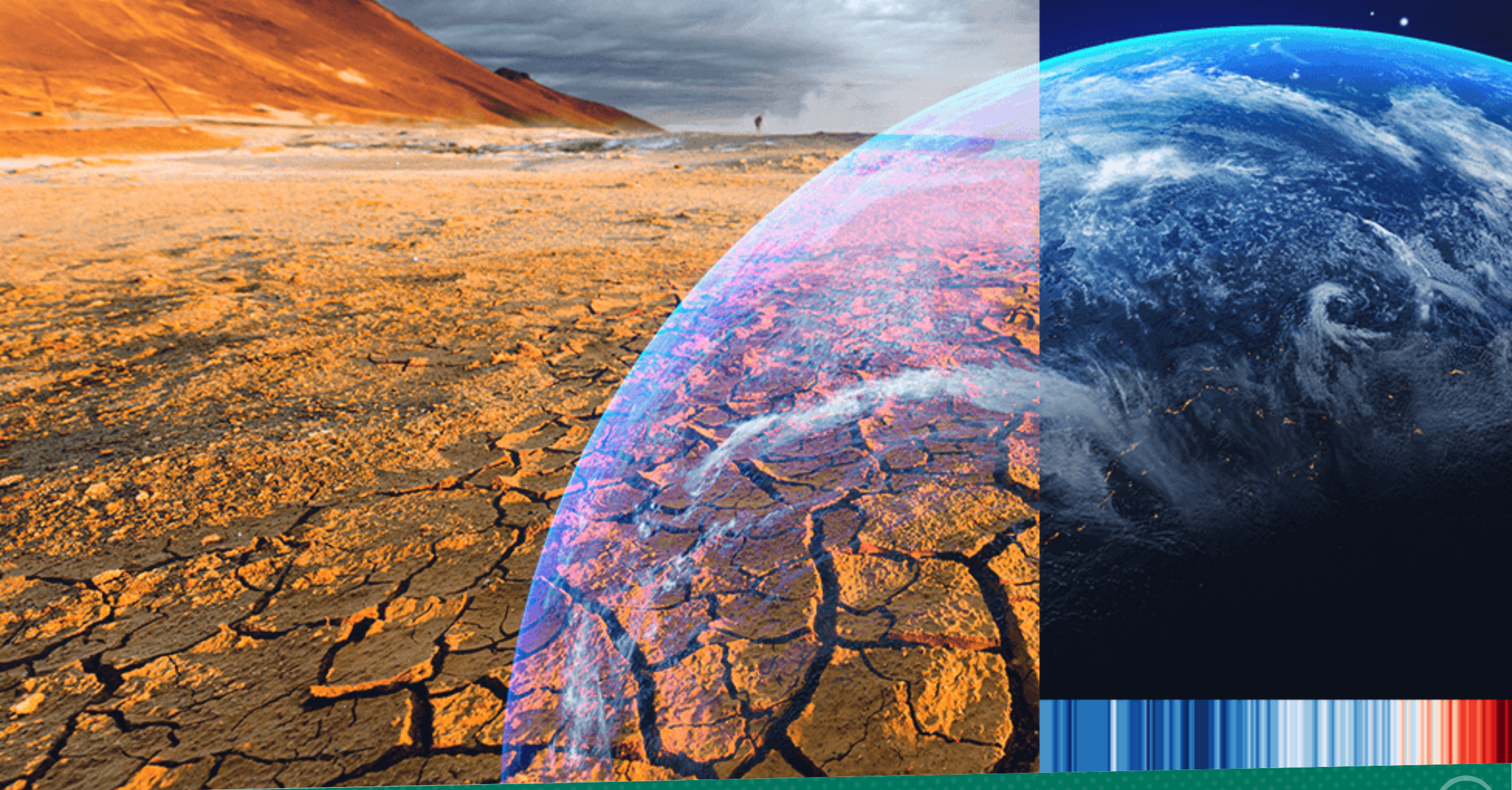
[Jeffery.Tomberlin@ag.tamu.edu](mailto:Jeffery.Tomberlin@ag.tamu.edu)

@fliesfacility

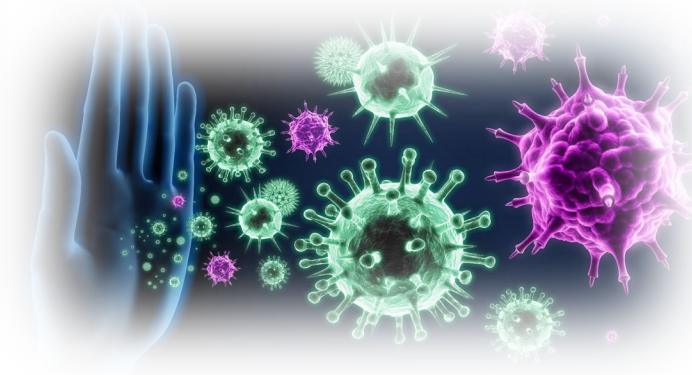
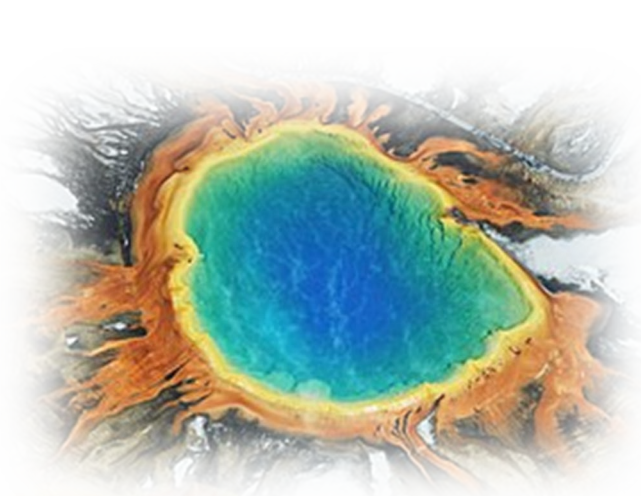




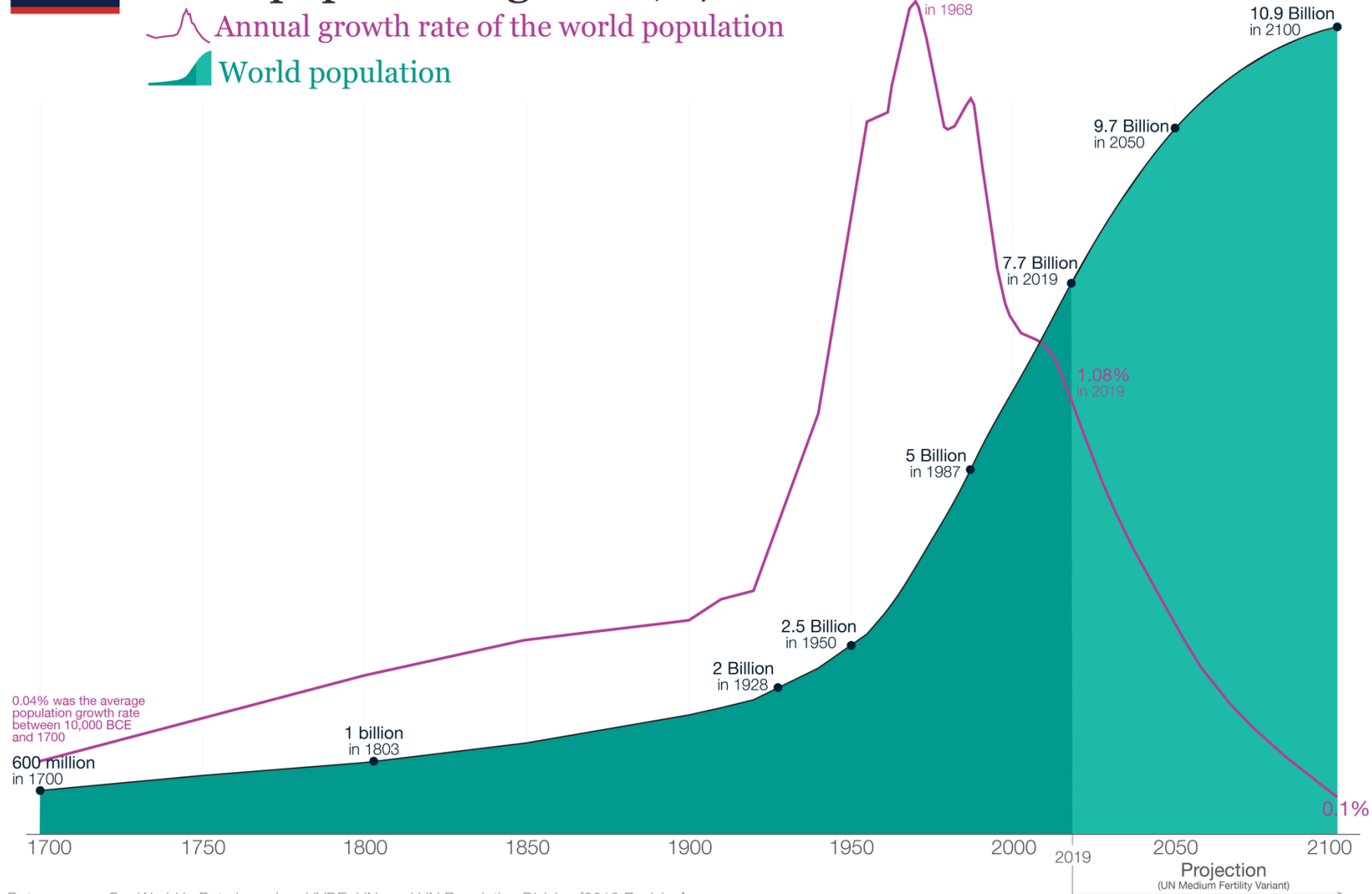




*Hermetia illucens*  
(Diptera: Stratiomyidae)



## World population growth, 1700-2100



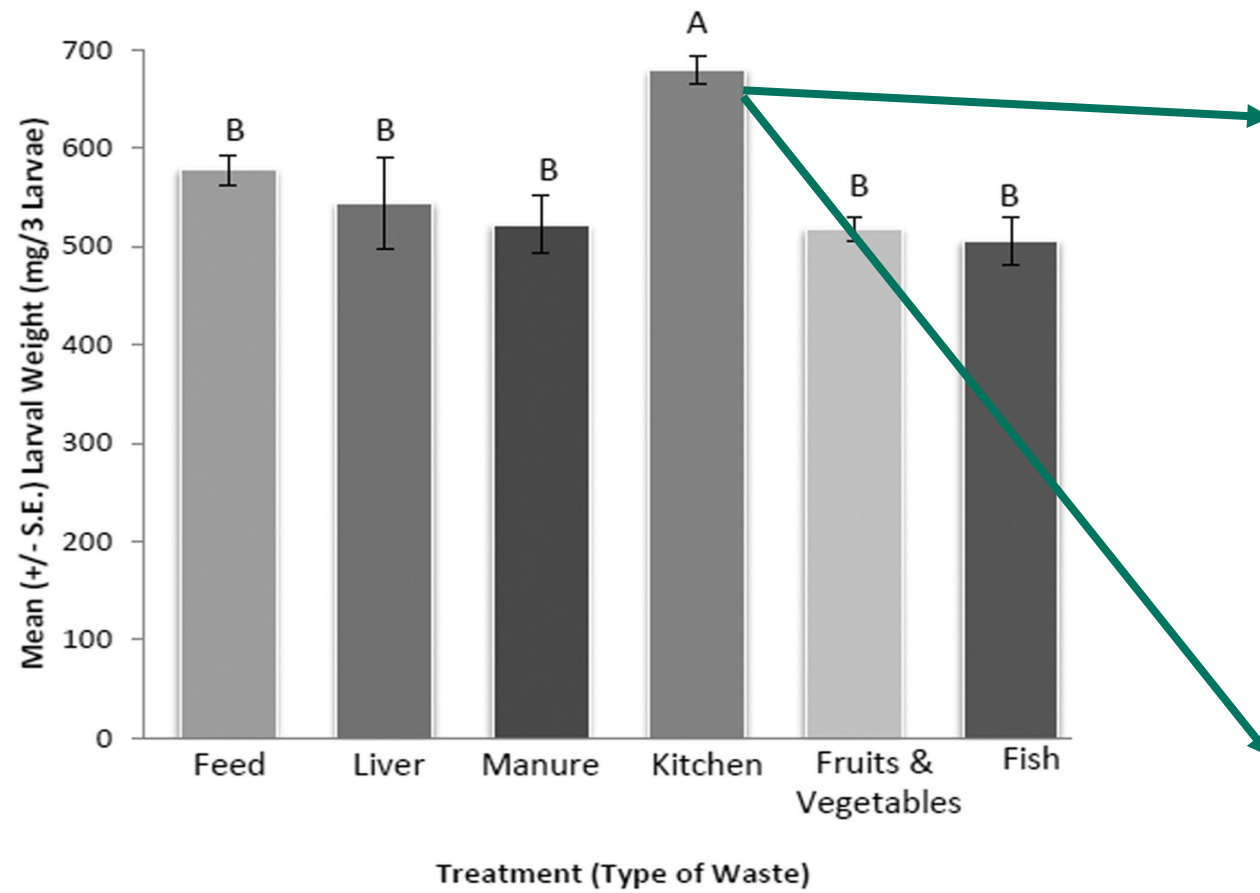
Data sources: Our World in Data based on HYDE, UN, and UN Population Division [2019 Revision]  
This is a visualization from [OurWorldinData.org](https://ourworldindata.org), where you find data and research on how the world is changing.

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[https://en.wikipedia.org/wiki/Projections\\_of\\_population\\_growth#/media/File:World\\_population\\_growth,\\_1700-2100,\\_2019\\_revision.png](https://en.wikipedia.org/wiki/Projections_of_population_growth#/media/File:World_population_growth,_1700-2100,_2019_revision.png)



According to the Food and Agriculture Organization (FAO) of the United Nations, one-third of all food produced around the world is wasted.

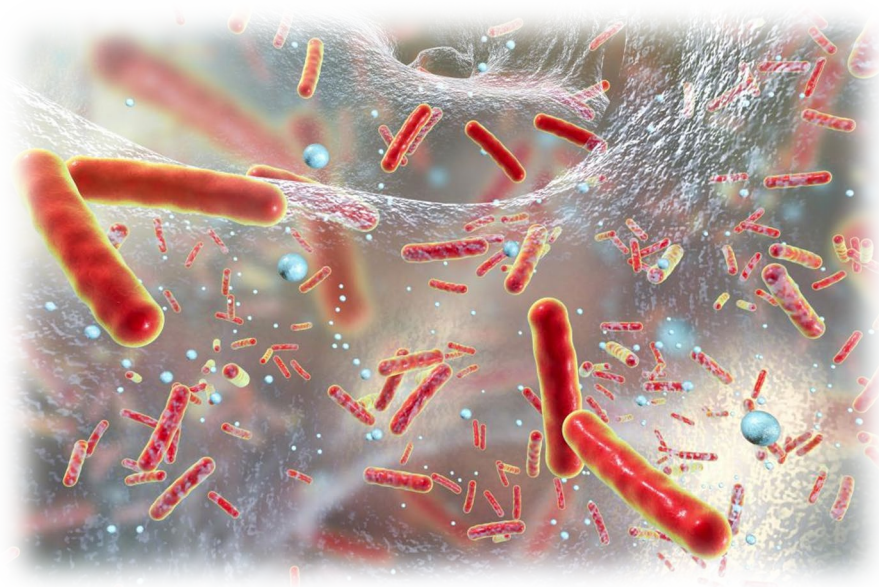


(Nguyen et al. 2015)



*E. coli* (Liu et al. 2008) & *Salmonella*  
(Erickson et al. 2004)

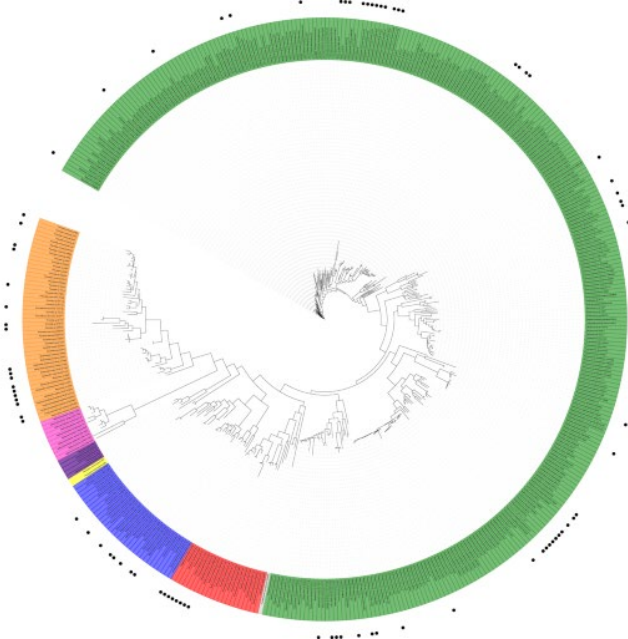
## Antibiotics (Mei et al. 2021)



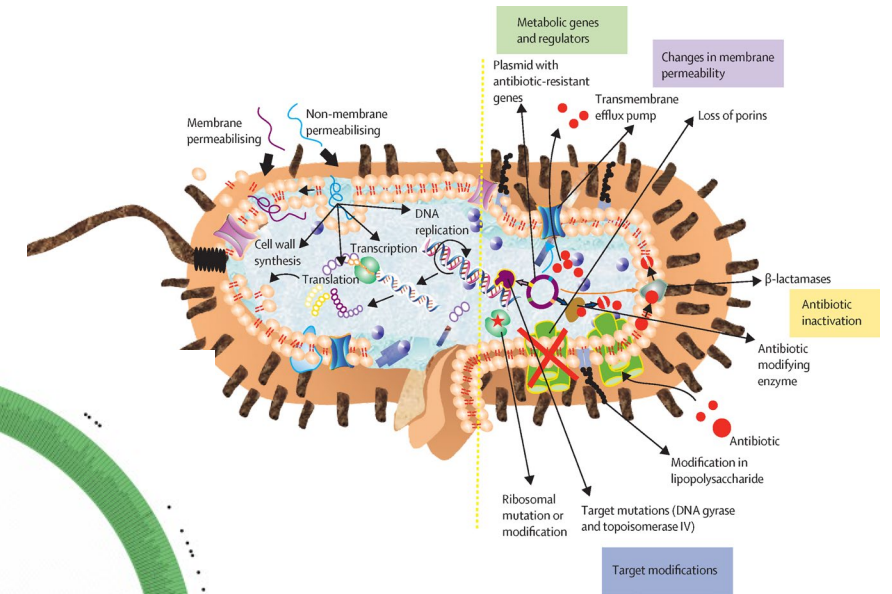
Tree scale: 0.1

Phyla

- Actinobacteria
- Firmicutes
- Proteobacteria
- Bacteroidetes
- Fibrobacteres
- Fusobacteria
- Euryarchaeota
- Spirochaetes



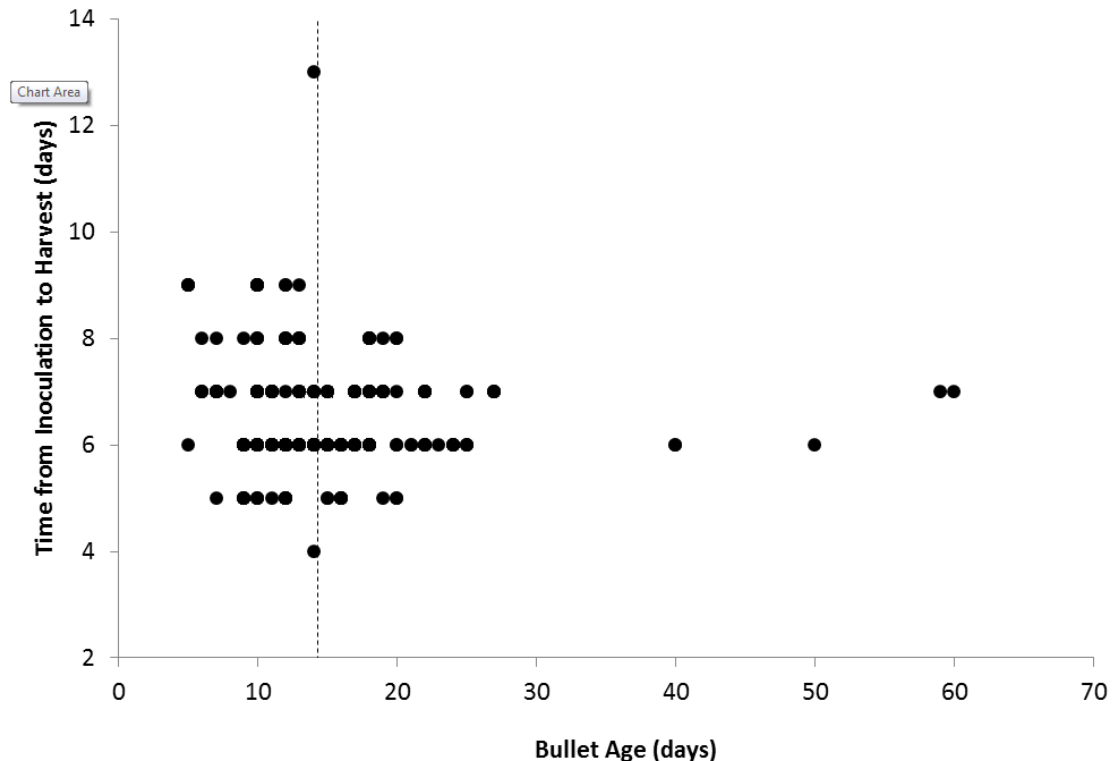
## Antibiotic Resistant Bacteria (Cai et al. 2018)



## Antibiotic Resistant Genes (Zhao et al. unpublished data)

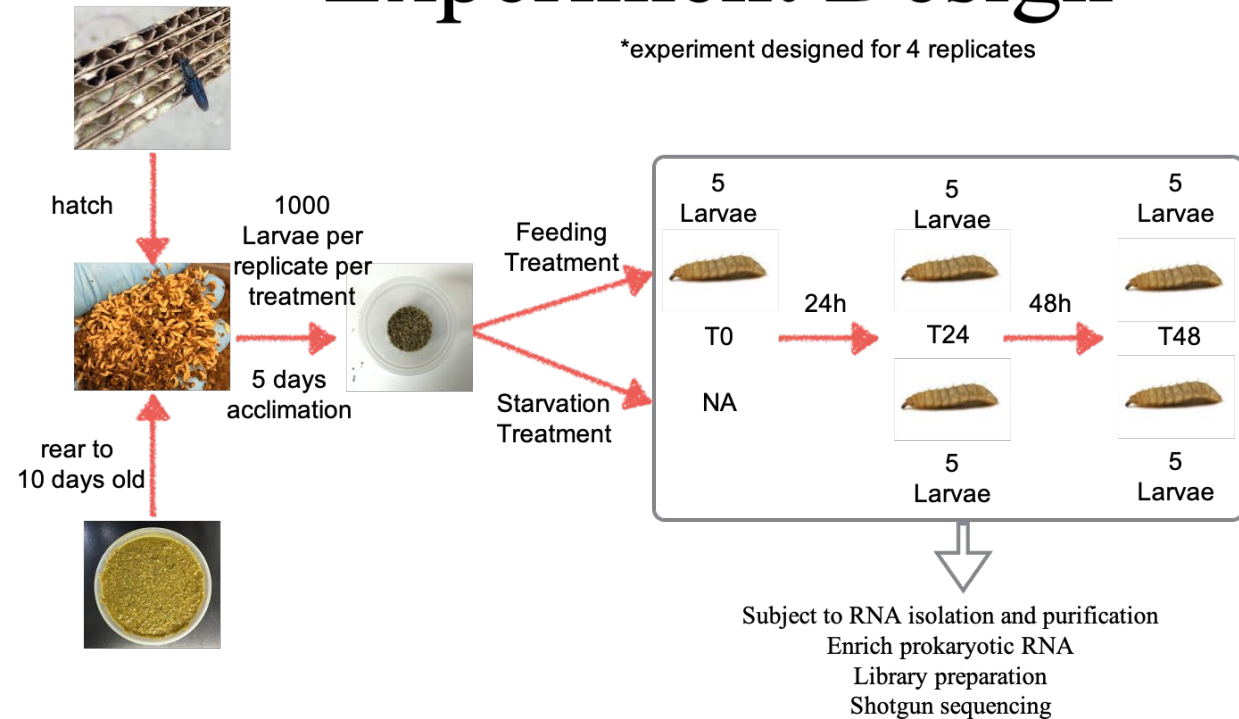
# Tailored Insects & Optimization- Microbes

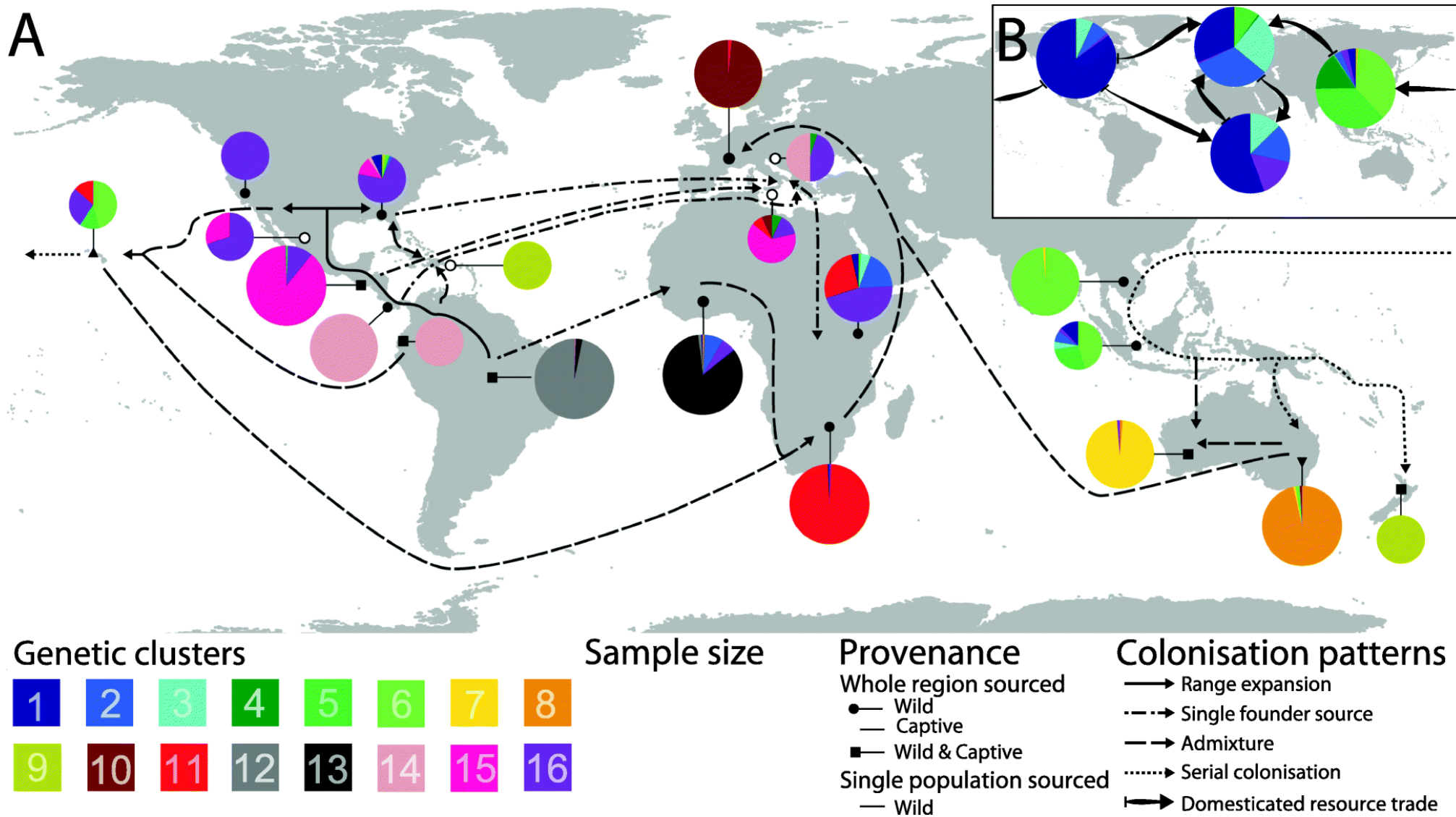
- Enhanced feeding- starvation (Yang et al. 2021)
- Feed conversions (Kooienga et al. 2020; Patent, Jordan and Tomberlin 2022)
- “Hibernation” (Patent: Tomberlin et al. 2021)



## Experiment Design

\*experiment designed for 4 replicates





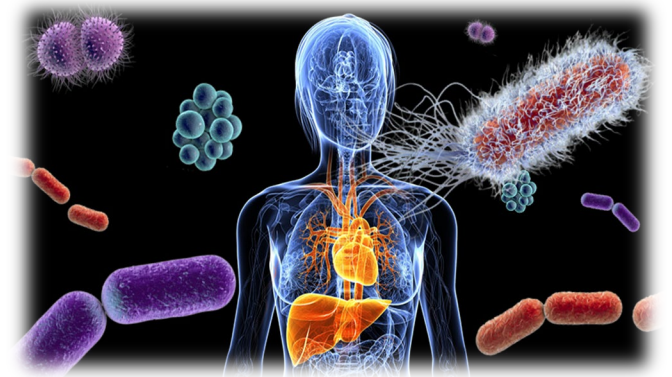
(Kaya et al. 2021)





# Advancing Insect Agriculture





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- Texas A&M AgriLife Research State Air Quality Initiative (SAQI)
- Texas A&M AgriLife Institute for Advancing Health Through Agriculture



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**Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation or the Industry Advisory Board Members of the Center for Environmental Sustainability through Insect Farming.**



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