

# **Efficacy of Ear Tags for Horn Fly Control in Texas**

Aaron Sumrall and Sonja Swiger

June 2019 – November 2019

Horn flies are one of the most important pests to the livestock industry. Controlling horn flies is a must in the United States and can be very time consuming and costly. Horn fly adults are blood feeders that consume between 30 – 40 blood meals per day. The adults remain in constant contact with cattle until oviposition, therefore providing control opportunities. Lack of adequate horn fly control can lead to weight loss and eventually economic loss.

## **Objectives**

- Record horn fly numbers during the 2019 fly season in Texas (June – November) by making weekly fly counts of cattle tagged with different types of products (Python, and Magnum).
- Compare products to determine which is the most effective at controlling horn fly densities.

## **Methods**

- The study was conducted from June 21, 2019 thru November 1, 2019.
- All cattle within a herd were tagged with a designated ear tag, one herd with one herd with Magnum tag (pyrethroid) and one herd with Python tag (pyrethroid).
- Two ear tags were used on all cows in compliance with the label, except for the Magnum herd which is one tag per animal.
- A control herd was also selected for comparison counts.
- Fly counts were conducted weekly from one side of 10 randomly selected cattle in each group (tagged and control).
- No other products were used for fly control during the experimental time period on tagged cattle.
- Products were used for fly control during the experimental time period on the control herd if horn fly numbers began to reach above economic impact numbers (>1000/cow).

## Data & Results

### Control

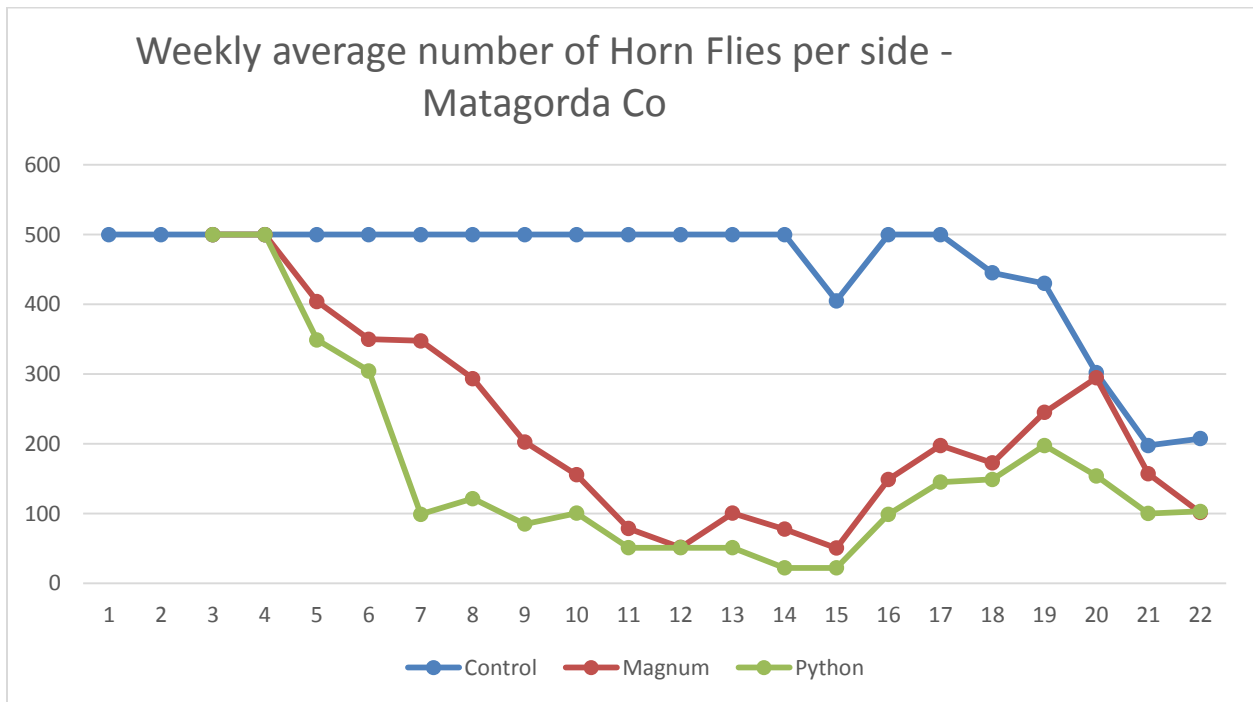
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
6/7/2019	6/14/2019	6/21/2019	6/28/2019	7/5/2019	7/12/2019	7/19/2019	7/26/2019	8/2/2019	8/9/2019	8/16/2019
450	550	450	550	450	550	450	550	450	550	450
425	400	425	400	425	400	425	400	425	400	425
550	500	550	500	550	500	550	500	550	500	550
500	550	500	550	500	550	500	550	500	550	500
550	475	550	475	550	475	550	475	550	475	550
475	530	475	530	475	530	475	530	475	530	475
525	515	525	515	525	515	525	515	525	515	525
475	535	475	535	475	535	475	535	475	535	475
525	545	525	545	525	545	525	545	525	545	525
525	400	525	400	525	400	525	400	525	400	525
Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22
8/23/2019	8/30/2019	9/6/2019	9/13/2019	9/20/2019	9/27/2019	10/4/2019	10/11/2019	10/18/2019	10/25/2019	11/1/2019
550	450	550	350	550	450	400	450	350	250	150
400	425	400	375	400	425	400	425	325	225	200
500	550	500	450	500	550	450	450	300	150	200
550	500	550	400	550	500	450	400	275	200	250
475	550	475	400	475	550	425	450	250	250	175
530	475	530	425	530	475	500	400	330	200	230
515	525	515	425	515	525	475	450	300	225	215
535	475	535	425	535	475	475	425	315	175	235
545	525	545	400	545	525	450	425	325	175	245
400	525	400	400	400	525	425	425	250	125	175

### Herd 1– Magnum

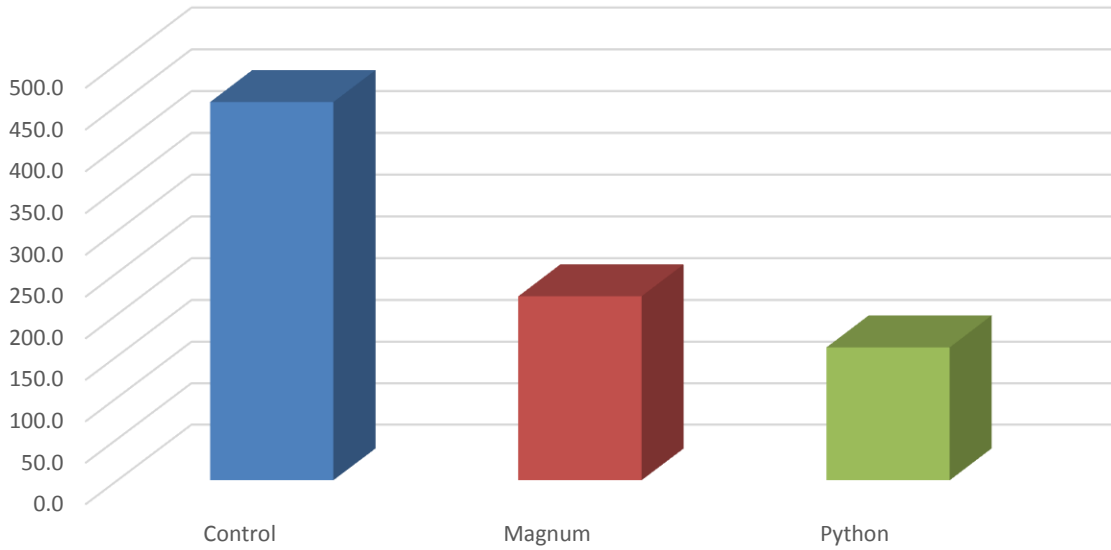
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
6/7/2019	6/14/2019	6/21/2019	6/28/2019	7/5/2019	7/12/2019	7/19/2019	7/26/2019	8/2/2019	8/9/2019	8/16/2019
		450	550	415	400	400	300	250	250	75
		425	400	425	375	375	400	225	150	60
		550	500	400	350	350	275	200	200	125
		500	550	375	350	350	200	200	150	115
		550	475	425	350	350	350	250	175	50
		475	530	400	375	375	345	175	130	60
		525	515	410	250	225	315	175	115	75
		475	535	375	375	375	300	150	135	50
		525	545	415	325	325	250	200	100	100
		525	400	400	350	350	200	200	150	75
Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22
8/23/2019	8/30/2019	9/6/2019	9/13/2019	9/20/2019	9/27/2019	10/4/2019	10/11/2019	10/18/2019	10/25/2019	11/1/2019
100	100	100	100	200	100	100	250	250	100	100
50	115	75	30	100	150	150	225	400	75	100
50	75	75	75	175	100	100	250	400	100	75
75	50	80	50	150	200	200	200	250	150	150
50	125	55	25	125	250	250	250	300	250	125
20	150	100	25	150	225	225	275	350	225	115
25	70	75	70	175	300	250	225	320	200	85
20	150	100	45	150	350	150	275	250	220	100
75	80	60	40	115	150	150	250	200	150	75
50	90	55	45	150	150	150	250	225	100	90

## Herd 2- Python

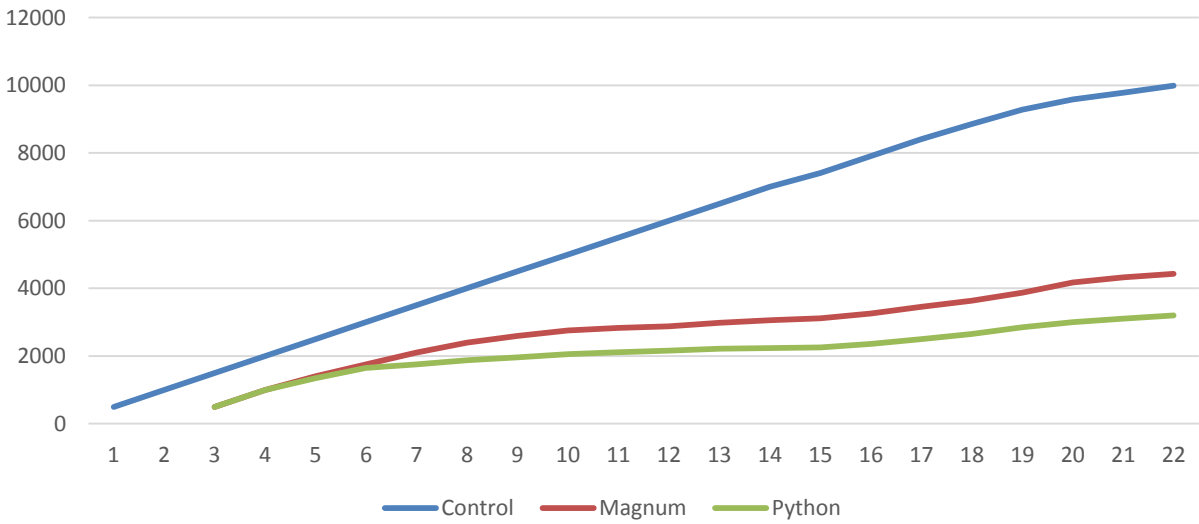
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
6/7/2019	6/14/2019	6/21/2019	6/28/2019	7/5/2019	7/12/2019	7/19/2019	7/26/2019	8/2/2019	8/9/2019	8/16/2019
		450	550	360	325	100	150	100	100	100
		425	400	330	275	100	150	80	115	30
		550	500	275	250	75	80	75	75	75
		500	550	425	400	50	75	50	50	50
		550	475	350	350	125	125	125	125	25
		475	530	325	400	150	150	100	150	30
		525	515	275	250	70	70	70	70	70
		475	535	350	300	150	150	125	150	45
		525	545	375	250	80	175	75	80	40
		525	400	425	245	90	90	50	90	45
Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22
8/23/2019	8/30/2019	9/6/2019	9/13/2019	9/20/2019	9/27/2019	10/4/2019	10/11/2019	10/18/2019	10/25/2019	11/1/2019
100	100	20	20	100	125	200	100	100	100	100
30	30	15	20	100	150	100	150	100	75	100
75	75	25	20	75	75	175	100	175	75	75
50	50	25	25	50	75	150	200	50	70	150
25	25	10	10	125	175	125	250	125	125	125
30	30	20	15	150	150	150	225	150	150	115
70	70	25	20	70	200	175	300	200	75	70
45	45	20	20	150	150	150	350	250	150	125
40	40	40	40	80	250	115	150	300	80	80
45	45	20	30	90	100	150	150	90	100	90



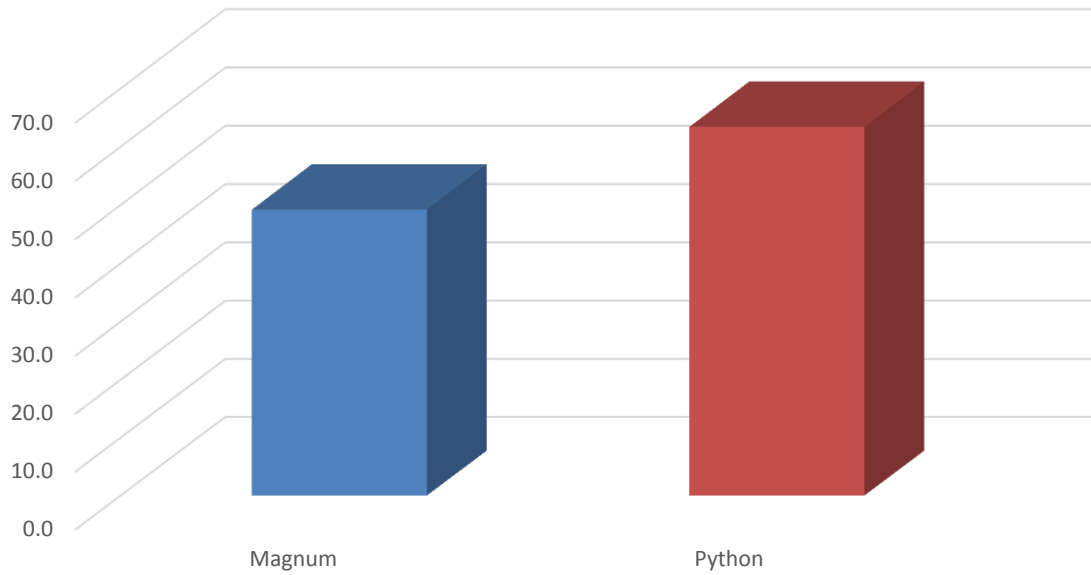
### Average number of Horn Flies per side



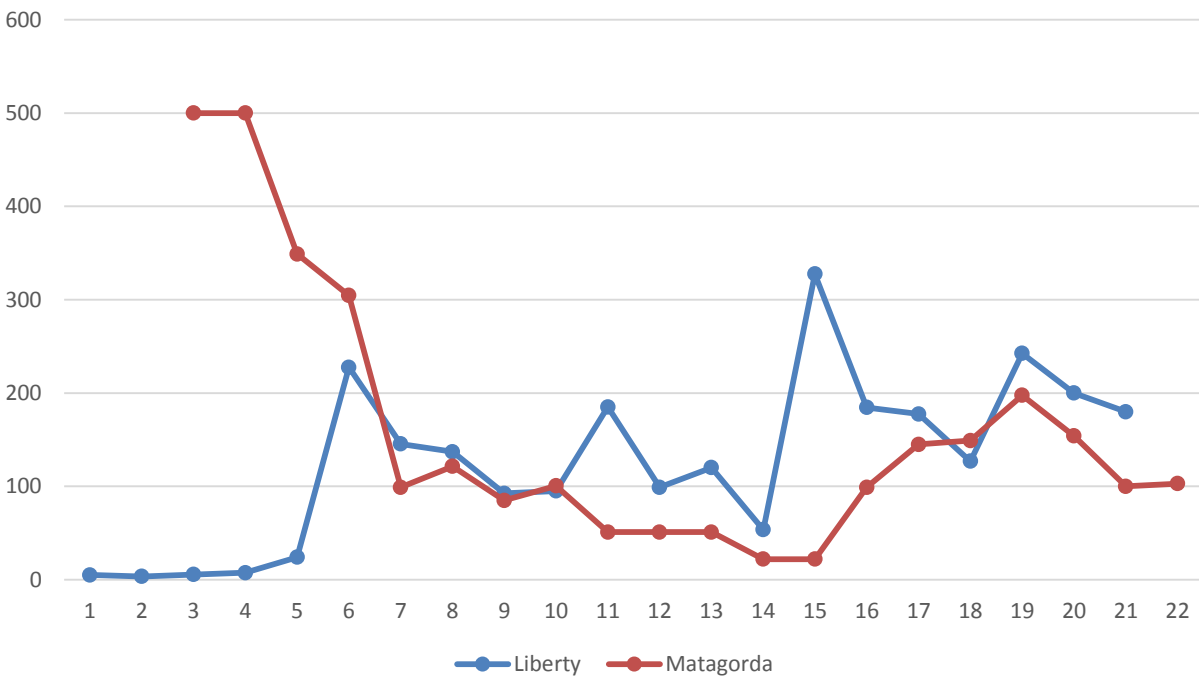
### Cumulative weekly average number of horn flies per side



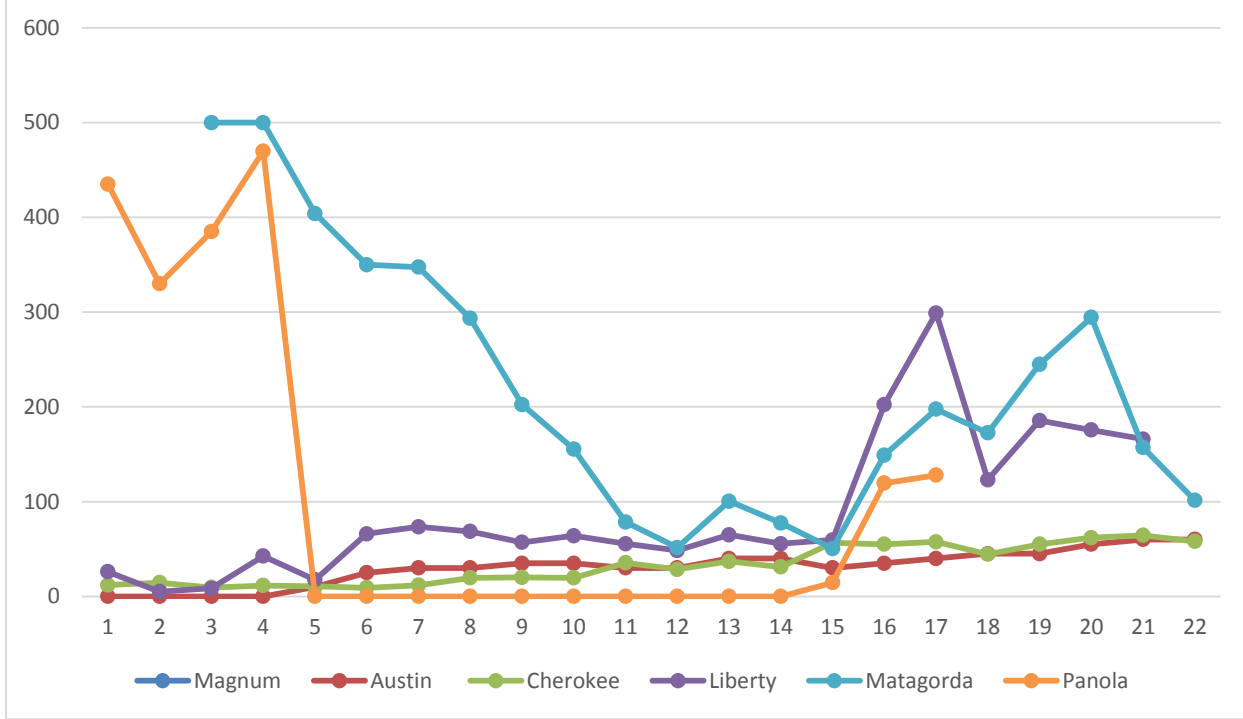
### Overall Average % Controlled



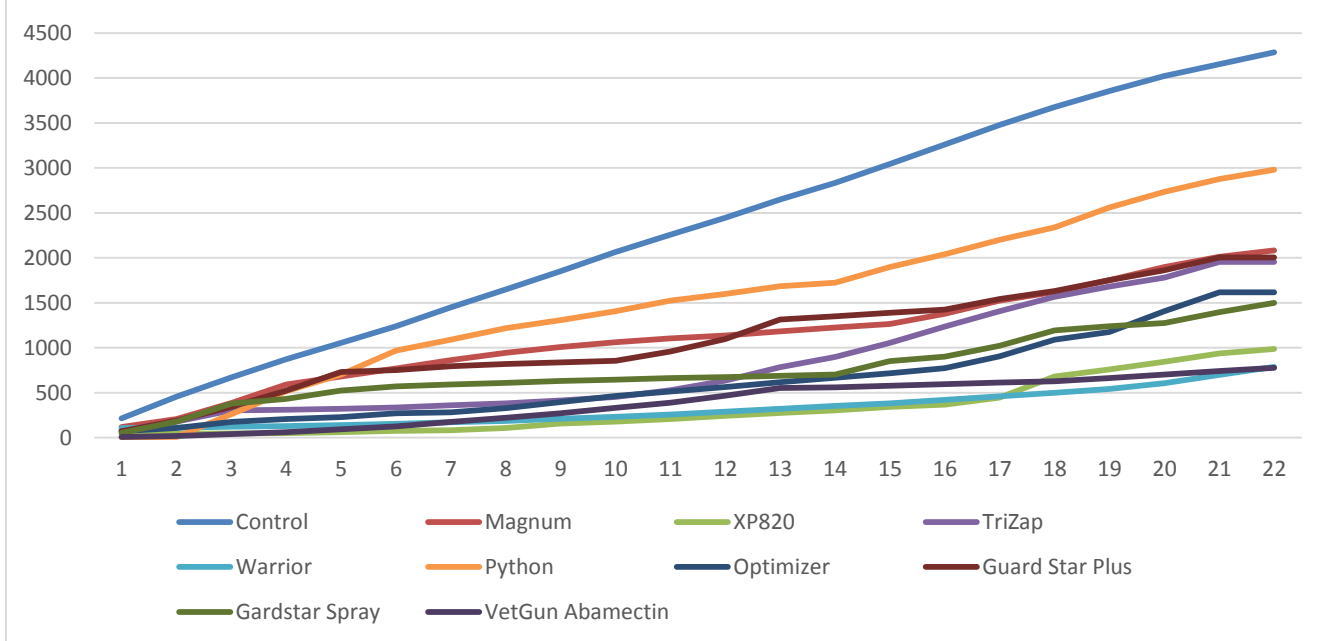
### Average horn fly numbers of Python herds



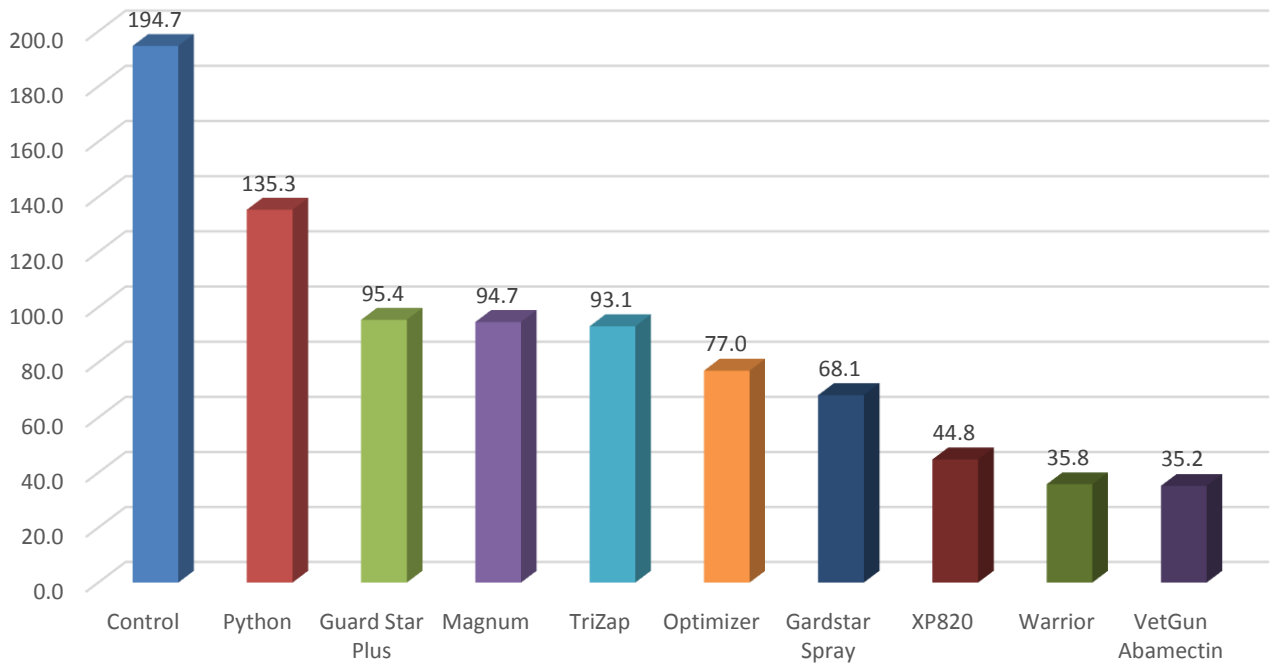
Average horn fly numbers of Magnum herds



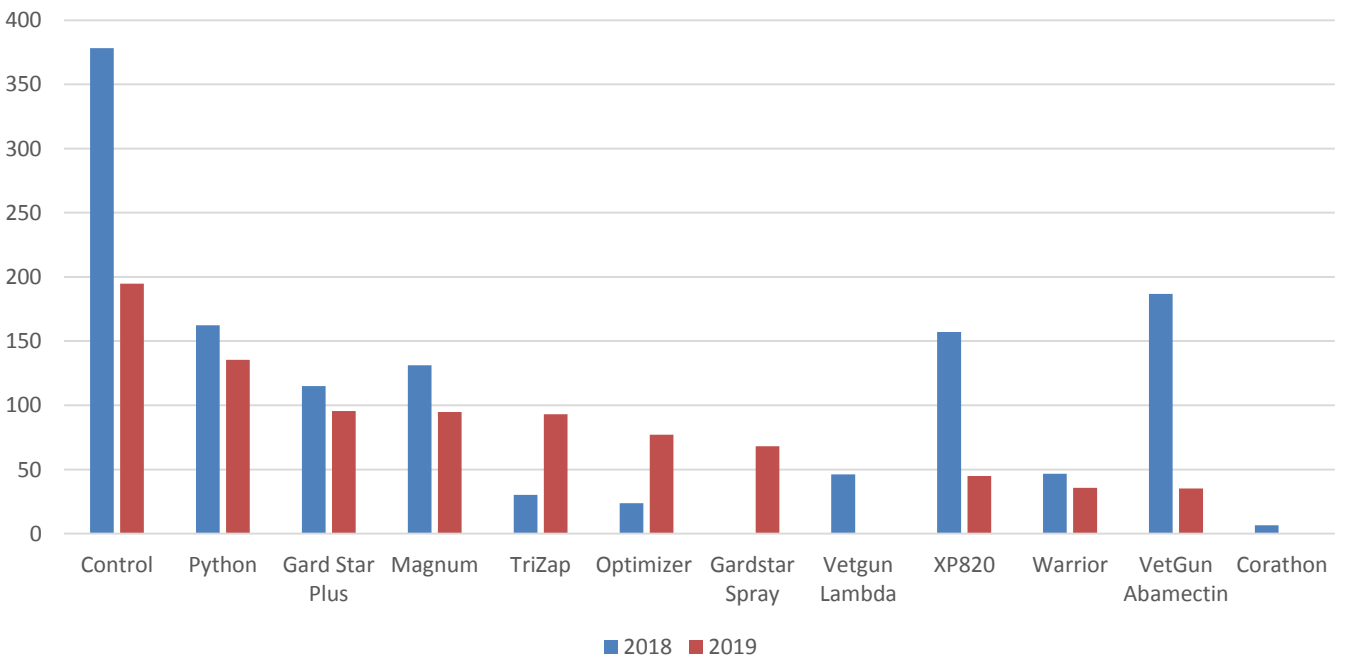
Cumulative weekly average number of horn flies per side for each tag - Texas 2019



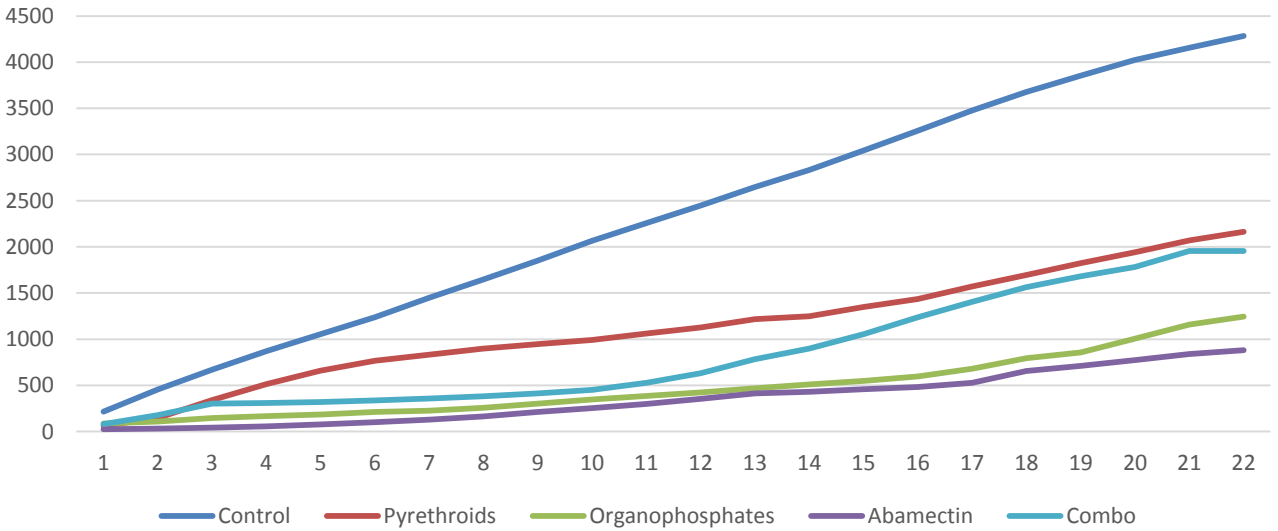
**Average number of horn flies per side with insecticide treatment in Texas 2019**



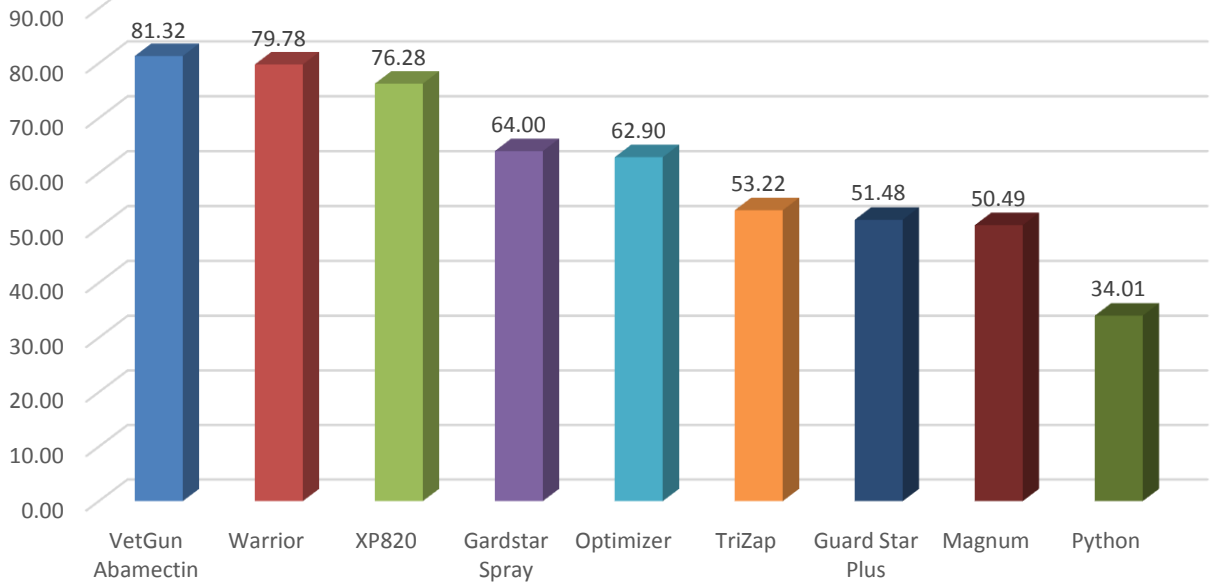
**Average number of horn flies per side with insecticide treatment in Texas 2019 vs. 2018**



### CUMULATIVE AVERAGE NUMBER OF HORN FLIES PER SIDE PER INSECTICIDE CLASS

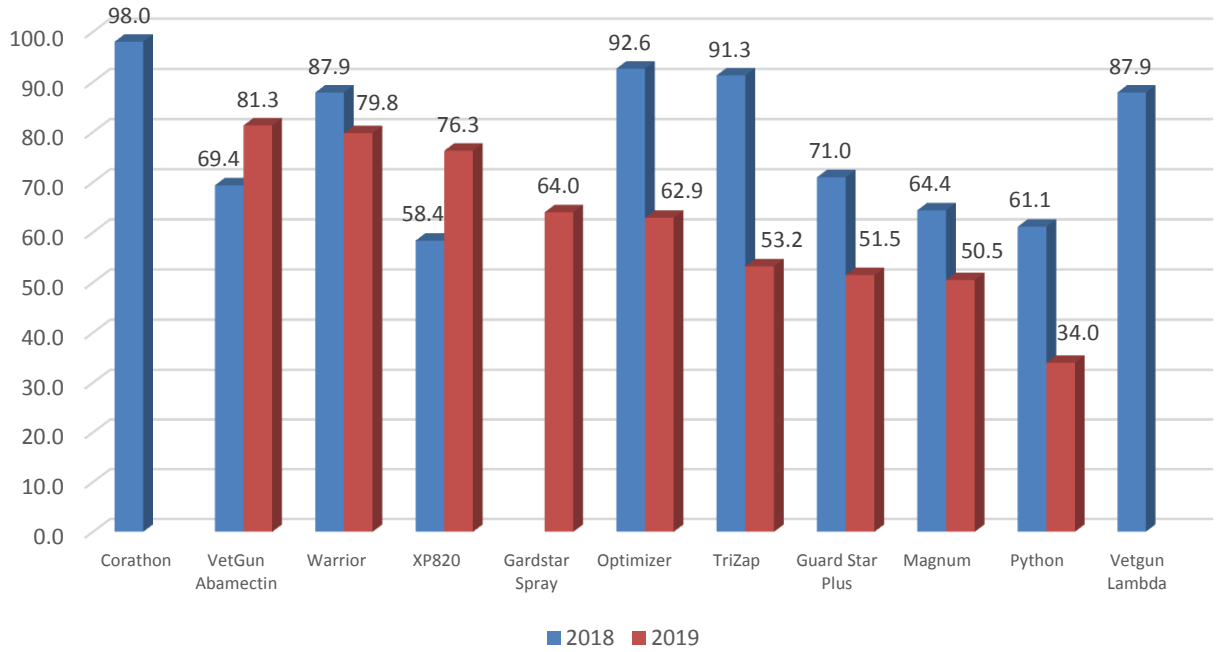


### Overall Average Percent Controlled by Insecticide

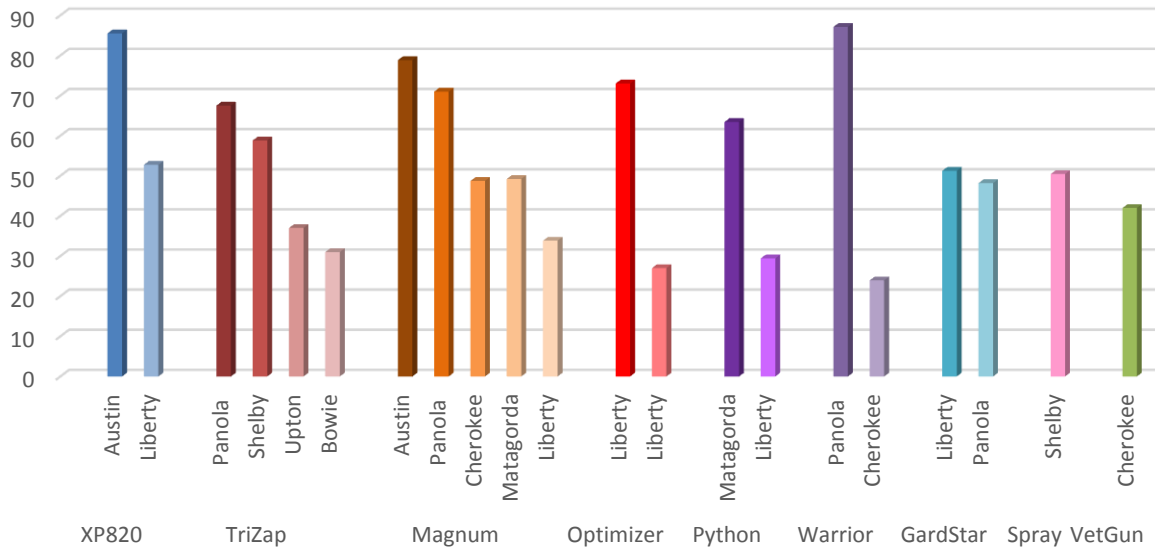




Overall Average Percent Controlled by Insecticide 2018 vs 2019



County Comparison of % control by products



## **Conclusion**

Years of analysis show that there is significant effectiveness in every county when insecticide ear tags, vetcaps or sprays are used to control for horn flies, this is represented in the graph titled Cumulative Weekly Average Number of Horn Flies per Side, even with products that did not look to be very effective. Some counties are showing optimal results with several of the ear tags, vetcaps or sprays but then other counties have very little efficacy when using the same ear tags, vetcaps or sprays. The horn fly life cycle occurs in direct contact with cattle, adults utilize cattle for food and drink (blood) and the eggs are laid in fresh manure which is always moist despite the amount of rain. Horn fly larvae are capable of increasing developmental time when needed and can grow from egg to adult in 7 days when temperatures are above 85°F. Even if horn fly numbers are similar during a wet year when compared to a drought year, it is typically harder to control the number of horn flies with insecticides when there is optimal rain. In instances where ear tags were put in after a horn fly population has developed above threshold, data shows the insecticide tags impact the population numbers to be significant and longer lasting than when the tags are put in early.

The data tabulated for the 8 counties in 2019 completing the demonstration (Austin, Bowie, Cherokee, Liberty, Matagorda, Panola, Shelby, and Upton) show effective horn fly control achieved with all the insecticide ear tags used, organophosphates, pyrethroids and abamectin products, and the abamectin VetCaps. When looking at the weekly average horn fly numbers for the various counties, it is easy to see that numbers were higher in 2018 than in 2019 but some of the ear tags used in 2019 did not exhibit better efficacy. Some of the tags that were previously considered to be very effective, lost their efficacy before the 20<sup>th</sup> week in 2019. Loss of effectiveness is recorded when horn fly numbers average over 100 per side in a week.

Last year, 2018, the average number of horn flies recorded on the control herds was 378, this is almost two times higher than the numbers recorded this year (195). This year only the Python ear tags averaged over 100 horn flies per side (135) but three tags averaged just under one hundred and could be interpreted to be poor results as well (GardStar Plus with 95, Magnum with 95 and TriZap with 93). The Optimizer ear tags averaged 77 horn flies per side, GardStar spray averaged 68, XP820 tags averaged 45, Warrior tags averaged 36, and abamectin vetcaps averaged 35. The best results were achieved with the Warrior ear tags and VetGun Abamectin VetCaps.

This year's results show some distinct count differences between the pyrethroid and the combination products compared to the organophosphate and abamectin products, this is different than 2018 where the combination tags had excellent results and the abamectin products did not. The data counts, were generally very good for almost all the treatments for the most of the 22-week study period. Most of the high fly count numbers were recorded around weeks 3 and 4 or at the later weeks (after week 15) of the study period.

Overall average percent control by insecticide treatment showed good to decent results but lower than what was recorded in 2018, this has more to do with the low numbers on many of the control herds and not as much to do with the ear tags being ineffective. It is hard to show quantitatively the impact overall low horn fly numbers in control herds has on calculations for the whole state. Some counties had high numbers in many herds while others had low numbers in all herds and then several showed low numbers on treated cattle and high numbers on control herds, which is what we hope to see. Control percentages ranged from 81% with VetGun abamectin to 34% with the Python tags (disclaimer, not all control herds exhibited higher numbers than the treated herds and this heavily impacts percent control rates). The abamectin vetcaps showed a percent control of 81% and the Warrior tags achieved 80% control. The XP820 abamectin ear tags showed 76% control, the Gardstar spray had 64% control, Optimizer ear tags had 63% control, TriZap showed only 53% control this year, GardStar Plus tags had 52% control, while Magnum only showed 50% control and Python ear tags came in last with 34% control. Compared to the products tested last year, only the abamectin products had increased control percentage rates this year, 81% for the VetCaps compared to 69% in 2018 and 76% for the XP820 tags compared to 58% in 2018.

Matagorda County horn fly numbers averaged the highest of all the counties this year and only had eight weeks where numbers were below threshold. The lowest average was recorded at 22 per side with the Python ear tag at weeks 14 & 15. The Magnum herd averaged higher with the lowest numbers being recorded at 50.5 during week 15. The control cattle numbers were the highest recorded with an average of 454 and most weeks being recorded at 500 horn flies per one side. The other control herds in the state ranged from 302 to 60 horn flies per side. Averaged percentage control for each tag was lower than hoped with 63% for Python and 49% with the Magnum tag but there was a lot of horn fly pressure observed in Matagorda County. The Python tags out preformed the Magnum tags.