



75TH EAAP ANNUAL MEETING
1/5 SEPTEMBER 2024 - FLORENCE, ITALY

Comparative larval growth of *Alphitobius diaperinus* (Panzer) populations on various substrates

Baliota G.V.¹, Rumbos C.I.¹, Steeghs N.², Athanassiou C.G.¹

¹Laboratory of Entomology and Agricultural Zoology,
Department of Agriculture, Crop Production & Rural Environment, School
of Agricultural Sciences, University of Thessaly, 38446, Volos, Greece

²Ynsect SAS, 1 Rue Pierre Fontaine, 91000 Évry - Courcouronnes, France





75th EAAP Annual Meeting - 1/5 September 2024 - Florence, Italy

PRESENTED BY: GEORGIA BALIOTA (mpaliota@uth.gr)



The lesser mealworm, *Alphitobius diaperinus*

- ✓ Vector of pathogens in poultry farms
- ✓ Secondary stored-product insect pest
- ✓ Edible insect for food and feed



AQUAFEEDS

EU Regulation
2017/893



POULTRY & PIG DIETS

EU Regulation
2021/1372



FOOD

EU Regulation
2015/2283





75th EAAP Annual Meeting - 1/5 September 2024 - Florence, Italy

PRESENTED BY: GEORGIA BALIOTA (mpaliota@uth.gr)

FEED THE INSECT'S NEEDS

Knowledge gaps regarding the
optimization of mass rearing
Alphitobius diaperinus

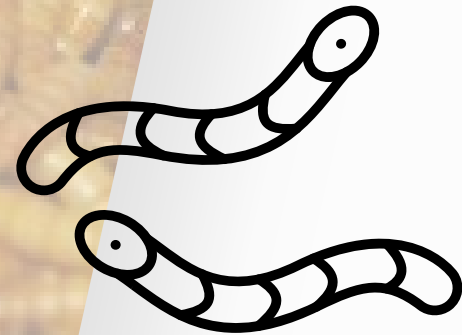


VALUES



Feeding Substances & Diets

Integrate locally available **agricultural byproducts** for rearing *Alphitobius diaperinus* larvae.



Choose wisely your population

Evaluate insect populations based on **desirable traits** that exhibit superior production output.

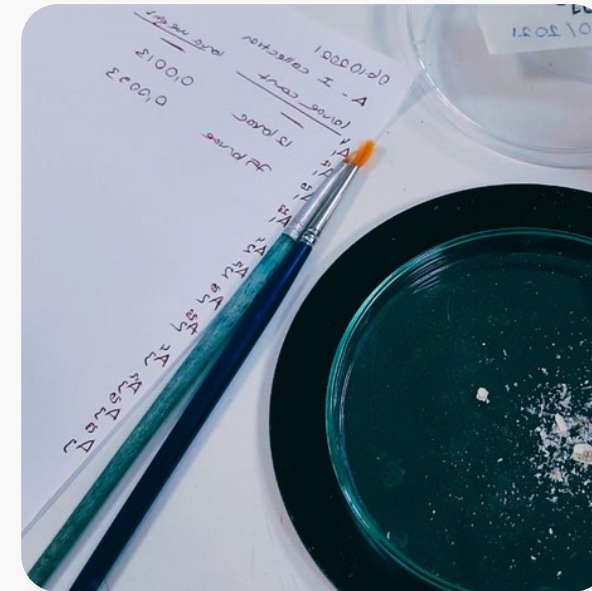


75th EAAP Annual Meeting - 1/5 September 2024 - Florence, Italy

PRESENTED BY: GEORGIA BALIOTA (mpaliota@uth.gr)

TRUE OR FALSE?

Can we select insect populations that can efficiently grow on specific, not so favorable, byproducts?



75th EAAP Annual Meeting - 1/5 September 2024 - Florence, Italy

PRESENTED BY: GEORGIA BALIOTA (mpaliota@uth.gr)

The Contestants



UTH
[GREECE]

Laboratory
population.
Brought in 2019
from a local store
Greece.



GRW
[GREECE]

Wild population.
Collected in 2021
from a local
broiler house in
Central Greece.



USW
[USA]

Wild population.
Collected in 2020
from a broiler
house in Delaware,
USA



TR
[Turkey]

Semi-commercial
meal for bird and
fish hobbyists.



NLT / NLK
[NETHERLANDS]

Commercial
populations for
insect meal.



75th EAAP Annual Meeting - 1/5 September 2024 - Florence, Italy

PRESENTED BY: GEORGIA BALIOTA (mpaliota@uth.gr)



UNIVERSITY OF
THESSALY

Feed Tracker



Wheat bran

The common byproduct
used as control diet



Rice hulls

Byproduct with toxic traits,
is used only for biogas



Sunflower

Full of lipids,
not suitable for mealworms

Materials & Methods

Start



50 larvae
per vial
Dry & wet
feed
6 replicates

Termination



Emergence
of the first
pupa per vial

Results

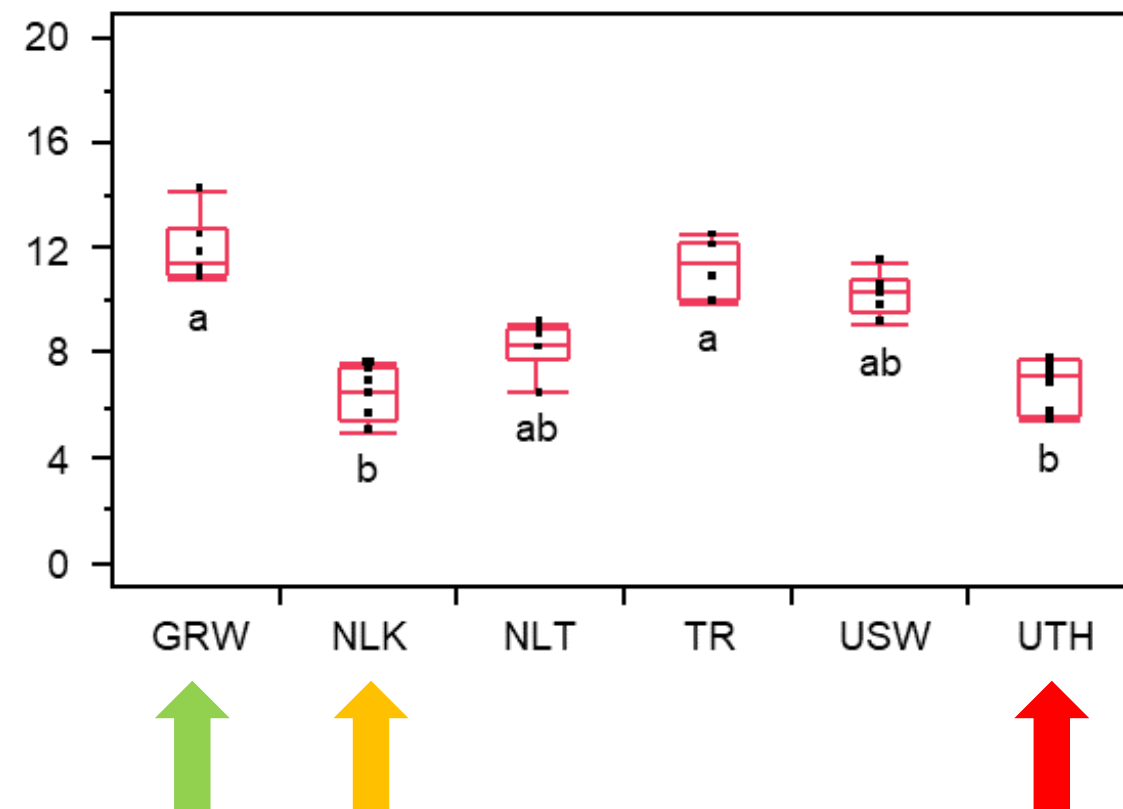


Survival,
growth,
development
time, FCR,
SGR, ECI

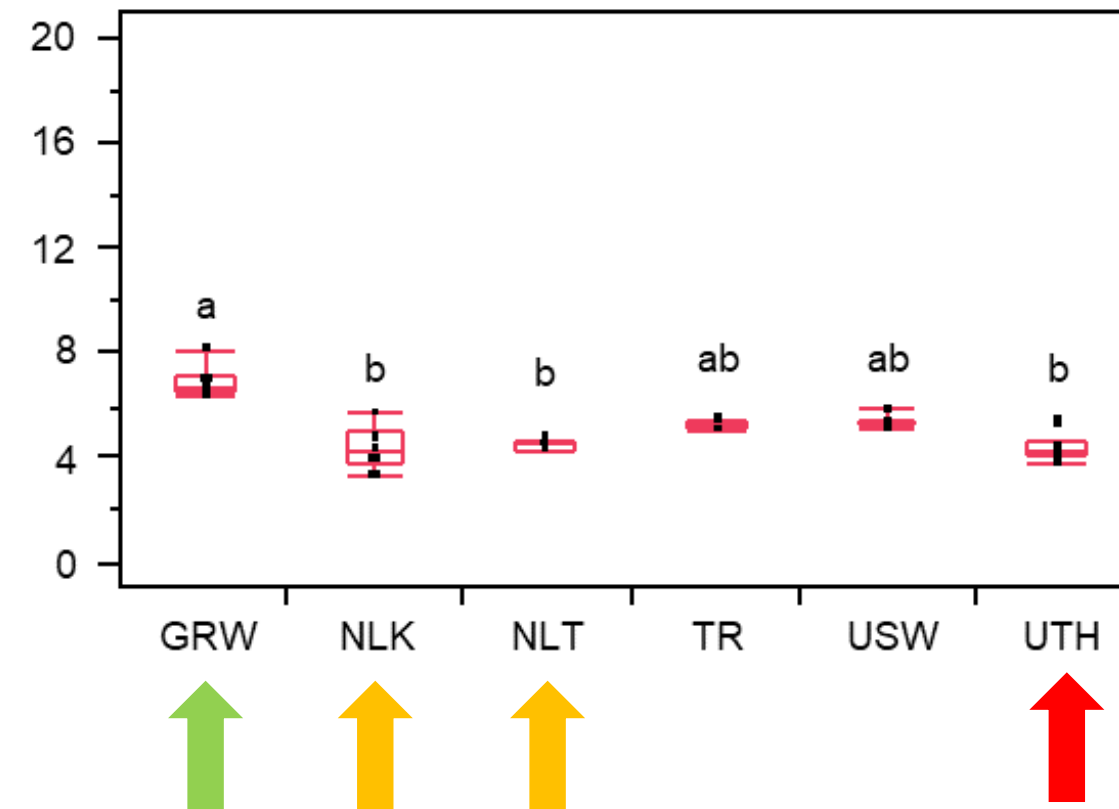
Individual larval weight (mg)

Individual larval weight (mg)

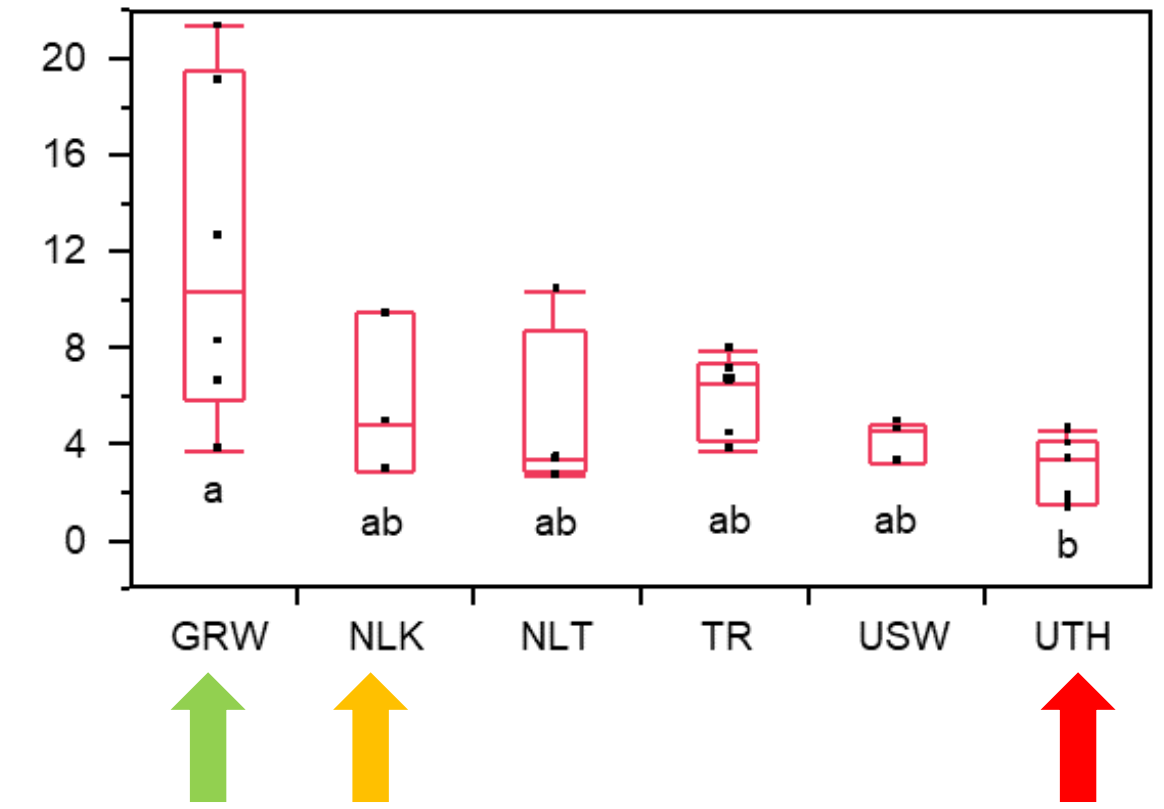
Wheat bran



Rice hulls

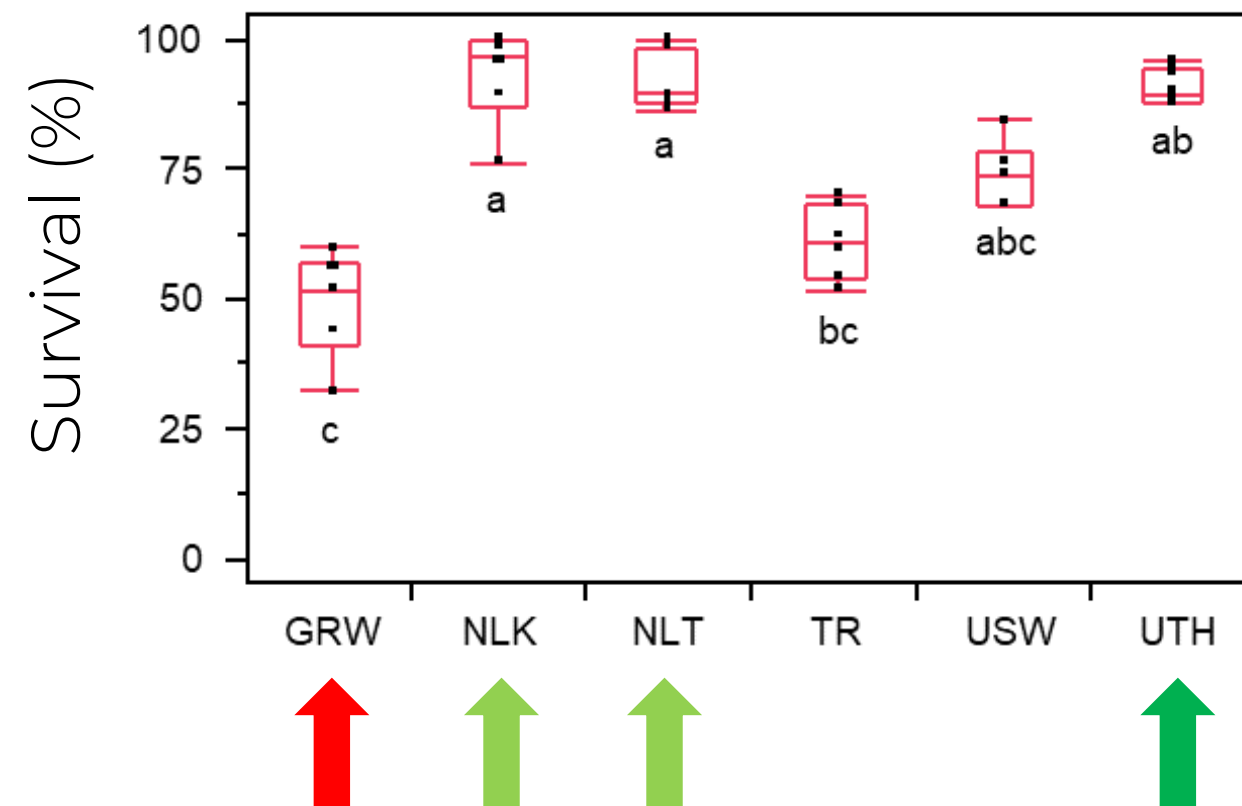


Sunflower

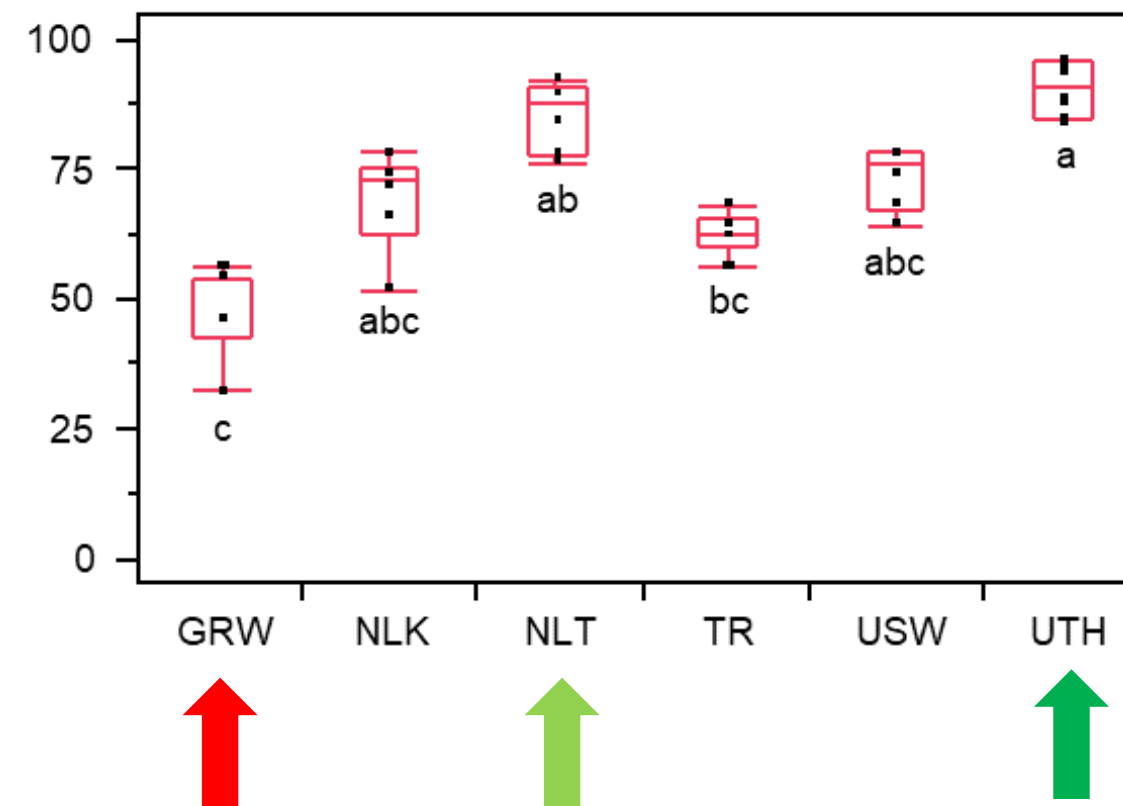


Survival (%)

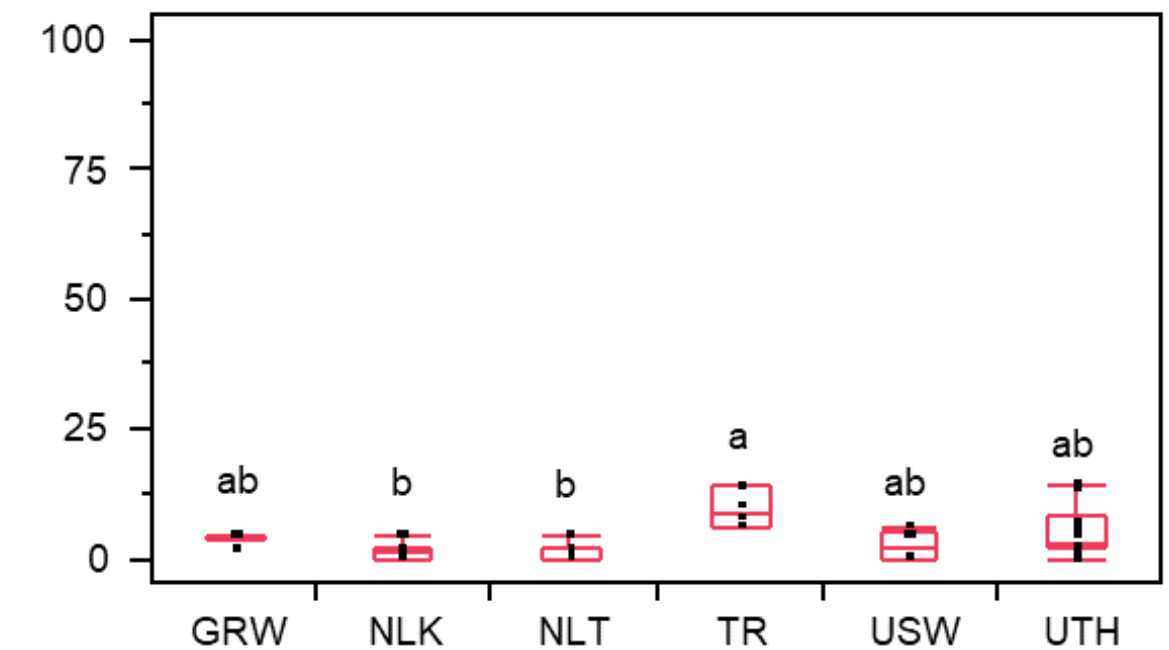
Wheat bran



Rice hulls

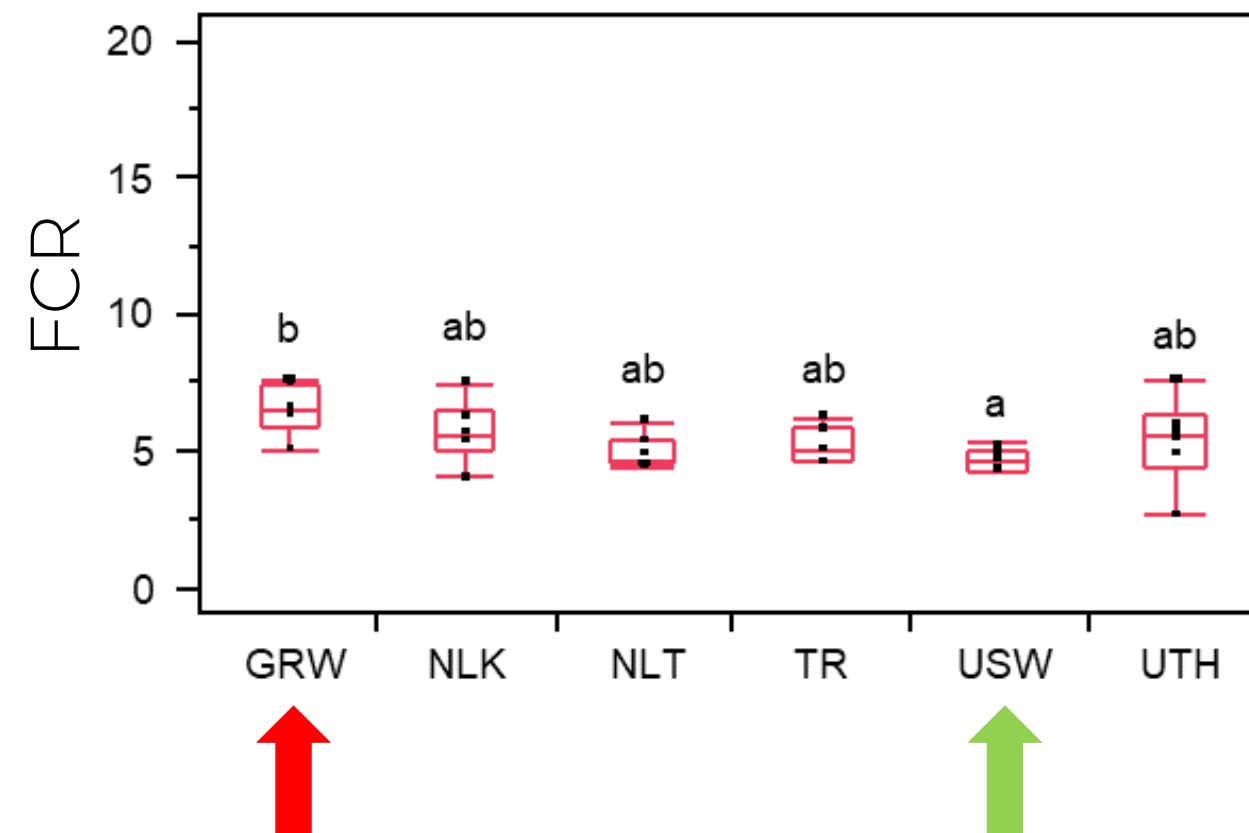


Sunflower

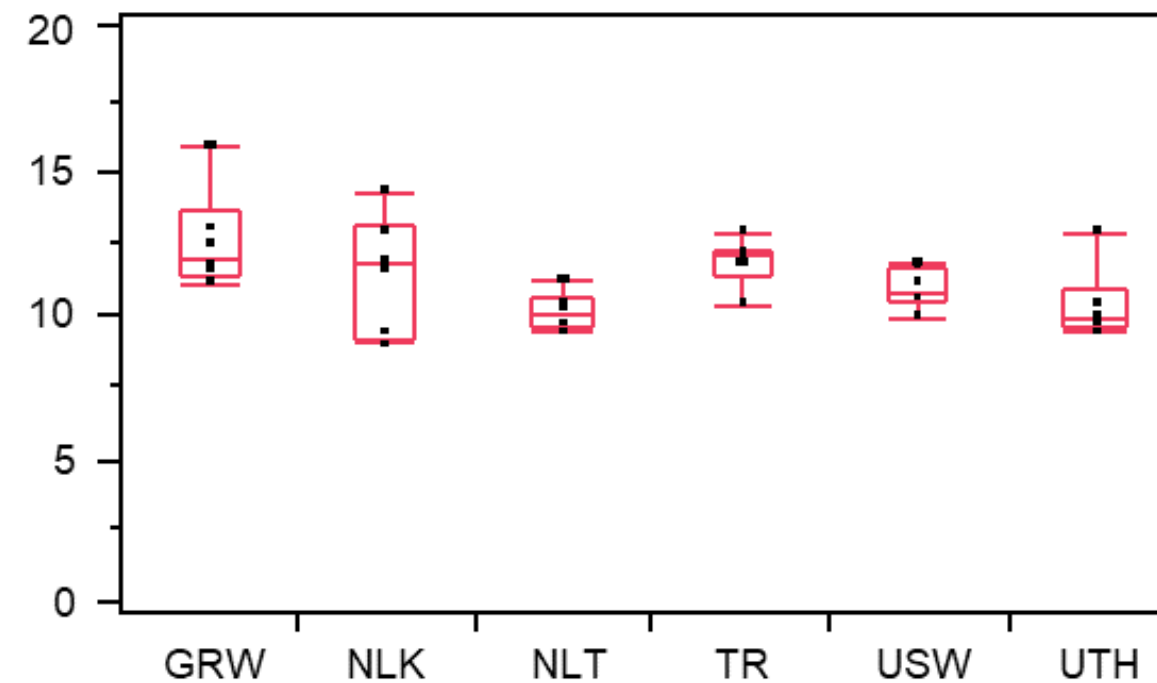


Feed Conversion Ratio

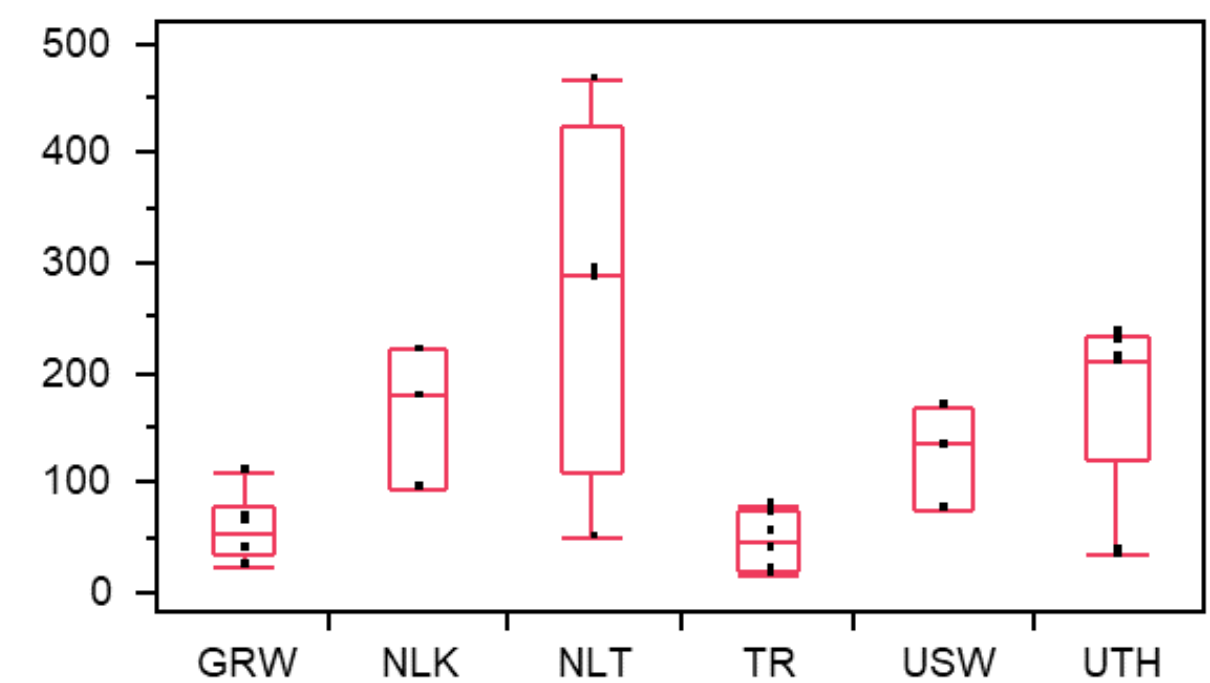
Wheat bran



Rice hulls

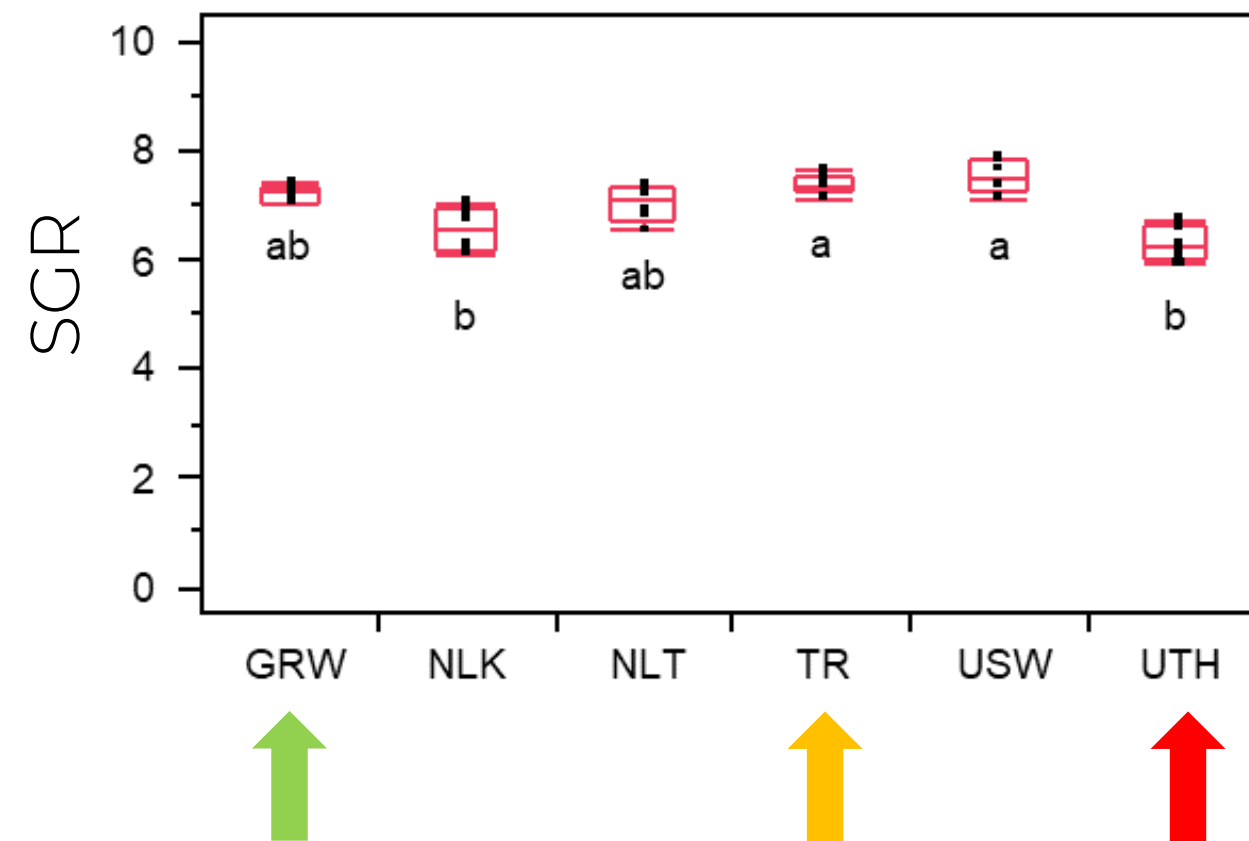


Sunflower

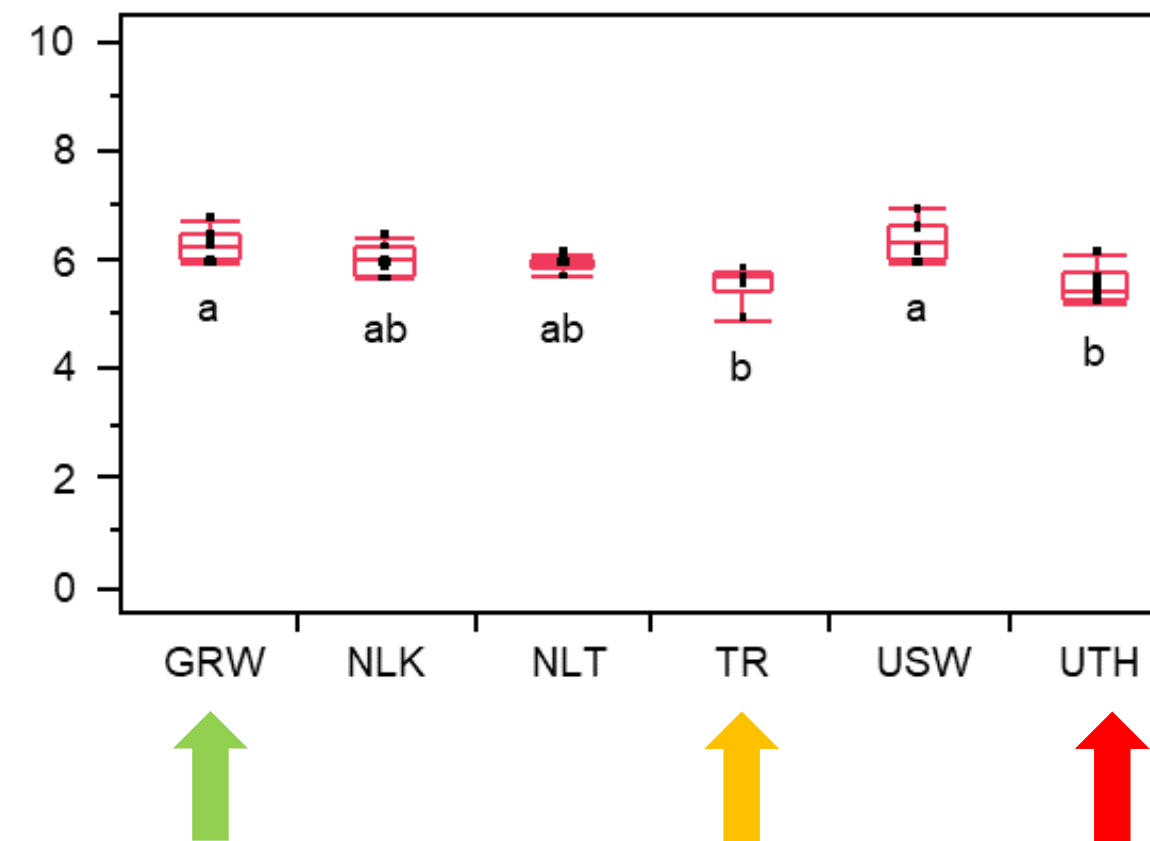


Specific Growth Rate

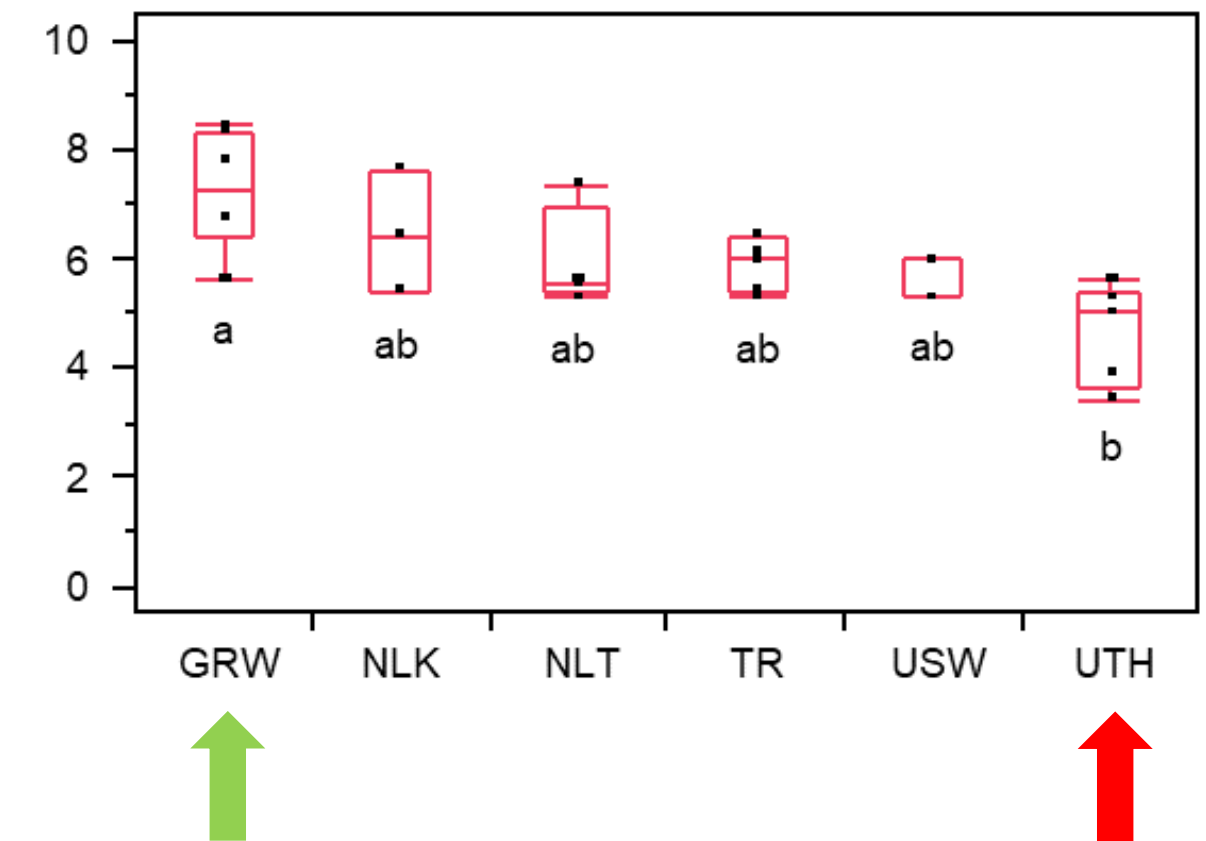
Wheat bran



Rice hulls



Sunflower





TIPS

Sustainability

Integrate locally available agricultural byproducts for rearing *Alphitobius diaperinus*.

Compound feeding diets

Compose diets using a variety of ingredients to suit the nutritional needs of the larvae.

Balanced nutritional profile

The ideal development of larvae may not depend just on the protein content of the feeding diet.





TIPS

Choose wisely

Evaluate strains based on desirable traits that exhibit superior production output.

What has been lost?

Understand the concept of inbreeding in insects.





The Insect -IMP network aims to support insect genetic improvement to enhance food security and sustainability while reducing environmental impact.

illumina

METEX
ANIMAL NUTRITION

NEOGEN

CIEL

VETAGRO

labo gena

CLOCK INC

INSECT GENETICS IMP rovement plementation act

Insect Genetic IMProvement, IMPlmentation, IMPact

Programme Scientific and Organizing Committee Venue Accomodations Contacts

Athens (Greece), 29-31 January 2025

Submit your abstract

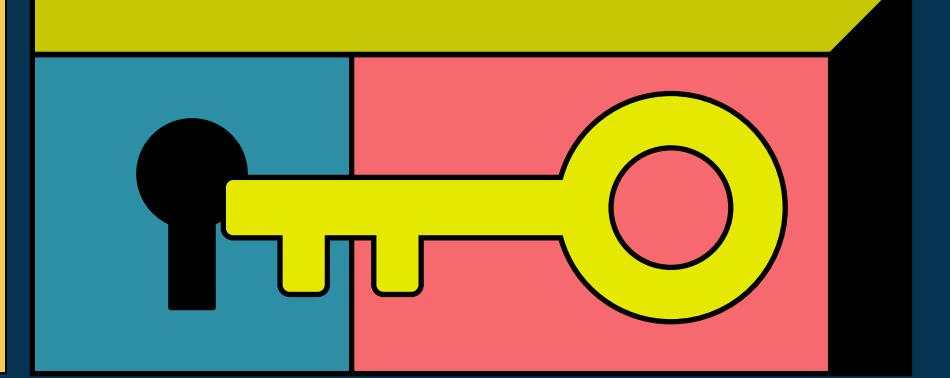
Insect breeding is a fast-growing industry that requires a vibrant support community and tailored-to-need genetics research related to everything from genetic diversity and population structure, phenotyping, breeding objectives, to estimation of breeding values in insects. The aim of this workshop is to bring together scientists working on various insect species and aspects of insect breeding, to present state-of-the-art research, spur debate across species and fields, and to train new generation of insect breeders.

The workshop is organized in tight collaboration with Insect-IMP COST Action that strives to connect edible and non-edible insects, academia and industry, as well as insect and livestock breeding to transfer knowledge to support insect genetic improvement to enhance food security and sustainability while reducing environmental impact.

FAO • FEZ • EAAP • EUROPA

EAAP

European Federation of Animal Science



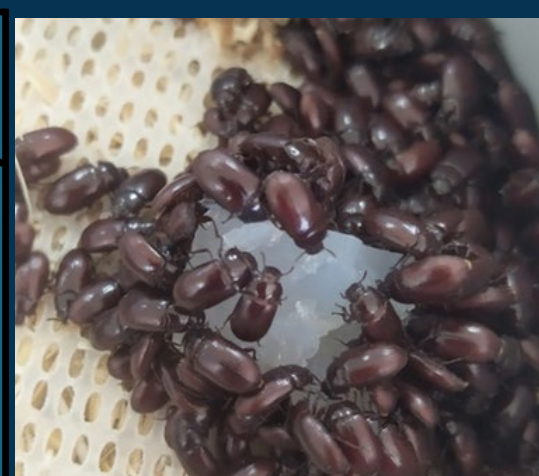
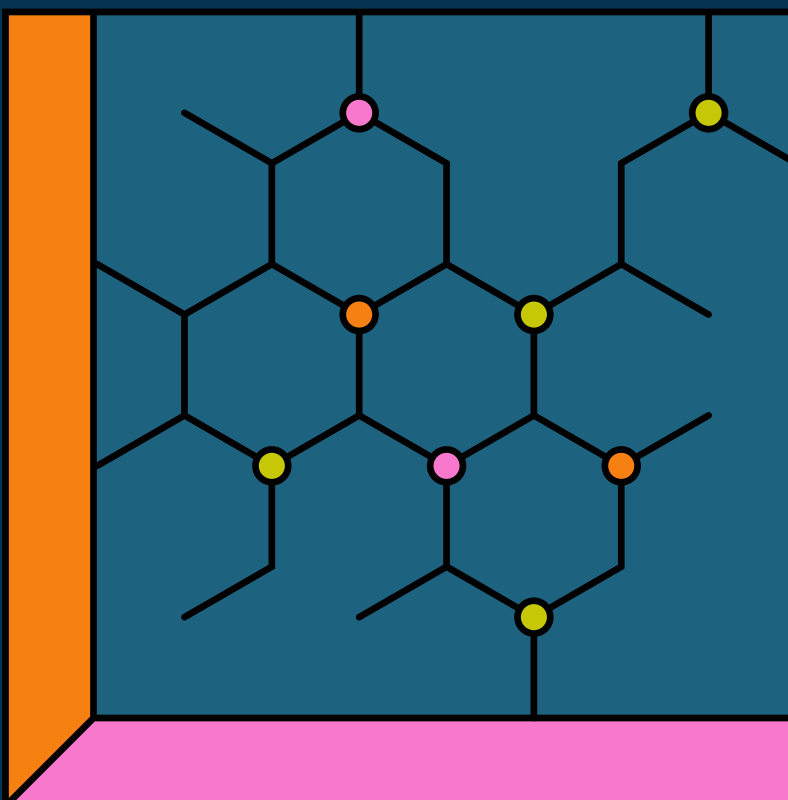
THANK YOU

Contact Info: mpaliota@agr.uth.gr



Scan the QRcode
for UTH works

Make your
Farm
Profitable



The research work was supported by the Hellenic Foundation for Research and Innovation (HFRI) under the 4th Call for HFRI PhD Fellowships (Fellowship: 11297)

