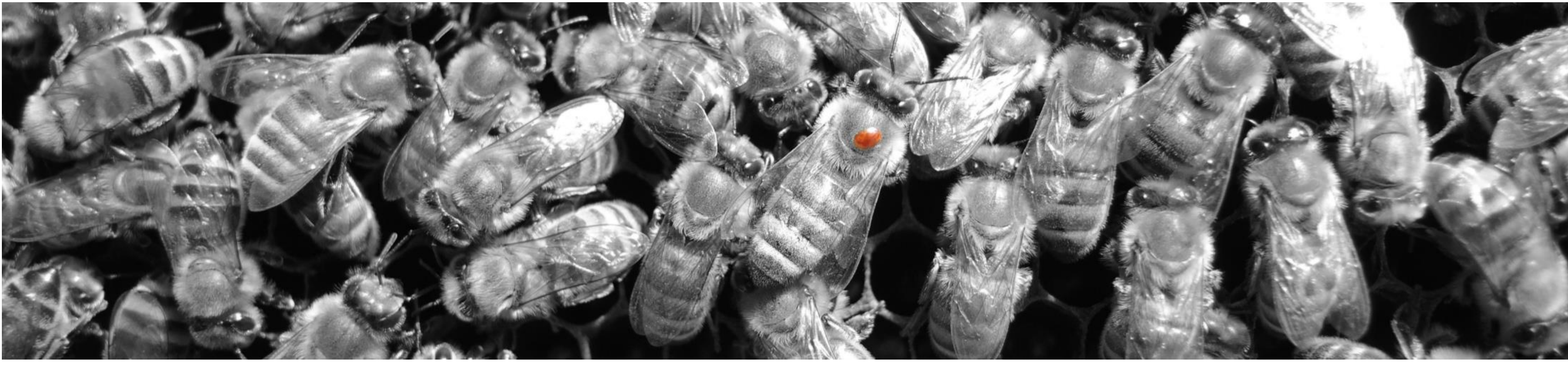
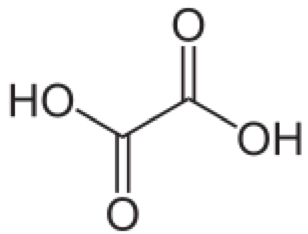
Sensibilité de *Varroa destructor* aux acaricides en Auvergne-Rhône-Alpes

Gabrielle ALMECIJA, PhD Student

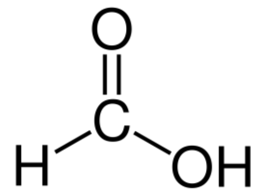
Rencontres Sanitaires Apicoles AURA



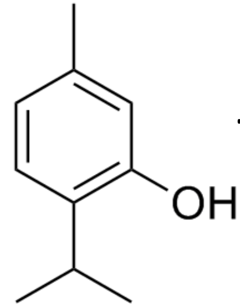
Les substances actives en France



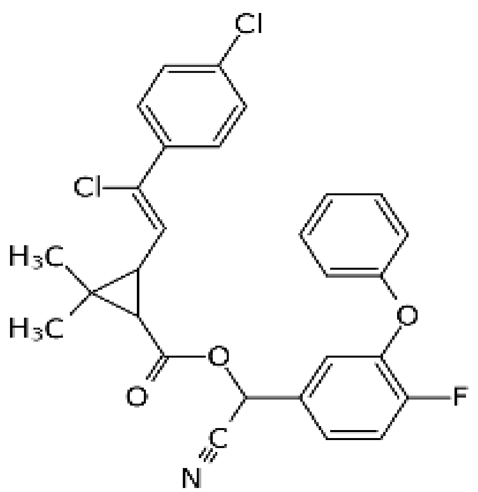
Acide oxalique



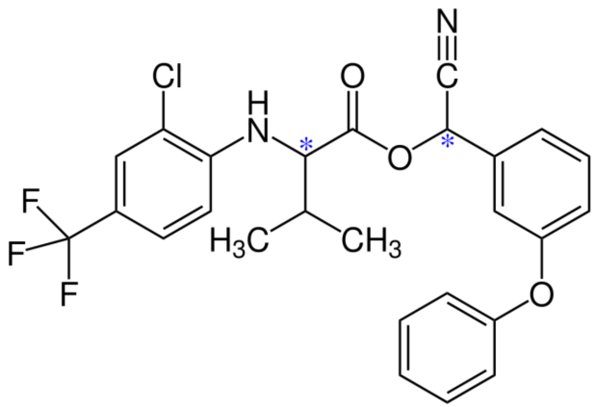
Acide formique



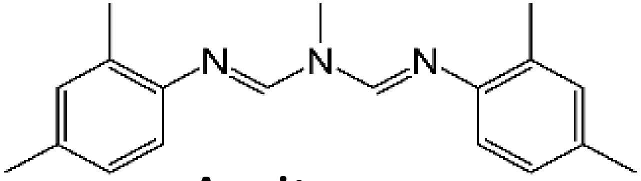
Thymol



Fluméthrine



Tau-fluvalinate



Amitraze

https://www.actualitte.com/article/bd-manga-comics/pour-noel-en-attendant-le-film-d-astier-et-clichy-un-album-

https://pixar-planet.fr/

Mode d'action des acaricides

Baron et al, 2018

- Les acaricides conventionnels : NEUROTOXIQUES

- Tau-fluvalinate
- Flumethrine

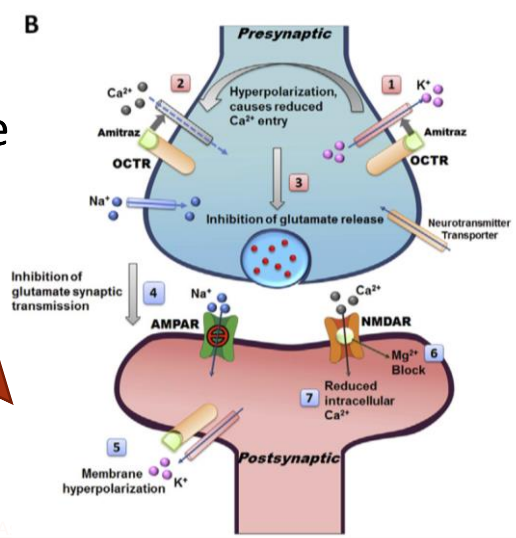
PYRETHRYNOIDES de type II

Fixation sur les canaux sodiques II

- Amitraze

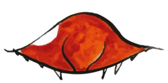
Formamidine

Fixation sur les récepteurs de l'octopamine



Rencontres Sanitaires Apicoles AURA

Un peu d'histoire …



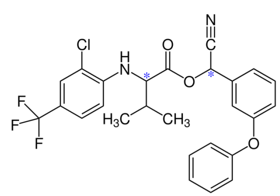
Arrivée du varroa en France

1982

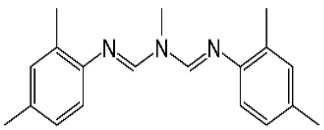
1995

Aujourd'hui

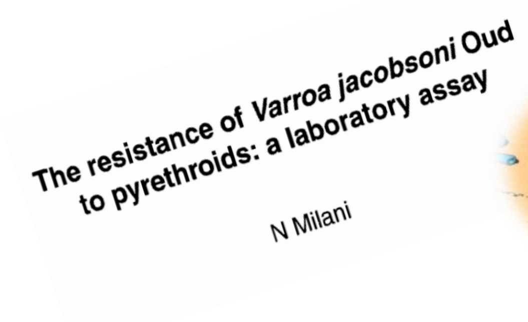
Utilisation massive de tau-fluvalinate



Utilisation massive d'amitraze



1er résistance au tau-fluvalinate


The resistance of *Varroa jacobsoni* Oud to pyrethroids: a laboratory assay

N Milani

1er résistance à l'amitraze ?

?

?

https://www.tiji.fr/Heros/Les-Schtroumpf

Un peu d'histoire …
le premier test de sensibilité

Dietemann et al, 2013

- Chercheur Milani (1995)
- Méthode référencée dans le Coloss Beebook (2013)
- Modifiée par Maggi et al, 2008 ; Lindberg et al, 2000, Kamler et al, 2016

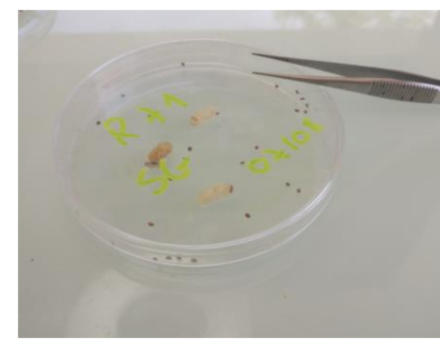
Préparation des boites

Collecte

Mise en contact (1h)

24h

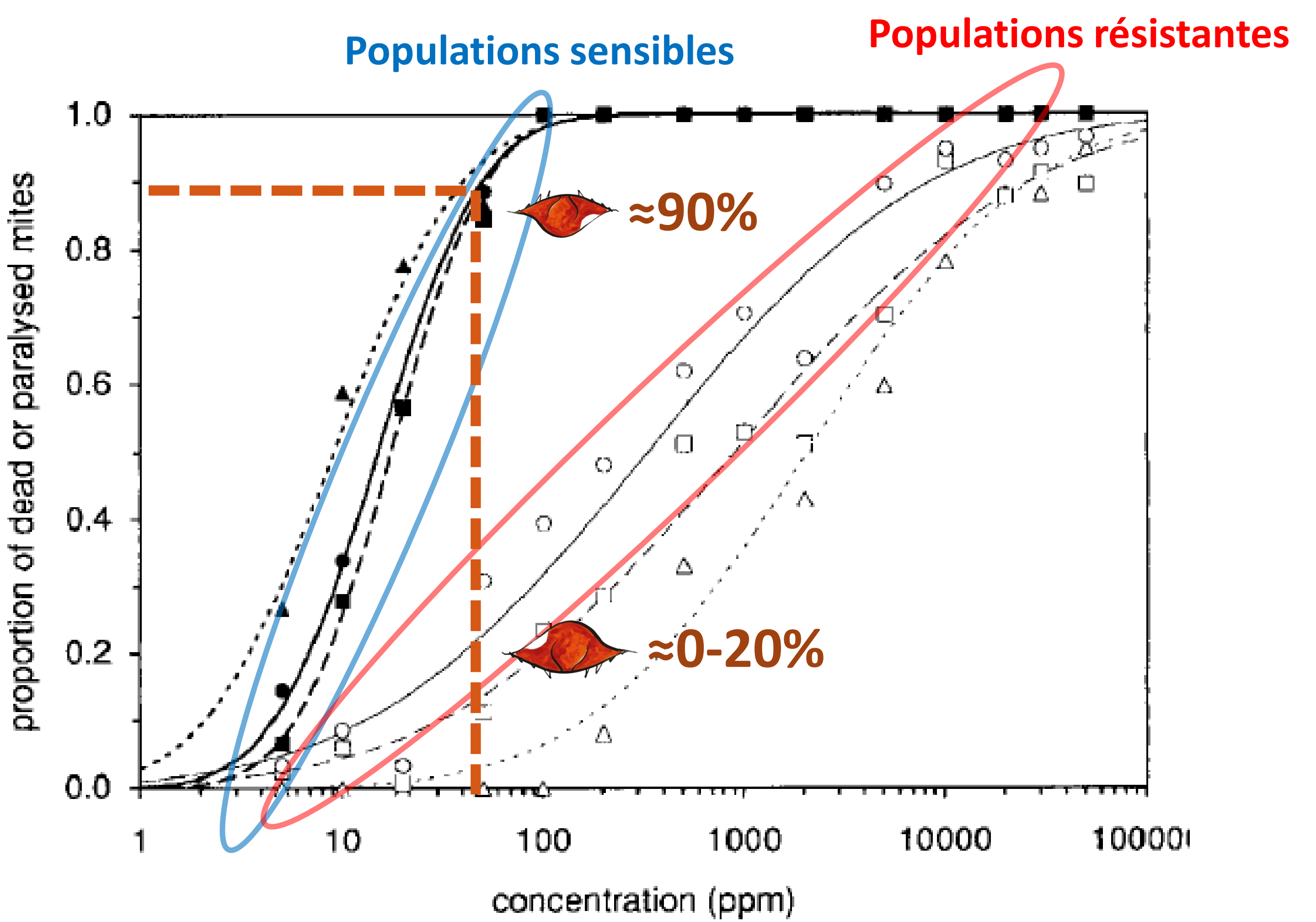
Mortalité

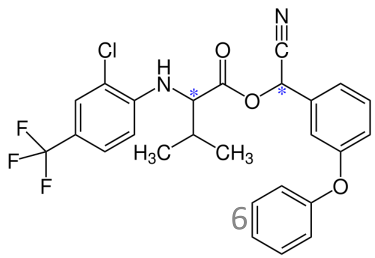


TAU-FLUVALINATE : CL90 (FRANCE 1998)

Milani, 1995, Trouiller, 1998

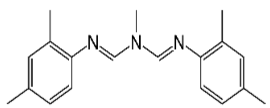
- Détermination de la Concentration Léthale à 90% = CL90



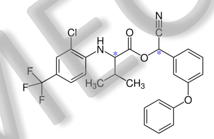


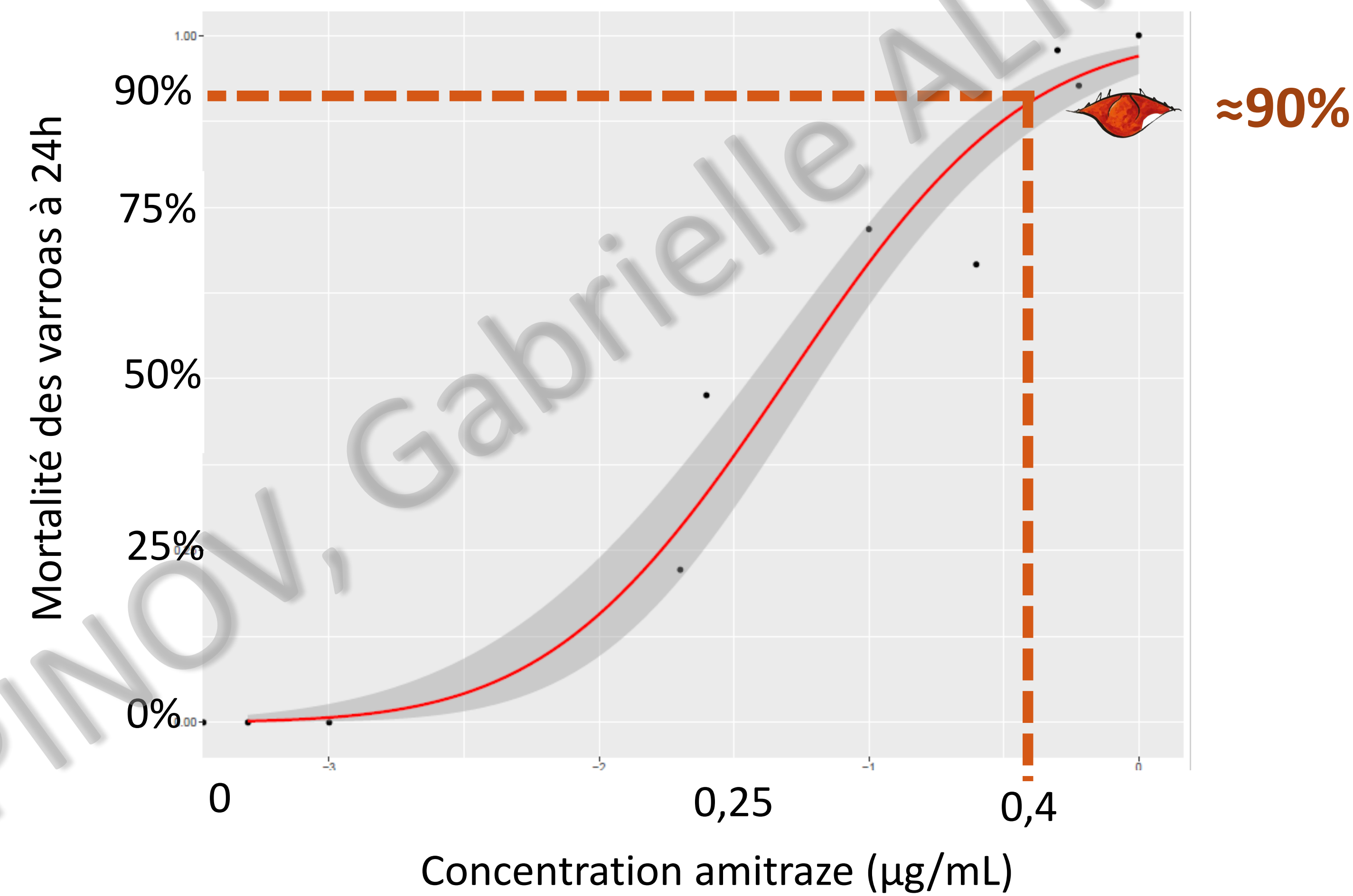
AMITRAZE & TAU-FLUVALINATE : CL90 (FRANCE 2019)

- CL90 (amitraze) = 0,4µg/mL



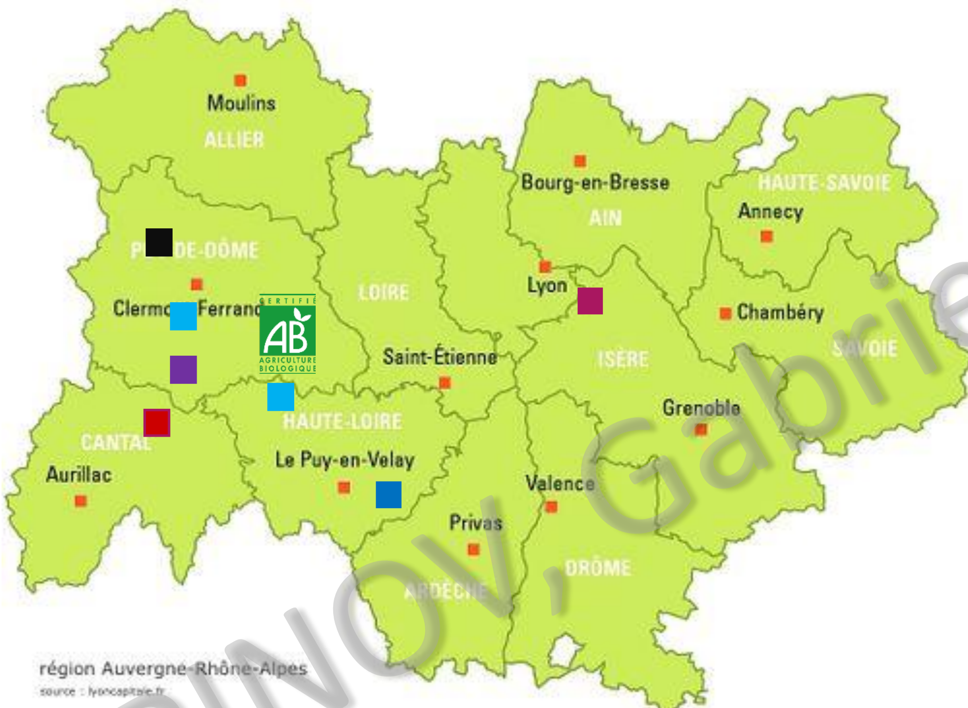
CL90(Tau-fluvalinate) = 20µg/mL





Cartographie des sensibilités 2018-2019
Prétraitement ou début de traitement (<2 semaines)

Tau-fluvalinate (n=7)



Amitraze (n=9)

M=75% M=40%

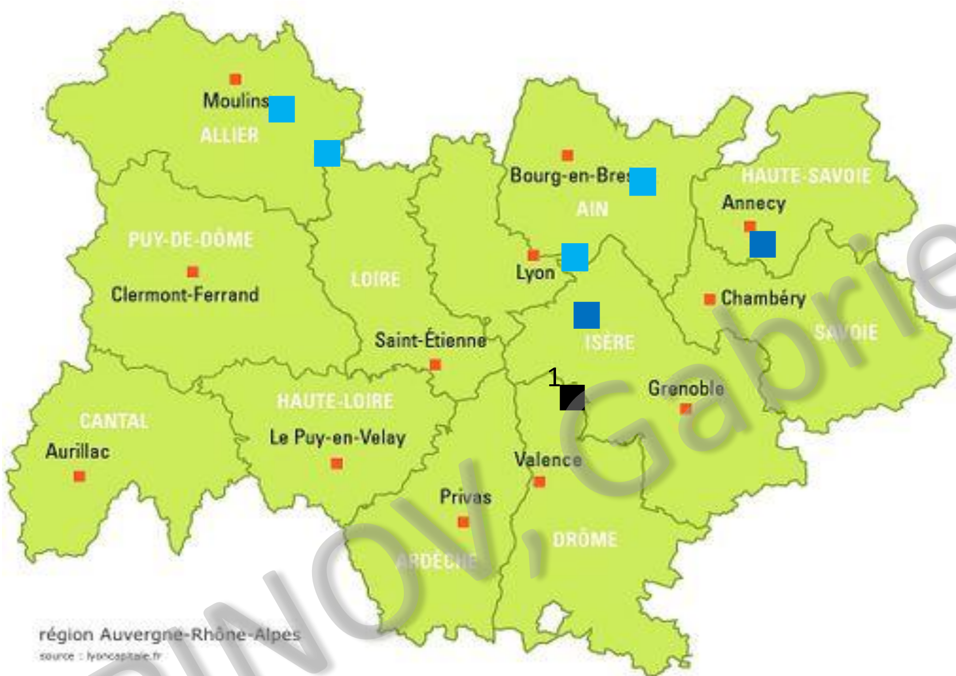
M=100% M=0%

Sensible modérée forte

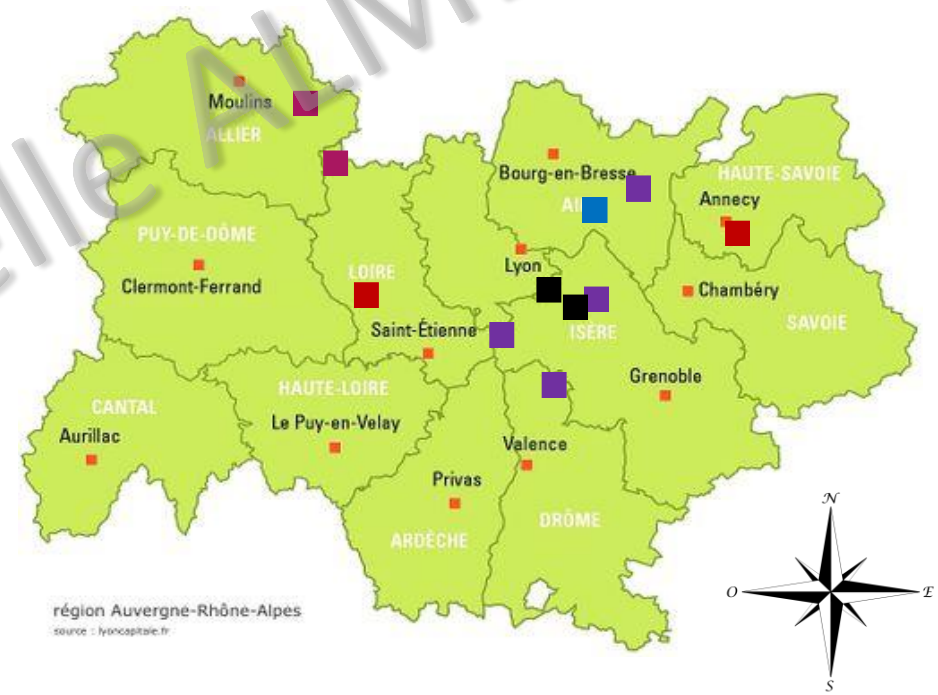
Résistante

Cartographie des sensibilités 2019
Post-traitement Amitraze

Tau-fluvalinate (n=7)



Amitraze (n=11)



M=75% M=40%

M=100% M=0%

Sensible modérée forte

Résistante

1. Traitement tau-fluvalinate depuis 2018

Conclusion & Limites

- Variabilité des sensibilités des varroas à l'amitraze et au tau-fluvalinate
  - AVANT et APRES traitement
  - Plusieurs populations de varroas : sensibles et résistantes
  - Influence des pratiques apicoles ? Cas par cas
  - Ratio de résistance plus grand pour le tau-fluvalinate → quelle influence ?

Chevillon et al, 2007, Kamler et al, 2016, Rinkevich, 2020

- La mortalité (CL90) en laboratoire ≠ Efficacité terrain
- Biais d'échantillonnage
  - Majoritairement des apiculteurs ayant des difficultés de traitement avec l'amitraze

    → ≈ surestimation des populations résistantes

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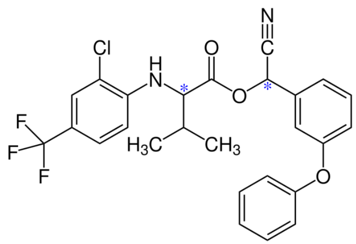
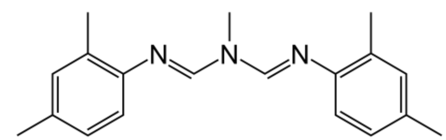
Perspectives pour la lutte

→ Intégrer la gestion de la résistance

- **Lutte alternée** : rotation de la substance active



Tau-fluvalinate
Ou flumethrine



Amitraze

Quelle rotation appliquer en fonction de la sensibilité des varroas ?

- **Bithérapie :** été / hiver, réduction de la résistance ?
- Les **autres stratégies** ? Refuge – Mixte – Alternance spatiale

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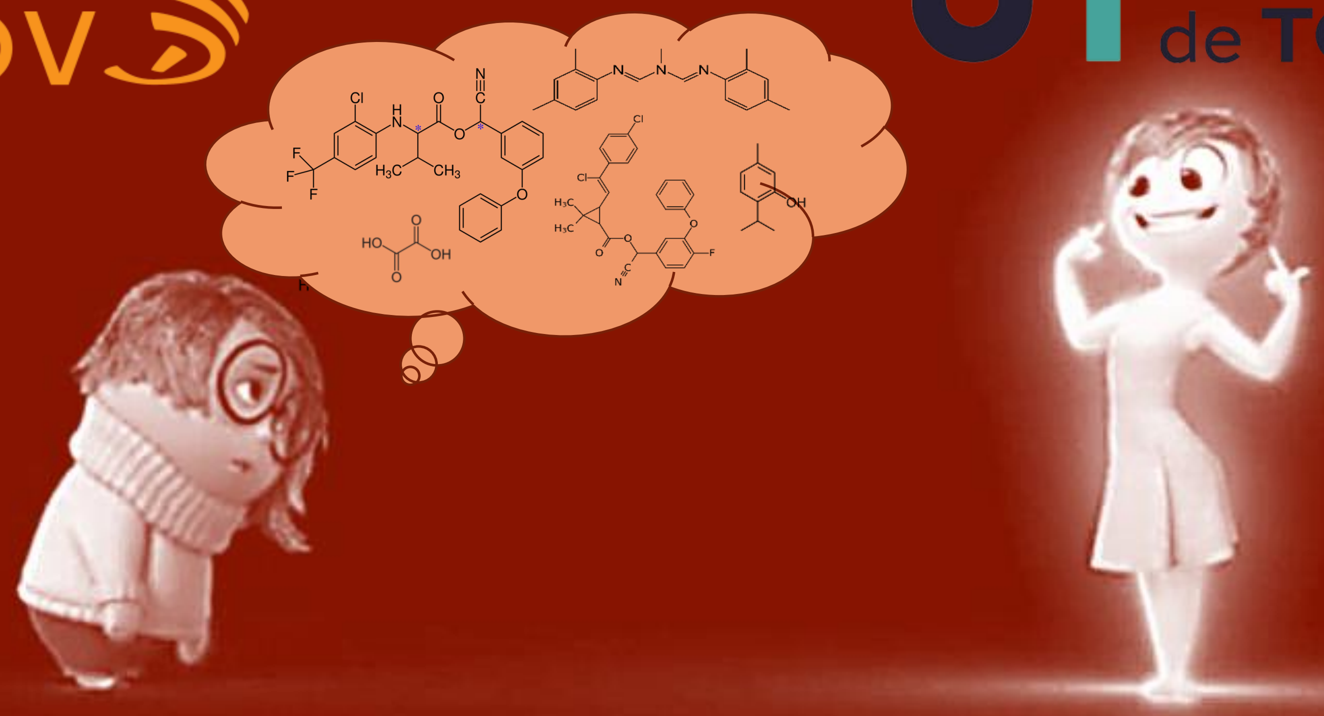
Merci pour votre attention !



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Pour aller plus loin …
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Pour aller plus loin …
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