Agritech
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Do’s and Don’ts for arthropod pest management in strawberry

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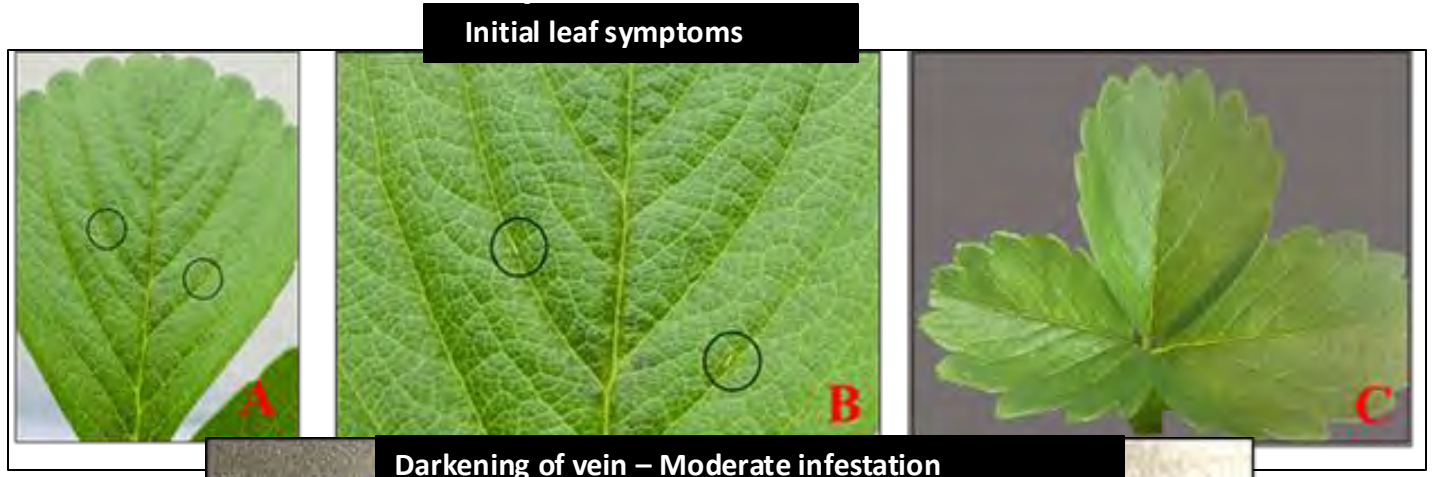
Chilli Thrips

- *Scirtothrips dorsalis* (Hood)
- Invasive and phytophagous (Kumar et al. 2013).
- Six life stages- egg, first and second instar larvae, pre-pupa, pupa, and adult.

Kaur and Lahiri 2022. doi.org/10.32473/edis-IN1346-2022

Chilli Thrips

- Infest plants early in the season.
- Heavy feeding causes necrosis of leaf veins and petioles.
- Feeding damage causes bronzing and cracking of fruits.
- Yield loss.



Kaur and Lahiri 2022. doi.org/10.32473/edis-IN1346-2022

Chilli Thrips

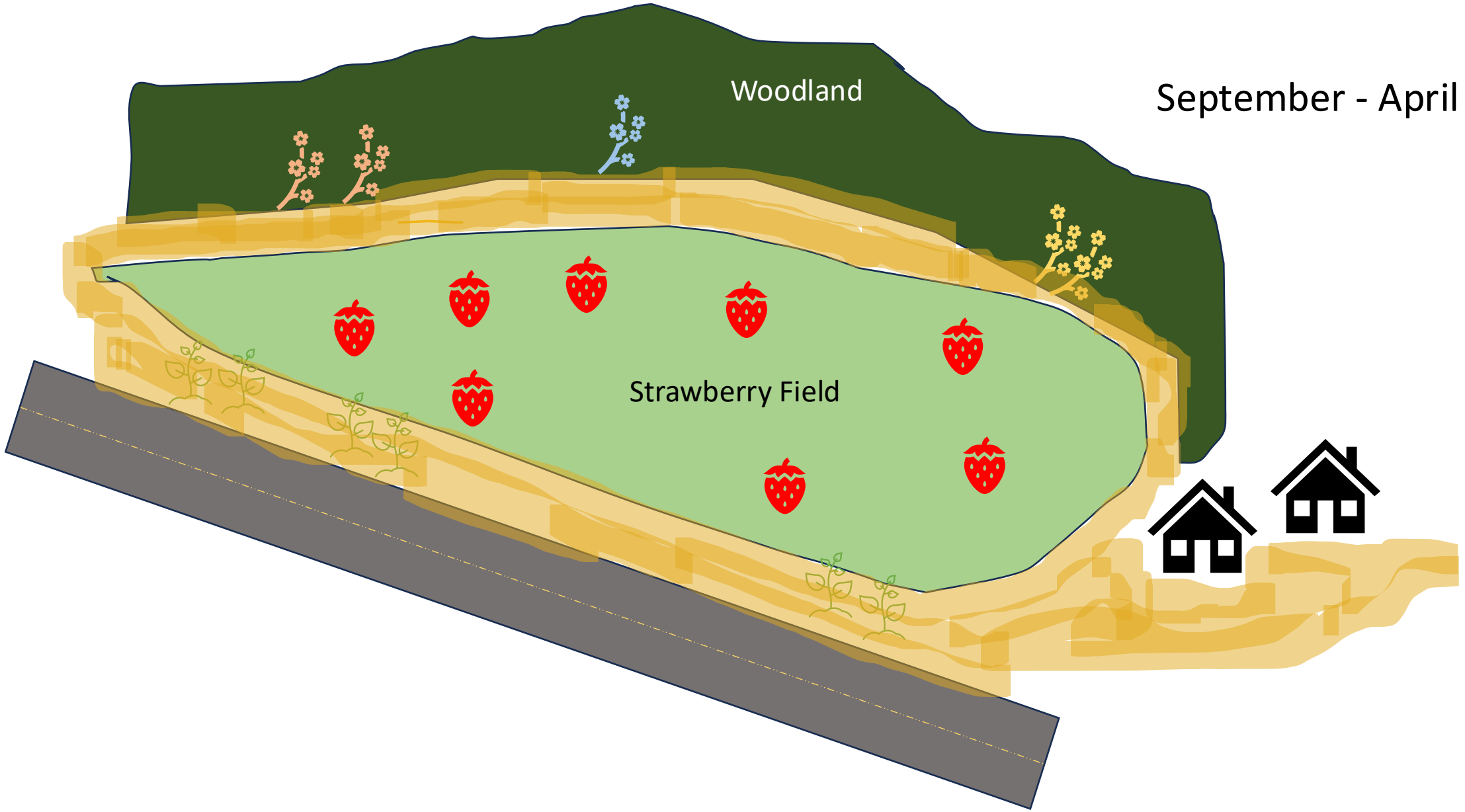
Chilli thrips eggs. Image: Lovely Adhikary, UF/IFAS GCREC

Severe infestation

Bronzing and cracking of fruits

Kaur and Lahiri 2022. doi.org/10.32473/edis-IN1346-2022

Chilli Thrips



Chilli Thrips

Sugarberry

Water oak

Camphor

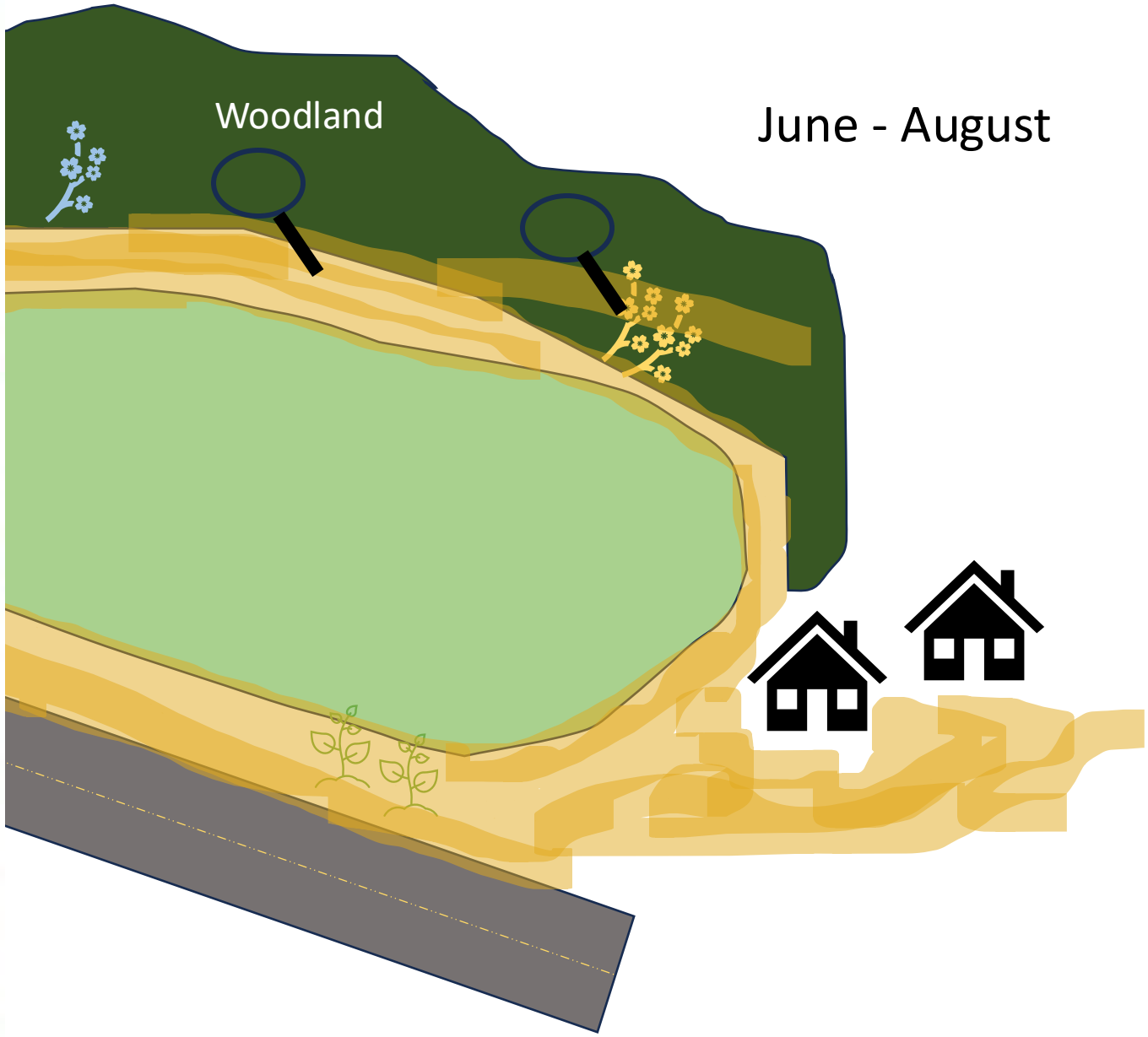
Laurelcherry

Laurel oak

Ragweed

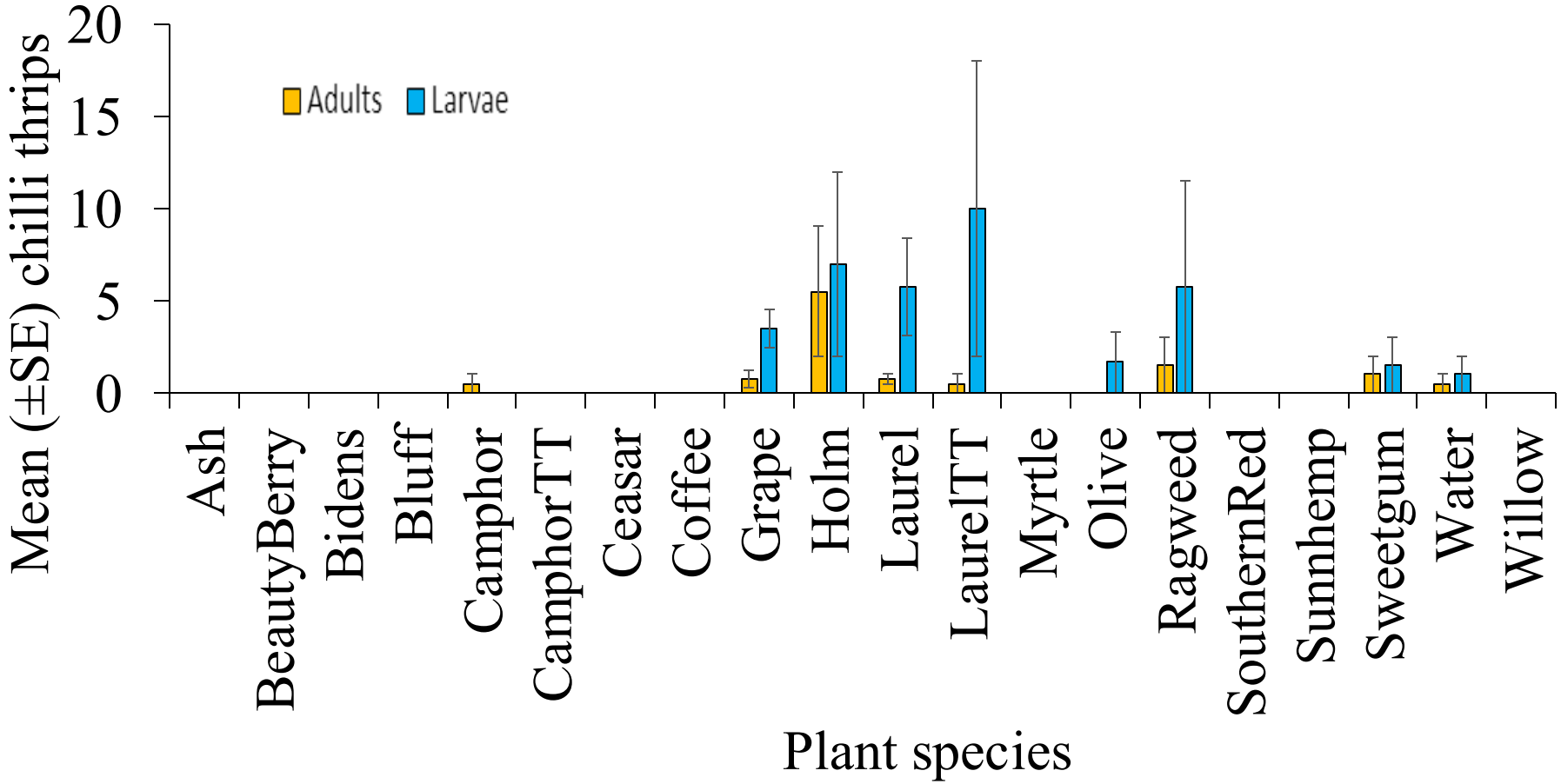
Grape

Sweet gum



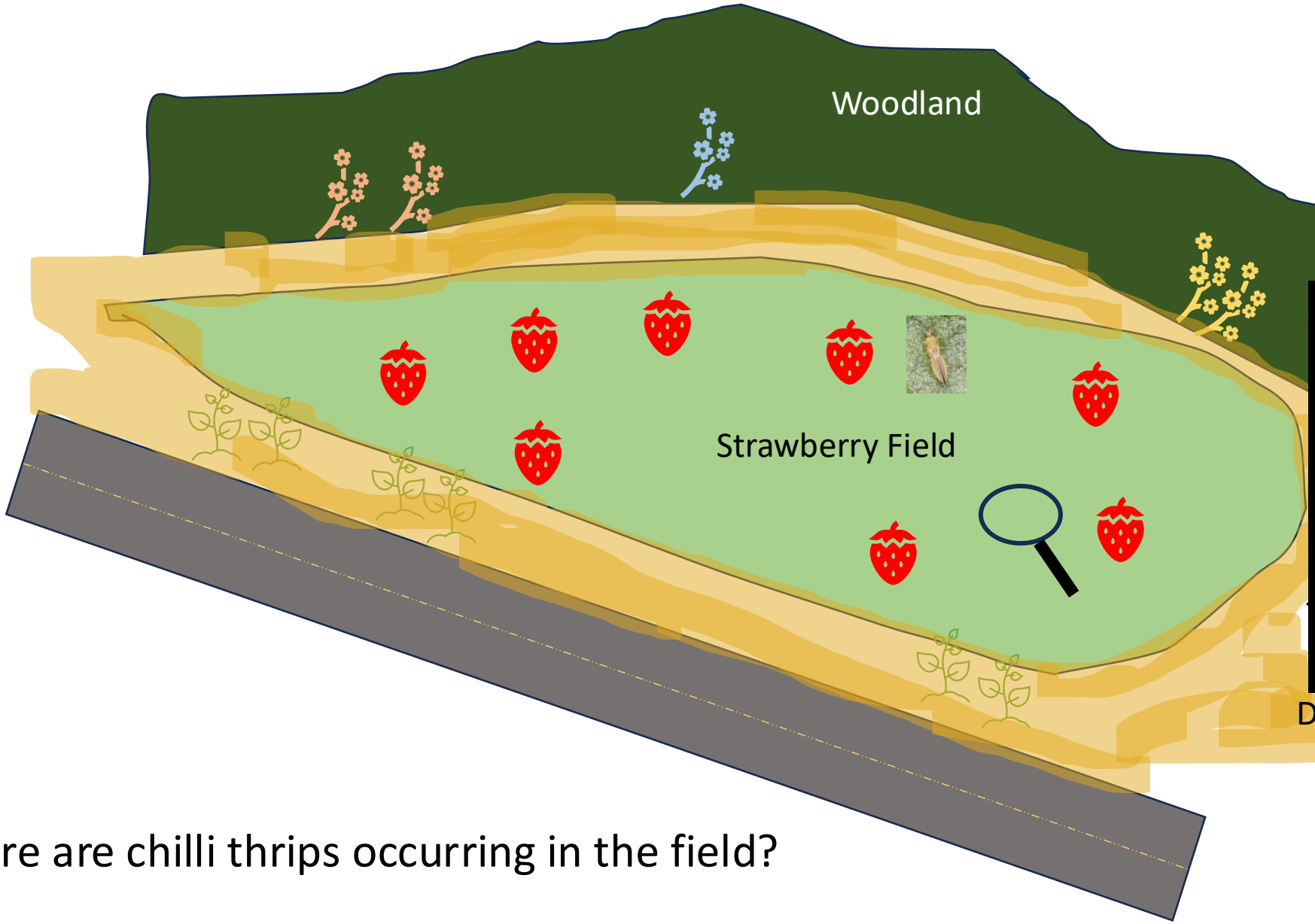
Chilli Thrips

Chilli thrips present on wild trees and weeds during June and July, 2023 in woodland borders of three strawberry fields in FL.



June - August

Chilli Thrips

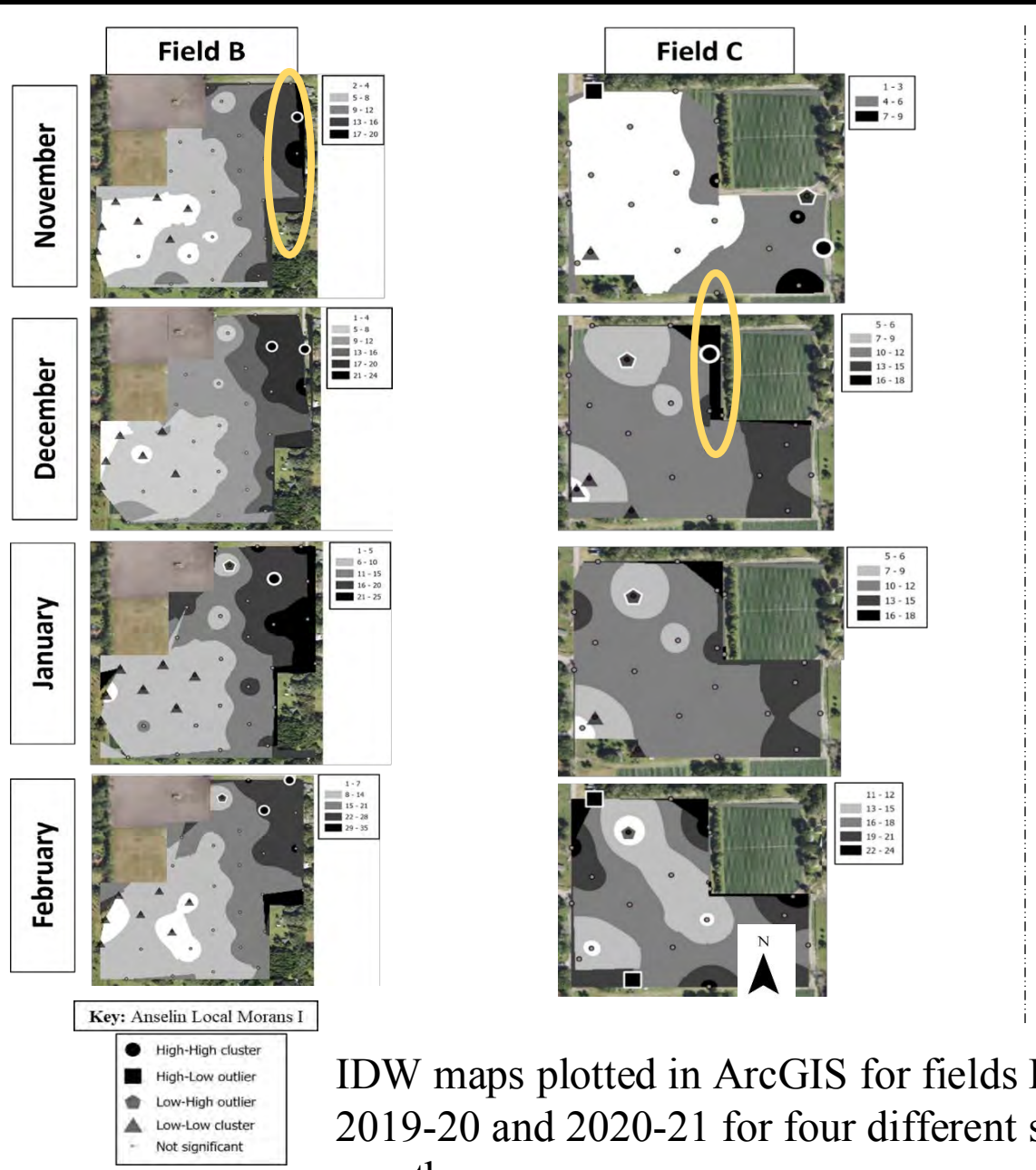


September - April

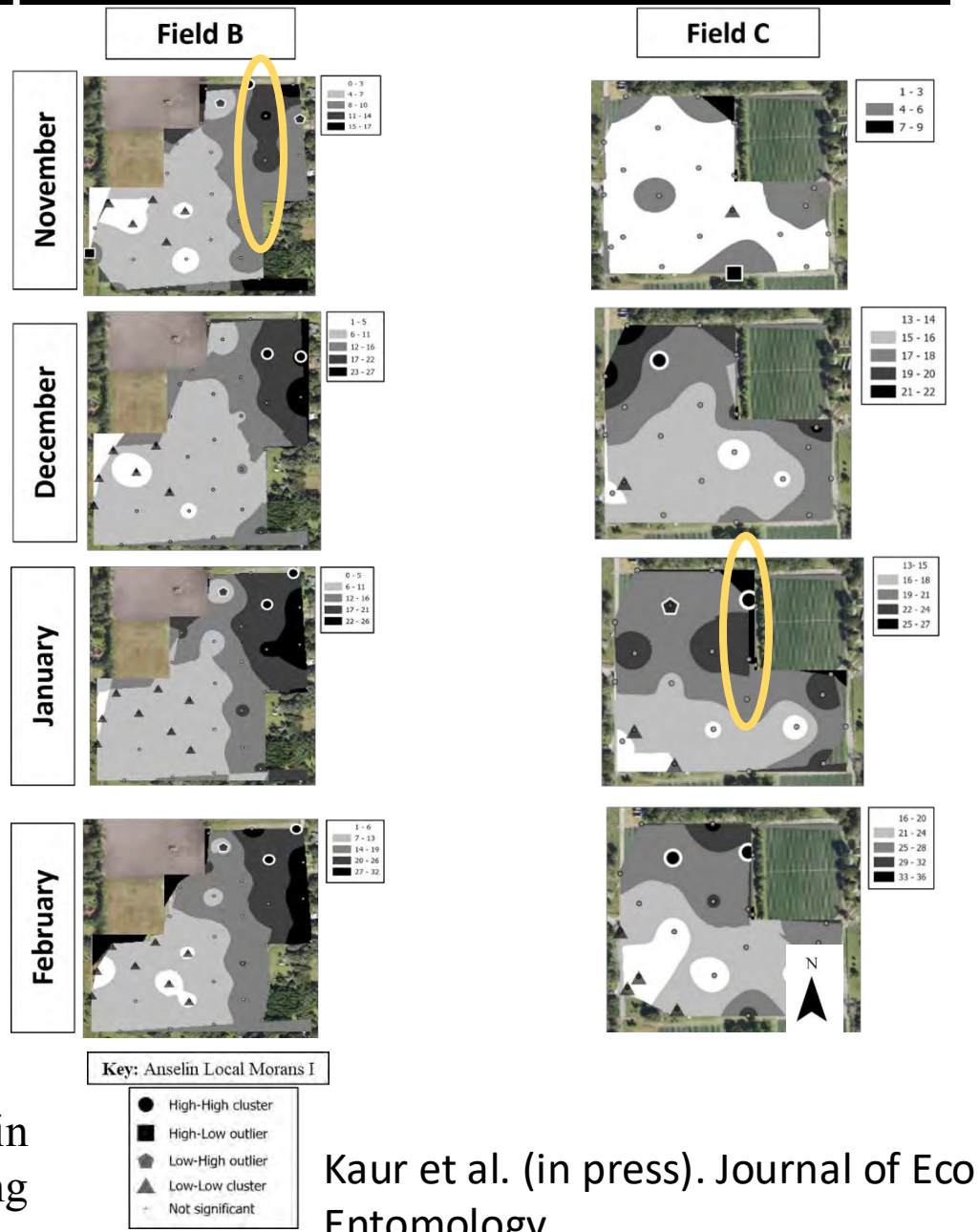
Dr. Gagandeep Kaur

Where are chilli thrips occurring in the field?

Chilli Thrips

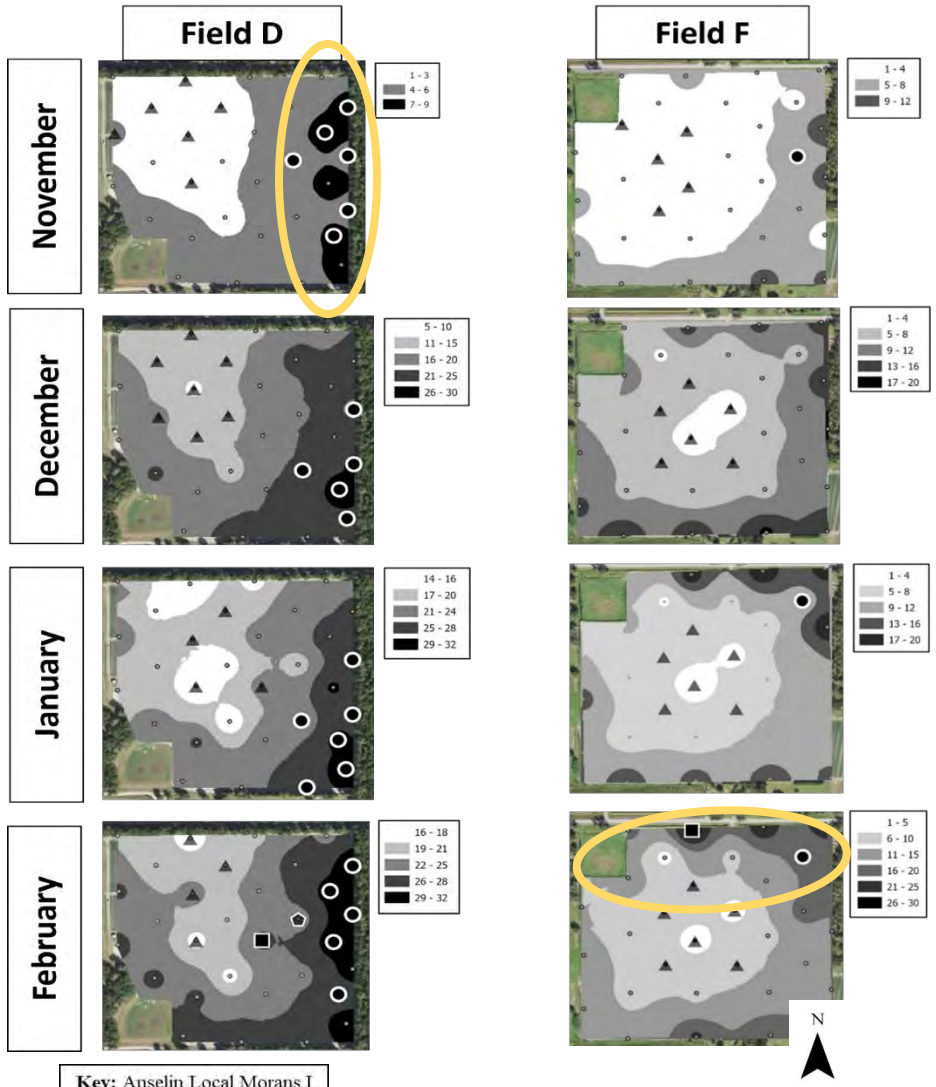


IDW maps plotted in ArcGIS for fields B & C in 2019-20 and 2020-21 for four different sampling months.

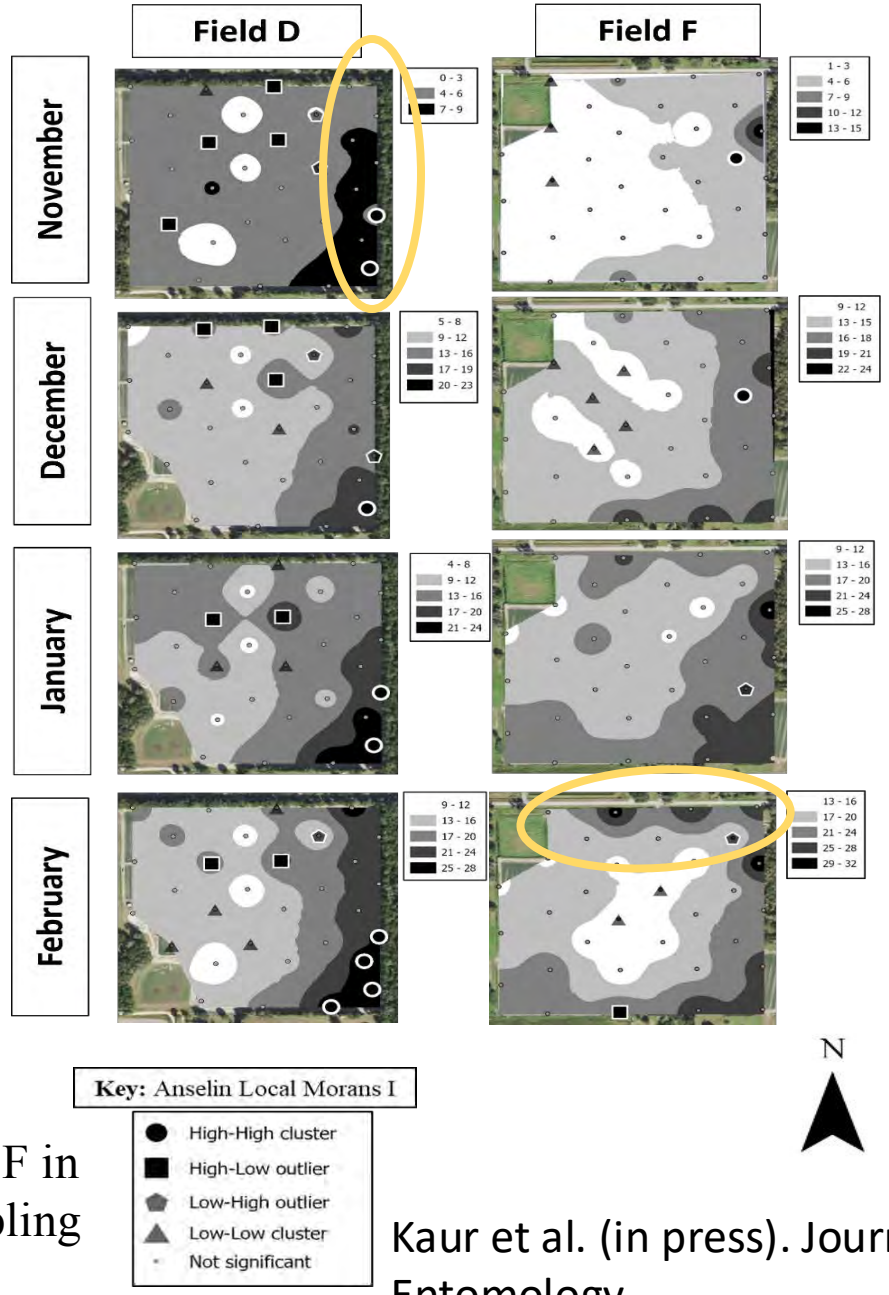


Kaur et al. (in press). Journal of Economic Entomology.

Chilli Thrips



IDW maps plotted in ArcGIS for fields D & F in 2019-20 and 2020-21 for four different sampling months.



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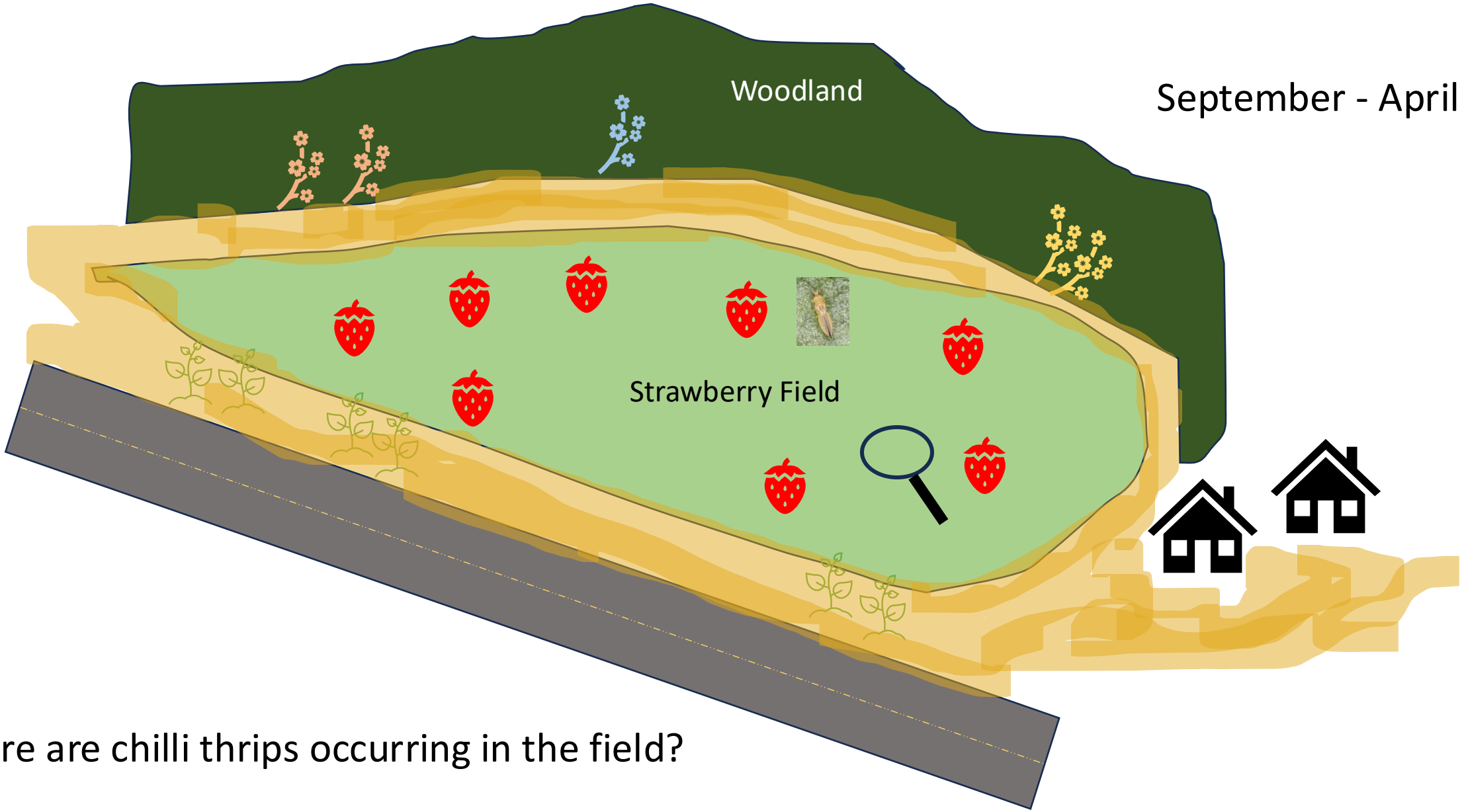
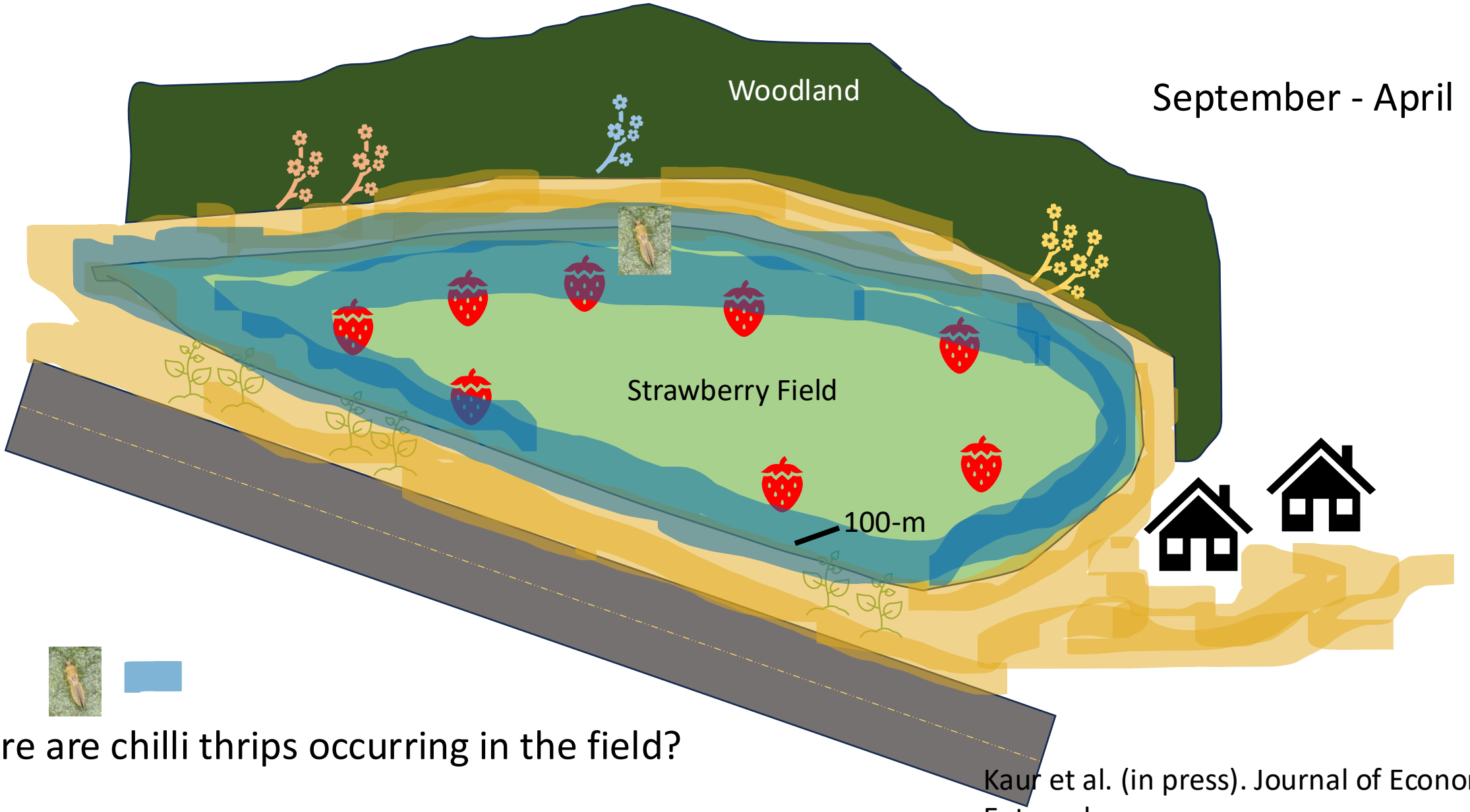
Chilli Thrips



Where are chilli thrips occurring in the field?

Chilli Thrips



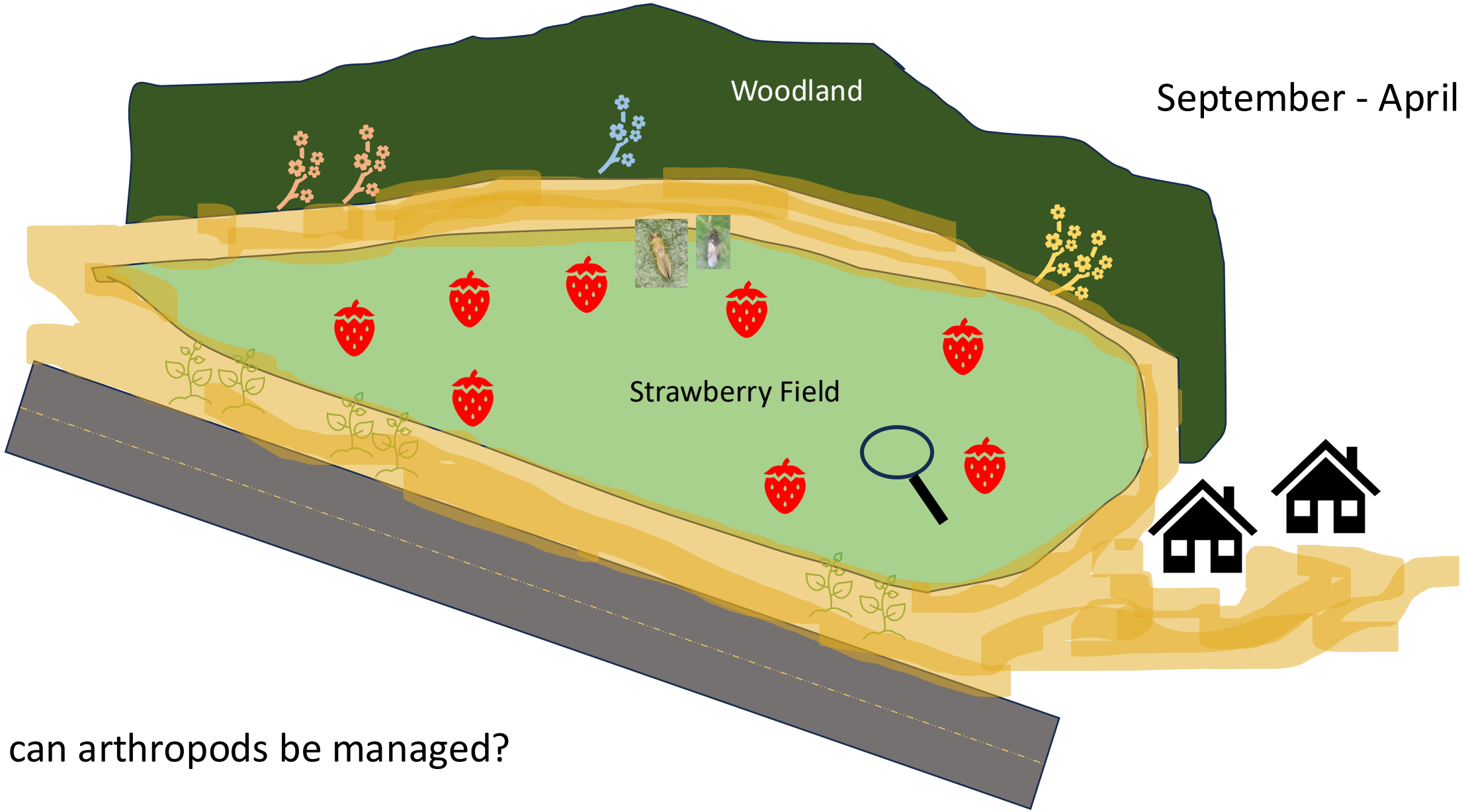
Where are chilli thrips occurring in the field?

Kaur et al. (in press). Journal of Economic Entomology.

Chilli Thrips

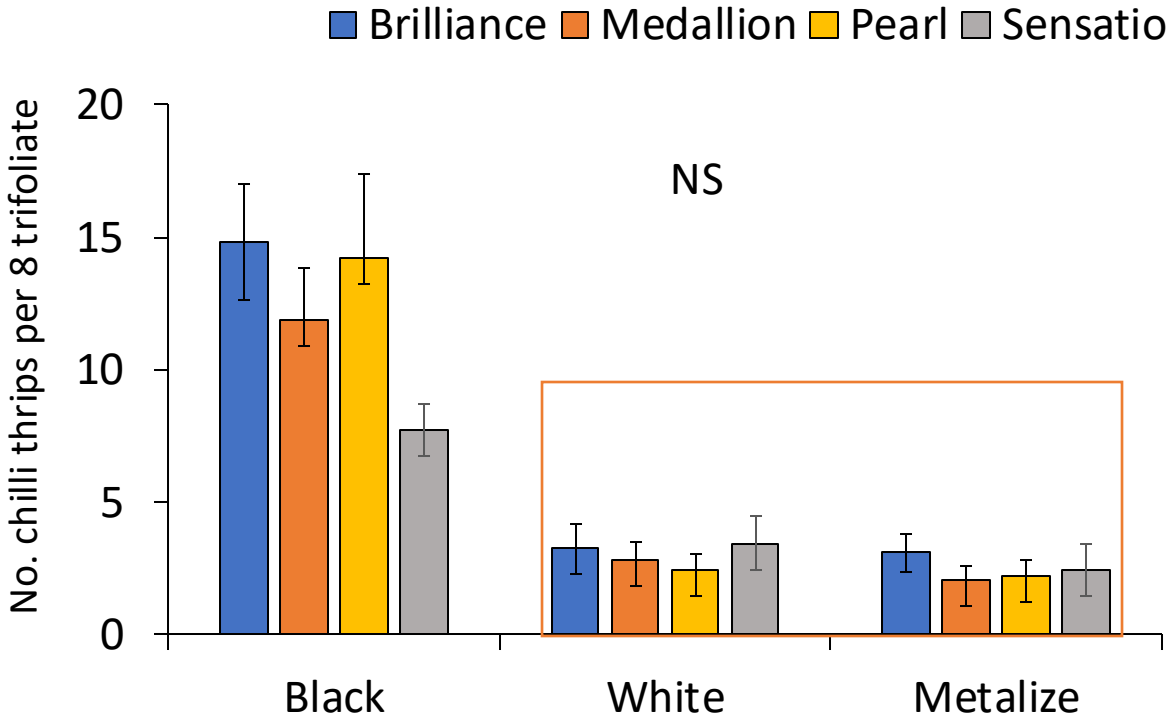
Image Credit: Sara Paz Corrales, UF/IFAS GCREC

Chilli Thrips



How can arthropods be managed?

Cultural Control



Mean (± SE) chilli thrips count in four strawberry cultivars planted on black, white and metallic mulch. PROC MIXED followed by Tukey-Kramer test (α = 0.05), SAS Institute v.9.4. Gireesh et al. (in prep.).

Biological & Chemical Control

TABLE 3 Percent mortality of *Scirtothrips dorsalis* collected from different field populations in Plant City, FL (2019–2020) to four insecticides.

Sampling locations	Acetamiprid		Cyantraniliprole		Spinetoram		Bifenthrin	
	Early season	Late season	Early season	Late season	Early season	Late season	Early season	Late season
Lab-SS	80.0a	82.5a	72.5a	82.5a	92.5a	87.5ab	70.0a	85.0a
Field A	57.5b	52.5ab	90.0a	82.5a	90.0a	87.5ab	47.5b	57.50ab
Field B	77.5a	67.5ab	90.0a	82.5a	95.0a	95.0a	75.0a	57.5ab
Field D	82.5a	35.0b*	87.5a	47.5b*	92.5a	40.0d*	75.0a	35.0b*
Field E	90.0a	65.0ab	90.0a	52.5ab*	85.0a	60.0cd*	75.0a	55.0ab
Field F	87.5a	57.5ab*	95.0a	42.5b*	92.5a	57.5cd*	82.5a	45.0b*
Field G	87.5a	52.5ab*	82.5a	47.5b*	87.5a	65.0bc	80.0a	50.0b*
Field J	90.0a	55.0ab	92.5a	50.0b*	87.5a	57.5cd*	75.0a	37.5b*

Note: Means within a column followed by the same letter are not significantly different ($p > 0.05$).

*Significant difference between early and late season populations within rows for each insecticide-population (Field) combination ($p > 0.05$).

TABLE 4 LC_{50} and LC_{90} values for spinetoram obtained using *Scirtothrips dorsalis* populations collected from eight commercial field locations in Plant City, FL, USA in 2019–2020.

Colony source	No. of adults assayed	Generations in the lab assayed	Slope ± SE	LC_{50} (ppm)	Resistance ratio (RR)	LC_{90} (ppm)
Lab-SS	240	n/a	0.87 ± 0.18	0.026	1	8.64
Field B	240	F2	n/a	2.057	78	>200
Field C	240	F2	0.72 ± 0.14	1.542	59	>200
Field D	240	F1	0.78 ± 0.14	0.585	22	>200
Field E	240	F1	0.27 ± 0.08	0.227	9	>200
Field F	240	F1	n/a	7.076	269	>200
Field G	240	F1	0.66 ± 0.13	0.159	6	>200
Field J	240	F2	n/a	2.74	103	>200

Kaur et al. 2023. Journal of Applied Entomology.

Biological & Chemical Control

Treatment[a]	Rate fl. oz/A	Overall Mean	
		Larvae	Adults
Untreated check	-	22.50ab	3.19A
NoFly	16	30.69a	2.81AB
Radiant SC	10	13.44b-d	2.75A-C
M52_Low	10	16.06bc	2.69A-C
M52 High	20	15.44bc	2.06A-D
BoteGHA Optima	32	7.38cd	1.13A-D
Knack	10	9.88cd	0.88B-D
CX10283 *B. bassiana*	32	4.06cd	0.75B-D
Plinazolin	10	6.75cd	0.50CD
Sefina Inscalis	10	1.56d	0.19D
$F_{(9,117)}$		10.96	5.15
P		<0.0001	<0.0001

Means with the same letter in the column are not significantly different (Tukey's HSD, $P > 0.05$).
[a]The surfactant Induce was included with all treatments at the rate of 0.125% (v/v)

Labeled for whitefly

Not registered

Not labeled

Conventional Strawberry Field Study of February 2024, UF/IFAS GCREC

Biological & Chemical Control

Apta (Grp. 21A)

Exirel (Grp. 28)

Timectin (Grp. 6)

Rimon (Grp. 15; IGR)

Knack (Grp. 7C; IGR)

Radiant

Entrust SC OMRI **(Grp. 5)**

Assail (Grp. 4A)

Sivanto Prime (Grp. 4D)

OMRI

BoteGHA Optima
(EPF: *Beauveria bassiana*)

Captiva Prime (Botanical: Capsicum + garlic + canola)

Azera (Botanical: Neem + pyrethrin)

Predatory mite, *Amblyseius swirskii*

Minute pirate bug, *Orius* spp.

Biological & Chemical Control

Portal (Grp. 21A)

Onager Optek (Grp. 10A)

Agri-Mek (Grp. 6)

OMRI

PFR- 97 **(EPF: *Isaria fumosorosea*)**

Captiva Prime **(Botanical: Capsicum + garlic + canola)**

Azera (Grp. 3A)

(Botanical: Neem + pyrethrin)

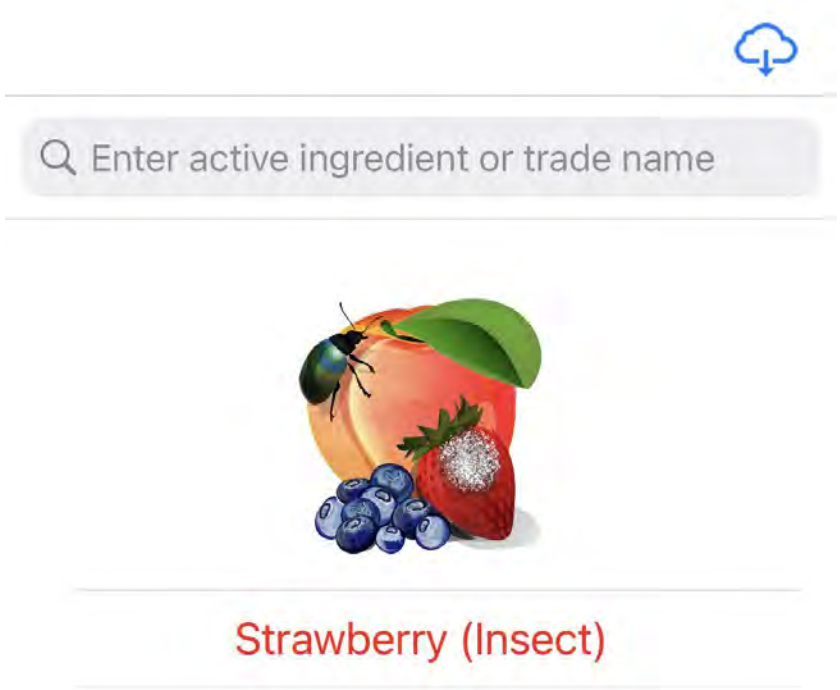
Predatory mites, *Amblyseius swirskii, Neoseiulus cucumeris, Neoseiulus californicus,* and *Phytoseiulus persimilis*

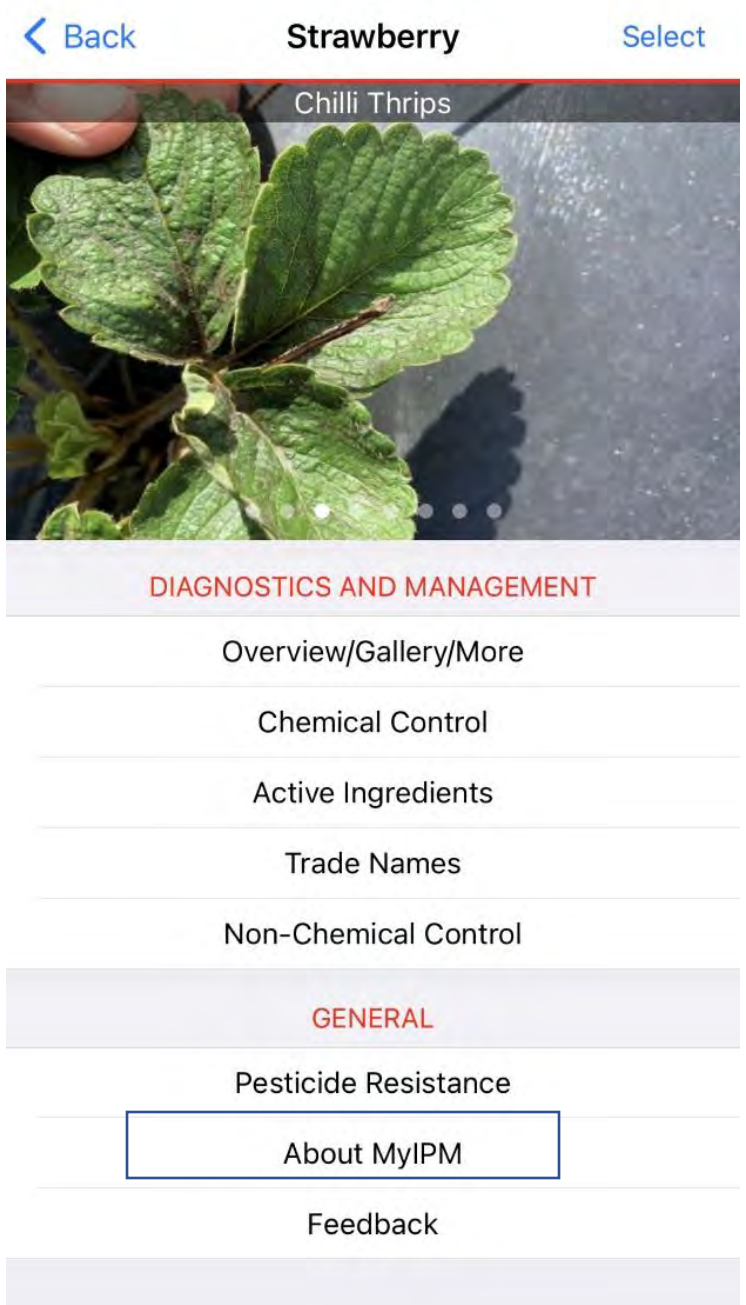
Spider mite with eggs

Image: J. Montemayor, UF/IFAS GCREC

MyIPM Cellphone App.

MyIPM



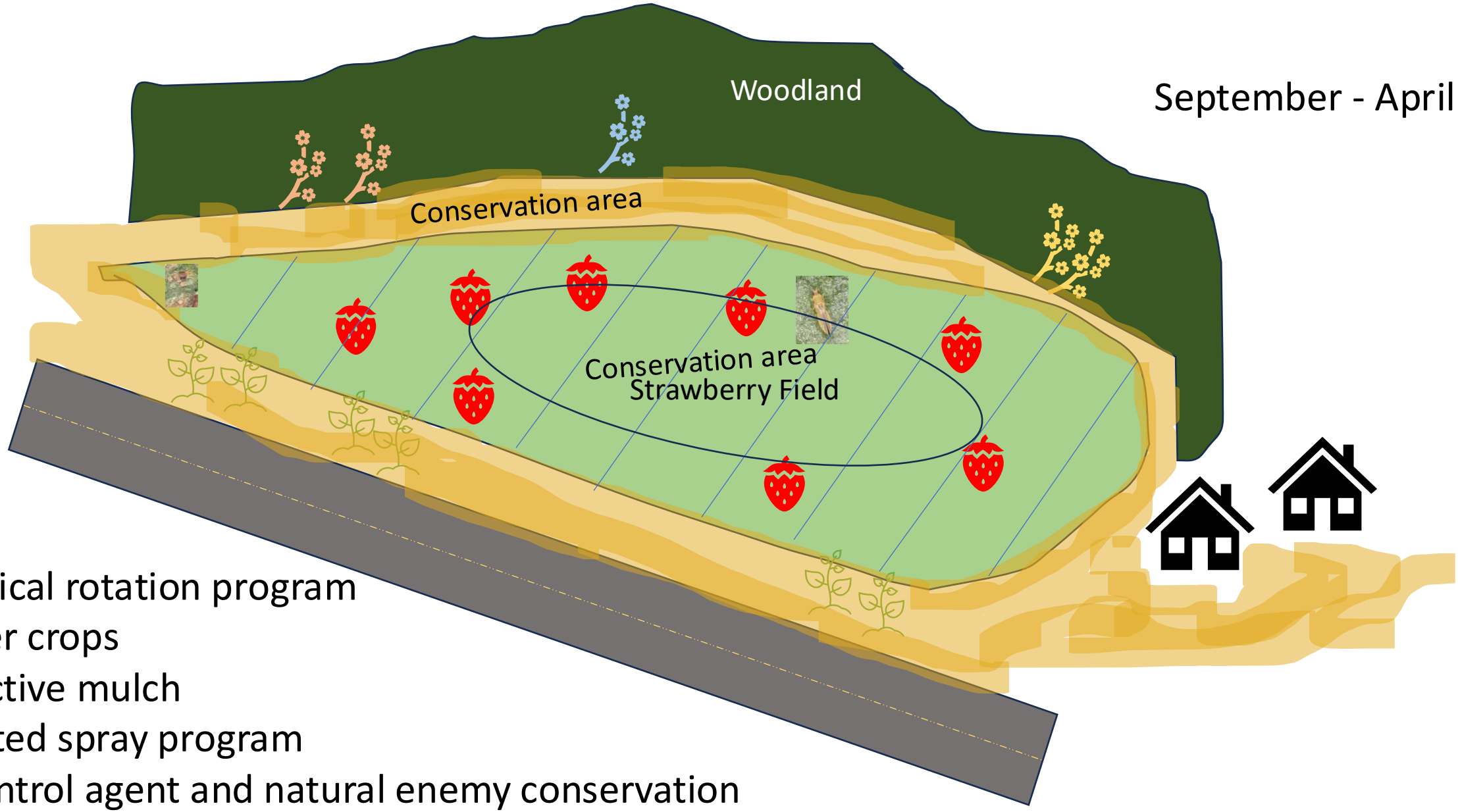


USDA NIFA, Agreement No. 2014-70006-22485 via Southern IPM Center Working Group

Development and Design: Guido Shnabel, Clemson Univ & Mengjun Hu, Univ. of Maryland & Brett Blaauw, Univ. of Georgia

Content for Strawberry Insects: Sriyanka Lahiri, Univ of Florida

Chilli Thrips & Spider Mites



September - April

Chemical rotation program
Banker crops
Reflective mulch
Targeted spray program
Biocontrol agent and natural enemy conservation

Chilli Thrips & Spider Mites

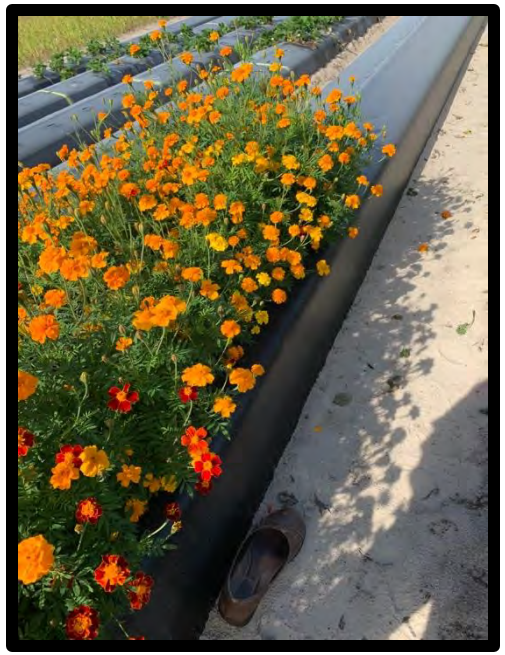
September - April

Chemical rotation
Banker crops
Reflective mulch
Targeted spray program
Biocontrol agent and natural enemy conservation

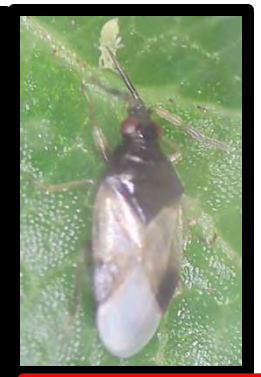
Summary

Do's

Reflective mulch



Banker crops: Mexican sunflower, marigold, sweet alyssum



Biocontrol agents and botanicals

DON'T:

- Overuse same chemical modes of action.
- Use harsh chemicals while using biocontrol agents.
- Spray the whole field with broad-spectrum pesticides for chilli thrips management.

References

Kaur, G., L. L. Stelinski, X. Martini, N. Boyd, and S. Lahiri. 2023. Reduced Insecticide Susceptibility Among Populations of *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) in Strawberry Production. Journal of Applied Entomology. 147(4), pp.271-278. https://doi.org/10.1111/jen.13108

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Acknowledgements

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Hatch Project No. FLA-GCR-005888

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Specialty Crop Block Grant Program

FSGA Florida Strawberry Growers Association

UF University of Florida Entomology & Nematology