

Production Losses Caused by Weevils in Midwest Hazelnut Plantings

Ariadna Chediack

UW-Madison Extension Bayfield County
ariadna.chediack@wisc.edu



Extension

UNIVERSITY OF WISCONSIN-MADISON
BAYFIELD COUNTY

**Upper Midwest
Hazelnut
Development Initiative**

WEEVIL/S





Hazelnut larva found in a nut from Spooner. Identified as a species in the Curculionidae (weevil) family.

Curculio obtusus,
hazelnut weevil.
Eastern US, Southeastern
Canada..



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<http://www.insectsexplained.com/thesis.htm>

Curculio occidentis,
hazelnut weevil.

West coast, Arizona, New Mexico.

Similar to *C. obtusus*



Weevil traps







Polidrosus formosus, green immigrant leaf weevil. Bayfield.



Male and female. Hayward.

Adult weevils

Strophosoma melanogrammum, nut leaf weevil.



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Otiorynchus ovatus, strawberry root weevil.



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Polydrosus formosus, green immigrant leaf weevil.



Weevil, *Larinus* sp.



Alfalfa weevil, *Tychius* sp.

Broad nose weevil, Curculionidae: Entiminae.

Only known to feed on hazelnuts

Curculio obtusus, hazelnut weevil.
Tomahawk, WI.



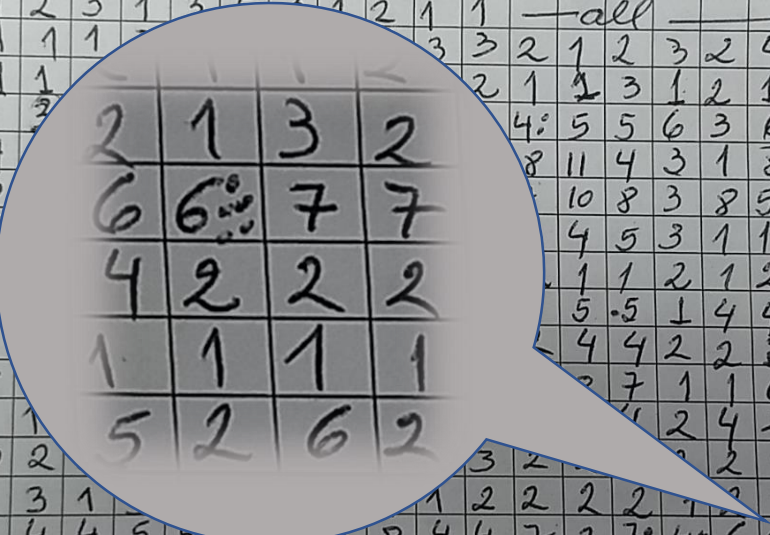
METHODS


- Data from 2017 → 10 random nuts/plant. ①
- Data from 2018 → 20 random nuts/plant. ②
- Data from 2019 → nuts from 30 random clusters/plant, or all if less than 30 harvested. ③
 - 100 random nuts from AHC's grading data. ④

Data use for the analysis are the 2019, 30 clusters counted.

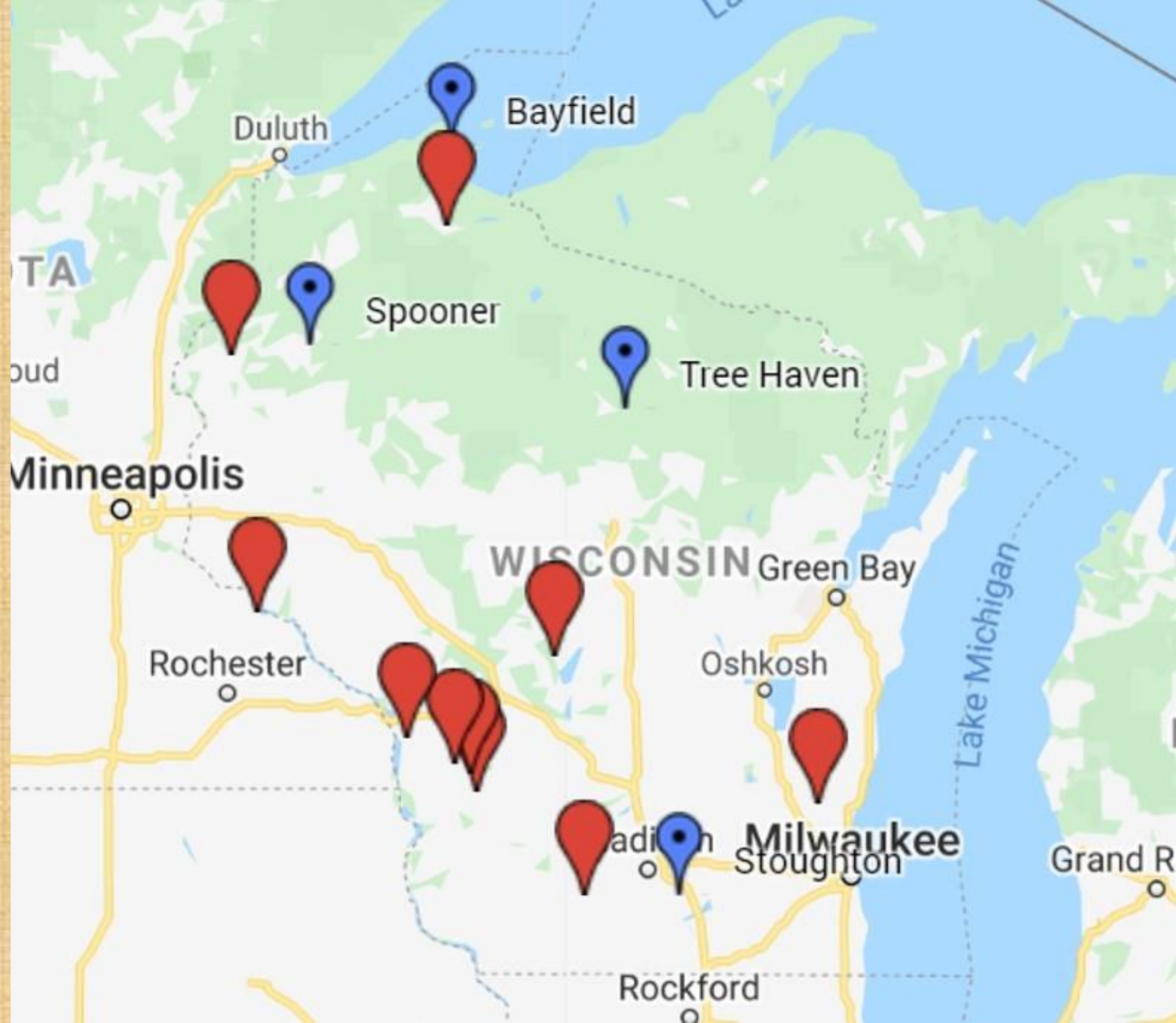
At the end I will compare damage among years and locations.

PLANTING	plant ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
BAY	C-8	8	5	6	2	7	7	6	7	5	4	2	8	7	7	1	4	2	6	2	7	5	10	8	6	8	8	7	10	4	7			
	A-33	6	4	1	4	8	8	6	2	2	7	4	8	1	3	7	4	2	3	2	3	6	1	4	3	4	1	8	2	2	2			
	Q-35	1	2	2	1	1	2	1	2	1	1	1	2	4	2	3	2	3	1	2	1	2	2	1	2	2	2	2	3	2	2			
	O-05	6	3	6	6	3	7	2	5	9	2	1	6	1	6	1	5	4	6	5	2	4	6	2	4	1	6	2	6	8	3			
	Q-04	1	1	1	4	4	4	7	1	4	2	1	2	2	1	2	2	3	2	4	1	3	1	2	3	1	1	1	2	2	1			
	R-17	3	1	5	4	1	4	5	2	5	6	3	2	3	4	4	2	4	1	1	1	4	2	5	4	2	2	4	2	4	2			
	E-75	2	1	1	2	3	1	2	3	4	3	1	2	3	1	3	5	2	1	2	1	1	1	—	—	—	—	—	—	—	—			
	Q-5	3	1	1	2	3	2	3	3	2	3	1	1	1	—	—	—	—	—	—	—	3	3	2	1	2	3	2	4	2	4	1		
	Q-12	2	1	2	1	2	1	2	1	1	2	1	1	—	—	—	—	—	—	—	—	2	2	1	2	3	1	2	1	2	2	3		
	A-7	1	5	5	4	3	5	10	4	4	4	3	—	—	—	—	—	—	—	—	—	4	5	5	6	3	6	6	6	6	6			
	A-17	13	2	3	8	1	9	5	10	6	2	4	—	—	—	—	—	—	—	—	—	8	11	4	3	1	8	1	1	3	—			
	A-21	3	8	2	1	3	5	8	9	7	1	3	—	—	—	—	—	—	—	—	—	—	10	8	3	8	5	3	3	4	—			
	C-31	4	3	3	4	6	2	5	4	4	2	3	—	—	—	—	—	—	—	—	—	—	4	5	3	1	1	4	5	2	—			
	L-16	1	1	2	1	1	3	1	4	1	2	—	—	—	—	—	—	—	—	—	—	—	1	1	2	1	2	1	4	2	—			
	N-13	5	3	1	2	2	1	3	2	1	2	4	—	—	—	—	—	—	—	—	—	—	5	5	1	4	4	5	3	1	—			
	F-7	3	2	2	3	2	4	3	3	2	1	3	—	—	—	—	—	—	—	—	—	—	4	4	2	2	3	1	4	2	—			
	A-23	1	7	4	1	3	2	11	8	5	7	8	—	—	—	—	—	—	—	—	—	—	7	1	1	6	7	2	1	—				
	B-7	3	2	3	1	3	3	6	3	2	2	3	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
	P-15	5	1	1	5	8	3	1	6	8	3	5	2	—	—	—	—	—	—	—	—	3	2	—	—	—	—	—	—	—	—			
	B-5	2	1	3	5	1	1	2	3	1	2	1	3	1	—	—	—	—	—	—	—	1	2	2	2	2	1	2	1	3	2	2		
	E-10	8	3	6	8	3	4	8	6	4	5	5	4	4	5	5	6	—	—	—	—	1	8	4	4	7	2	7	4	6	6	7	7	8
	O-30	3	3	1	3	1	5	2	2	2	3	1	2	3	1	2	1	1	1	1	1	1	1	1	1	2	2	3	4	2	2	2	2	
	O-07	3	2	1	1	3	1	1	2	1	3	3	3	1	2	3	3	2	1	1	2	1	2	1	1	1	1	1	1	1	1	1	4	
	O-08	1	3	2	1	6	1	2	2	2	4	1	5	2	4	5	2	1	1	2	1	3	2	1	2	3	5	2	6	2	3	—		
	Q-39	1	1	3	2	3	5	2	1	1	2	3	1	2	1	1	5	1	1	2	2	3	2	1	3	1	1	2	2	1	3	—		
	C-38	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	3	1	1	—	—	—	—	—	—	—	—		
	B-33	2	2	2	3	2	3	3	2	7	5	2	2	1	3	2	2	4	2	4	3	4	2	1	1	1	2	4	6	2	5	—		
	A-30	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	2	1	3	2	1	1	2	1	2	1	1	1	1	1	4	—	
BAY	B-3	2	4	3	1	1	2	2	7	5	2	2	2	2	1	3	2	2	1	1	3	3	2	1	2	2	4	2	2	2	4	—		
STG	I-13	4	7	4	6	5	1	10	9	2	9	6	5	6	2	4	5	4	9	4	4	10	4	6	1	8	6	8	10	3	7	—		



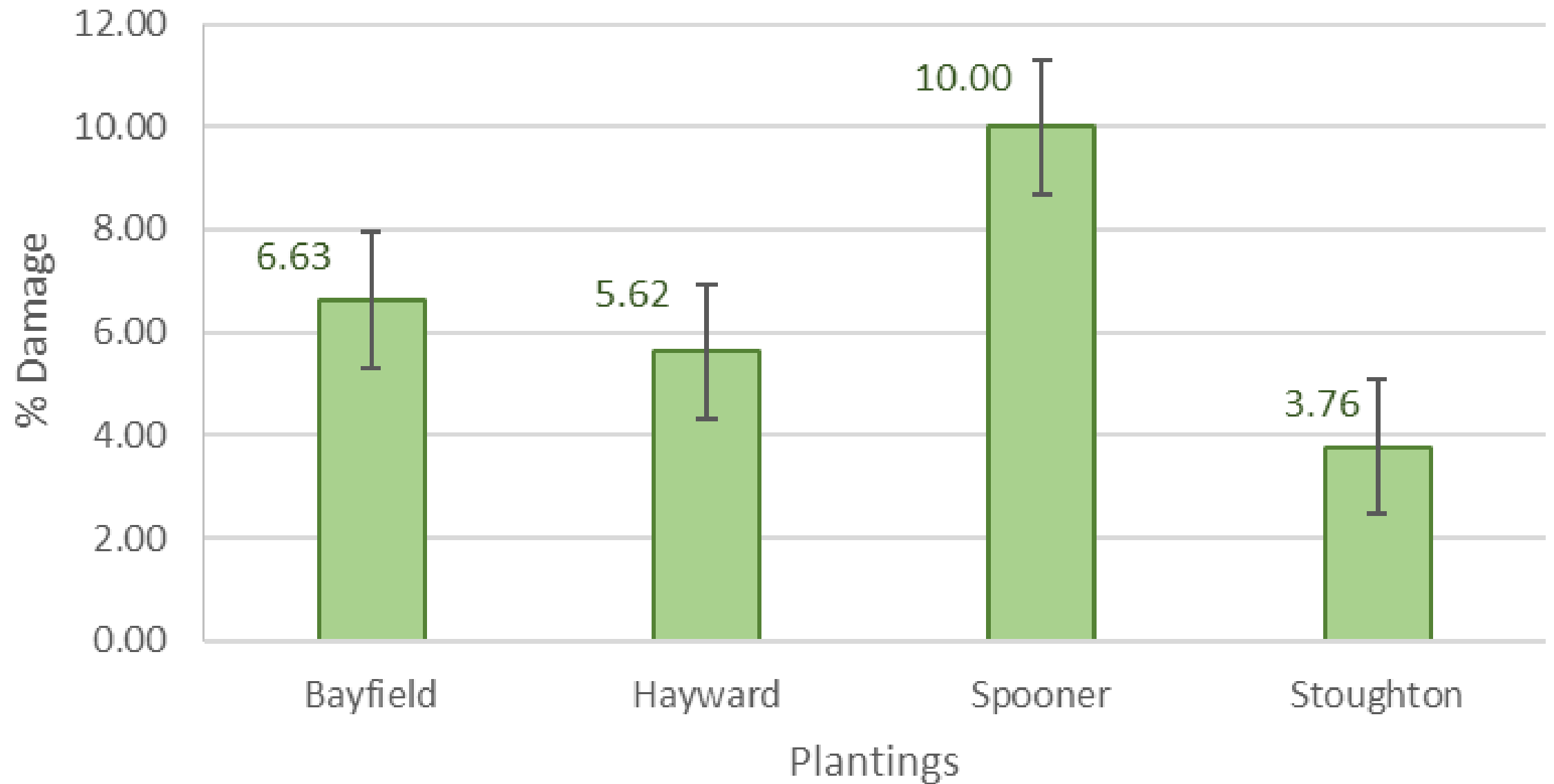
 Trial plantings

 AHC members



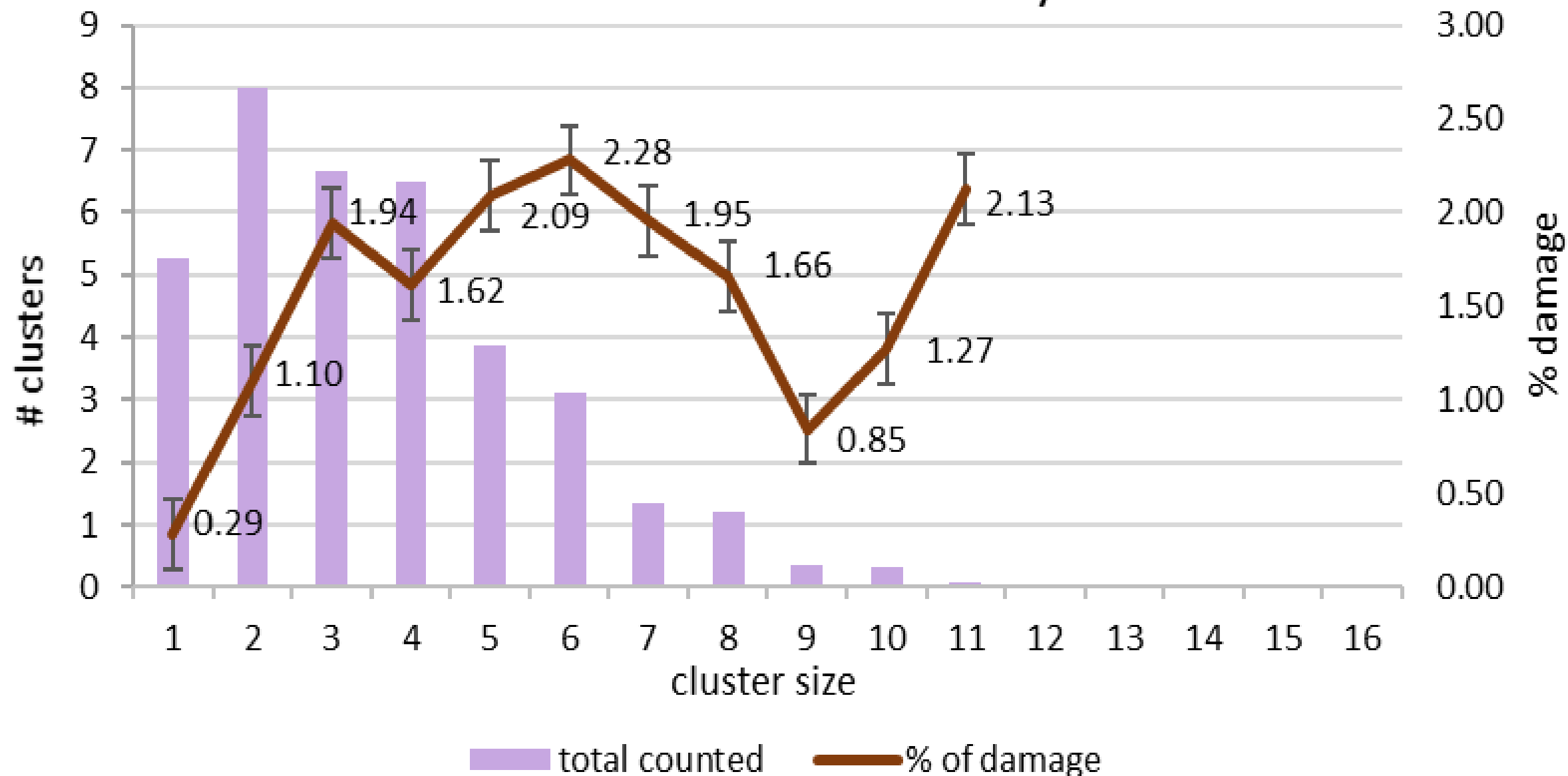
Sites	plants harvested	clusters counted	# clusters infested	nuts counted	nuts w/weevil hole
Bayfield	345	10,496	178	33,118	209
Hayward	402	10,050	41	30,470	51
Spooner	170	5,129	291	16,903	341
Stoughton	354	10,940	36	51,781	44
Total	1271	36,615	546	132,272	643

% of Clusters with Weevil Damage

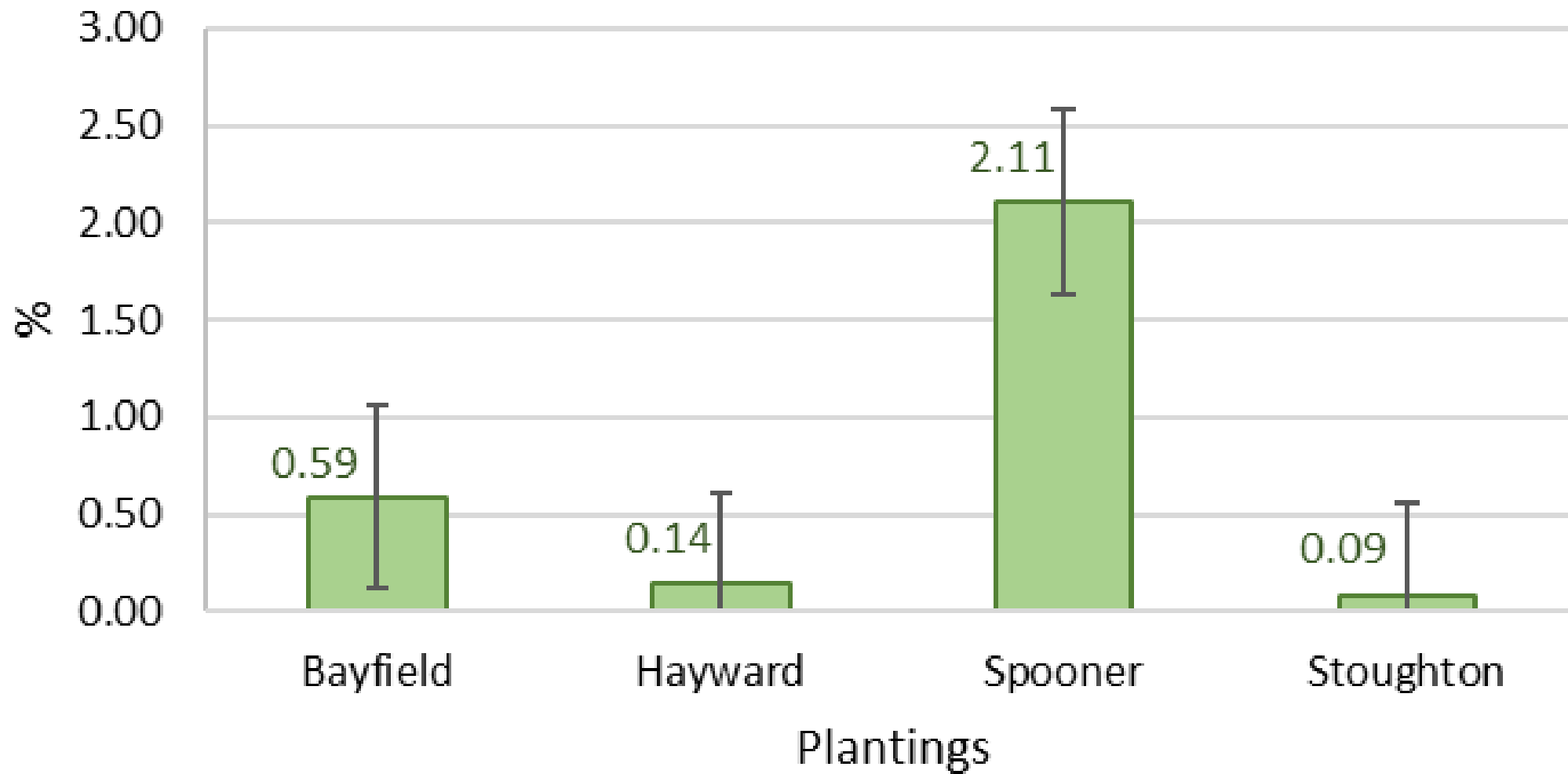


% of Clusters Damaged by Weevils in Relation to the Total Amount of Cluster Counted by Cluster Size

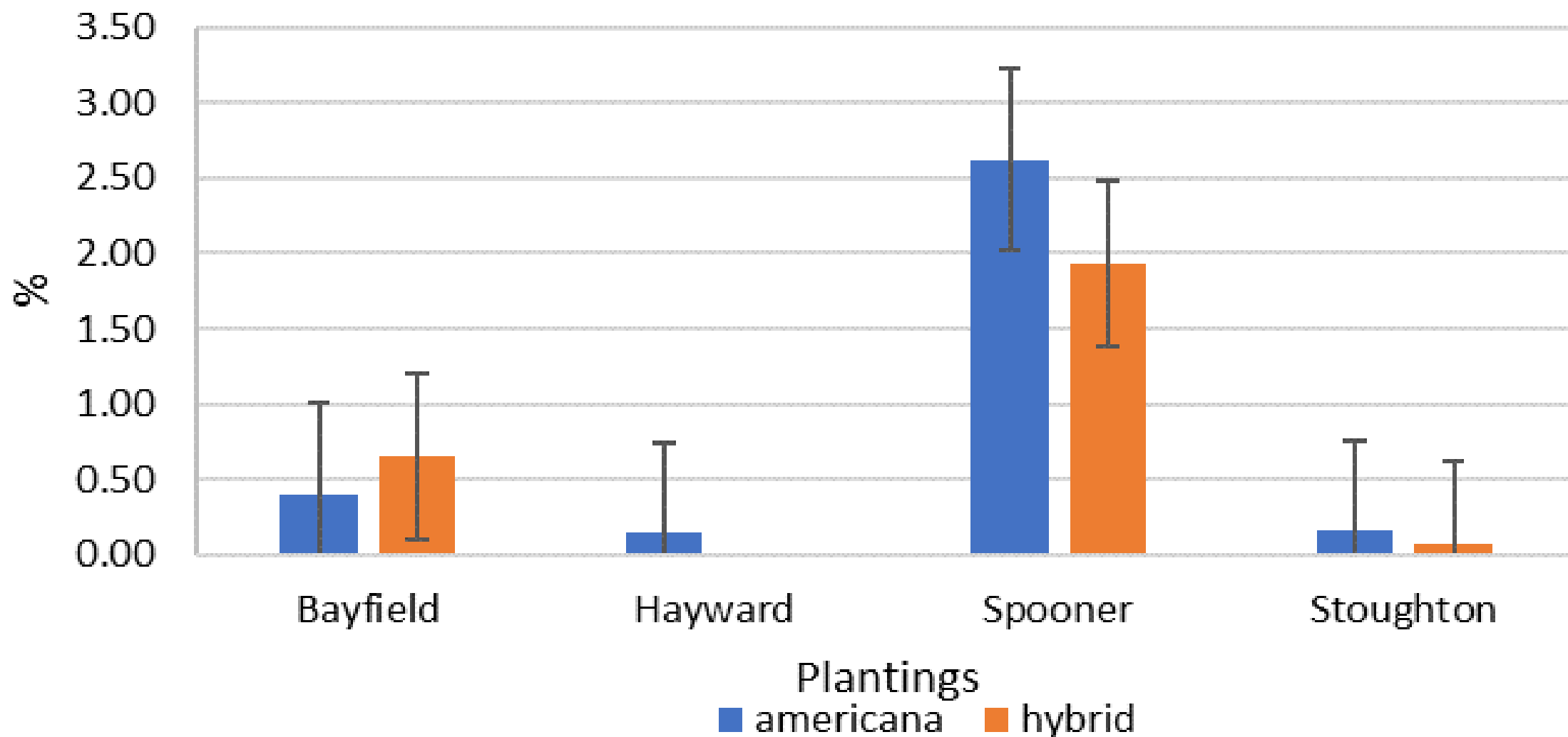
Thousands



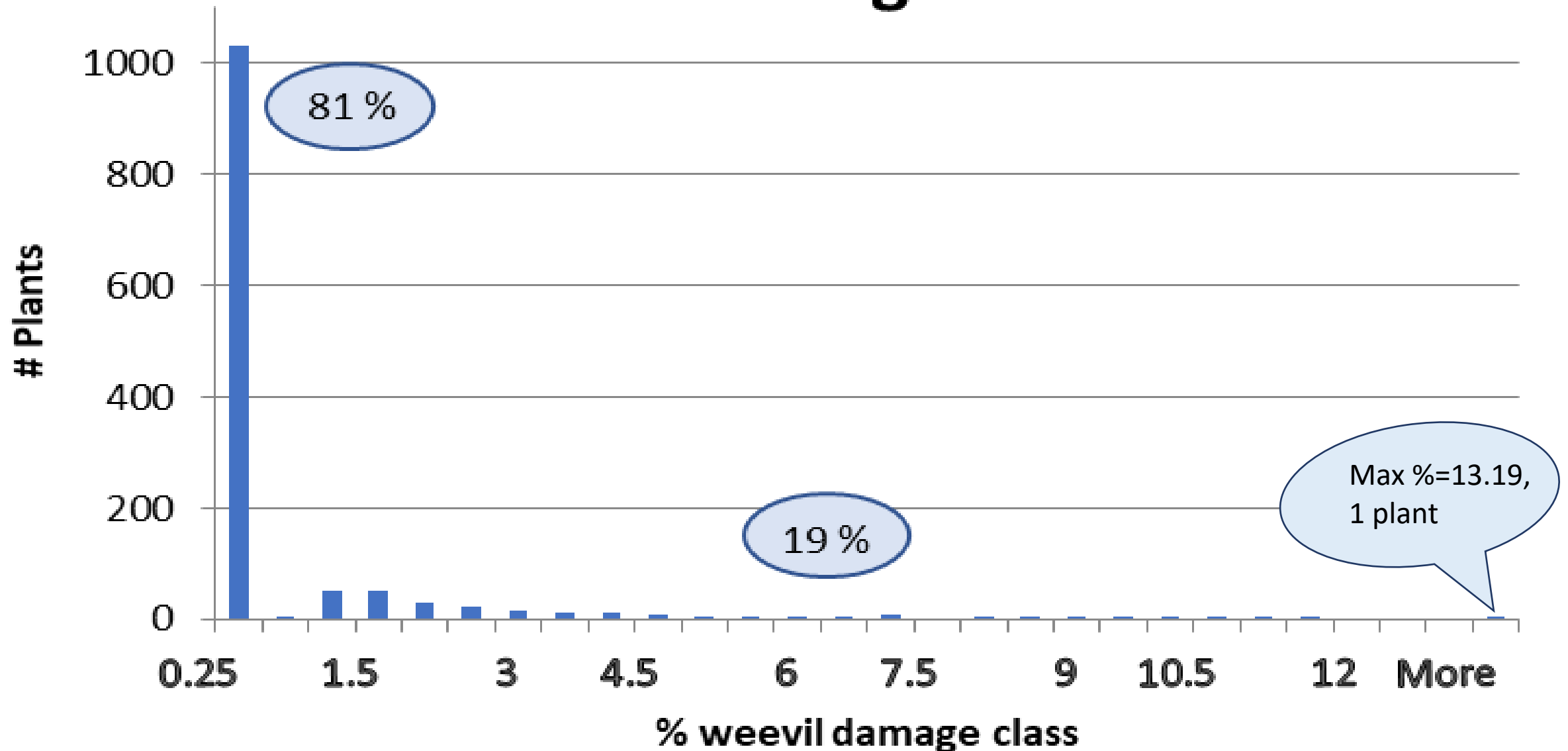
% of Nuts Counted with Weevil Damage



Comparison of Species by Percentage of nuts predated by weevils



Distribution of % of Nuts with Weevil Damage



Comparison of Percentage of nuts with weevil damage among locations and years

Planting	2017 ^①	2018 ^②	2019
Bayfield	2.06	3.36	0.59 ^③
Spooner	0.82	1.68	2.11 ^③
Stoughton	0.00	0.48	0.09 ^③
Tomahawk	0.71		
Hayward			0.14 ^③
Finley			2.00 ^④
Marengo			3.00 ^④
Lake City			6.00 ^④
Bernaveld			0 ^④
Siren			0 ^④
La Crosse			0 ^④
Viola			0 ^④
Viroqua			0 ^④
Viroqua			0 ^④
West Bend			0 ^④

- ① 10 nuts
- ② 20 nuts
- ③ nuts from 30 clusters
- ④ 100 nuts

Conclusions

- ♥ Still UNKNOWN weevil species that are feeding on the hazelnuts.
- ♥ Only ONE specimen found in Tomahawk (2 Aug. 2019) of hazelnut weevil, *C. obtusus*, which disperses by walking (0.6-20.5 m/day, Traedwell 1968).
- ♥ Overall, weevil damage is less than 2.5%.
- ♥ So far, there is one planting (in Lake City, WI) with a 6% weevil damage recorded, based on the 100 nuts sampled before processing.

Conclusions

- Spooner has the highest % of nuts (2.11) and clusters (10) predation by weevils.
- Most of the plants (81%) has less than 0.25% of damage by weevil.
- Weevil seems to prefer clusters with 3 to 8 nuts. More analysis and study has to be done considering variables such as genotypes, plant dimensions, and plant structure, locations, and planting surroundings among others.

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Questions ?

