Evaluation of Tarnished plant bug responses to the risk of predation in the presence of *Nabis americoferus*

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PEST HOST CHOICES

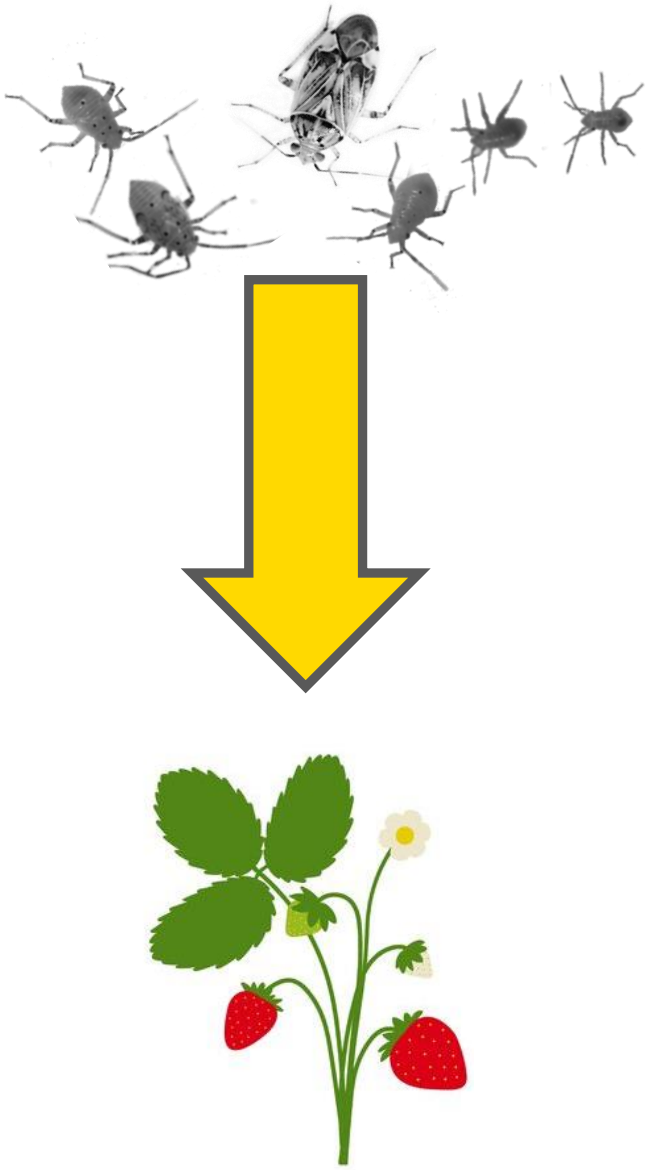


Photo: Strawberry monoculture in Quebec

PEST HOST CHOICES

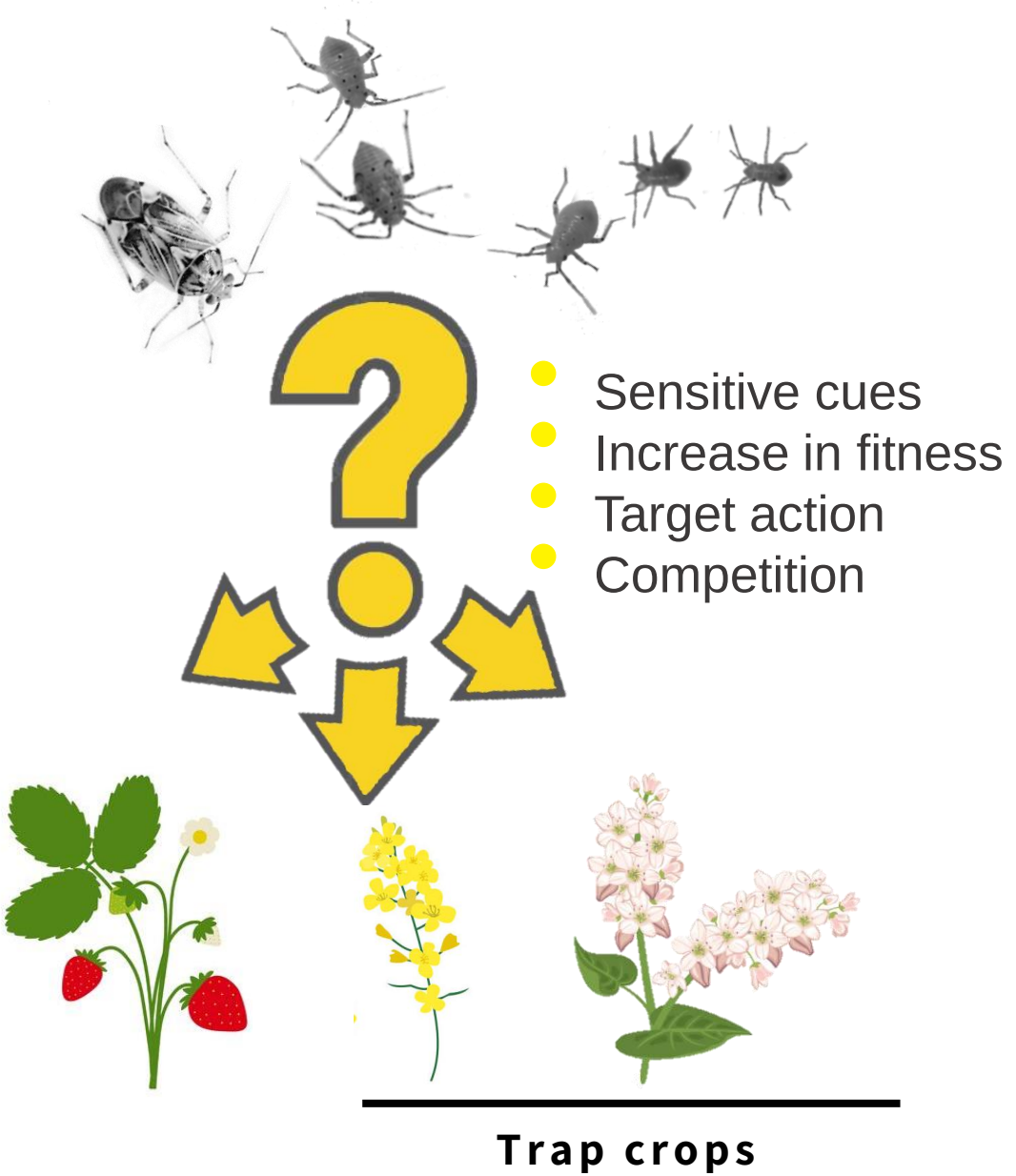
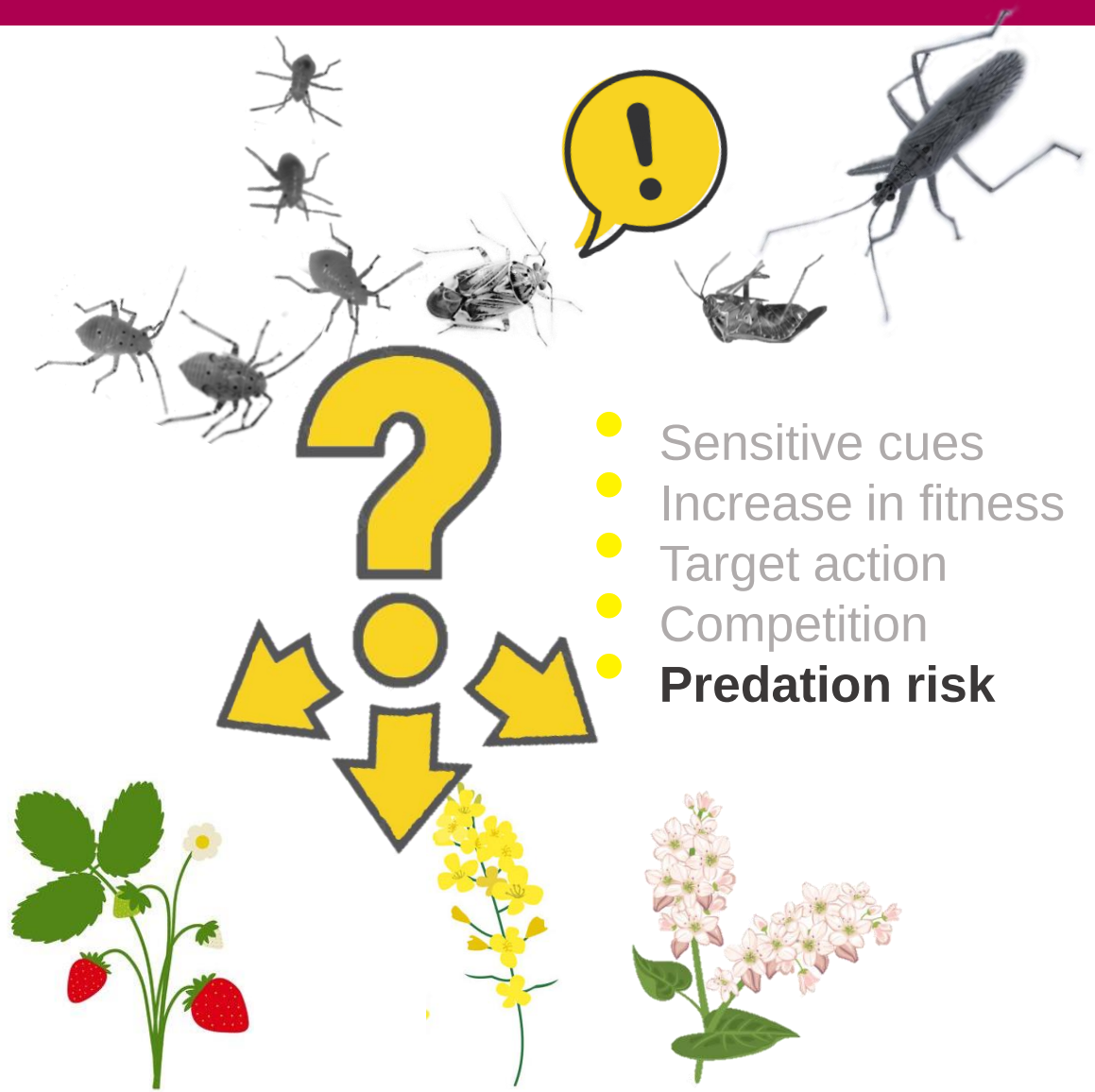


Photo: Strawberry field with an experimental buckwheat trap crop marge in Quebec.

PEST HOST CHOICES IN FRONT OF PREDATION RISK



- Sensitive cues
- Increase in fitness
- Target action
- Competition
- **Predation risk**

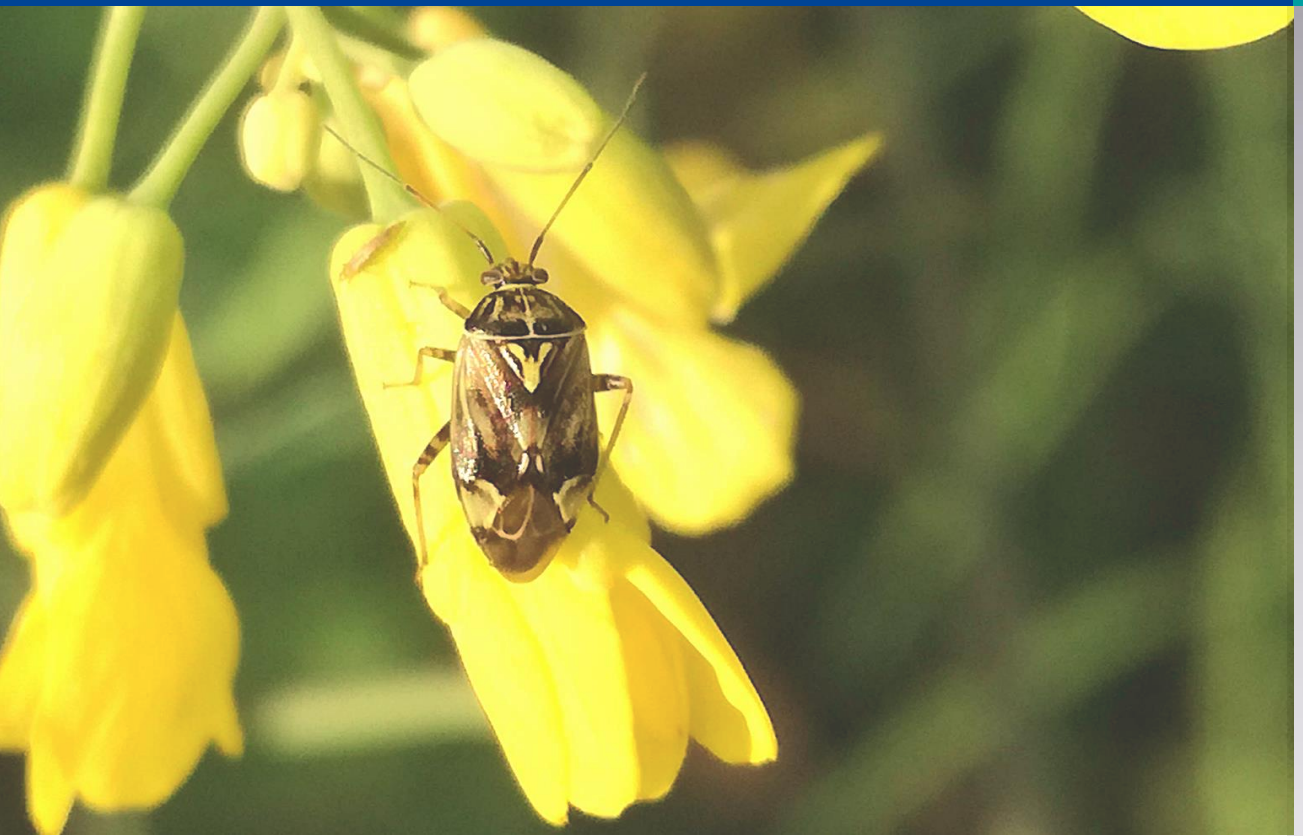
Trap crops

Photo: *N. americoferus* preying on Tarnished plant bug.

TARNISHED PLANT BUG (TPB)

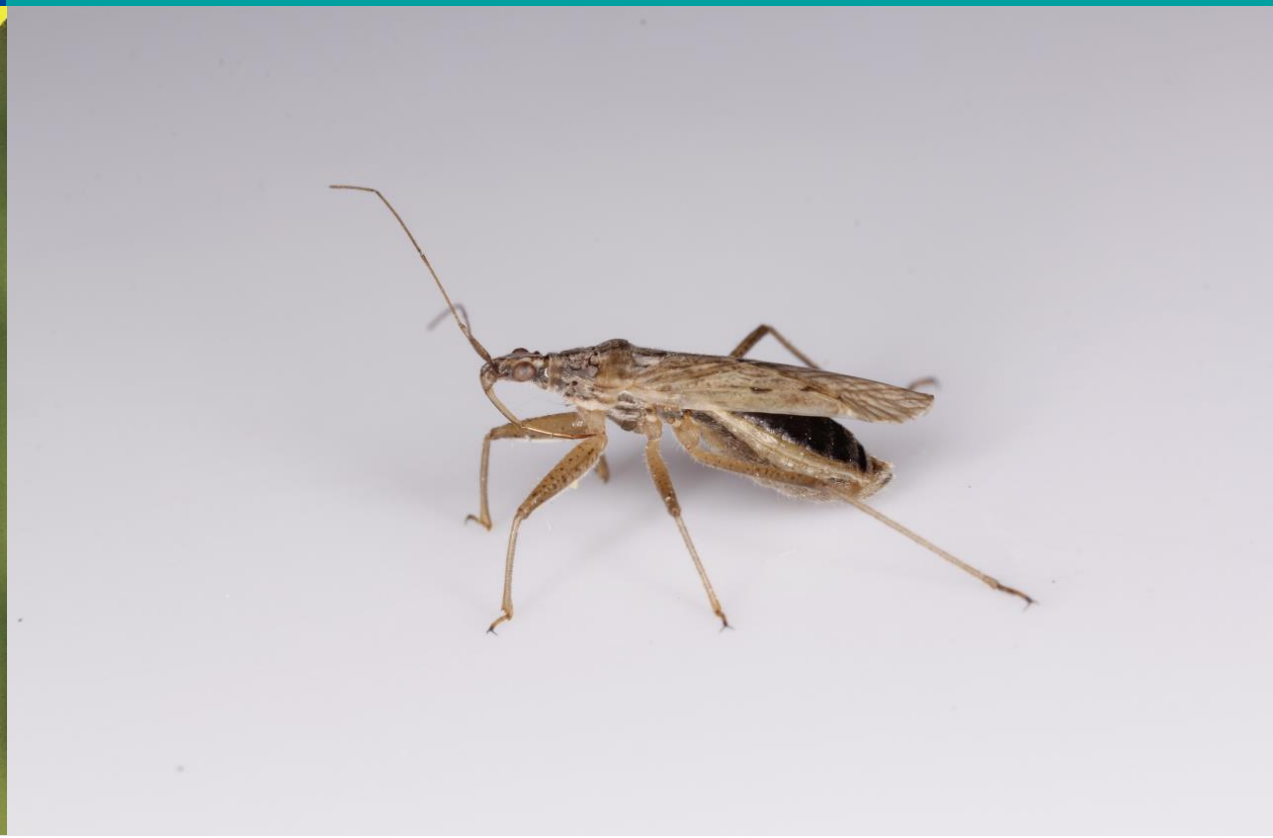
Lygus lineolaris

(Hemiptera: Miridae)



NABIS AMERICOFERUS

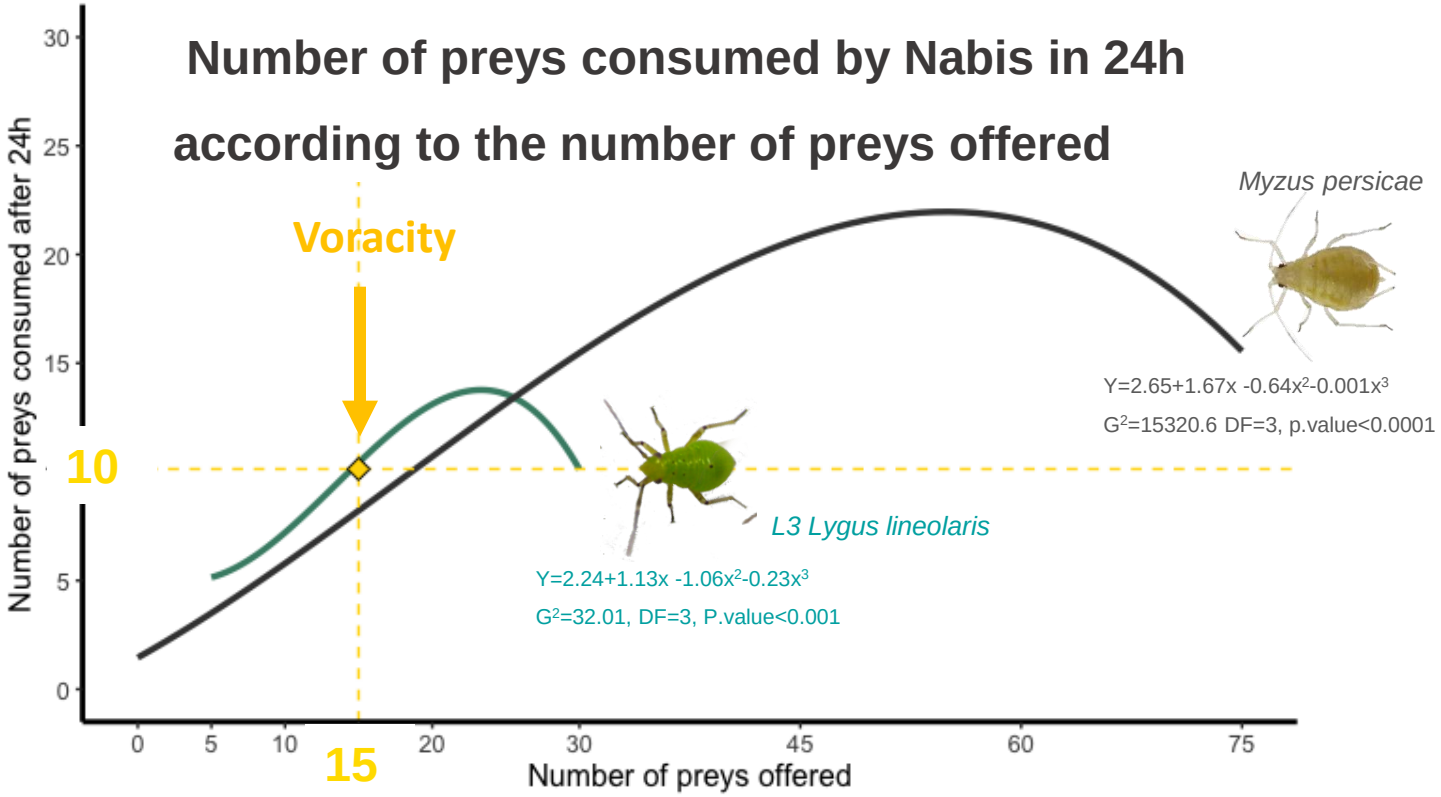
(Hemiptera: Nabidae)



- **PEST:** Threats more than 130 crops in North America.
- Complex behaviour
- No effective control strategy

- **PREDATOR:** Naturally present in TPB hos crops.
- Life cycle matches with TPB.
- Potential as control agent against TPB

EVALUATION OF NABIS AS CONTROL AGENT AGAINST TPB



- Predates on all TPB developmental stages
- High voracity
- Functional response **type III** of generalist predators.

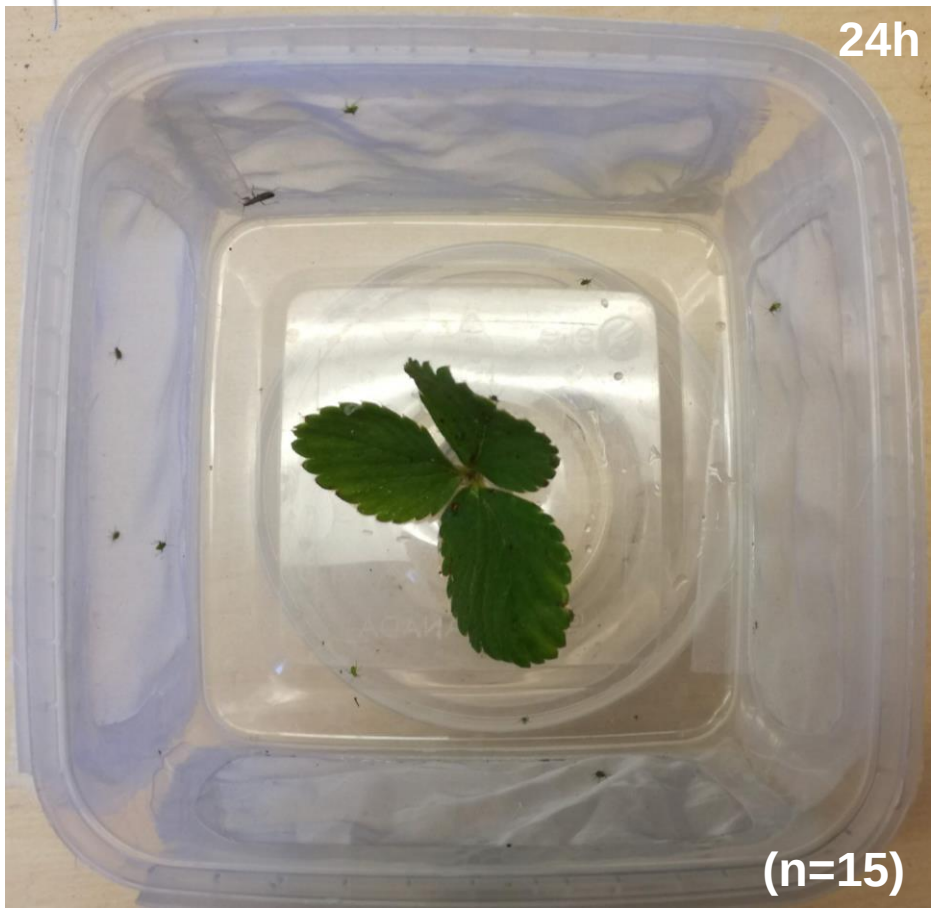


Photo: Experimental feeding arena with Nabis, TPB and a strawberry leaf.

TPB RESPONSE TO THE RISK OF PREDATION IN CUCUMBER GREENHOUSE EXPERIMENTS

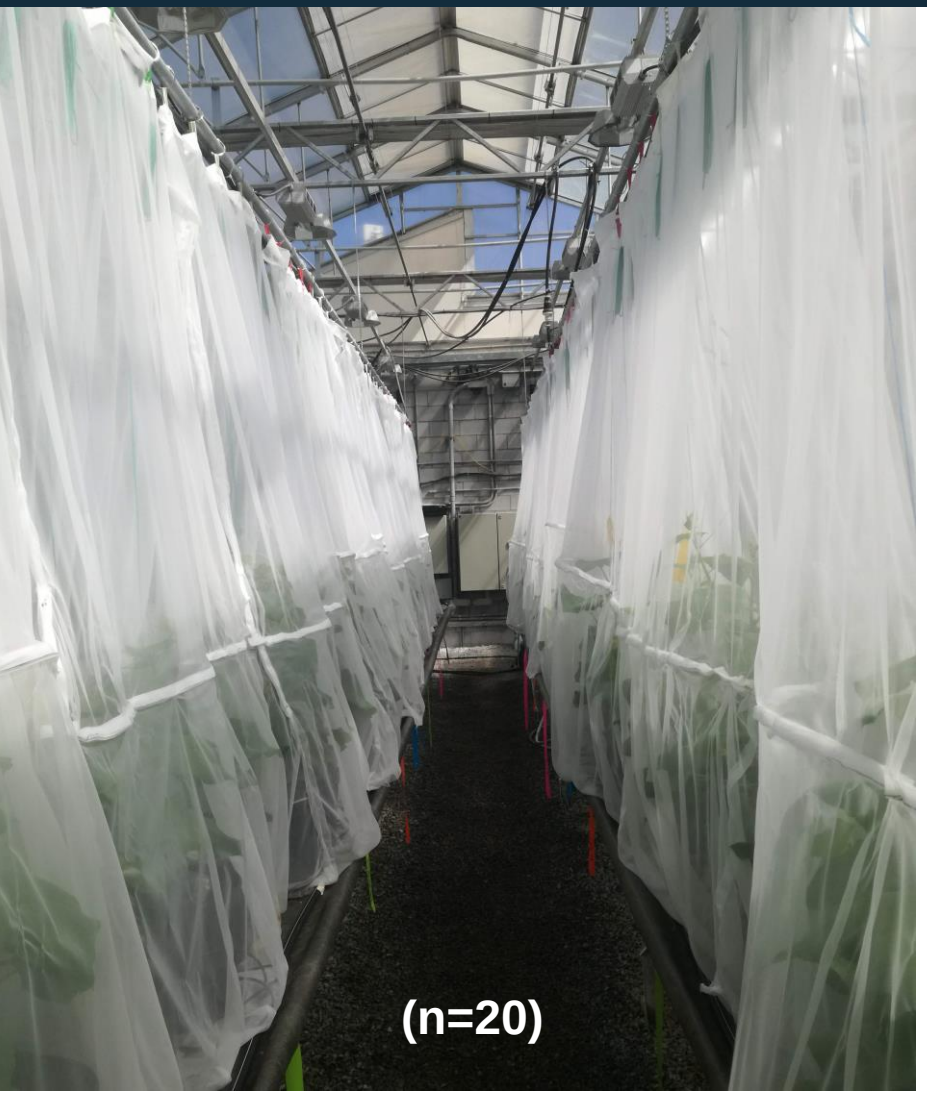
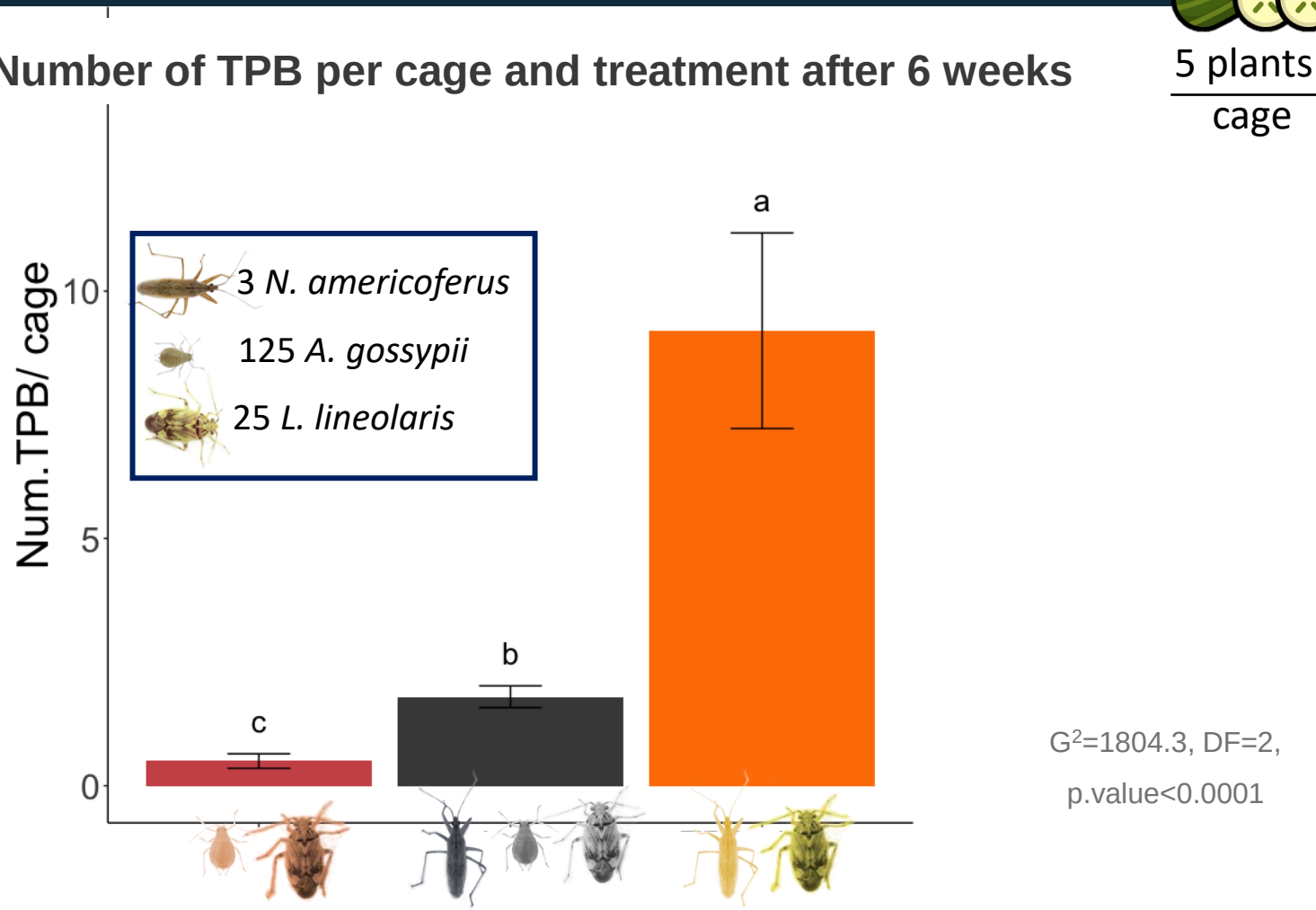
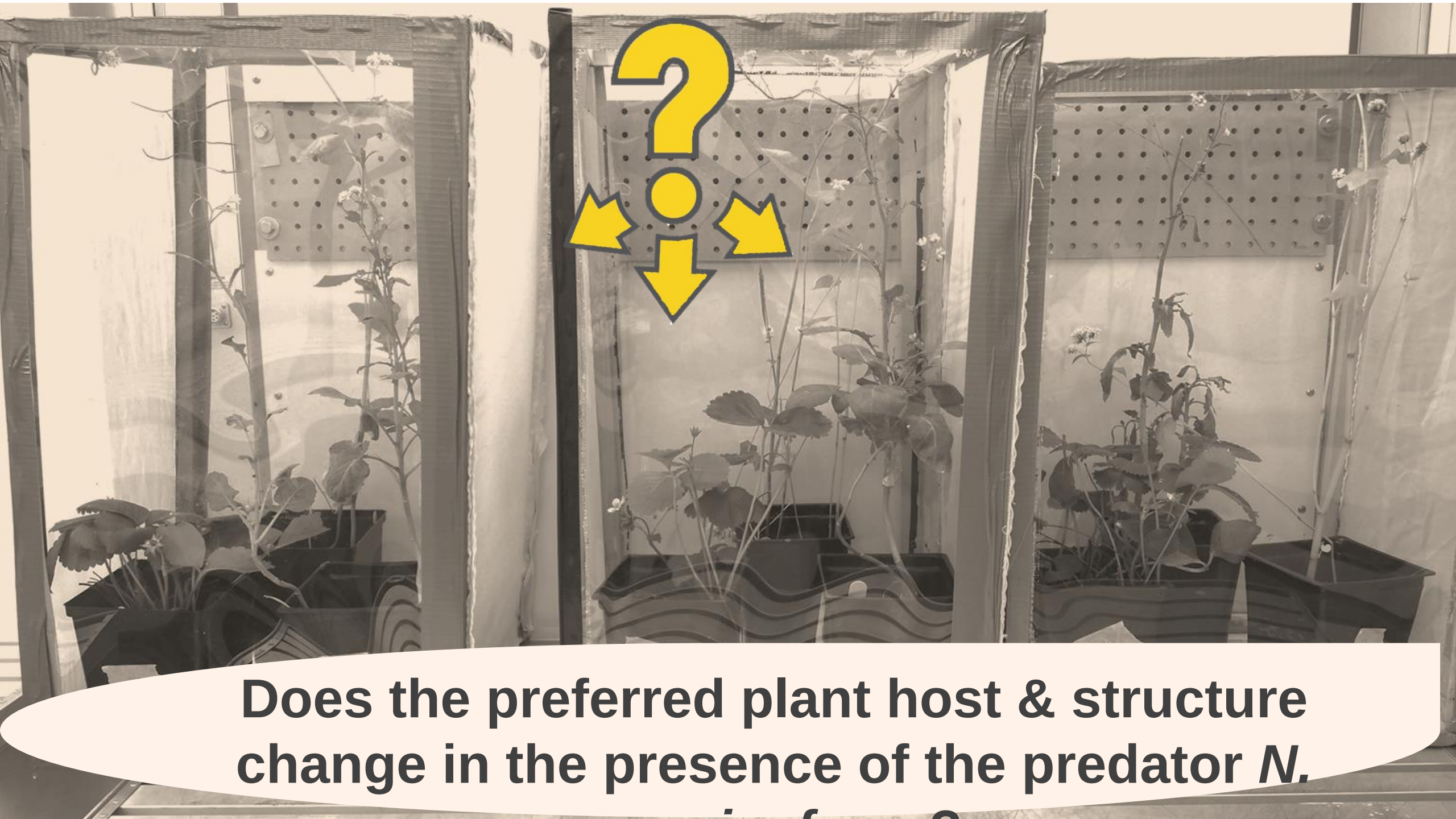


Photo: Experimental cucumber cages in the greenhouse.



TPB population was higher when the predator was present, especially, when no aphids were present.



Does the preferred plant host & structure change in the presence of the predator *N.*

TPB RESPONSE TO THE RISK OF PREDATION IN CHOICE TESTS

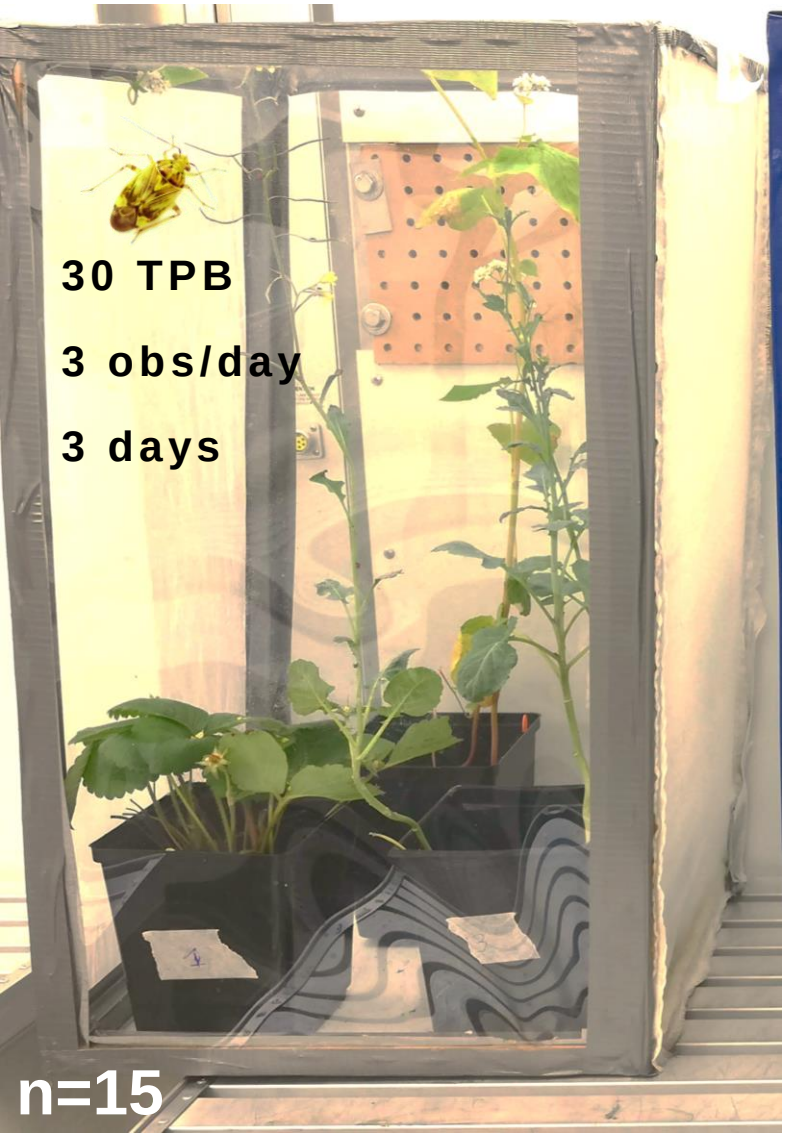


Photo: Choice test arenas.

Hosts

Spider mites

aphids

Strawberry

Buckwheat

Canola

Trap crops

Plant structures

Flower

Stem

Adaxial leaf side

Abaxial leaf side

Treatments

Without Nabis

With 3 Nabis

TPB RESPONSE TO THE RISK OF PREDATION IN CHOICE TESTS

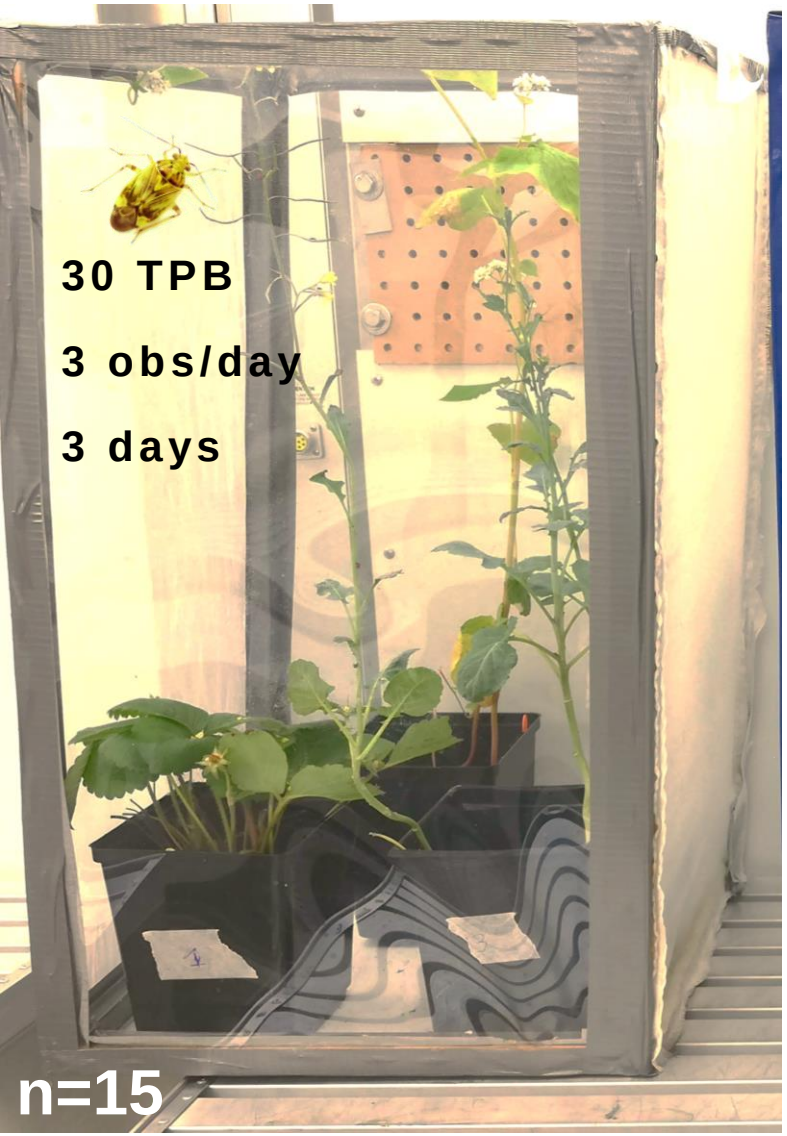


Photo: Choice test arenas.

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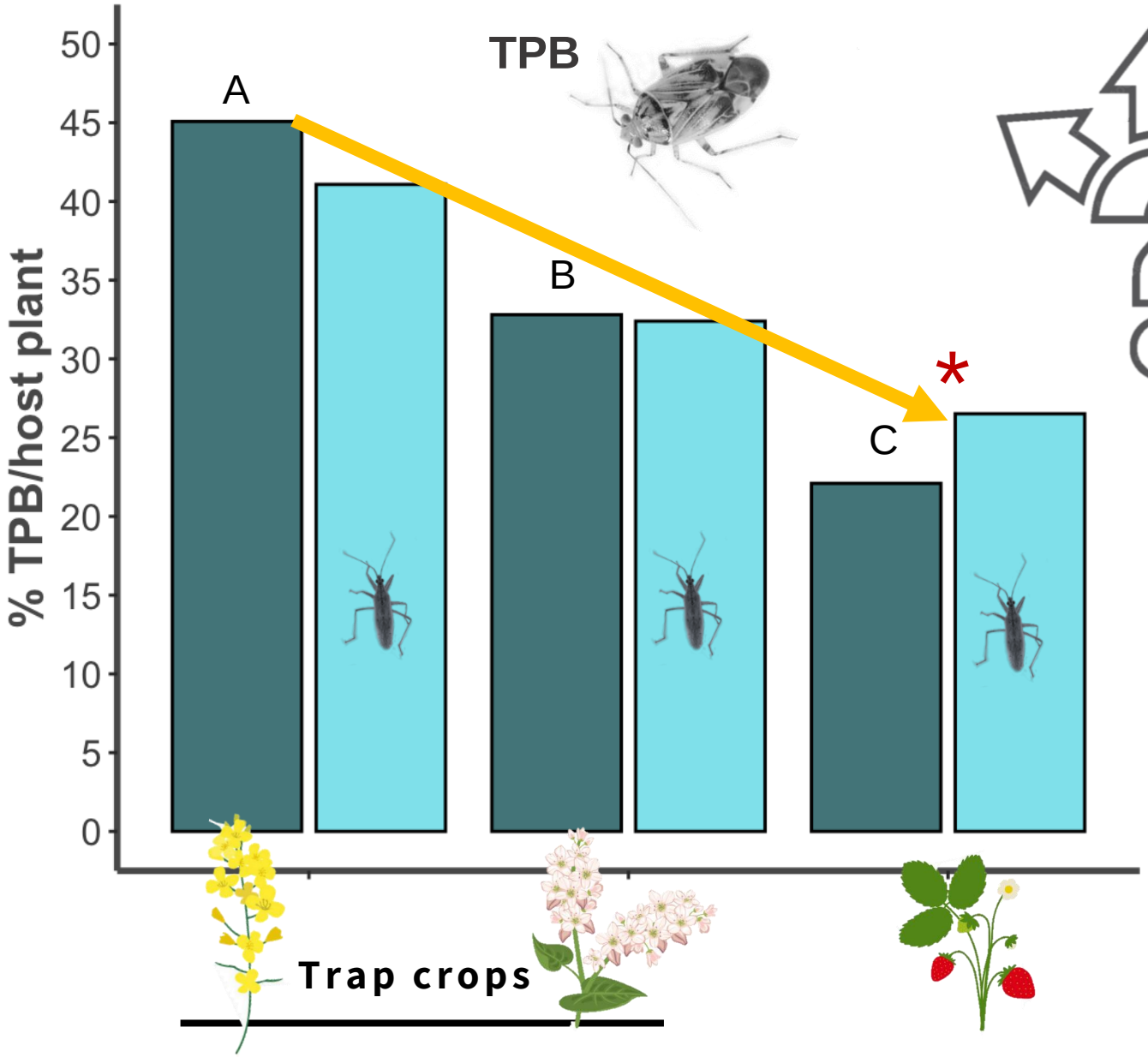
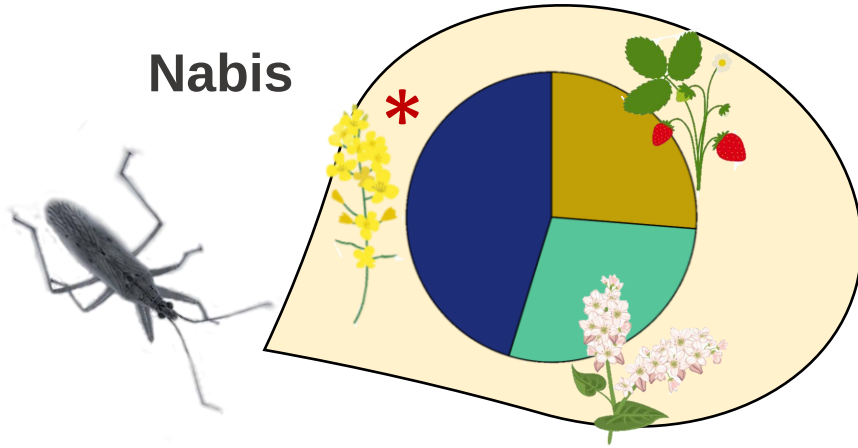
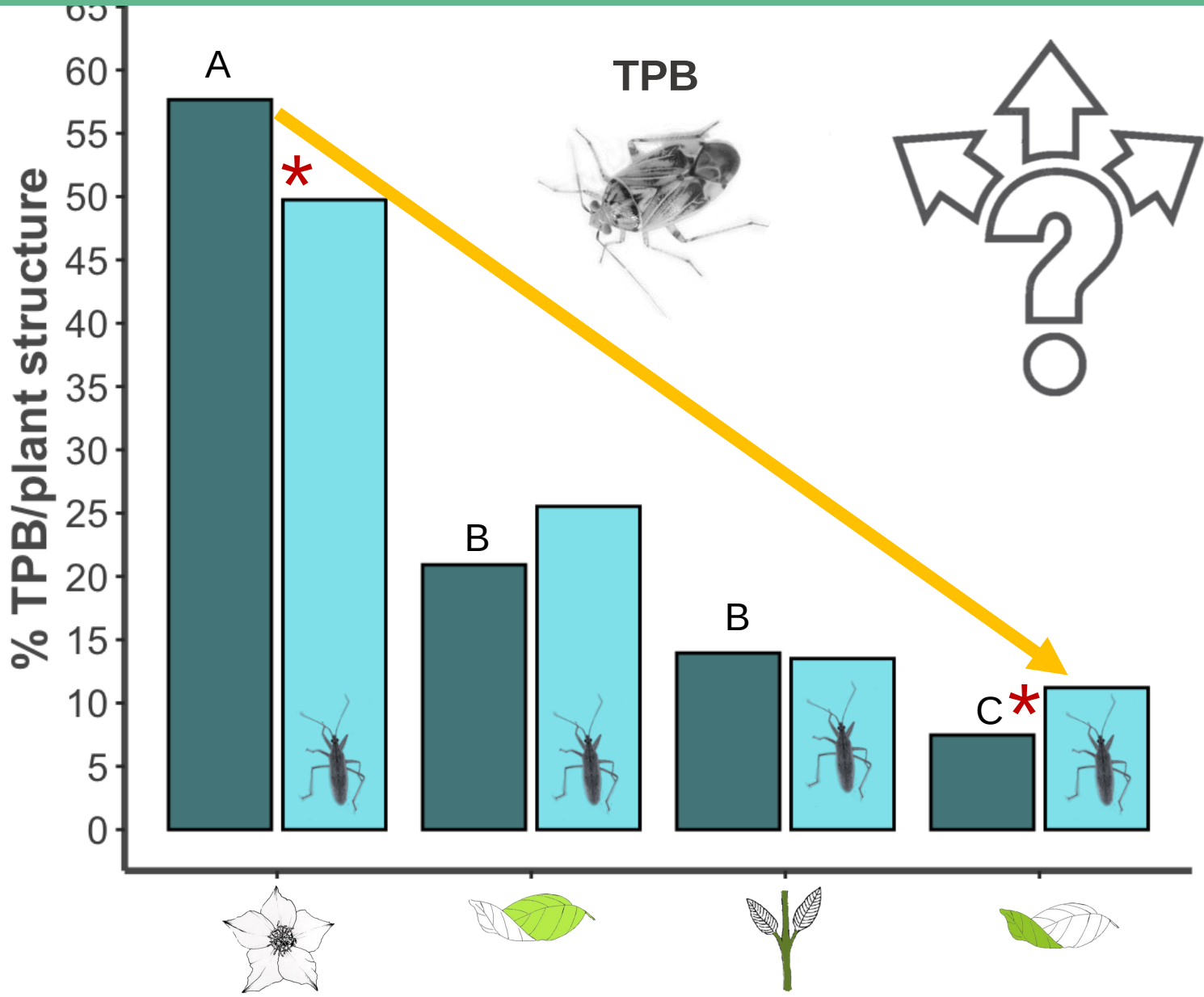
HOST PLANT CHOICES





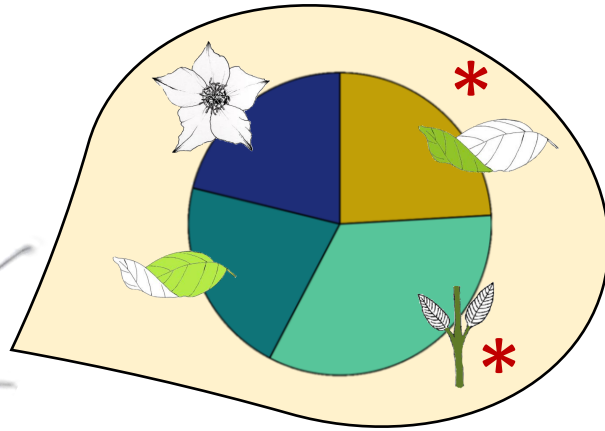
- TPB & Nabis distributes among the 3 plants.
- Trap crops are preferred, especially canola.
- **When the predator is present**, the number of TPB in **strawberry** significantly increase.

PLANT STRUCTURE CHOICES



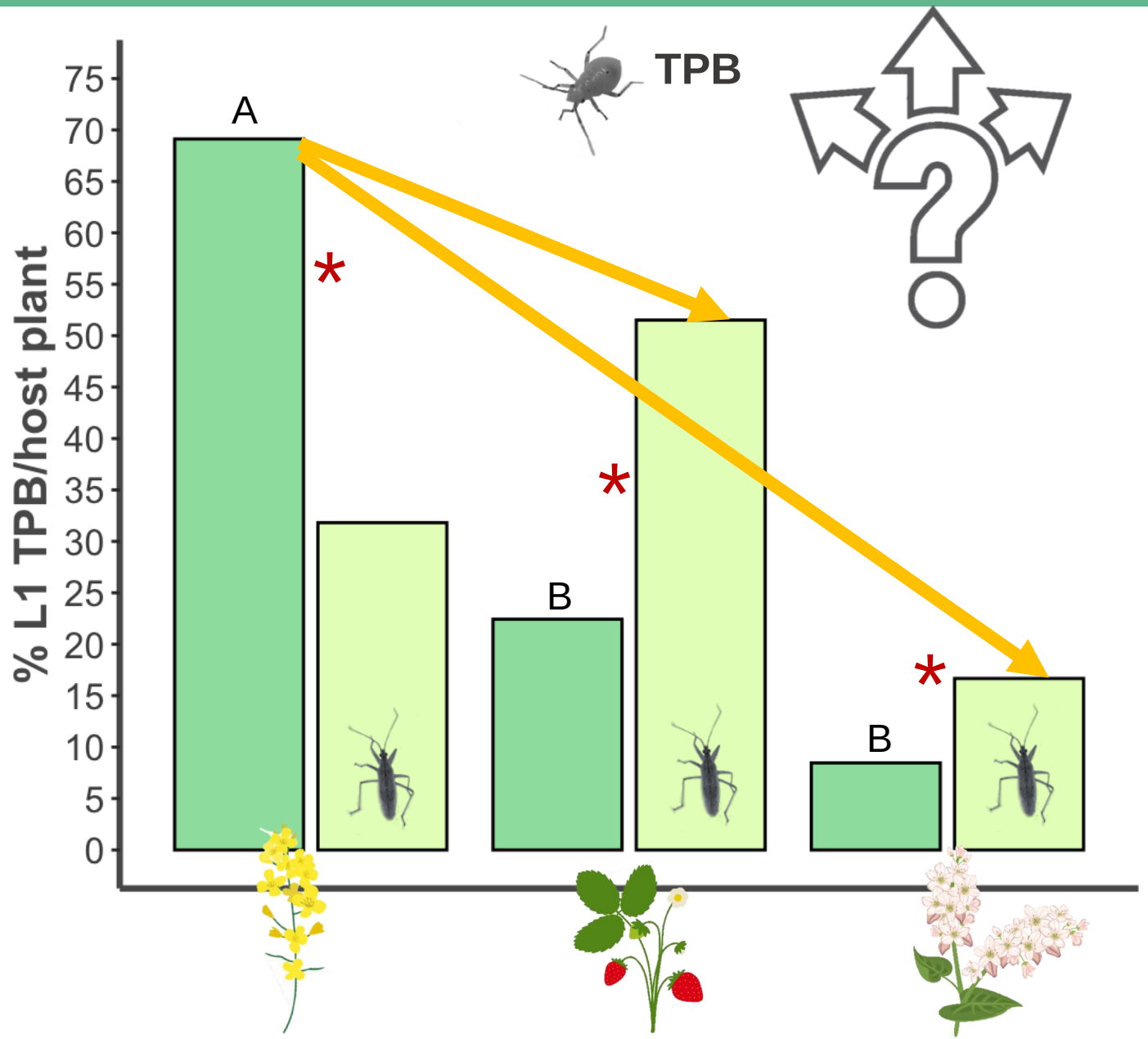
TPB

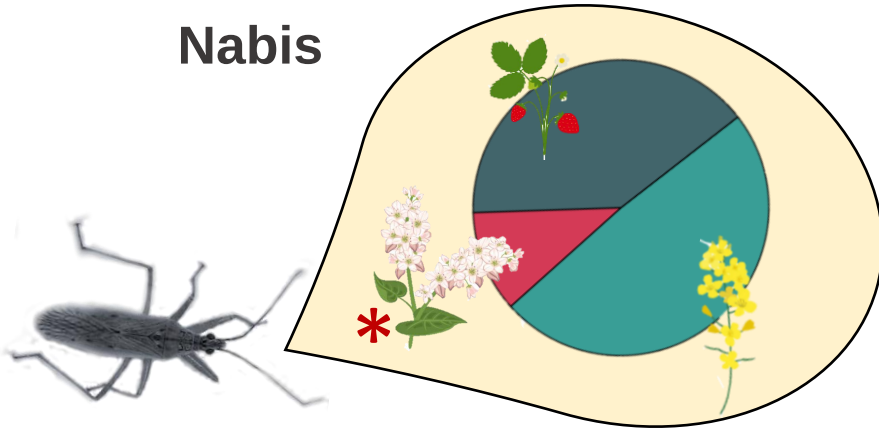
Nabis



- **Flower** is TPB preferred plant structure while **stem & abaxial** leaf side are preferred for Nabis.
- **When the predator is present**, TPB increase it's presence to less preferred plant structures.

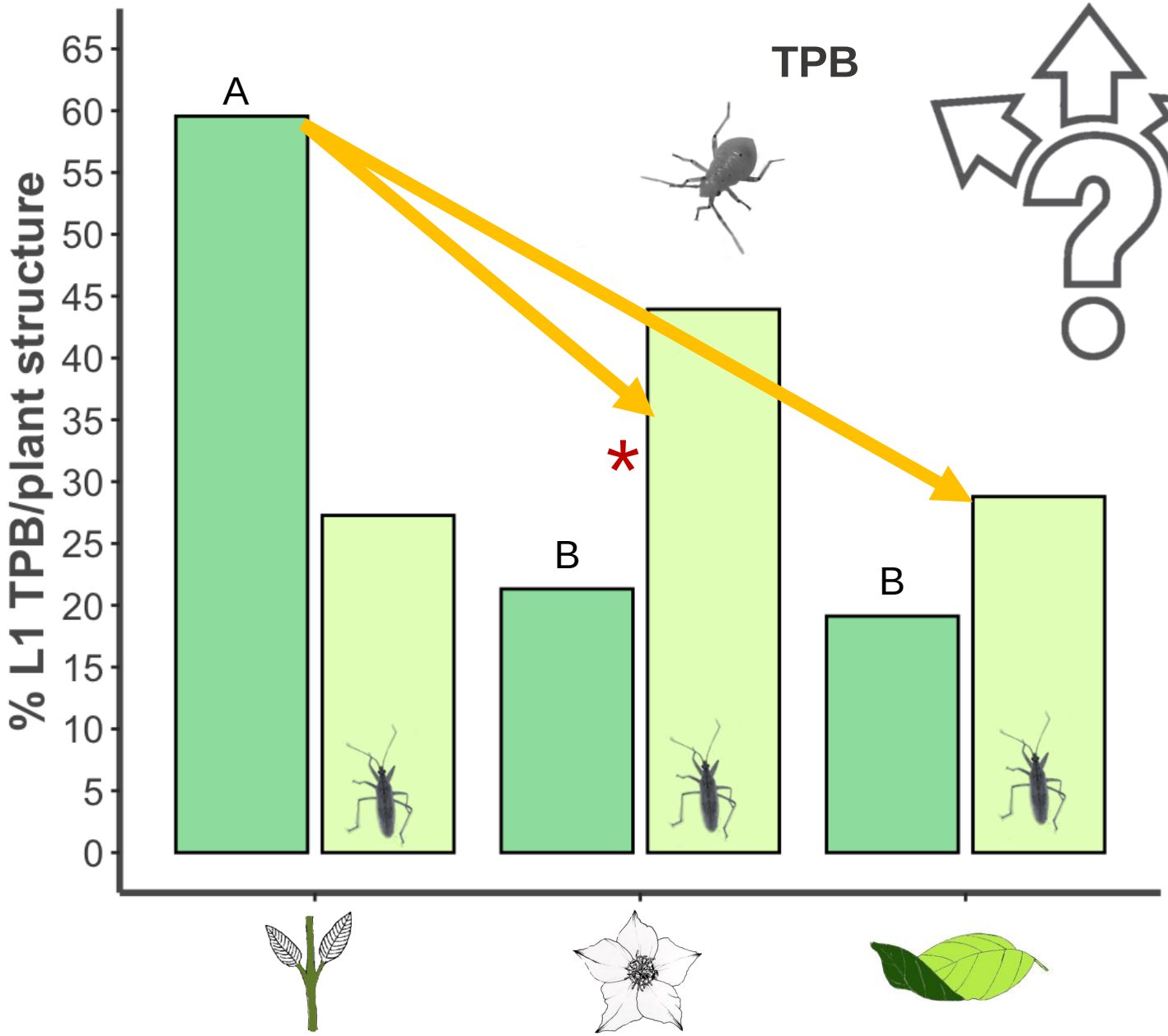
OVIPOSITION HOST PLANT CHOICES

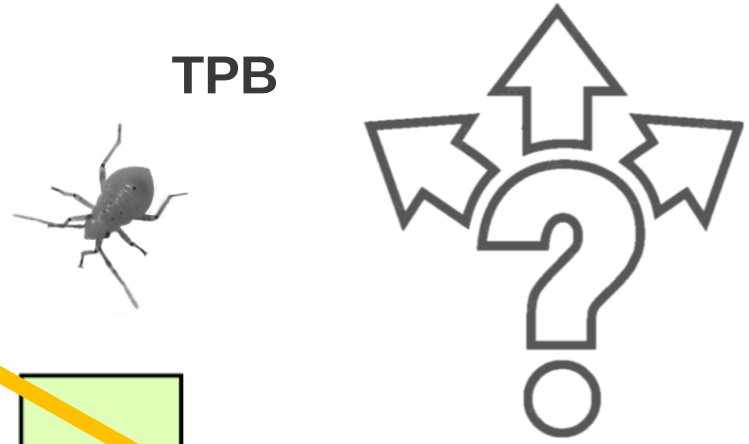


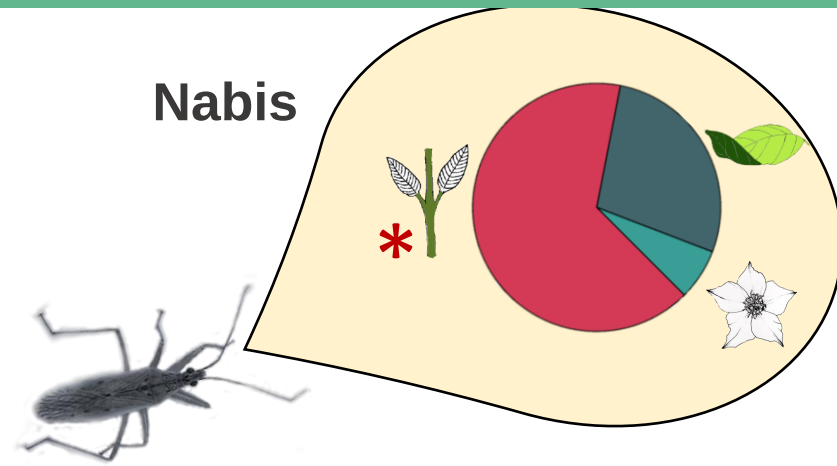


- **Canola** is TPB & Nabis preferred oviposition host while the least preferred is **buckwheat**.
- **When the predator is present**, the number of L1 in **canola** significantly decreases while increases in strawberry and buckwheat.

OVIPOSITION PLANT STRUCTURES CHOICES







- **Stem** is the preferred TPB & Nabis oviposition plant structure.
- **When the predator is present**, the number of L1 in the **stem** decreases in the detriment of other plant structures.

Conclusions

- Trap crops and Nabis can be applied as BC against TPB.
- Host preferences depend on the target action.
- In the presence of Nabis, TPB may invest in reproduction or switch it’s choices towards the economical crop and fruit.

Understanding predator non-consumptive effects on TPB is needed to apply optimal biological control strategies.

Predator non-consumptive effects may have a negative effect on the control of TPB

Thank you

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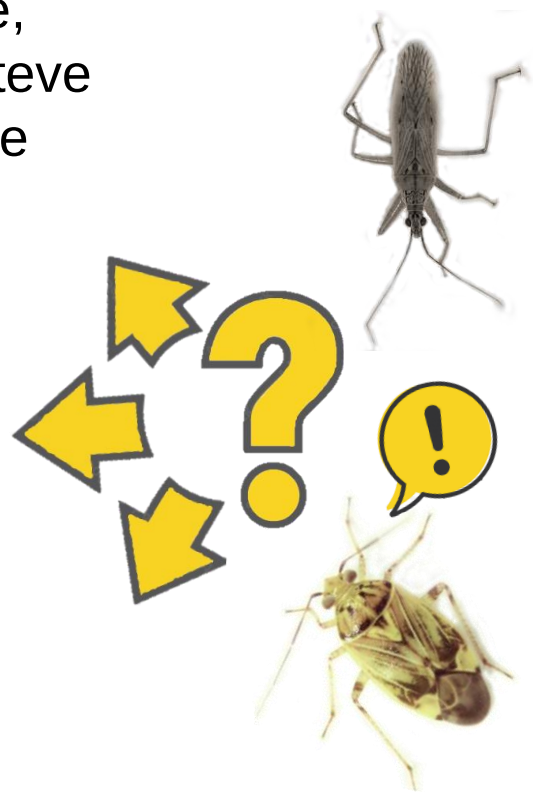

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