2019-20 NH Winter Hive Survey Results

Heather Achilles

2019-20 Survey Executive Summary

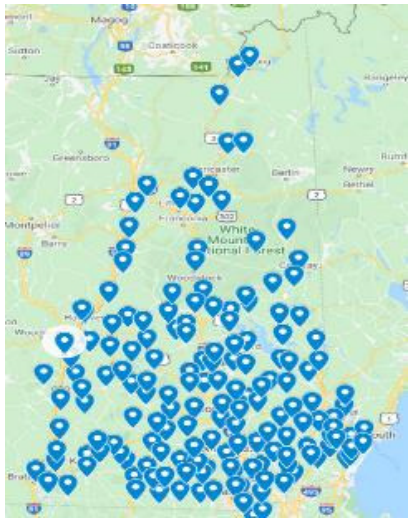
- **2019-20 Winter Survival is the best we've seen since doing the survey : 65% (35% loss)**
  - 75% of respondents have between 1-10 hives.
- Survey covered the period from Oct 1, 2019-Mar 31, 2020
- 6% increase in the number Hives & NUCs over last year.
- Queen Issues were in the top 5 reasons for loss for the first time
- Notable management practices changes
  - ¾ of apiaries used commercial varroa treatment at least 1 time
  - More varroa mite testing being done
  - More Apiaries (62%) treated for varroa mites multiple times
  - Increasing number of comments/notes about hives being in a building for the winter
  - Less fall feeding done in 2019
- County level analysis gives insights into some interesting trends.

2019-20 Hive Loss Survey Recommendations & Request for Approval

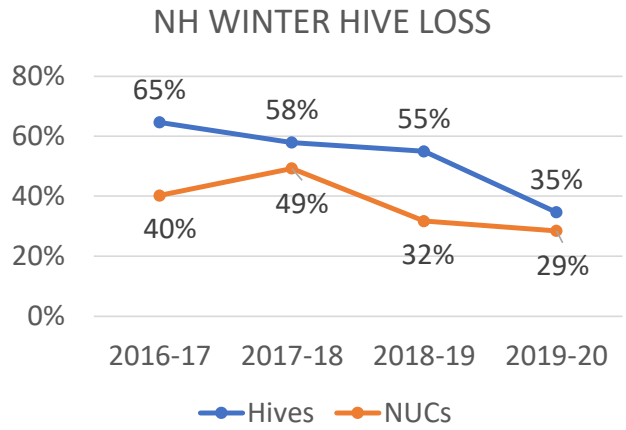
- Make this summary data public on our website
  - Present data at webinar & club meetings if the clubs are interested.
  - Email the summary (or a pointer to the info on the website) to all participants that submitted information to the survey
  - Send paper copies of the summary to members who participated via postal mail.
- Work with our UNH coop extension colleagues using this data to continue :
  - Support grant applications to further beekeeper education.
  - Help shape future grant requests
- Do additional analysis to determine:
  - Combine with data from the other citizen science projects
  - Add weather and other factors as overlays to gain more insight.
- Submit an article to ABJ and/or Bee Culture describing our findings
- Run this survey in 2021

NHBA Board Approved: 6/11/20

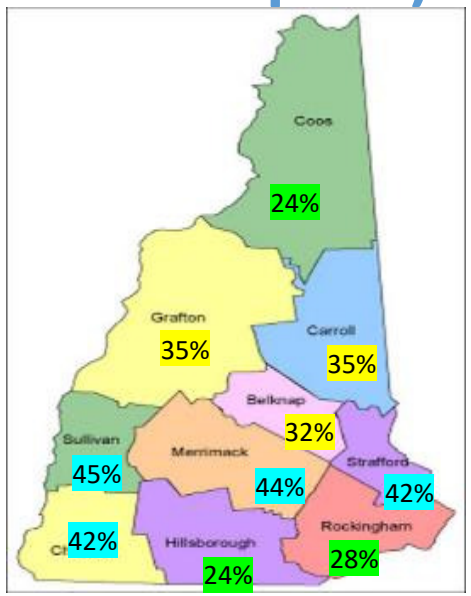
2019-20 NH Winter Hive Survival (Oct 1→Apr 1)



2019-20: 169 towns/427 apiaries

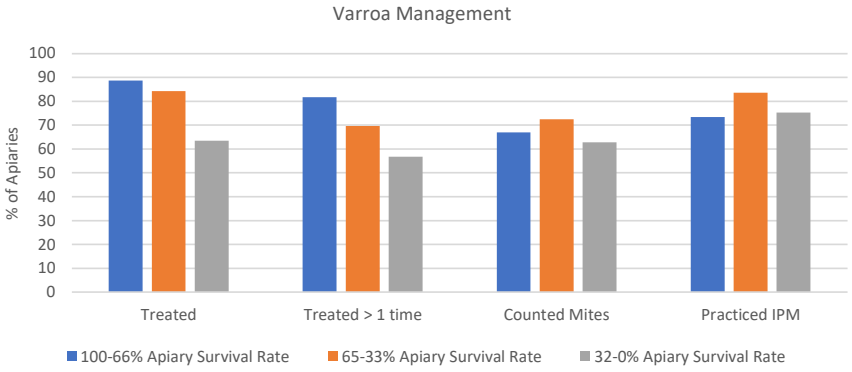


Trend is in the right direction!
Now we need to understand why 2019-20 had such a drop

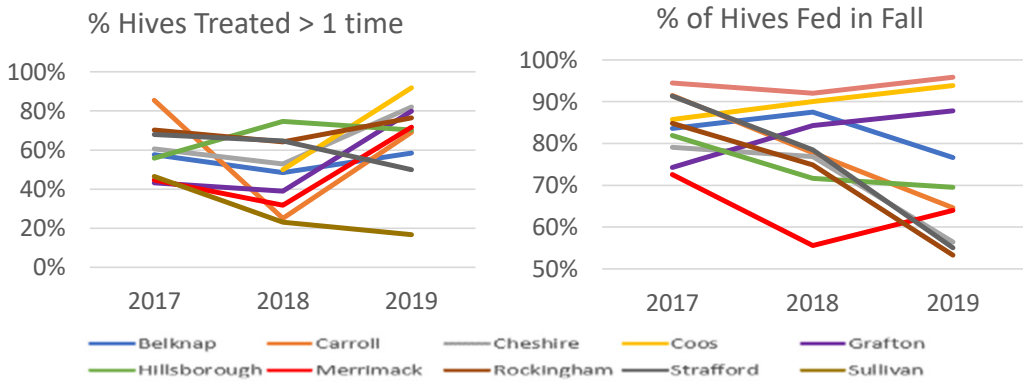


2019-20 Loss by County

Survival Rate based on Management Practices



By County Analysis



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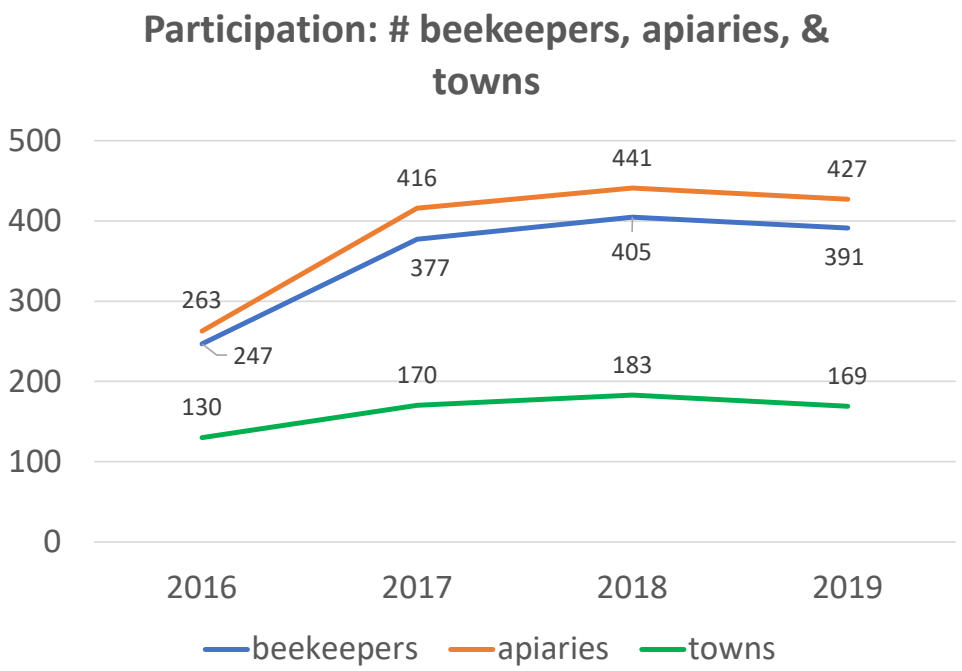
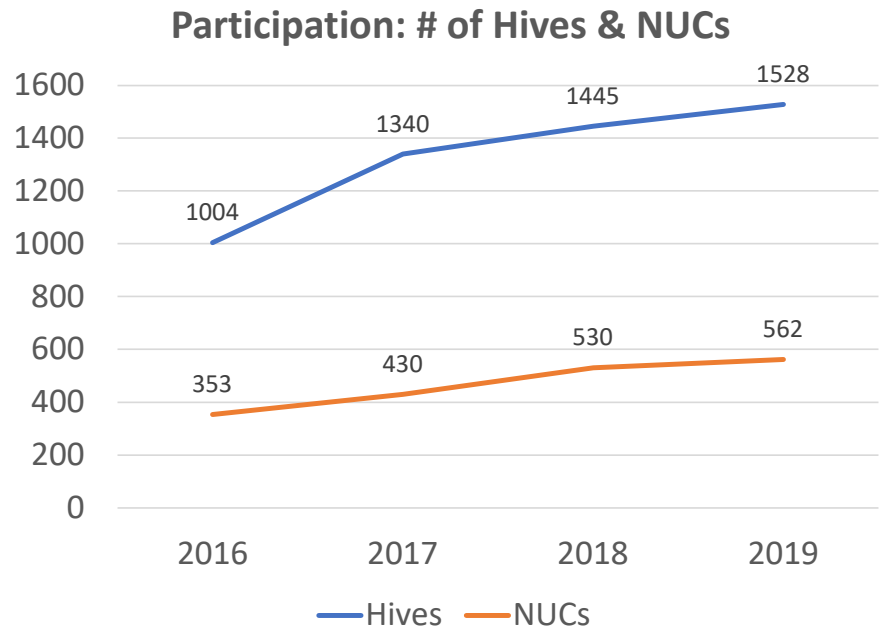
Participation & Demographics

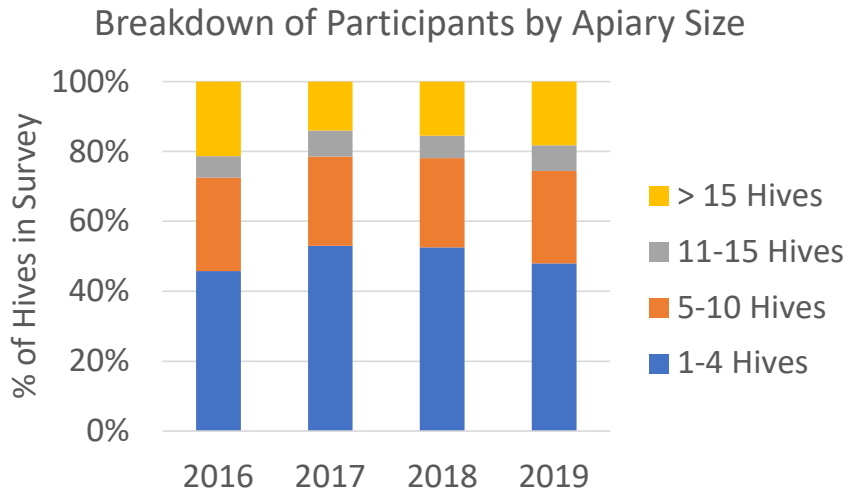
Survey Participation Over the Years





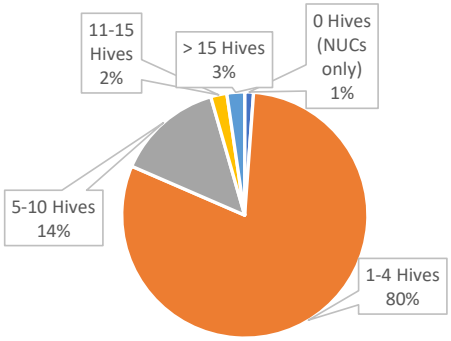
2019-2020 Survey : Excellent Response!
Out of state Participants: MA: 3 apiaries (12 Hives), VT : 6 apiaries (12 Hives, 6 NUCs)

Size of Apiaries Participating in Survey

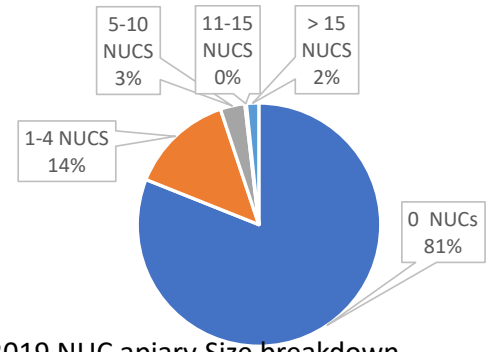


Apiary representation in Survey by number of hives

	2016	2017	2018	2019
1-4 Hives	46%	53%	53%	48%
5-10 Hives	27%	26%	26%	26%
11-15 Hives	6%	7%	6%	7%
> 15 Hives	21%	14%	16%	18%



2019 Hives - Apiary Size Greakdown



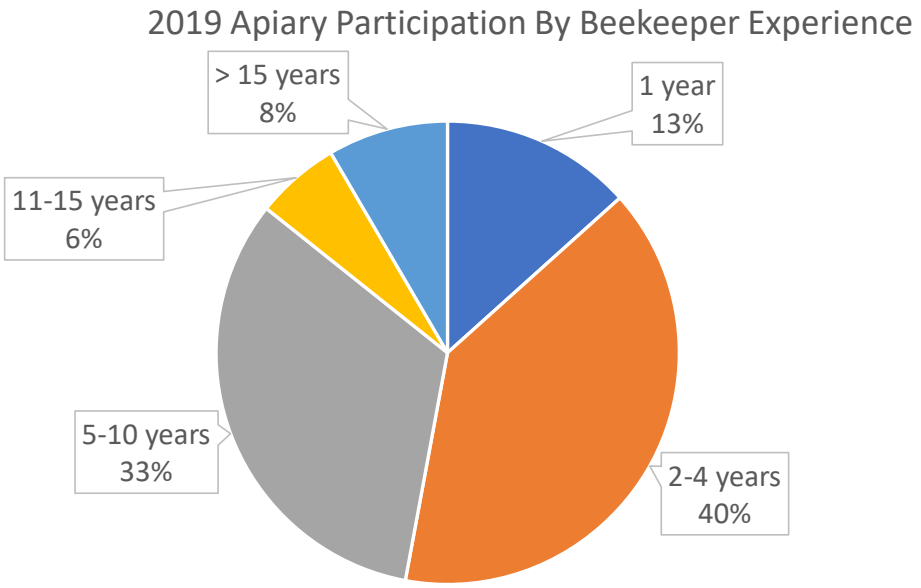
2019 NUC apiary Size breakdown

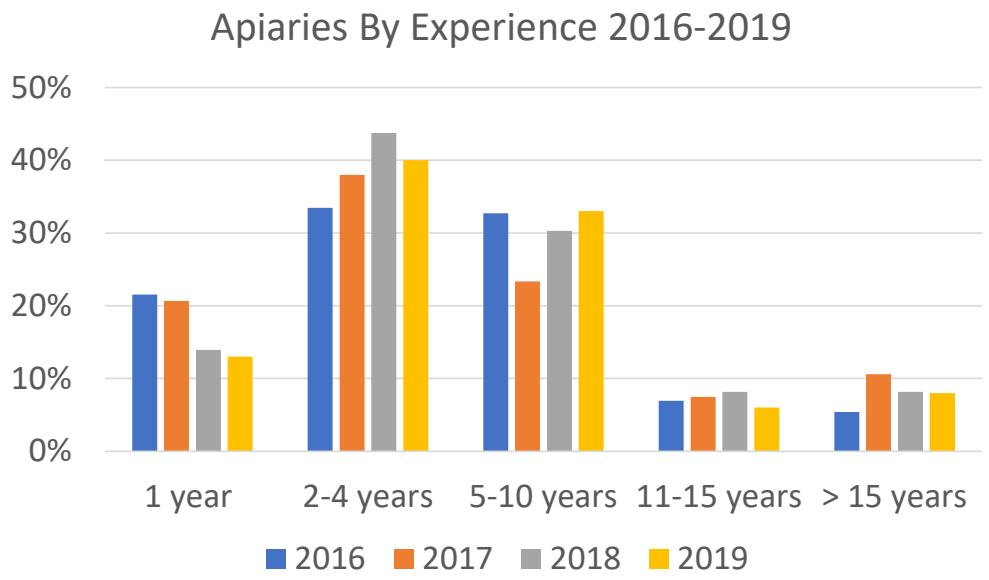
2019-20 : average hives per apiary: 3.6

Each year approximately :

- 50% of the hives in the survey are in apiaries with 1-4 hives
- 25% are in apiaries with 5-10 hives
- 6-7% are in apiaries with 11-15 hives
- 16% are in apiaries with > 15 hives

Experience of Beekeepers Participating in Survey





Participating apiaries in 2019
- ~13% managed by first year beekeepers
- ~73% managed by beekeepers with 2-10 years experience
- ~14% are managed by beekeepers with > 11 years experience

2019-20 Respondent's Club Affiliations

391 Respondents:

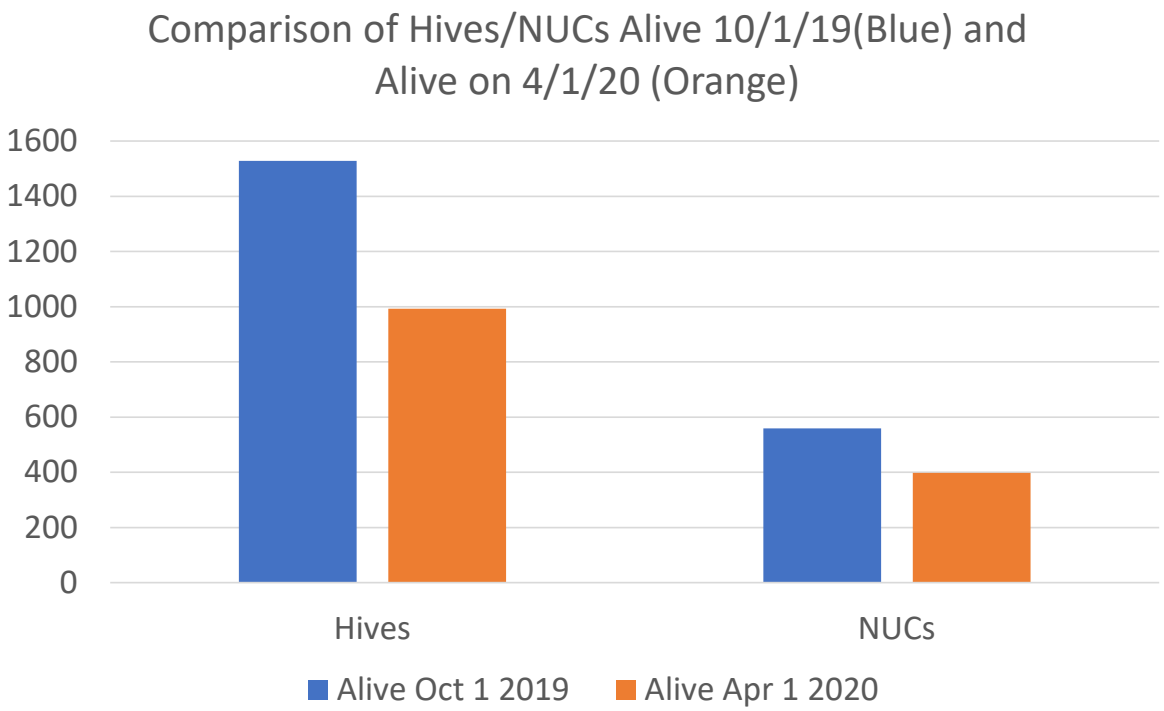
- 78 belong to NO Bee Club (~20%)
- 290 belong to a NH "local" bee club
  - 56 belong to 1 Club + NHBA
  - 7 belong to 1 Club + another state/nat'l club
  - 202 belong to just 1 club & no other bee club affiliations
- 12 belong only to NHBA
- Other clubs mentioned:
  - White Mountain Beekeepers
  - Mt Washington Beekeepers
  - Hillsborough
  - York County
  - Oxford Hills
  - Middlesex

Club	Respondents	Participation Rate
CABA	60	51%
Seacoast	30	43%
Pawtuckaway	40	44%
Monadnock	40	60%
KBA	41	51%
MVBA	57	67%
PBBA	25	20%
Winni	20	-
North Country	10	40%
CT River Valley	10	100%

Club	Respondent
NHBA	84
EAS	15
ABF	3
VT Beekeepers	11
MA Beekeepers	8
ME Beekeepers	7

Winter Hive Loss

2019-20 Hive and NUC Winter Loss



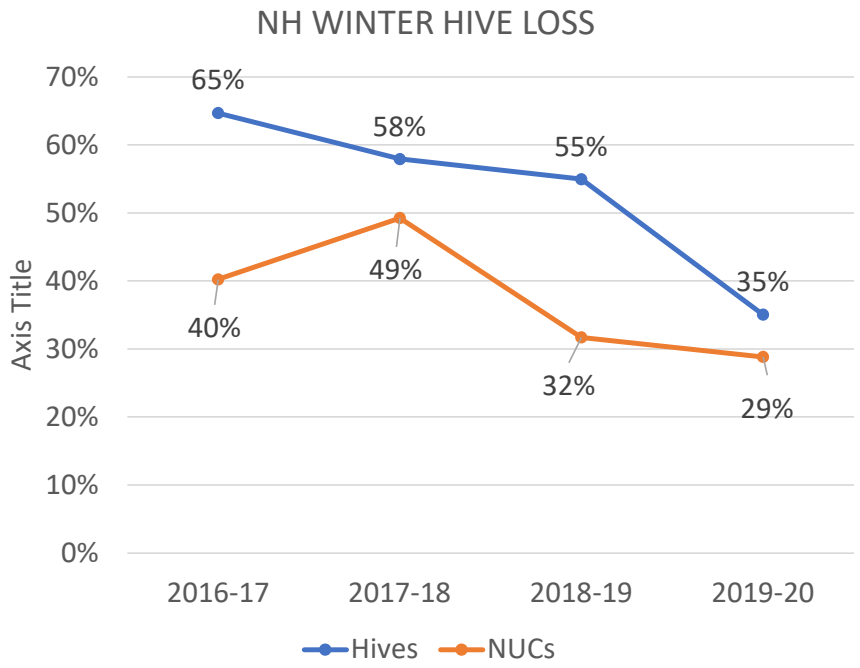
	# Hives	#NUCS
Alive Oct 1 2019	1528	559
Alive Apr 1 2020	993	398

2019-20 Winter Loss:
35% Hive & 29% NUC Loss

Of the hives lost:
- 262 were overwintered
- 327 were packages

*note these numbers don't add up to match the # of hives lost from above. Most likely there was a data entry error in some cases.

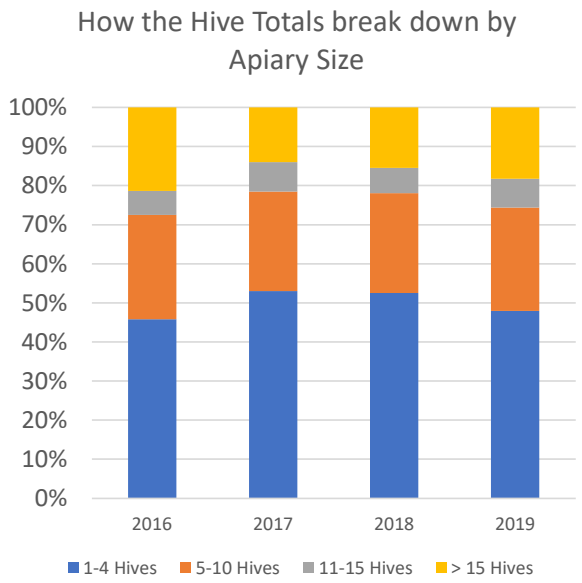
2019-20 Hive and NUC Winter Loss



	# Hives alive on 10/1	# NUCS alive on 10/1
2016	1007	353
2017	1340	323
2018	1445	530
2019	1528	559

The trend is going in the right direction!
Why did we get such a big drop in loss over the winter?

2019-20 Hive and NUC Winter Loss By Apiary Size



Hive Total Breakdown by Apiary Size

	2016	2017	2018	2019
1-4 Hives	46%	53%	53%	48%
5-10 Hives	27%	26%	26%	26%
11-15 Hives	6%	7%	6%	7%
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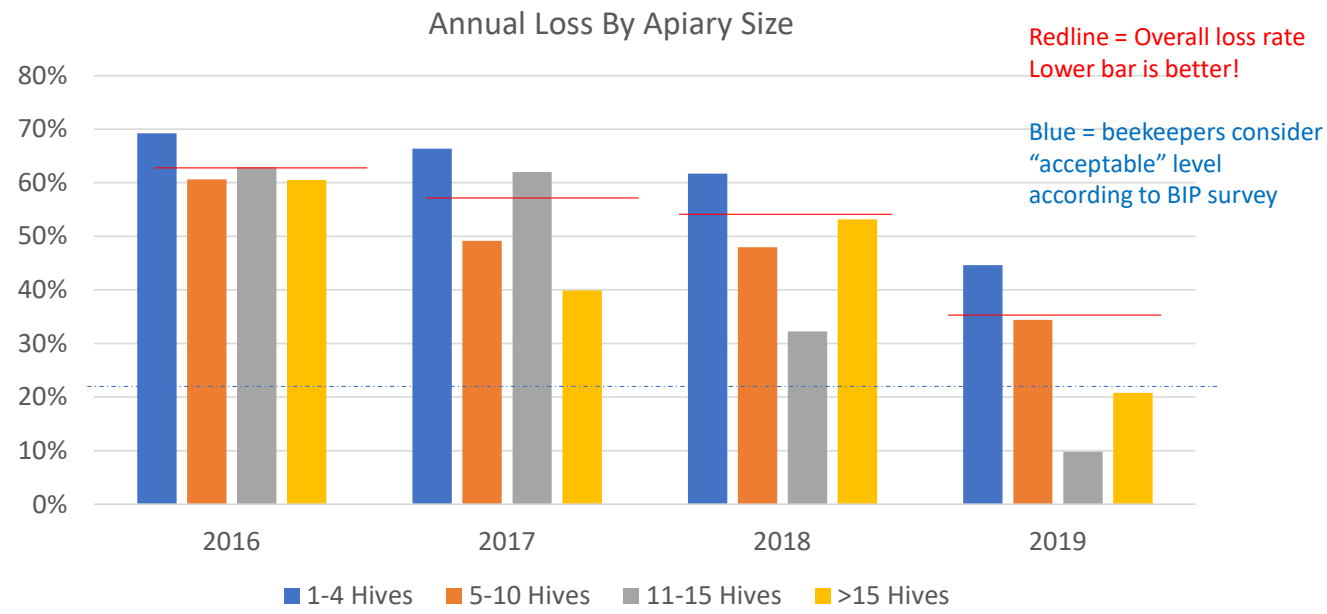


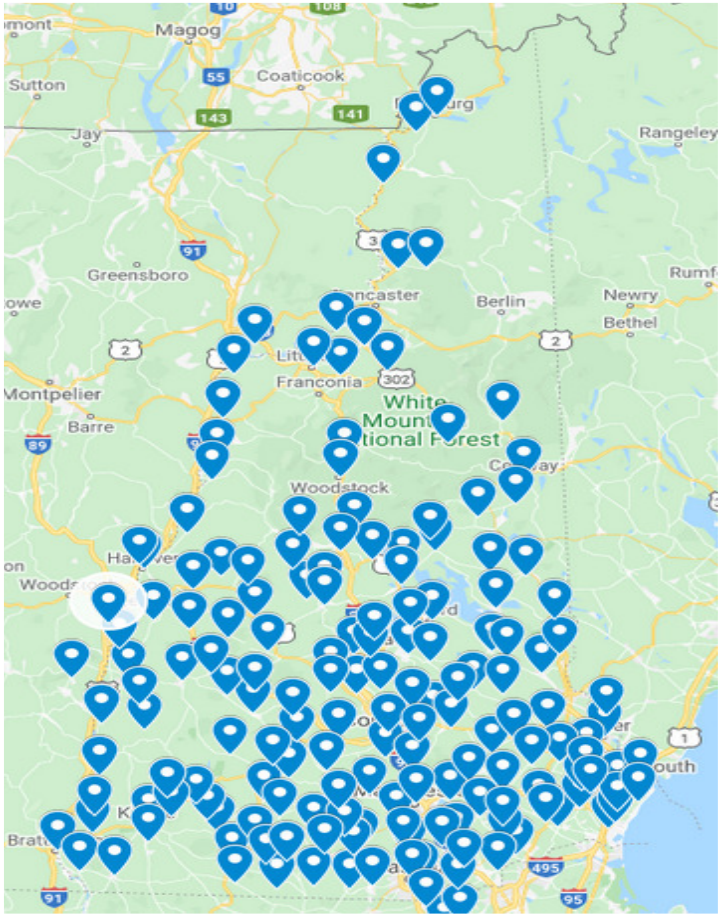
Redline = Overall loss rate
Lower bar is better!

Blue = beekeepers consider "acceptable" level according to BIP survey

Overall loss results are slanted toward smaller apiaries (1-10 hives) because they represent ~75% of the total hives.

However, in 2016-18, you can see that the loss rate was representative of at least 1 category of larger apiaries

2019-20 Reported Hive and NUC Loss by County

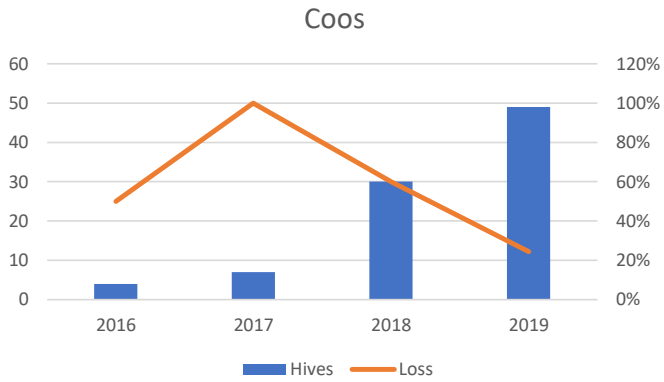


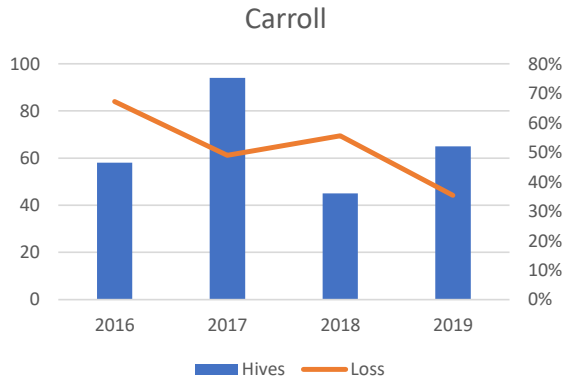
Each pin represents
a town with at least 1 hive

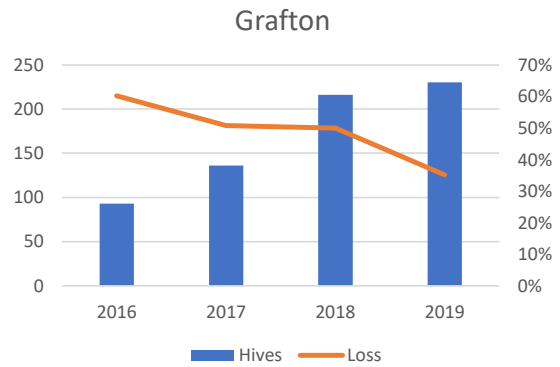
	# Hives Reported	Hive Loss	# NUCs reported	NUC Loss
Sullivan	121	45%	130	26%
Merrimack	225	44%	129	38%
Strafford	69	42%	15	40%
Cheshire	172	42%	39	41%
Carroll	65	35%	24	42%
Grafton	230	35%	140	16%
Belknap	60	32%	7	29%
Rockingham	184	28%	20	30%
Coos	49	24%	5	80%
Hillsborough	328	24%	44	18%

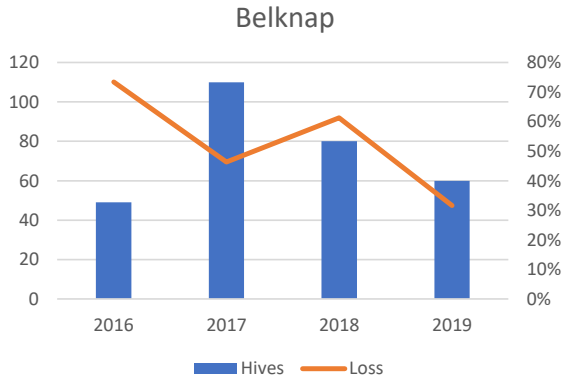
*MA: 13 hives (62% loss); VT: 10 hives/6 NUCs (50% loss each)

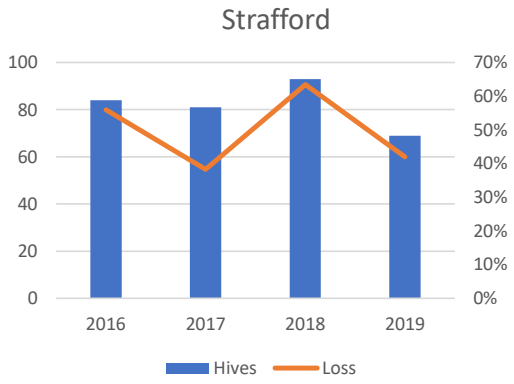
Hives Reported & Loss Rate Year to Year (by County)







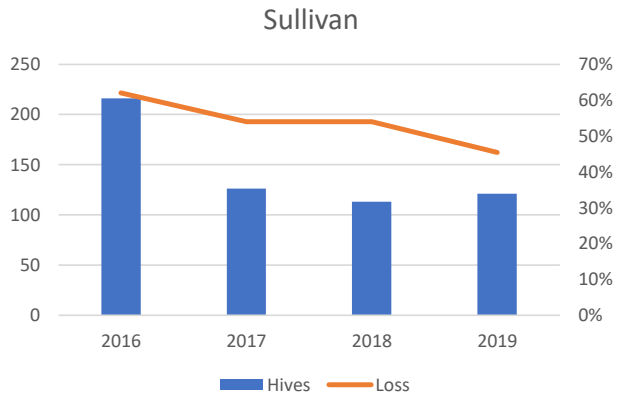


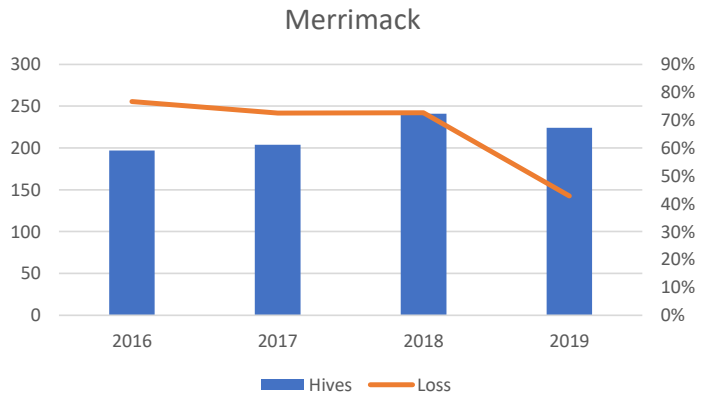


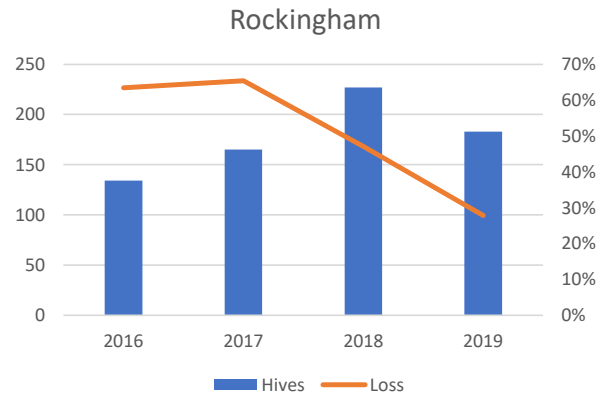
# of hives :

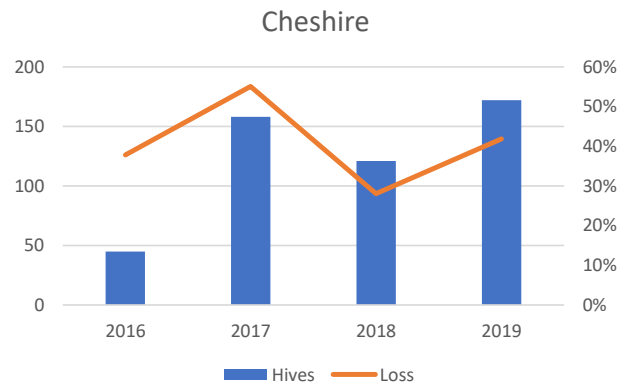
Hive loss :

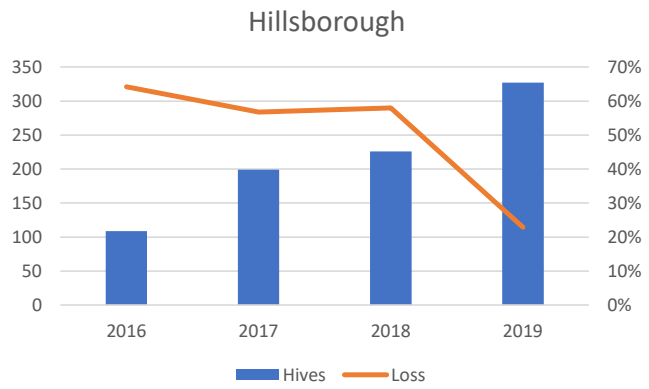
Hives Reported & Loss Rate Year to Year (by County)







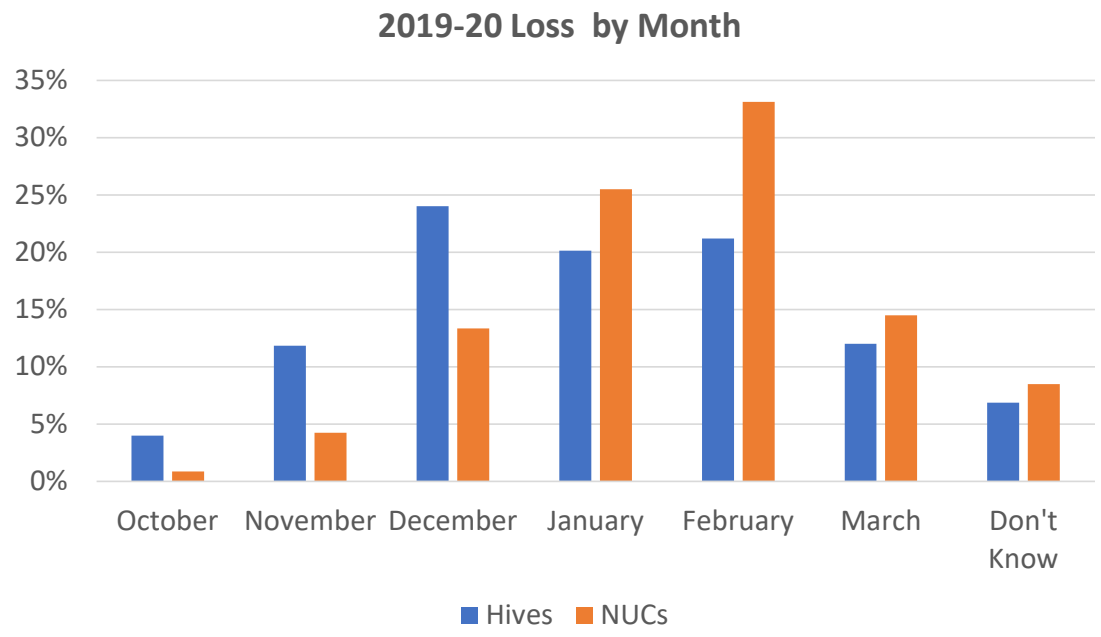




# of hives :

Hive loss :

Hive and NUC Loss By Month

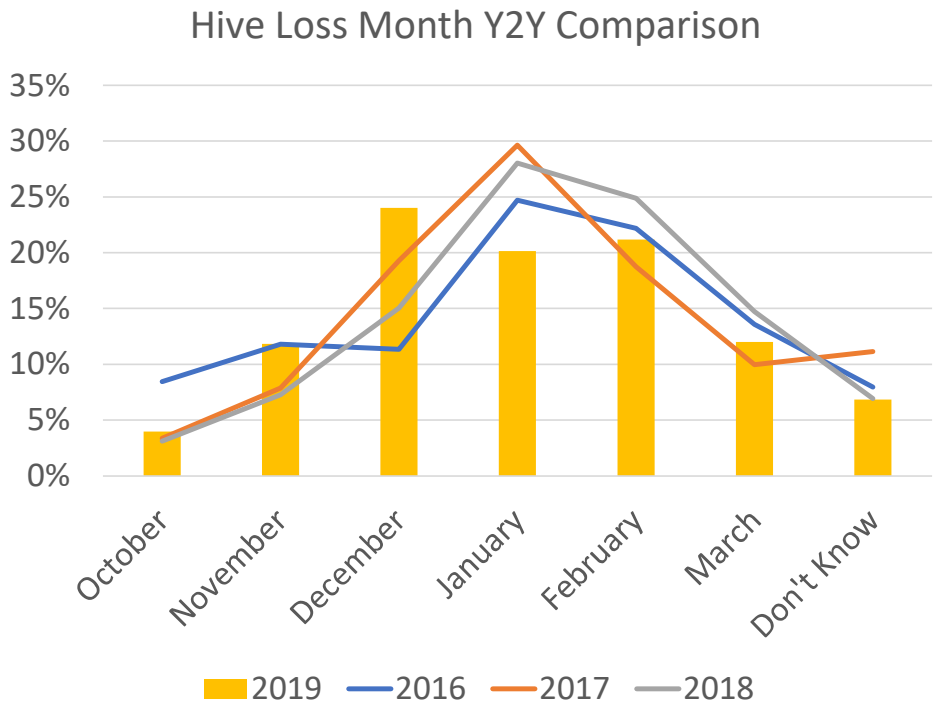


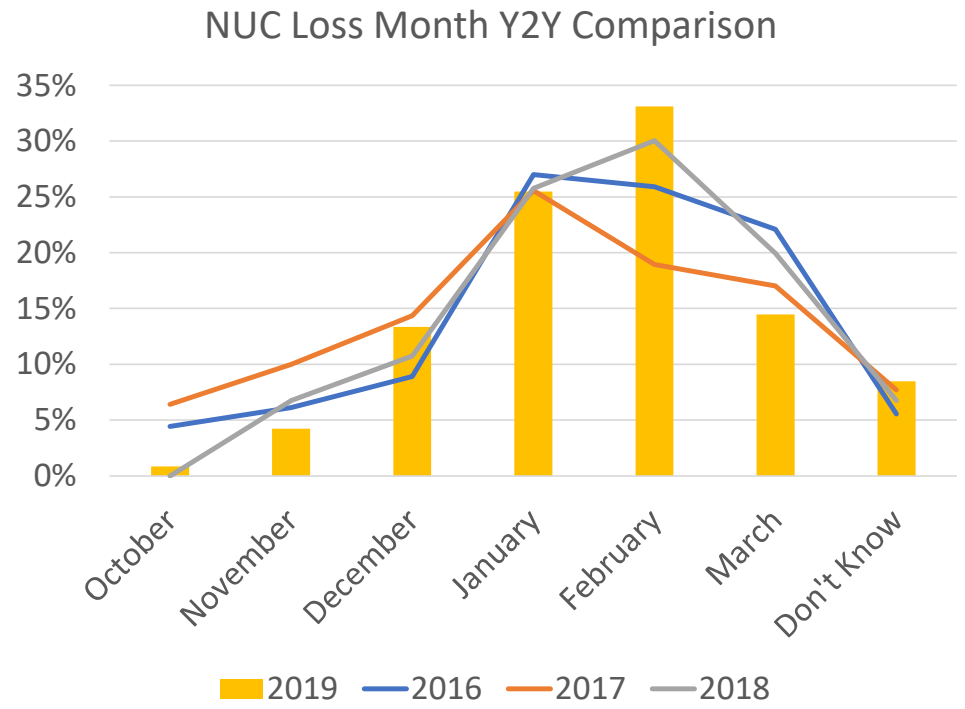
	# Hives Lost	# NUCs Lost
October	21	1
November	62	5
December	127	16
January	106	30
February	112	39
March	63	17
April	36	10
Don't Know	21	1

*note –When multiple months were listed for the loss in the apiary, the number of hives/NUCs lost was divided by the number of months listed & then applied equally to each month.

- December was the biggest loss month for Hives (typically Jan/Feb)
- Highest percentage of NUCs were lost in Feb (consistent with previous years)

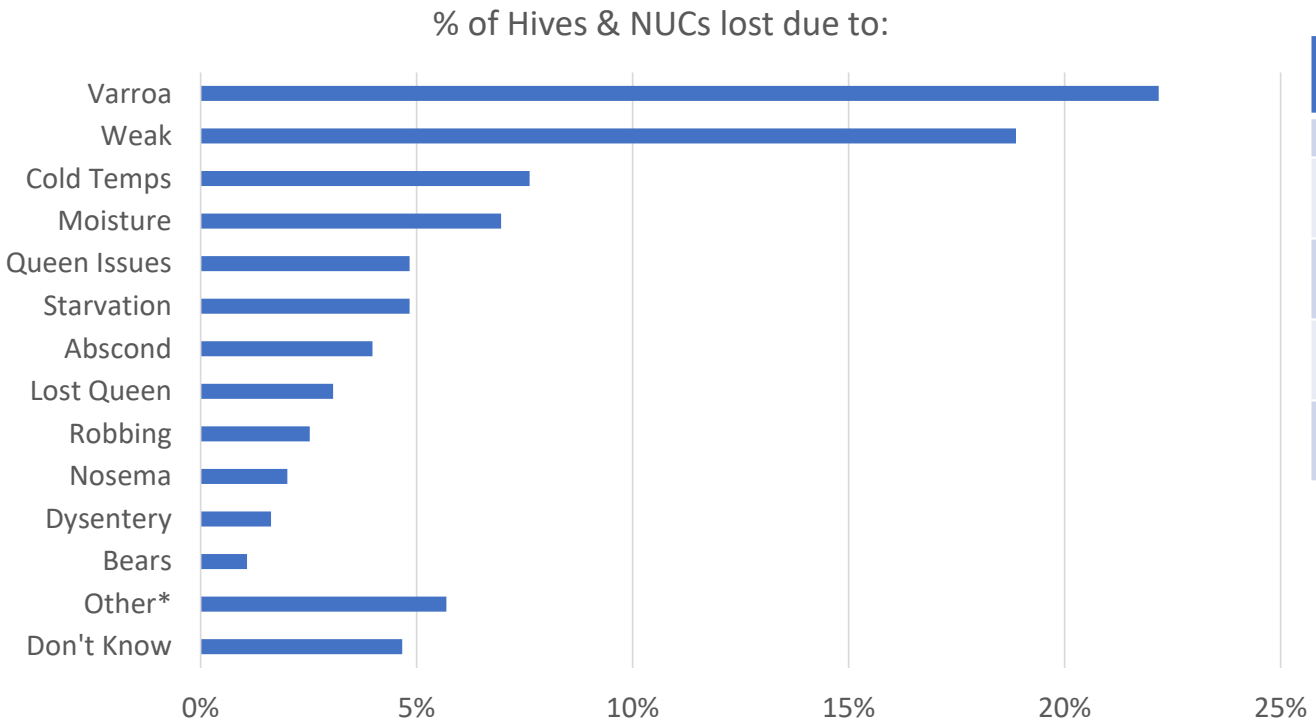
Month of Loss – Year over Year





- 2019 had more losses in Dec than other months
- Feb NUC Losses were higher in 2019 than all previous years

Reported Cause of Loss



Reported Cause	2016	2017	2018	2019
#1	Varroa	Varroa	Varroa	Varroa
#2	Don't Know	Don't Know	Starvation	Weak colony
#3	Starvation	Starvation	Moisture	Cold Temps
#4	Other	Moisture	Don't Know	Queen Issues*
#5	Weak colony	Cold Temps	Cold Temps	Moisture

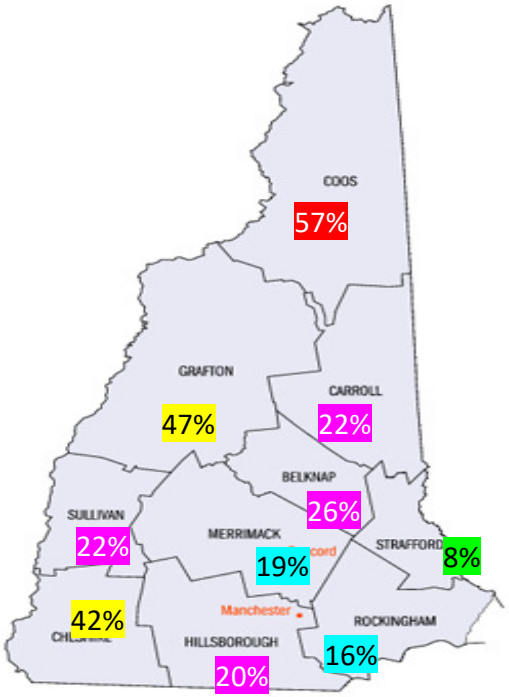
**Several additional comments that hives Survived but were queenless

**note –When multiple causes were listed for the loss in the apiary, the number of hives+NUCs lost was divided by the number of causes listed & then applied equally to each cause

"Other": poison, wax moths, cover blew off, no pollen, CCD, hives stolen, tree fell on hives, syrup jar dumped on bees several notes about yellow jackets killing hive

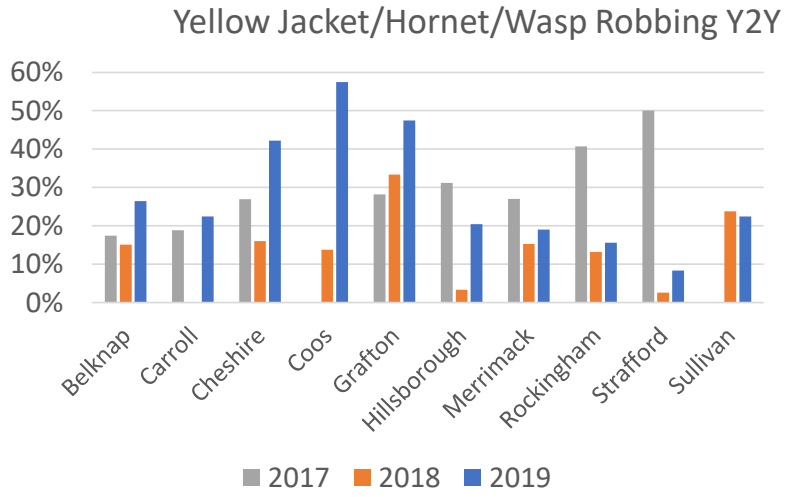
Yellow Jacket/Hornet/Wasp Robbing Issues

	% of hives that had yellow jacket robbing	# hives
Coos	57%	47
Grafton	47%	213
Cheshire	42%	166
MA	31%	13
VT	30%	10
Belknap	26%	53
Carroll	22%	58
Sullivan	22%	116
Hillsborough	20%	304
Merrimack	19%	142
Rockingham	16%	154
Strafford	8%	60
ME	0%	0



Lots of reports of Yellow Jacket /Hornet/Wasp Robbing across the state.

reports cover 1336 hives



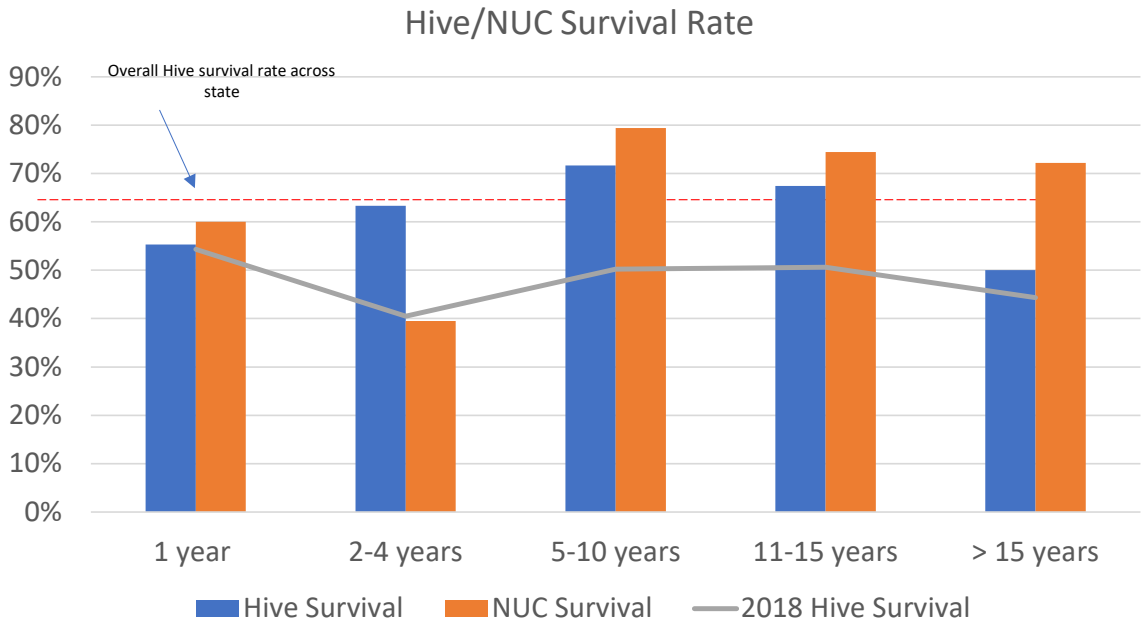
Interesting that there was more robbing even though it was a great year for pollen & nectar

*Is this an indication that there was a higher population of these insects due to the availability of food?
UNH extension reports a much higher call volume about these insects this year

Next sets of graphs are SURVIVAL RATES

(Red dash line in graph indicates hive survival rate for state)

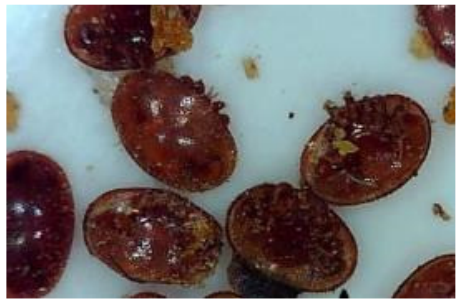
Do the Years of Experience Affect Survival Rate?



	# Hives On 10/1	# NUCs On 10/1
1 Year	94	15
2-4 Years	477	76
5-10 years	636	277
11-15 years	129	47
> 15 years	192	144

5 years experience seems to improve survival rate (consistent with previous years)
First year beekeeper survival was the lowest rate. In previous years first year survival = ~overall survival

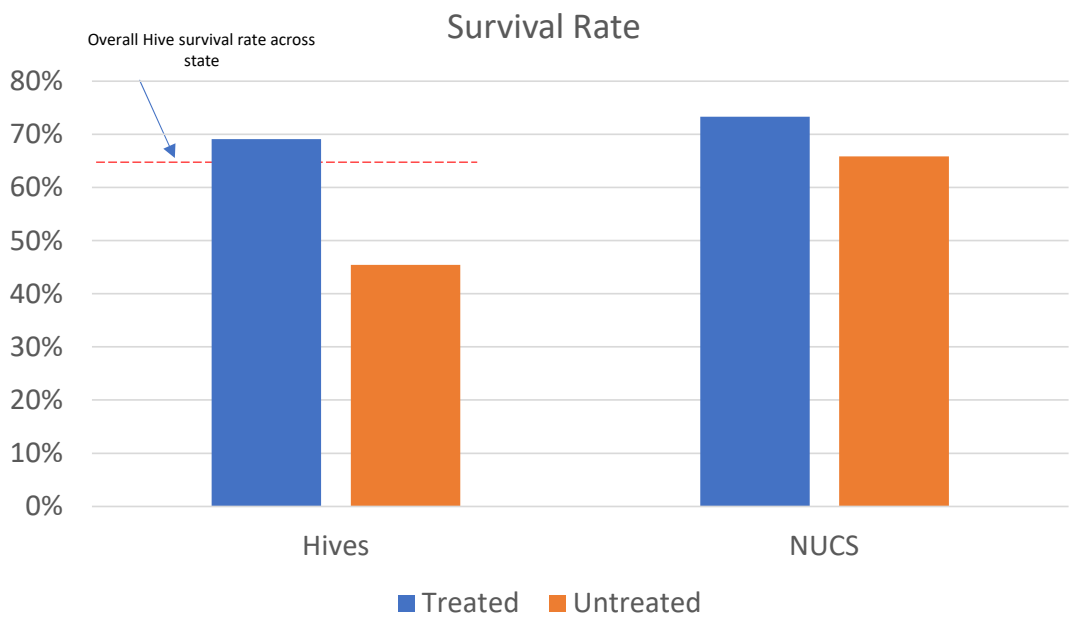
Varroa Management



2019 Highlights:

- Hive Survival:
  - Survival of hives treated with Commercial treatment was 25% better than those untreated
  - Survival of NUCs treated with a commercial treatment was approximately the same as those untreated
  - Hives treated > 2 times had an 80% survival rate
- ¾ of the apiaries representing ~80% of the total hives used a commercial varroa treatment at least 1 time
- ~62% of the hives were treated 2 or more times (up from 48% & 42% the previous 2 years)
- Treatment types:
  - Oxalic Acid Vapor & Formic Acid (MAQS/Formic Pro) continue to be the most popular treatment types
  - Continues to be unclear that any particular type of treatment is better than others – more likely the timing of the treatments
  - Other reported treatments: mineral oil fogging, thymol
- Mite Counting:
  - Number of apiaries that counted at least one time increased from 61% in 2018→66% in 2019
  - Counting 2 or 3 times a season increased significantly from 11% in 2018→30% in 2019

How does treating with commercial varroa treatments affect survival rate?

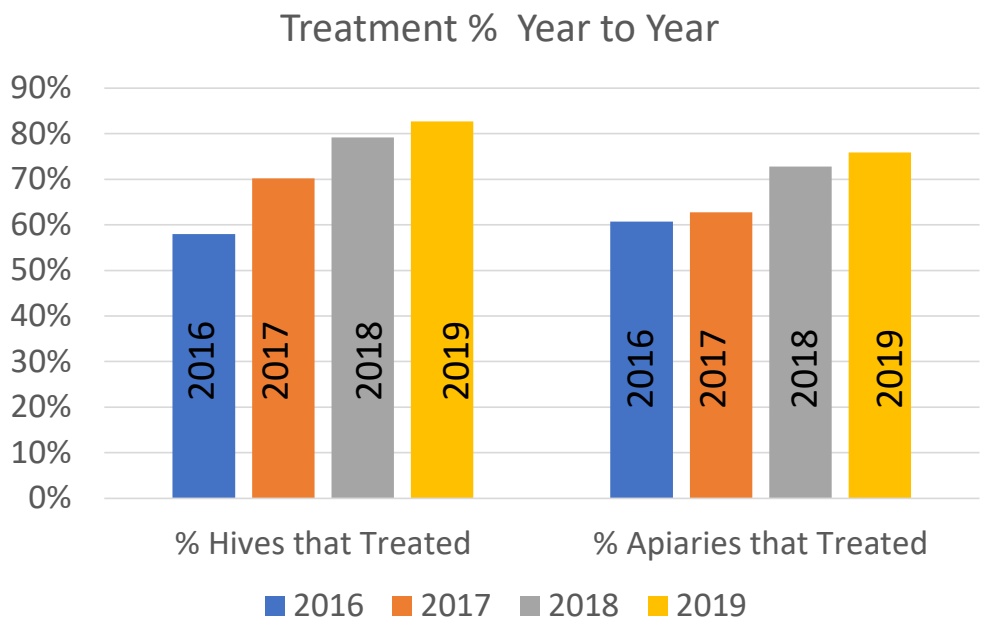


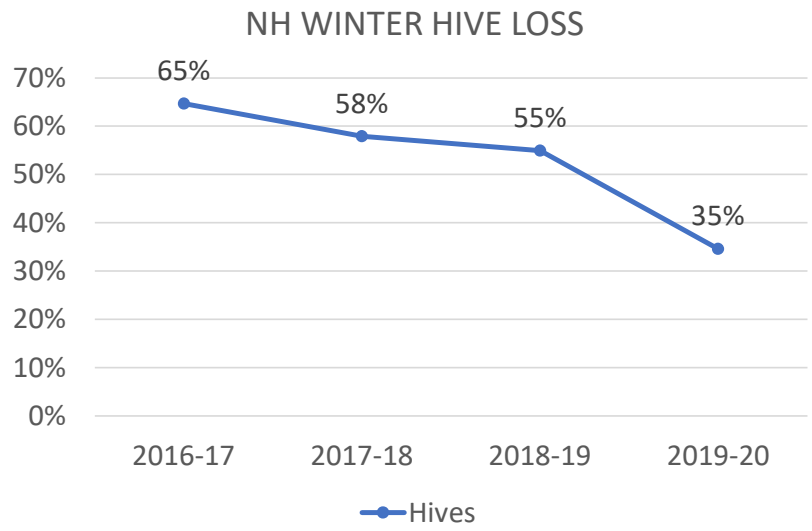
	# Hives on 10/1	# NUCs On 10/1
Treated	1264	401
Untreated	264	158

- Hives treated with commercial treatments had a better survival rate (69% vs 45%)
- Treated NUCs did slightly better than untreated ones in 2019

*"commercial varroa treatment" refers to registered products

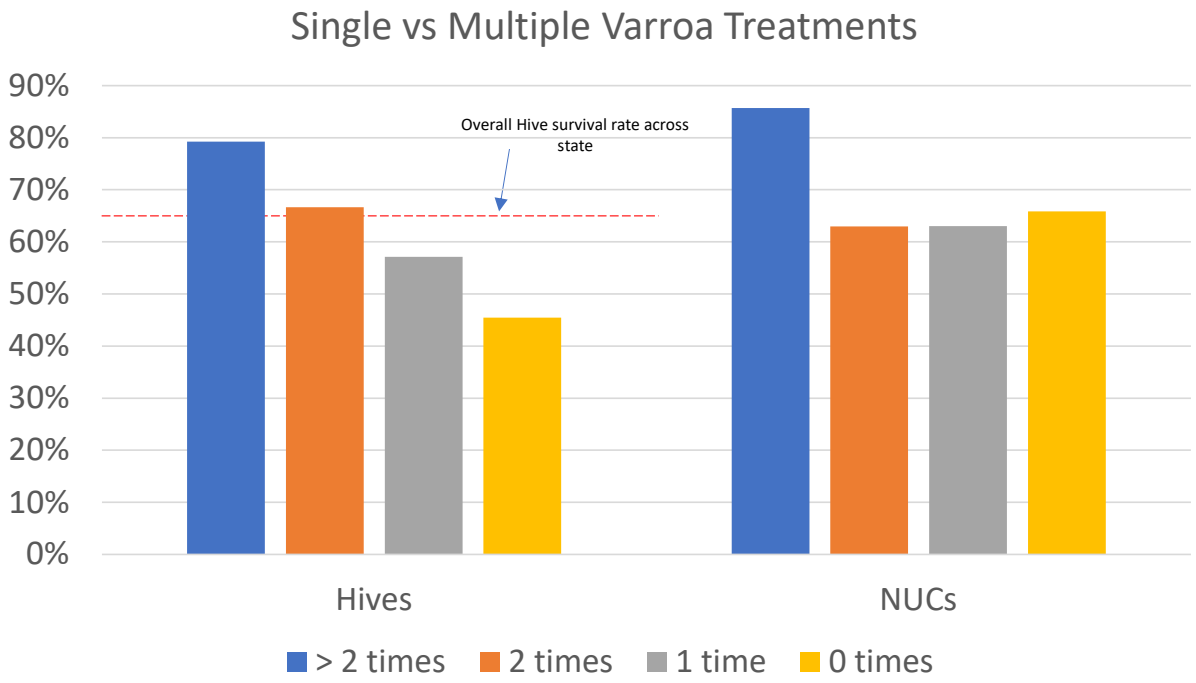
Has the percentage of hives/apiaries using treatments changed?





- Percentage of hives that are treated with and apiaries that use commercial treatment has increased annually

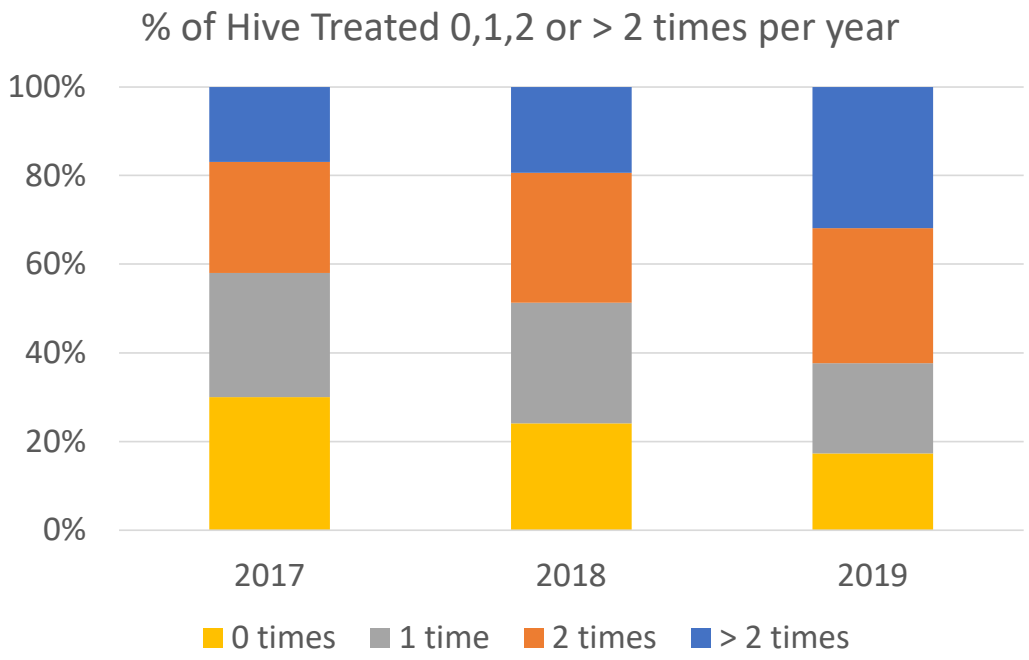
How does the number of times commercial treatments are used affect survival?



	# Hives On 10/1	# NUCs On 10/1
> 2 times	486	182
2 times	465	54
1 time	310	165
No treatments	264	158

Treating Hives more than 1 time through the season increased survival rates . (consistent with previous years)

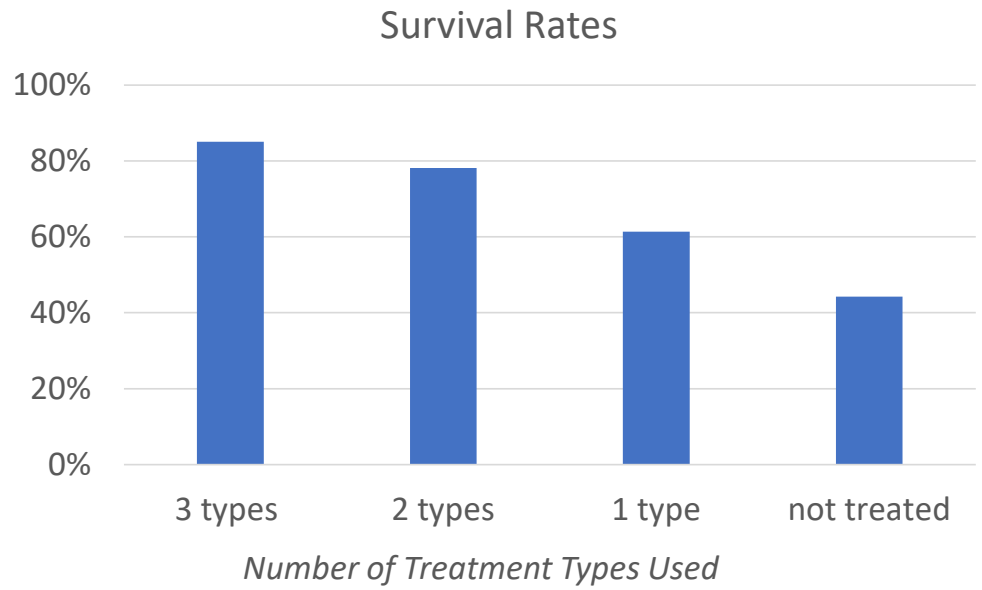
How Does Number of Times Hives are Treated Change Year-to-Year?



	2017	2018	2019
> 2 times	17%	19%	32%
2 times	25%	29%	30%
1 time	28%	27%	20%
0 times	30%	24%	17%

In 2019, ~62% of the hives were treated for varroa 2 times or more during the season. This is up from 48% in 2018 and 42% in 2019

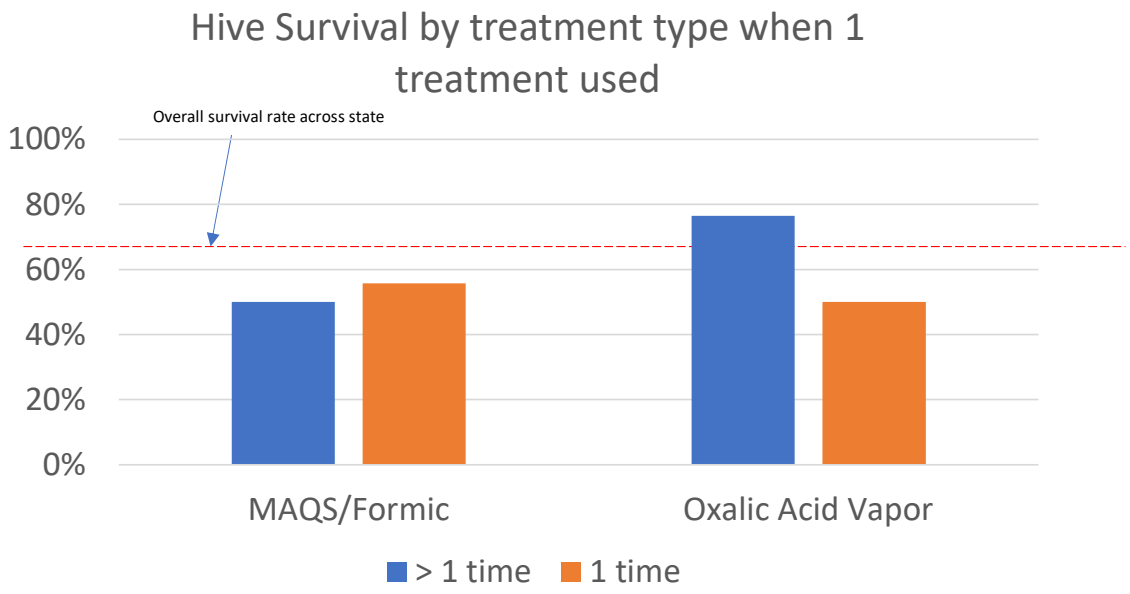
Does the Number of Different Types of Treatments Affect Survival?



	# Hives
3 types	47
2 types	518
1 type	712
not treated	251
Total	1528

Unclear if the number of different treatment types affects survival – it is more likely that the number and timing of treatments is more important

Does one commercial treatment help survival better than others?

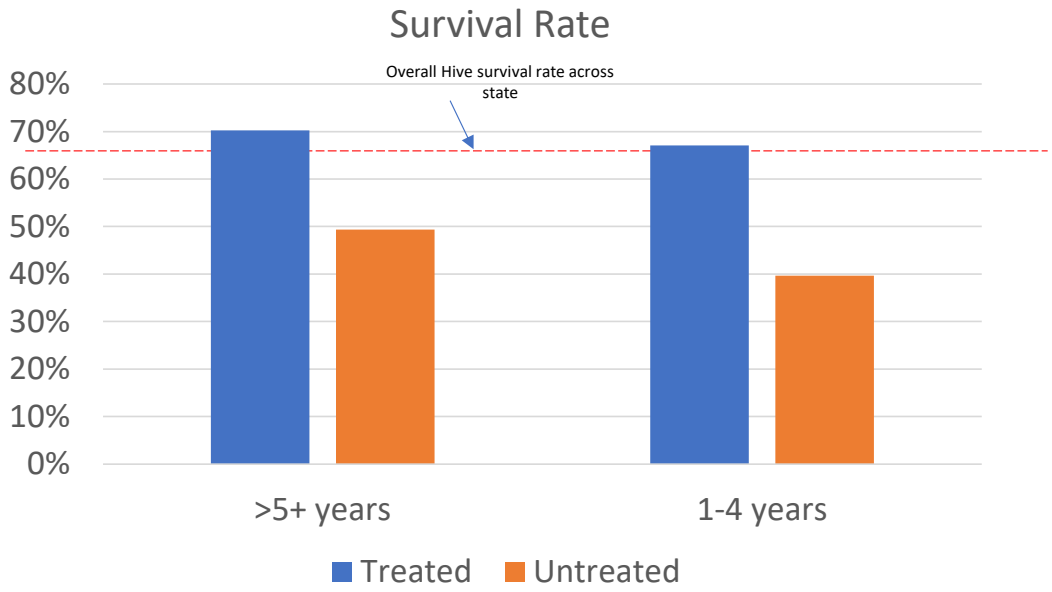


Unclear that a particular product improves survival rate – it is more likely the timing of the treatments.

	# of hives on 10/1 that had > 1 treatment of a single commercial product	# of hives on 10/1 that had 1 treatment of a single commercial product
Apiguard	35	35
ApiLifeVar	3	11
Apistan	4	2
Apivar	14	18
HopGuard	1	3
MAQS/Formic Pro	144	156
Other	10	4
Oxalic Acid Vapor	200	36
Oxalic Acid Dribble	2	1
Unknown	0	5
Total	**413**	**271**

Graph represents apiaries that were treated with only 1 type of commercial product during the year.
We did not include those apiaries that used multiple treatments because we don't know the split of treatments between surviving hives when multiple products were used
- 684 hives were treated with only 1 commercial product

Is survival rate for > 5 years experience because a higher percentage treat?



	# of hives for beekeepers with > 5 years experience	# of hives for beekeepers with 1-4 years experience
Treated	799	158
Didn't Treat	465	106

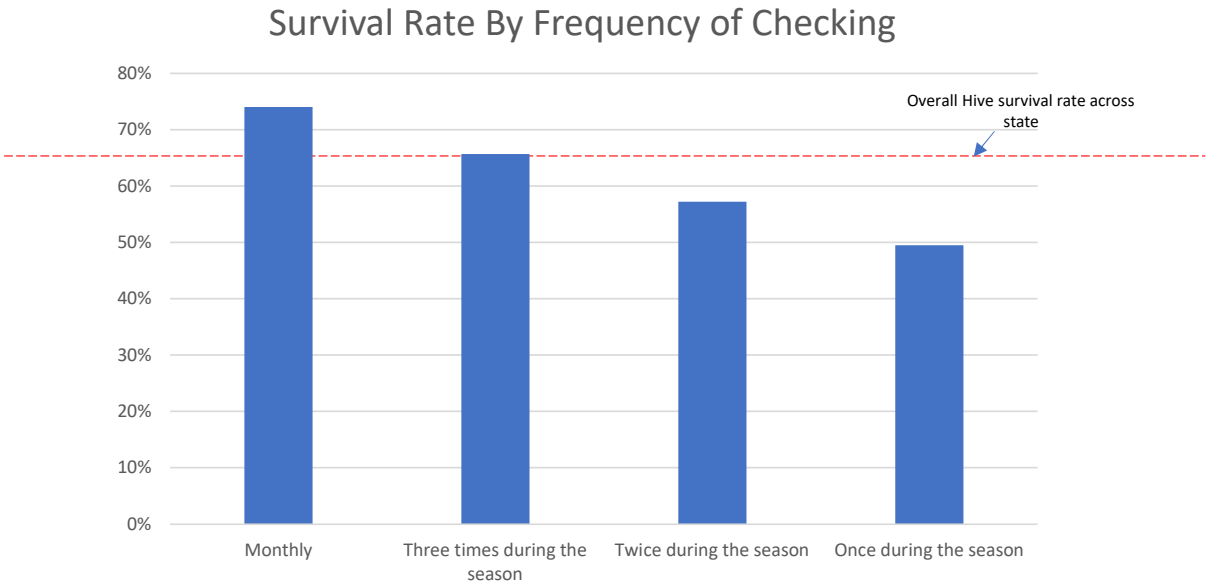
% of hives Treated with At least 1 commercial product:

	5+ years experience	1-4 years experience
2019	83%	81%
2018	79%	77%
2017	75%	63%

For 2 years in a row –
no significant difference in % of beekeepers with > 5 years experience that treated for mites

Could the difference now be related to how often or when hives are treated?

Survival rate based on the frequency of mite testing



Graph is for methods used on > 50 hives

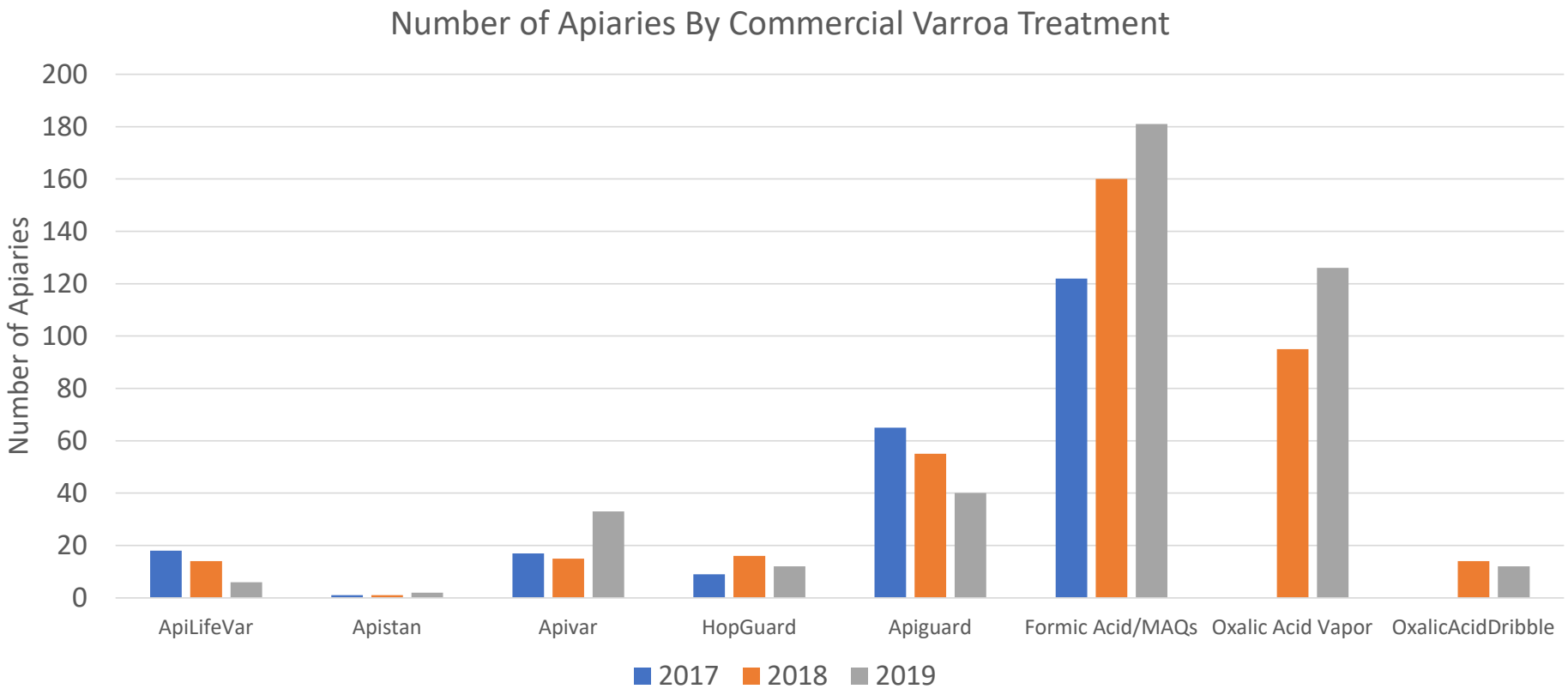
% of apiaries that counted at the given frequency

Mite Count Frequency	2017	2018	2019
Monthly	21%	24%	21%
Twice during the season	6%	9%	18%
Three times during the season	2%	2%	12%
Once during the season	21%	18%	8%
drone	5%	1%	3%
Twice a month	5%	6%	2%
Weekly	1%	2%	1%
No Testing	39%	39%	34%

~66% of 354 apiaries reporting counted mites at least 1 time (61% in 2018)

More frequent testing yielded better survival rates
Apiaries counted more frequently in 2019
Counting 2 or 3 times in a season increased from 11% in 2018→ 30% in 2019

What Types of Treatments are Used in our Apiaries?

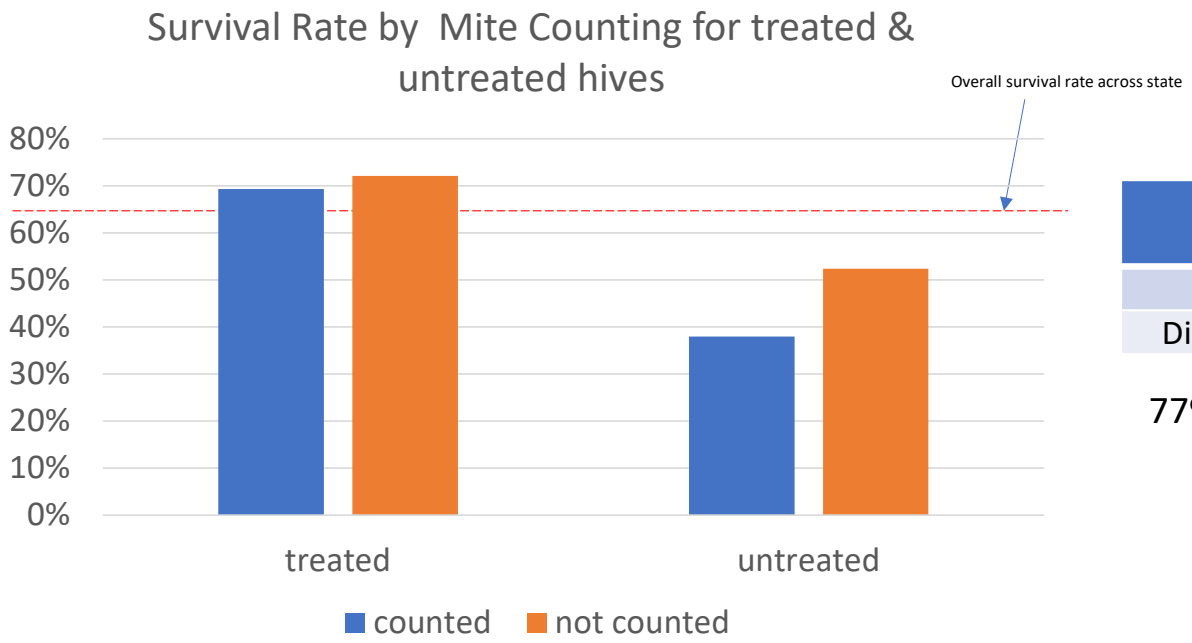


Does the brand of commercial treatment affect survival rate?

- To answer this question -
  - **Only used data from apiaries that reported only 1 brand of treatment**
  - For apiaries that used multiple brands, our data was not fine grain enough to understand which hives survived and which didn't

- 684 hives

Was hive survival rate better because mites were counted and hives were treated with commercial treatments?

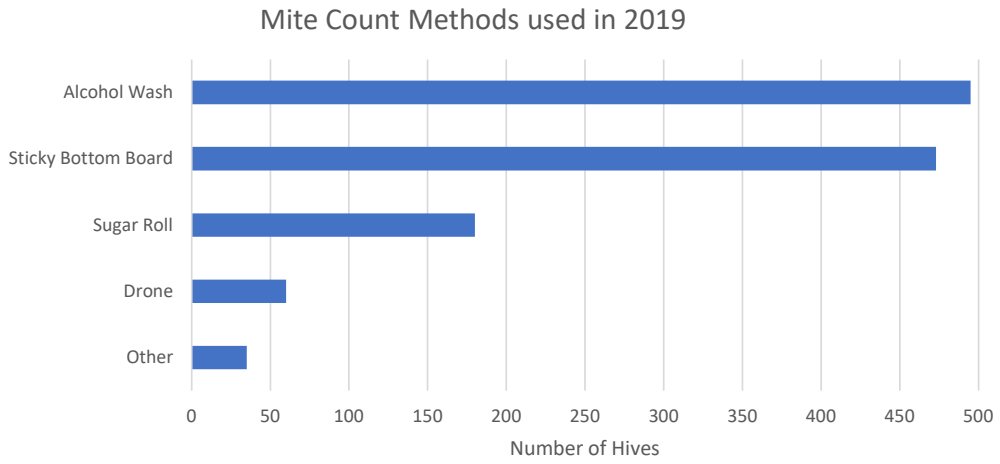


	# Hives Treated by 10/1	# Untreated Hives by 10/1
Counted	834	79
Didn't Count	247	149

77% of treated hives counted for mites at least 1 time

- Survival rate of treated + not counted slightly better than treated + counted (opposite of 2018)
- 77% of treated hives counted for mites at least 1 time (increase of 10% over 2018)

What mite count methods were most common?



	2017	2018	2019
Alcohol Wash	169	255	495
Sticky Bottom Board	428	411	473
Sugar Roll	234	265	180
Drone	N/A	N/A	60
Other	155	72	35

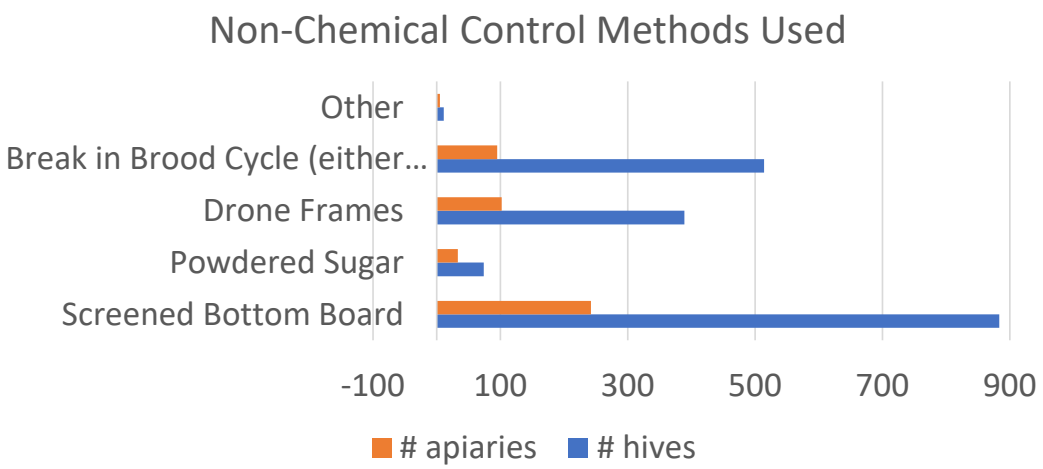
Other methods:

- Bee Scan App, BIP sentinel hives project, visual inspection

2019: # of counting methods used	# apiaries
3 methods	14
2 methods	37
1 method	189
not counted or didn't report	187

Number of hives tested with Alcohol wash increased 94% over 2018
66% of apiaries reported counting mites at least 1 time (2018: 61%)

What Non-Chemical Control Methods were used?

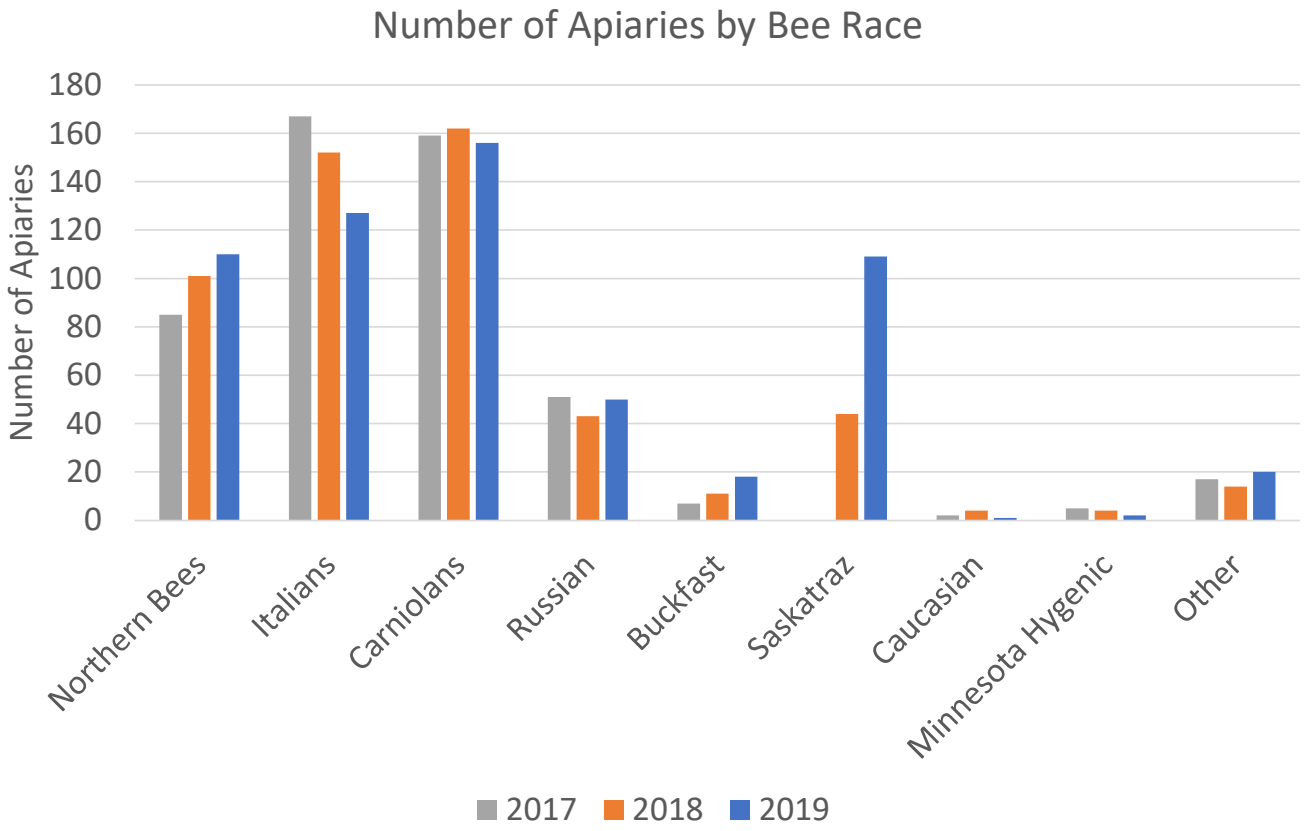


	# Hives	# Apiaries
Screened Bottom Board	883	242
Powdered Sugar	74	33
Drone Frames	389	102
Break in Brood Cycle	514	95
Other	11	5

- **Numbers are similar to 2017 & 2018**
- **Many apiaries use multiple Non-Chemical Control methods**
- "Other" responses:
  - Fogging with mineral oil
  - Sugar water with essential oils
  - Propagation queens back into the apiary via nucleus colonies
  - Rhubarb leaves
- 0 comments that they didn't know what IPM is

Bee Races

What kinds of bees do our apiaries have?



2019: 366 Apiaries

- 211 have 1 race of bees
- 104 have 2 races
- 36 have 3 races
- 9 have 4 races
- 6 has 5 races

*northern is defined as a hive with a northern mated Queen

*2017 Saskatraz was part of “other”

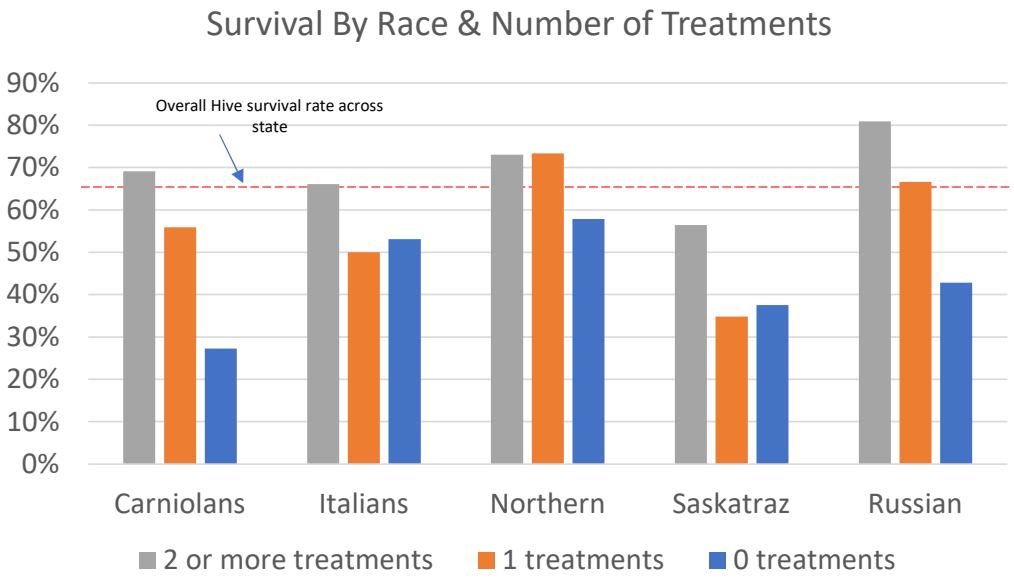
Does the “race” of bees affect survival rate?

- To answer this question -
  - **Only used data from apiaries that reported only 1 race of bees (211 apiaries of 427)**
    - For apiaries with multiple races, our data was not fine grain enough to understand which races survived and which didn’t

- 519 hives

- NUC Sample size is small so only the hive data is presented

How does the race of bees combined with number of mite treatment affect survival?



# of Hives in each treatment category

	"Northern"	Italians	Carni	Russian	Saskatraz	Total Hives
2 or more treatments	78	56	81	42	39	296
1 treatment	15	32	34	3	23	107
0 treatments	19	32	11	7	24	93

% of Hives in each Treatment category

	Northern	Italians	Carni	Russian	Saskatraz	All Hives
2 or more treatments	70%	47%	64%	81%	45%	60%
1 treatments	13%	27%	27%	6%	27%	22%
0 treatments	17%	27%	9%	13%	28%	19%

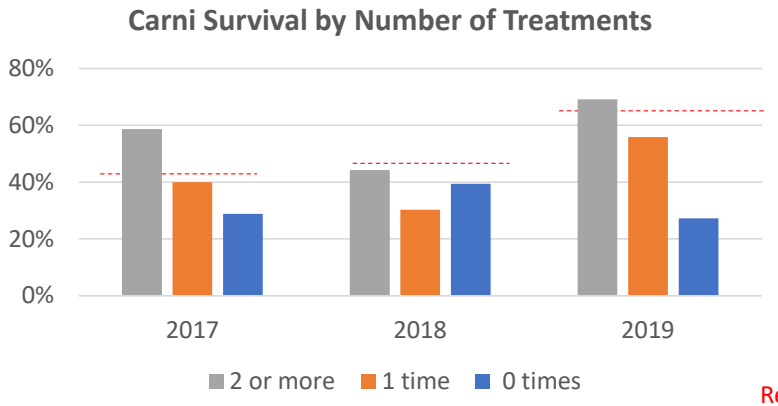
***Small Numbers but some interesting observations**

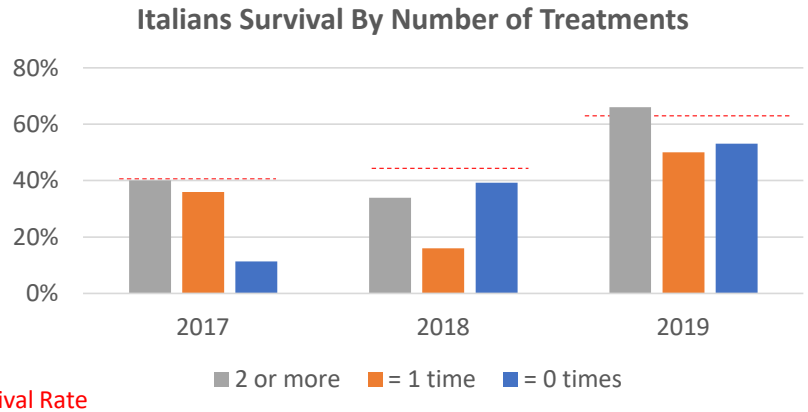
- More than 2 treatments gave higher survival rates for all races ** most hives were treated 2+ times
- Northern and Russian survival with more than 2 treatments is far above the average
- 496 Hives represented; 60% treated 2+ times; 22% treated 1 time; 19% treated 0 times.

*Data from apiaries with only 1 race

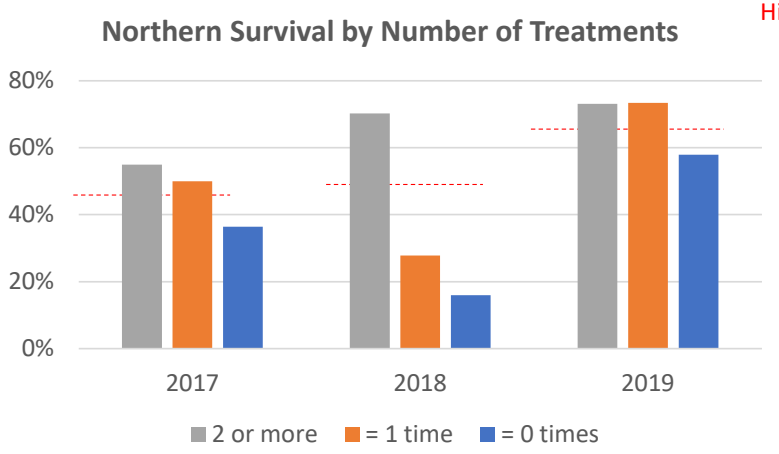
*Northern = queens mated in the "north" (North to be defined by the beekeeper)

How does the race of bees combined with number of mite treatments affect survival? (another view)





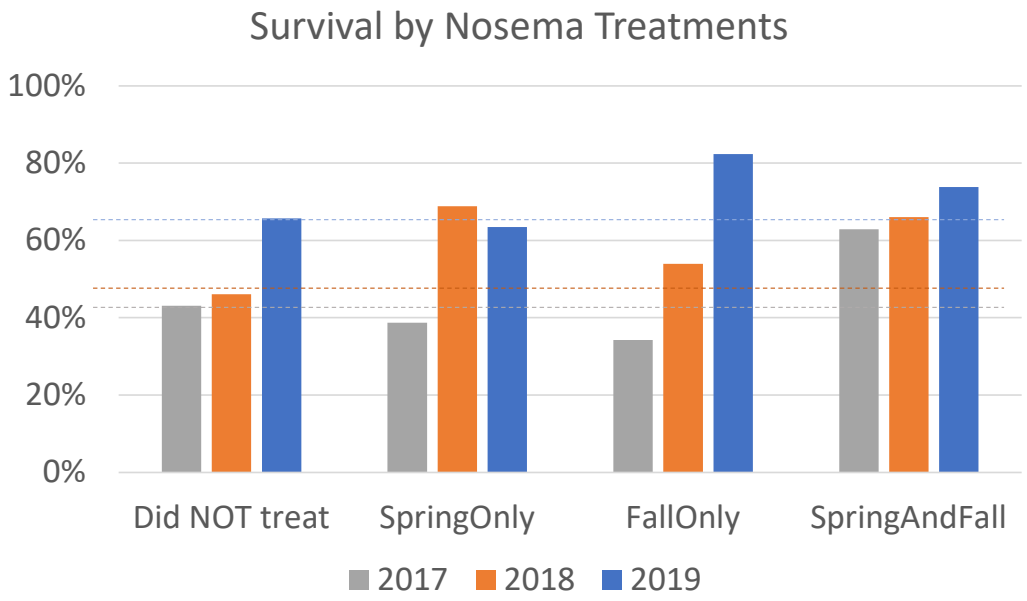
Redline = Overall Survival Rate
Higher bar is better!



Data from apiaries with only 1 race

Nosema Treatments

Did Nosema treatment affect survival?



	2017 Hives 10/1	2018 Hives 10/1	2019 Hives 10/1
Did Not Treat	947	953	1089
Spring Treatment only	62	61	93
Summer	0	3	7
Fall Treatment only	73	63	17
Spring & fall Treatment	105	103	145
Total	**1187**	**1183**	**1351**

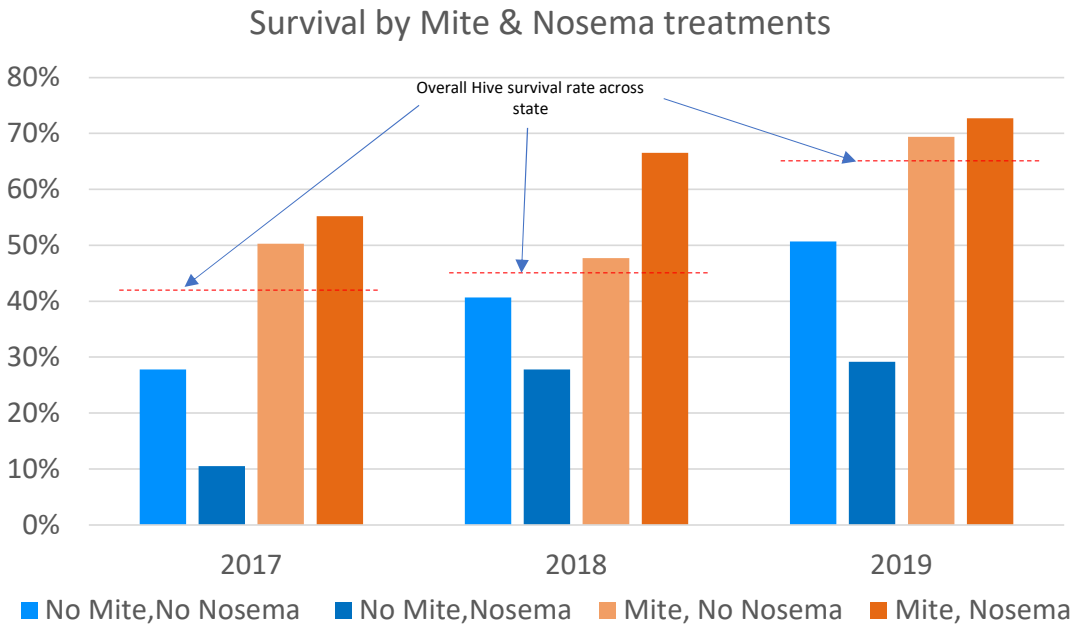
Dotted lines represent the survival rate each year:

2017: gray
2018: orange
2019: blue

~19-20% of hives were treated for nosema in 2019 (consistent with 2017,18)

Hives treated for Nosema consistently have higher survival

Overlaying mite treatment with Nosema treatment



*Orange bars = did at least 1 mite treatment
Blue bars – 0 mite treatments

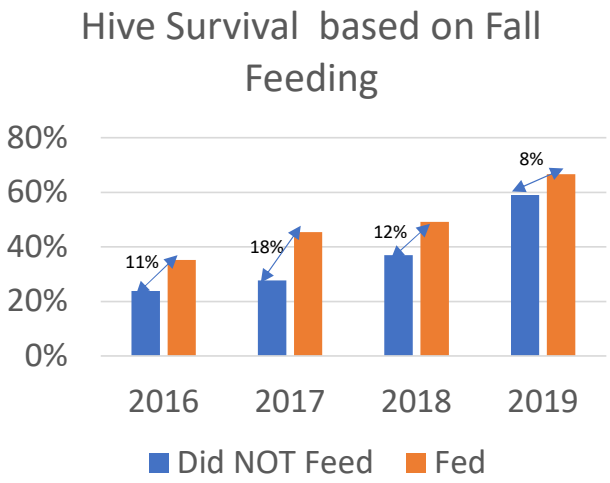
	2017	2018	2019
No Mite, No Nosema	284	219	213
No Mite, Nosema	38	18	24
Mite, No Nosema	654	734	873
Mite ,Nosema	201	212	238
Total	**1177**	**1183**	**1348**

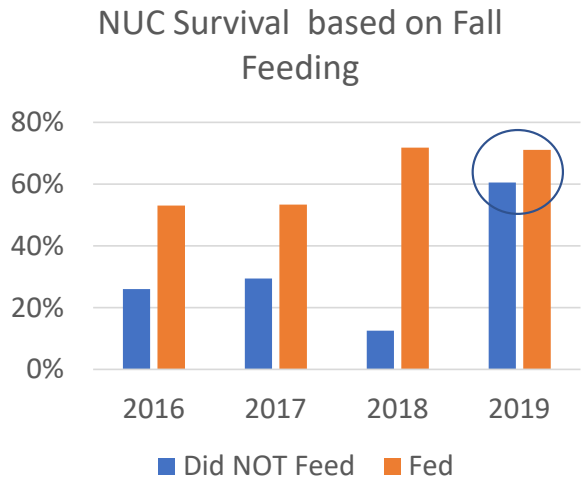
Nosema Testing by NH Diagnostic Network
- 2018 : ~67 tests
- 2019 : ~61 tests
- 2020: 9 tests

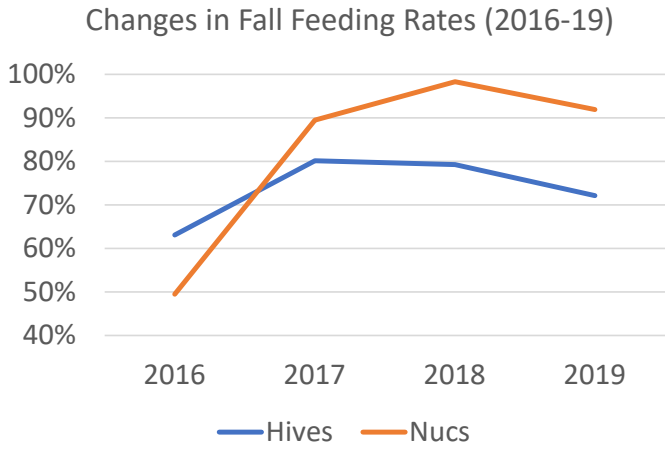
- Treating for Nosema in addition to treating for mites improved survival by a few points in 2019.
- Most hives treated for Nosema were also treated for mites

Feeding (Fall, Winter & Protein Supplements)

Did fall feeding help survival rate?





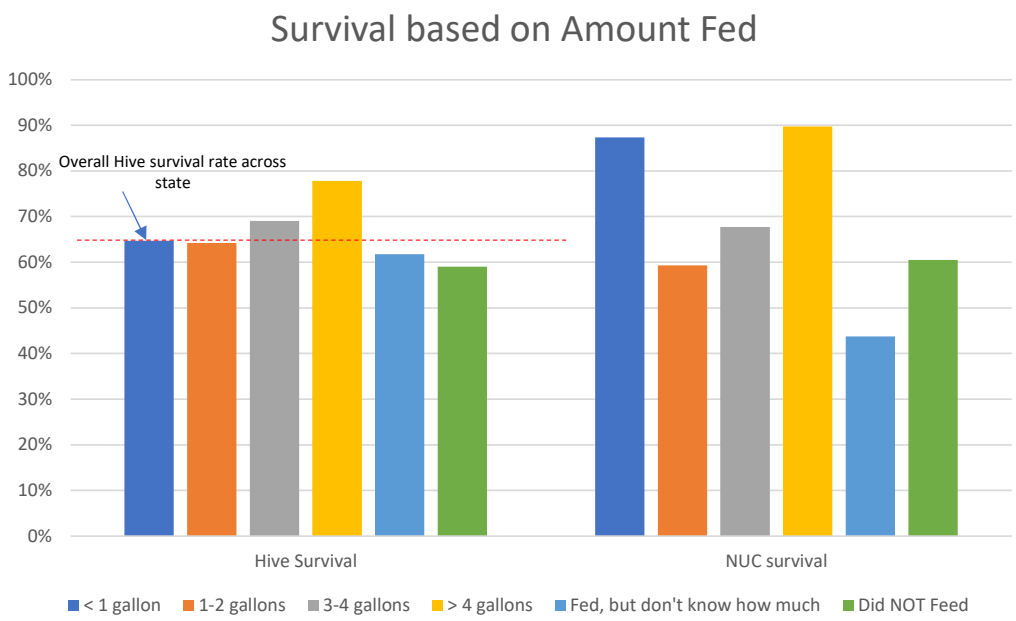


	# Hives on 10/1/19	# NUCs on 10/1/19
Fed	1074	432
Did Not Feed	415	38

	2016	2017	2018	2019
Hives	63%	80%	79%	72%
NUCs	49%	89%	98%	92%

- Survival difference between those that fed in the fall and those that didn't is the smallest since we've done the survey. This is especially noticeable in NUCs
- % of hives fed in fall was lowest in 3 years
- Possible indication that last year's food supply (and no dearth) helped winter survival?

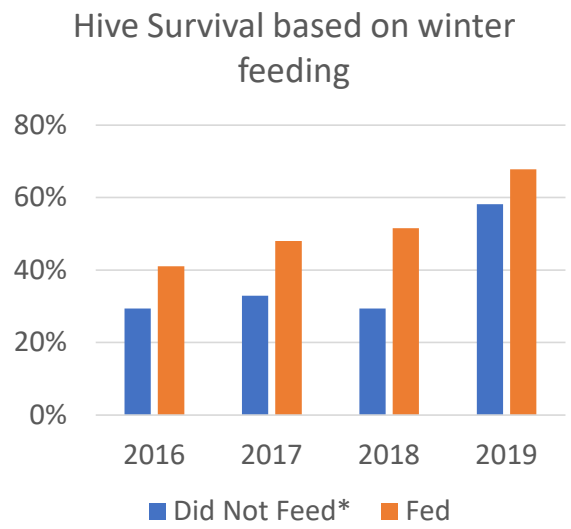
Did the amount of sugar syrup fed affect survival rate?

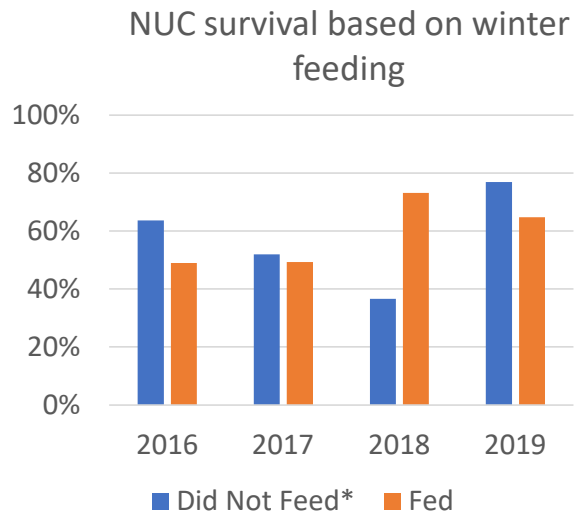


	# Hives on 10/1/19	# NUCs on 10/1/19
Did Not Feed	415	38
< 1 gallon	184	79
1-2 gallons	447	145
3-4 gallons	184	124
> 4 gallons	144	68
Fed but don't know how much	115	16

Hives that were fed had better survival rate - but much less of a difference than in the past. 28% of hives were fed in 2019 vs 37% in 2018 (and 28% in 2017)

Did winter feeding help survival rate?

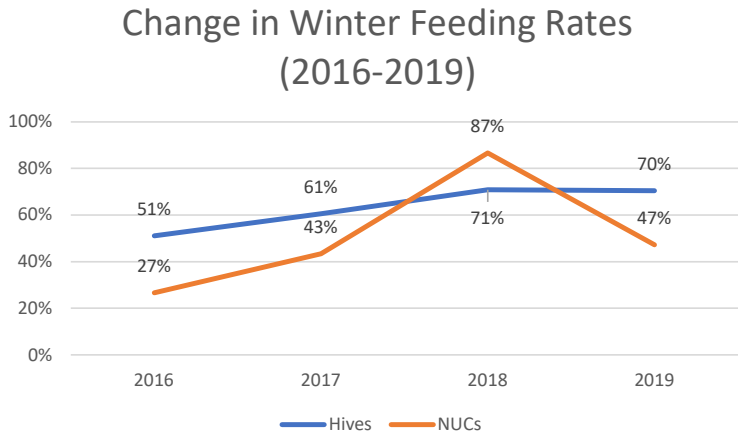




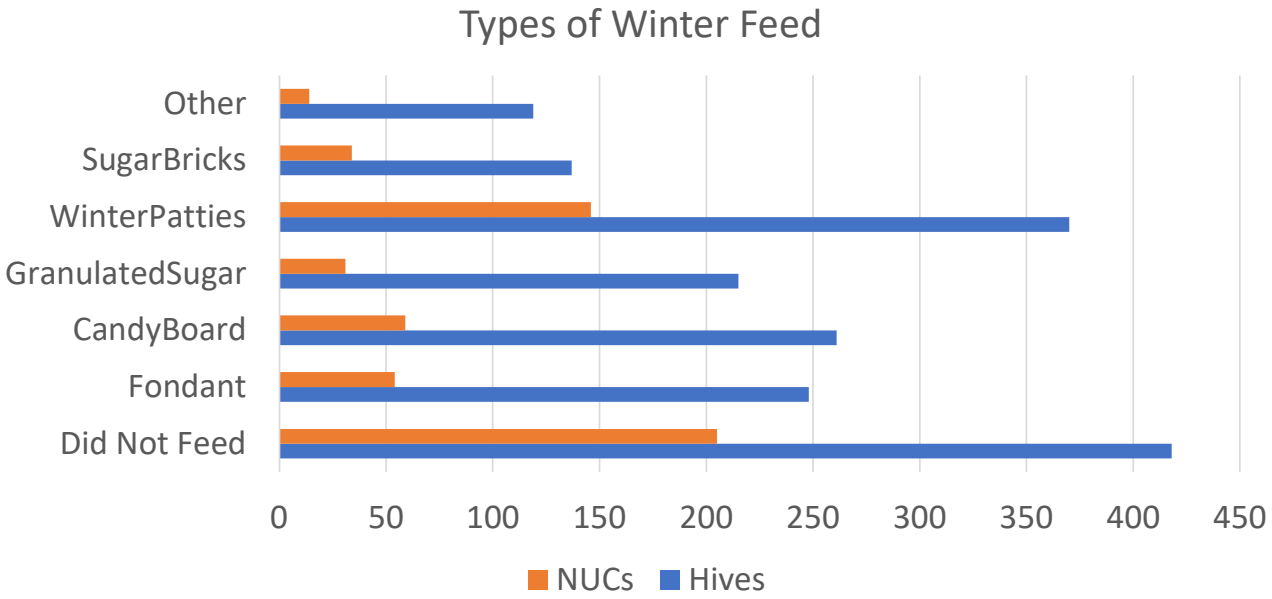
	# Hives on 10/1/19	# NUCs on 10/1/19
Fed	1076	264
Did Not Feed	452	295

*Many that did not feed in 2019 commented the bees had plenty of honey

Winter Feeding appears to help survival but less than in previous years



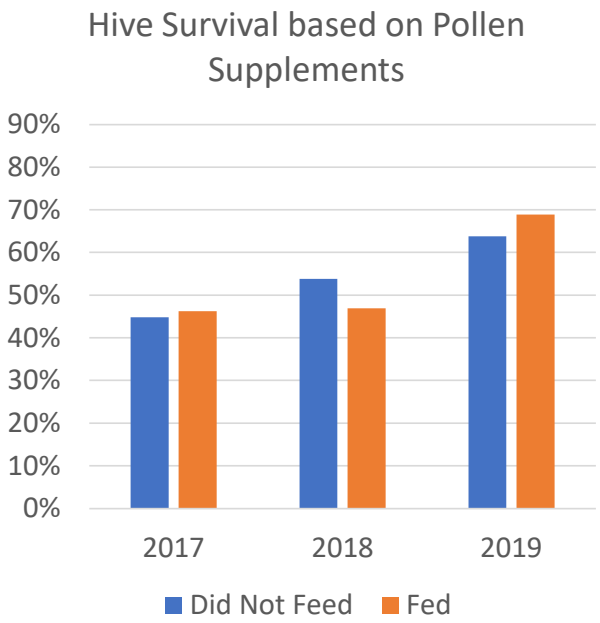
What types of winter feed were used?

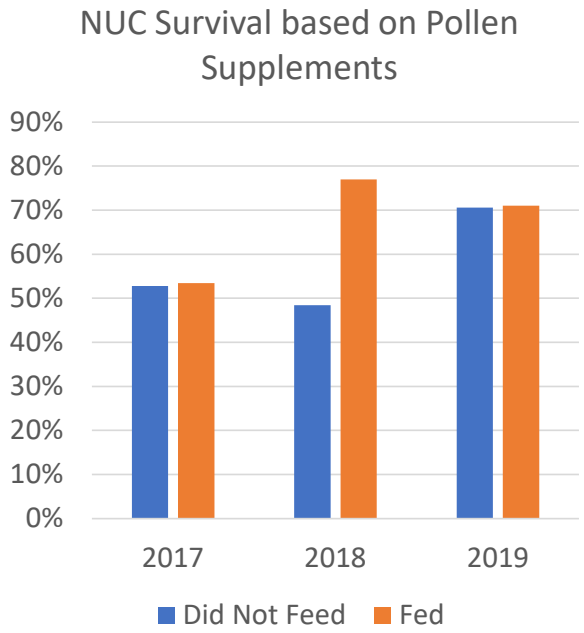


	# Apiaries
1 Type of Feed	232
2 types of feed	66
3 types of feed	5
4 types of feed	1

Other includes: left their own honey, sugar cubes

Does feeding protein supplements help survival?

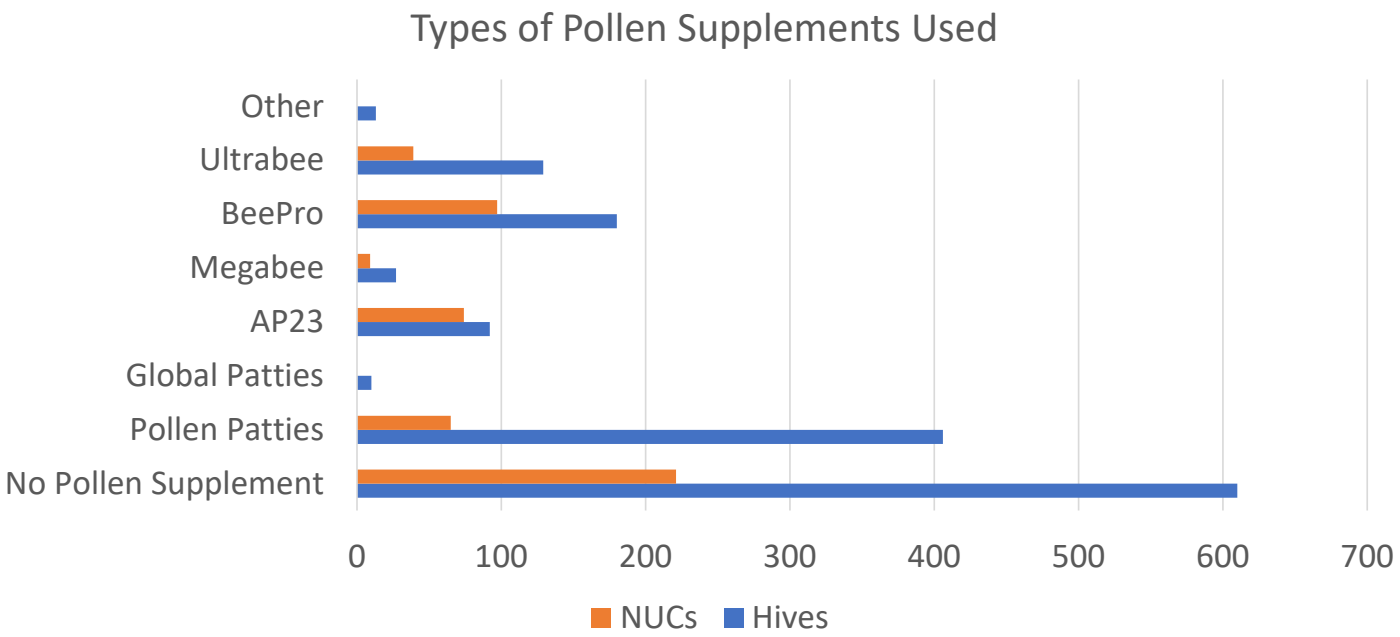




	# Hives on 10/1/19	# NUCs on 10/1/19
Fed	735	241
Did Not Feed	608	221

Hives fed pollen supplement in 2019 has slightly better survival than those that didn't

What types of protein supplements were used?

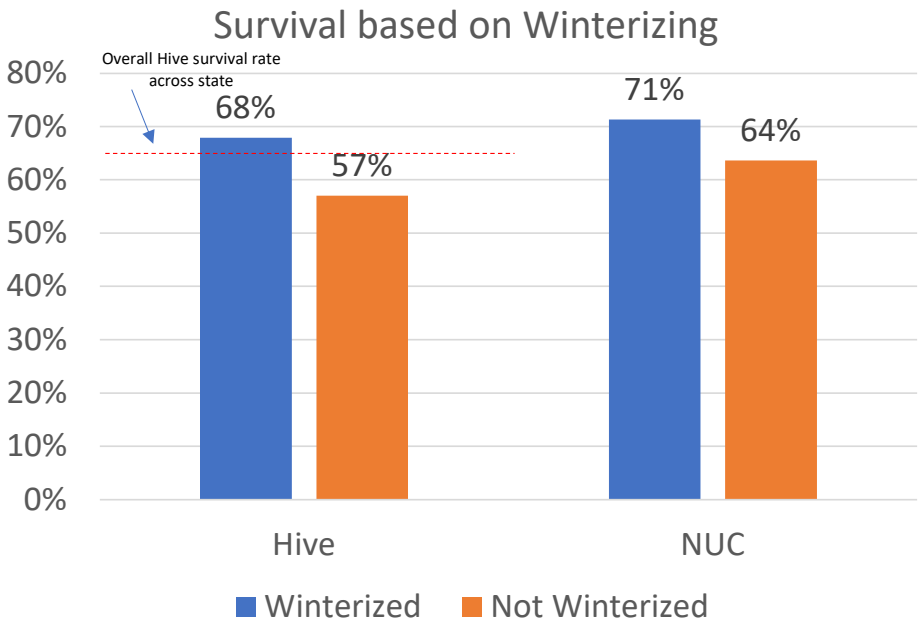


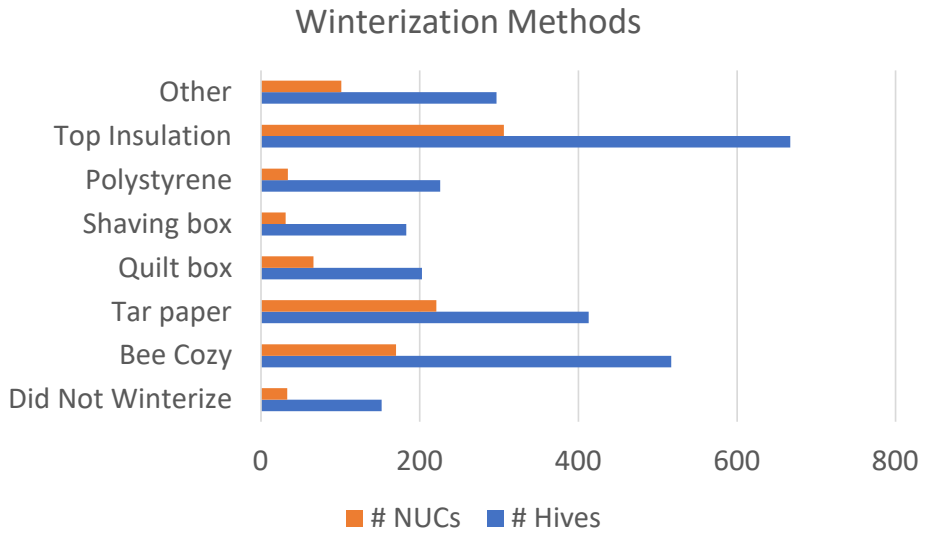
Other included: Mann Lake Ultra Patty, Winter Patties, frames of pollen from hives that died, homemade supplement, Honeybee Pollen-Hebert Honey

*They don't like it and I do it so I can feel better. I think it's like giving a starving man a twinkee. They prefer their own stores.

Winterizing & Moisture Control

Winterizing Hives





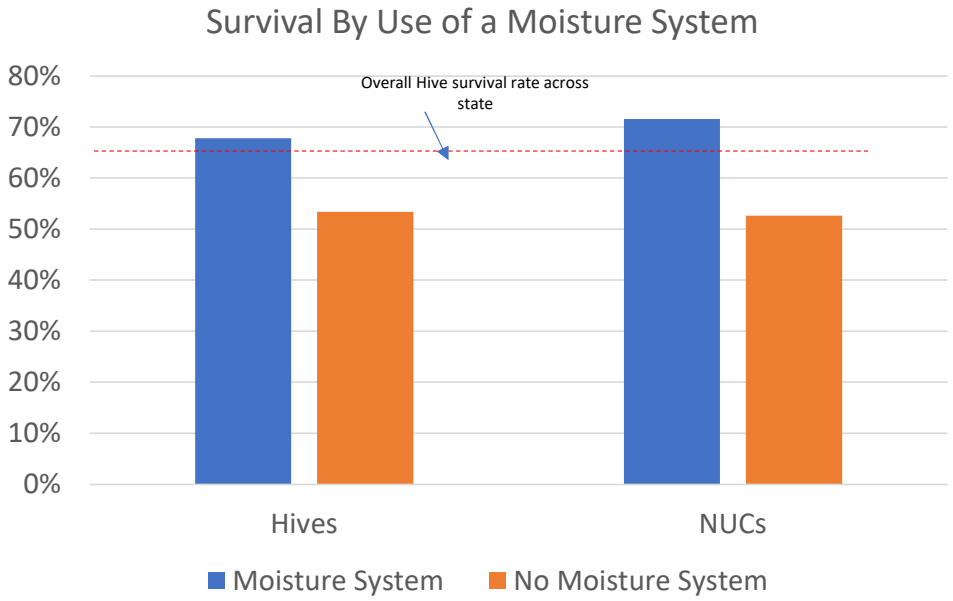
89% of hives & 93% of NUCs were winterized in 2019
*some hives that weren't winterized were dead by Nov/Dec

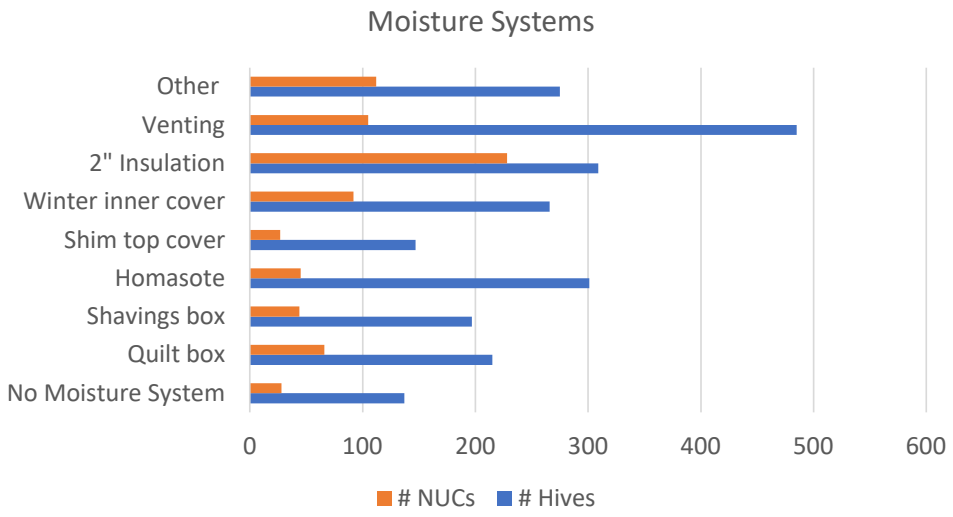
Tried to determine if one method helped survival more than others – but too few apiaries use just 1 technique to draw any conclusions.

Other includes:

- *Many hives were put into buildings or structures
- Black plastic, ty-par, Tyvek, tarps, landscape fabric, pool cover
- Various wind breaks= hay bales, plywood
- AV and Apimaye hives
- Fiberglass insulation
- Wool fleece on top
- Close bottom board, straw around bottom of hive
- Hot box winterizer

Winter Moisture Control





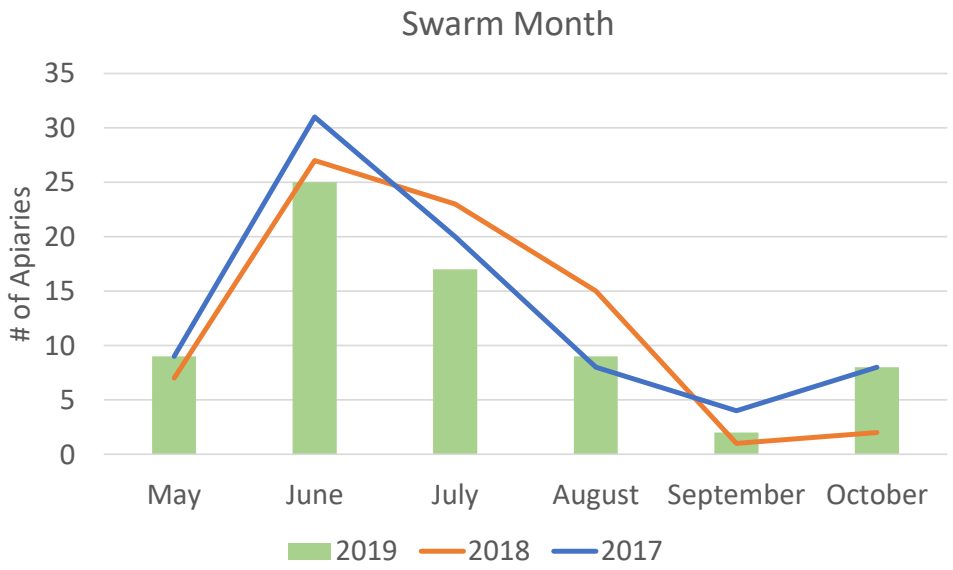
~91% of the reported hives used a moisture system
~96% of the reported NUCs used a moisture system

152 apiaries used 2 or more type of moisture control system

- Moisture board includes homasote, sound insulation
- Venting includes vent holes & open screen boards
- Other includes:
  - Wool, hay, pine needles, newspaper, burlap, Vivaldi box, spacer under inner cover, ventilation box, angling hive, candy boards

Swarming

Apiaries reporting swarms



- 70 apiaries reported swarms (23%)
- 232 apiaries (869 hives) did not have swarms

We do not have granular enough data to tie swarming to survival rate

	# of apiaries without swarms
2017	234
2018	245
2019	232

Swarming has been reported by 23-25% of the apiaries each year.

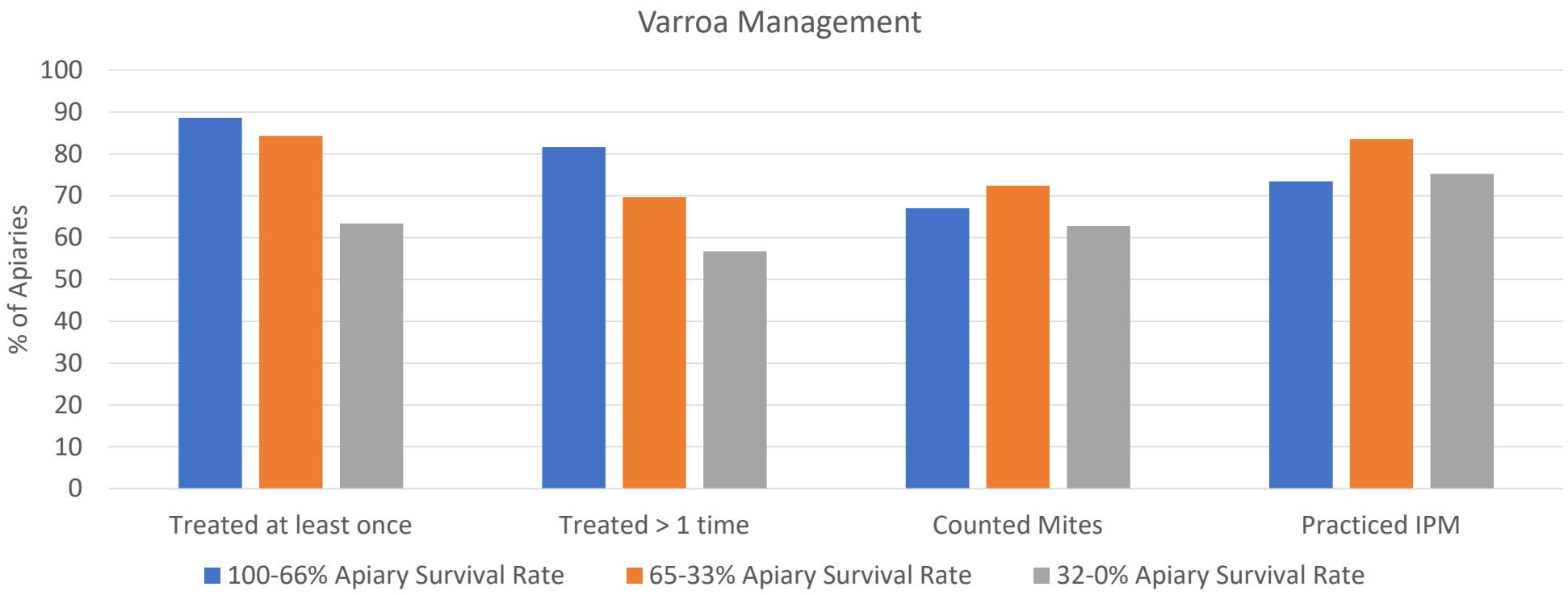
Big Picture: Can we determine "best management" practices from those apiaries that had high survival rate?

Methodology:

- Divided the apiaries in 3 groups: 32-0% survival; 65-33% survival & 100-66% survival
  - Hive breakdown in these groups was :
    - 32-0% survival: ~20% of hives
    - 65-33% survival: ~23% of hives
    - 100-66% survival: ~57% of hives

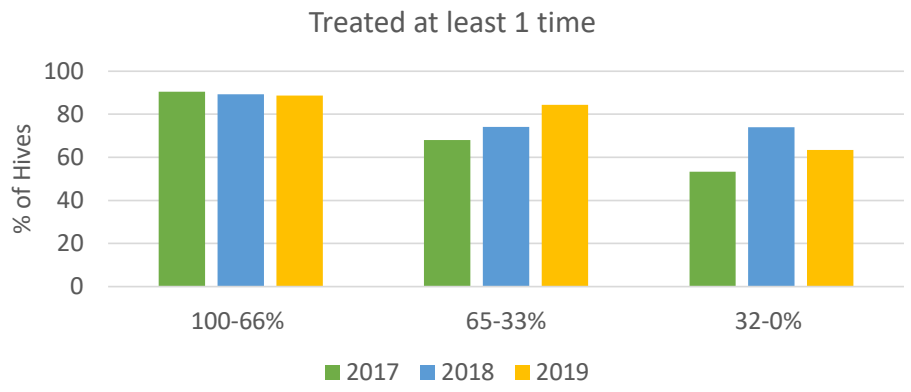
    *Note – in previous years this has been evenly split between groups
- For each major category, report what percentage of the hives were managed using a specific technique:
  - Ex: Report the percentage of the hives in each of the 3 categories that used commercial varroa treatments.
  - Assumption: all hives in an apiary were managed the same way.

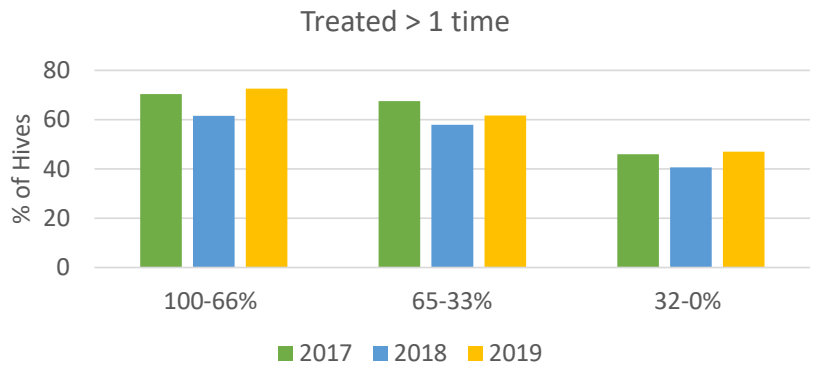
Big Picture: Varroa Management (2019)

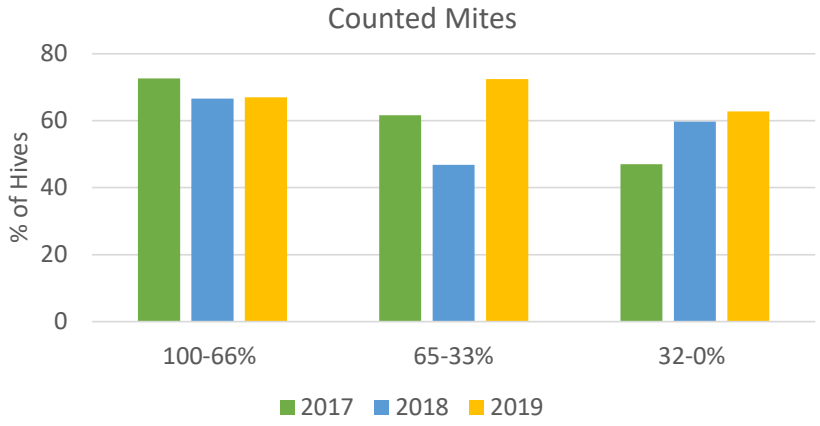


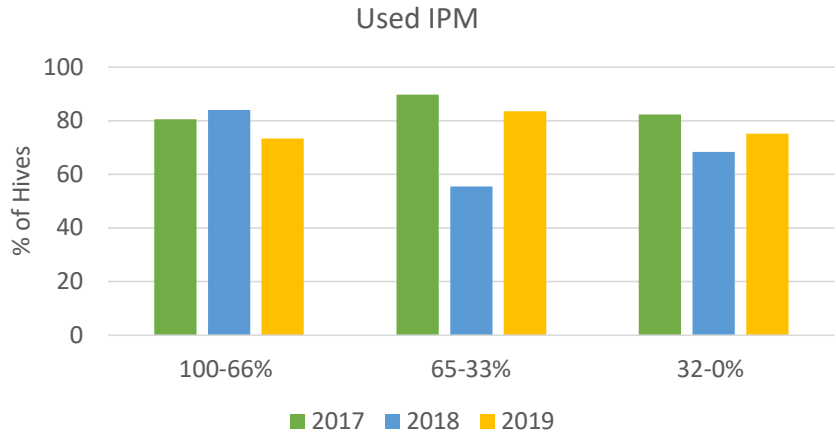
Hives in Apiaries with the best survival rates used a commercial varroa treatment at least one time
80% of the hives in the high survival group treated multiple times.

Big Picture: Varroa Management – comparing 2019,2018 & 2017

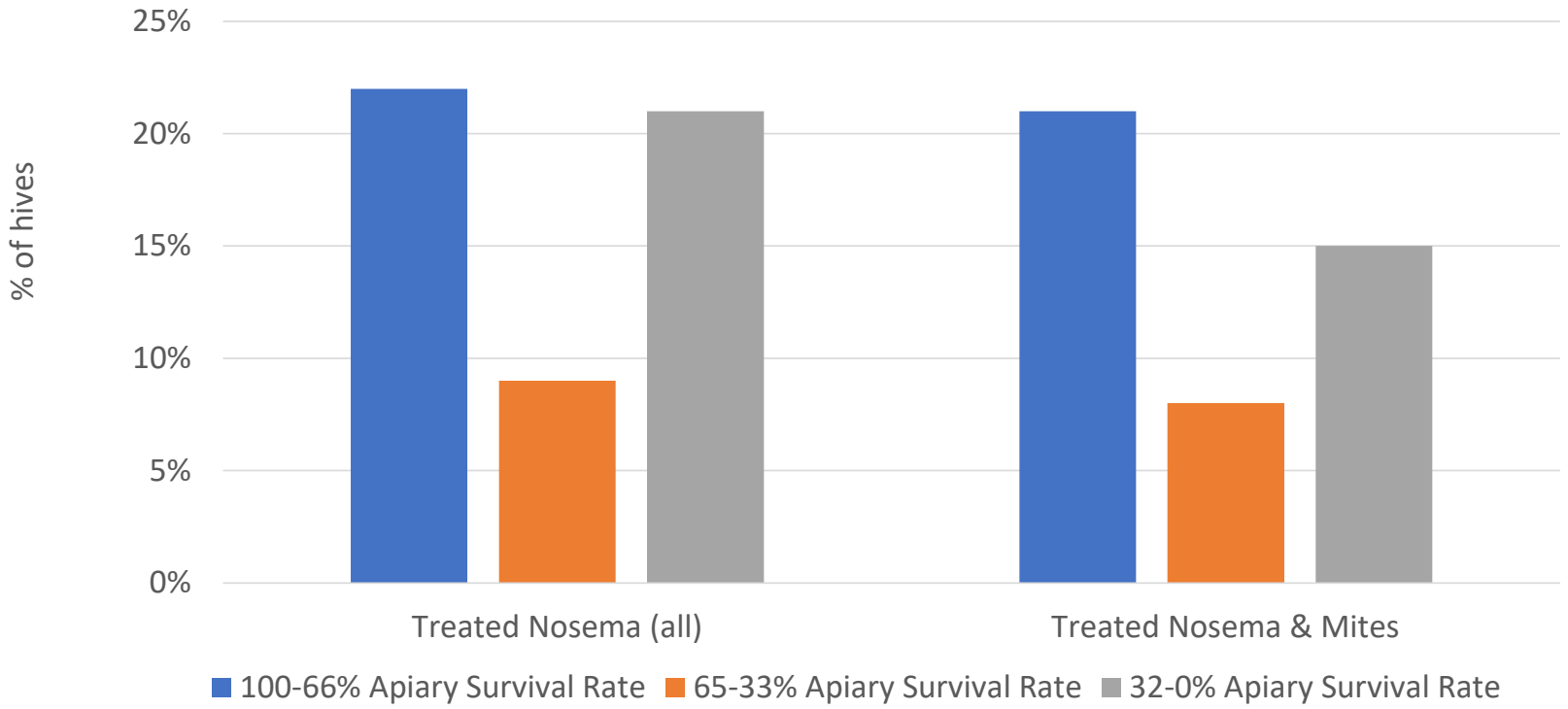








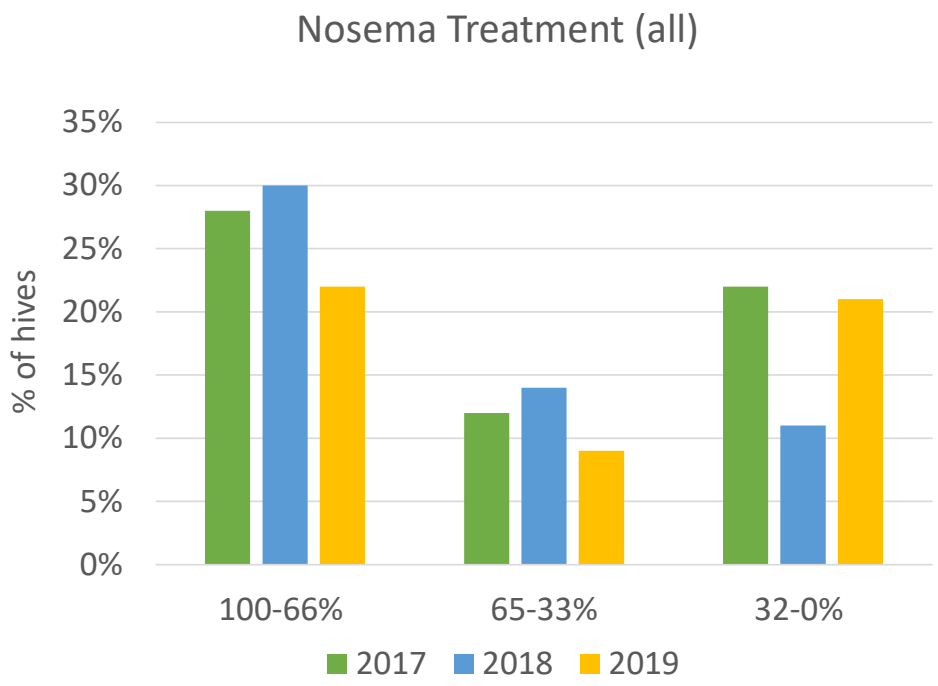
Big Picture: Nosema Management (2019)

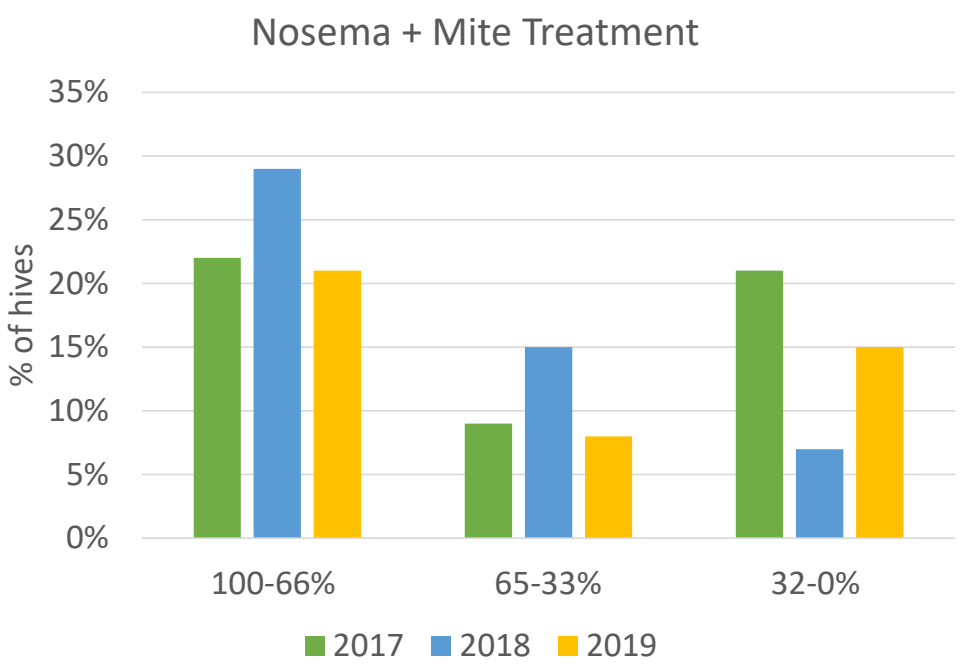


Generally if Hives in the High survival groups were treated for Nosema they were also treated for mites

*Medium Survival Rate group had significantly lower percentage of Nosema treatment in 2019

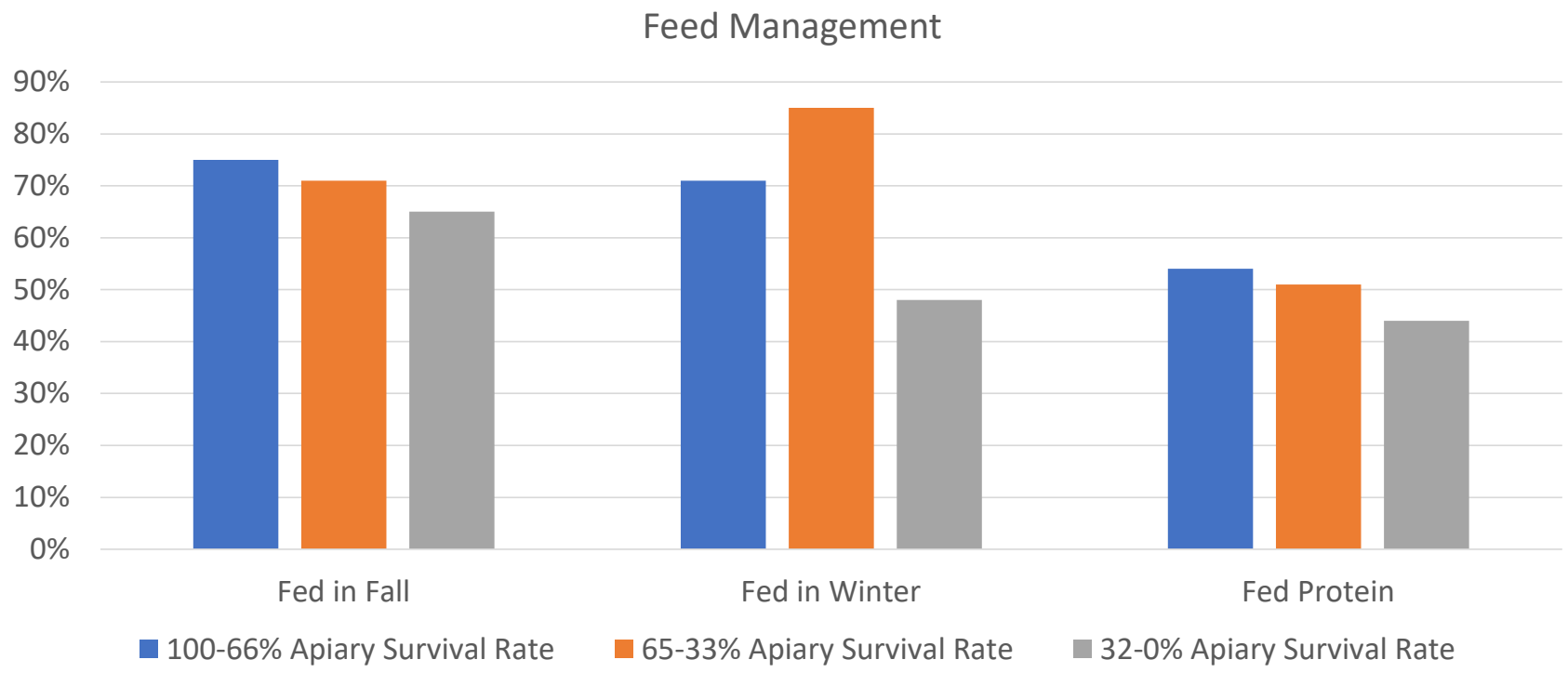
Big Picture: Nosema Management – comparing 2017 & 2018





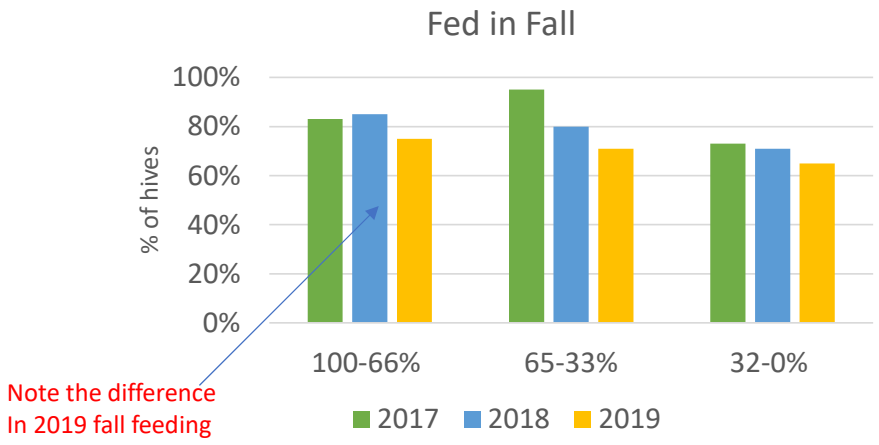
- Interesting that in 2 of the 3 years the “mid” group had significantly less nosema treatments than the other two
- For the “High” group, 2019 had the lowest % treated for Nosema of the 3 years. But overall the % of hives treated was consistent with other years.

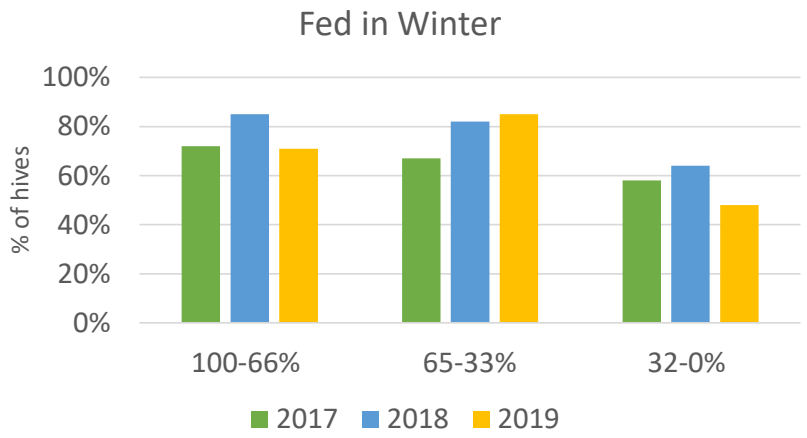
Feed Management

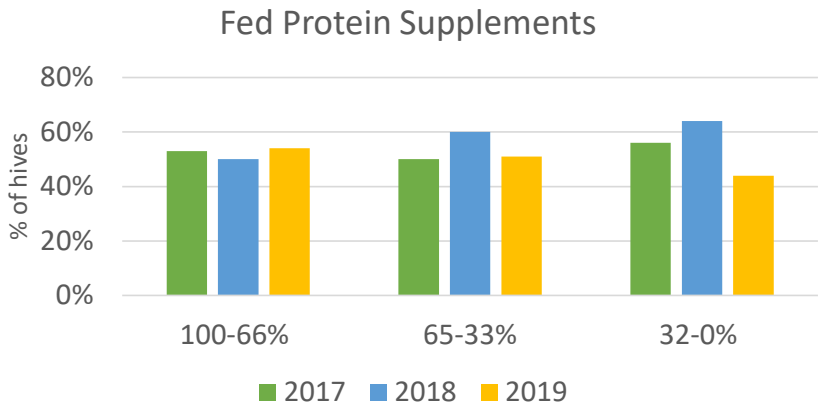


*Several notes that hives that died by Dec were not fed in the winter.
Since feeding needs are so hive & region specific, in the future should look at data more regionally

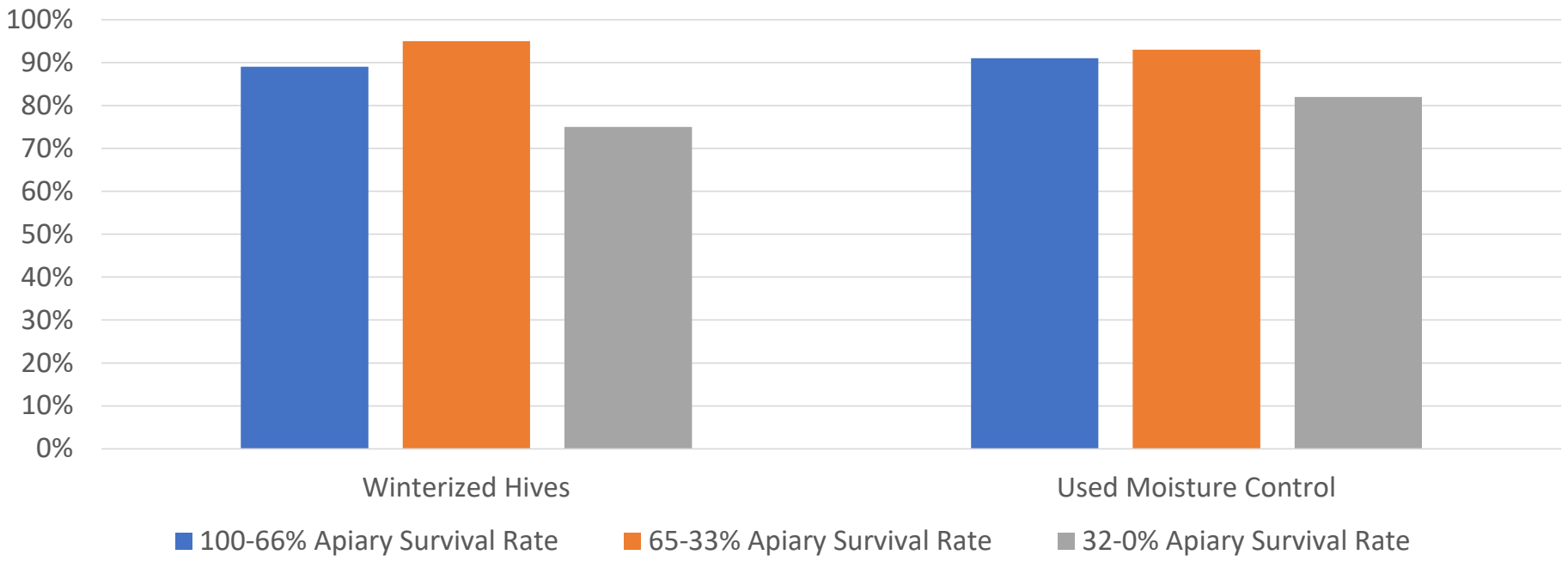
Big Picture: Feed Management – comparing 2019-17





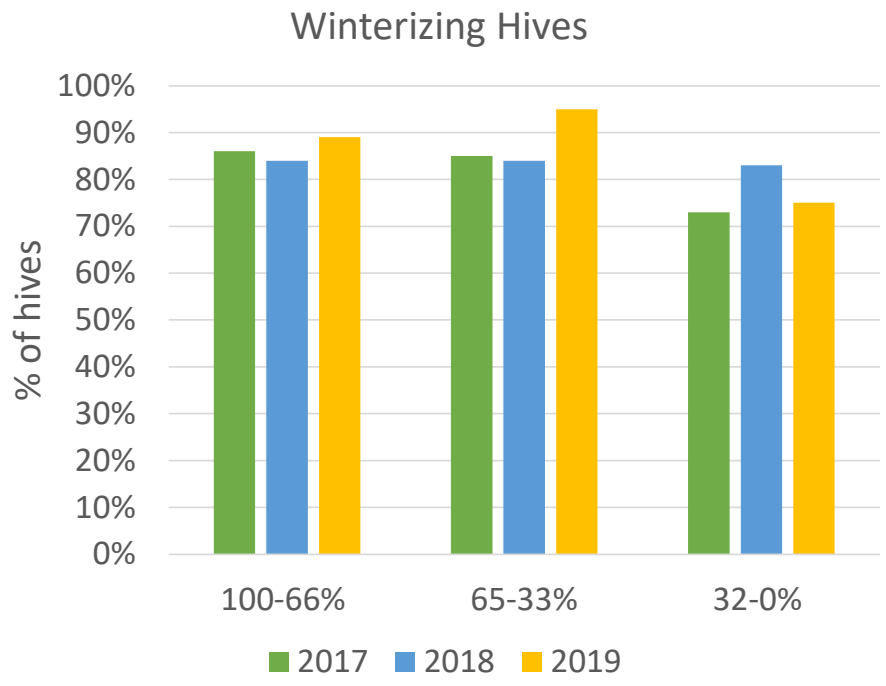


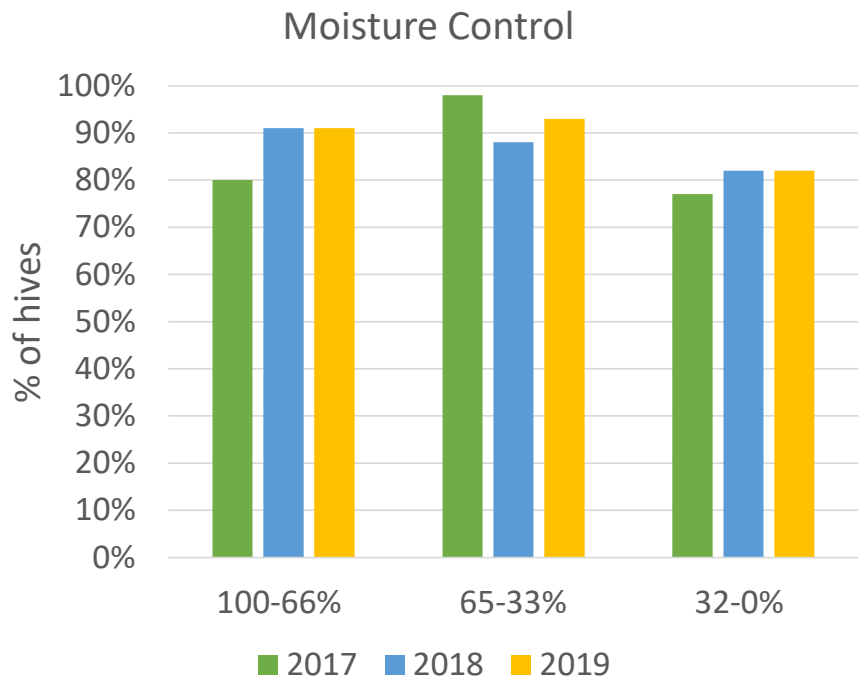
Big Picture: Winterizing d& moisture control systems



Low Survival Rate group winterized much less than other groups in 2019
In the future should look at data more regionally to see if there is more impact

Big Picture: Winter Management – comparing 2019-2017

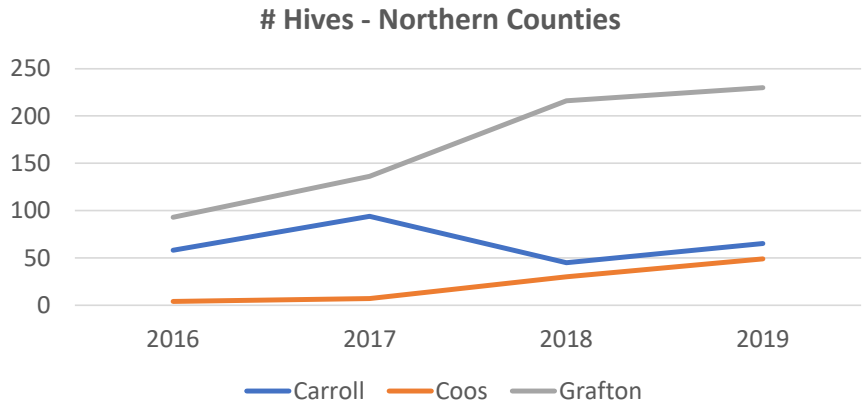




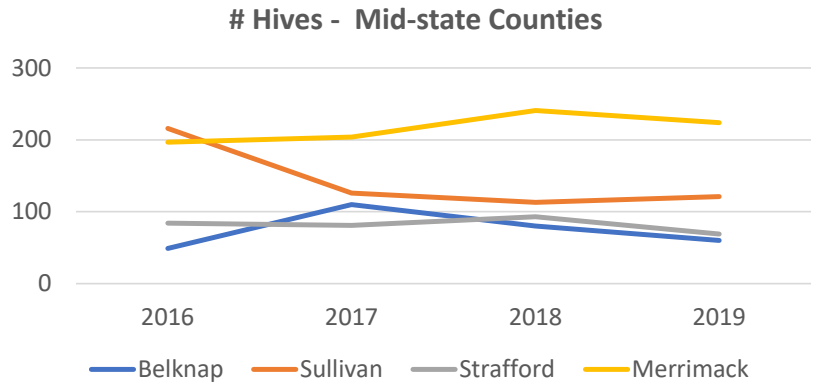
Low survival group typically has a lower percentage of hives winterized & using moisture control compared to other groups. - this could partly be because the hives died by December

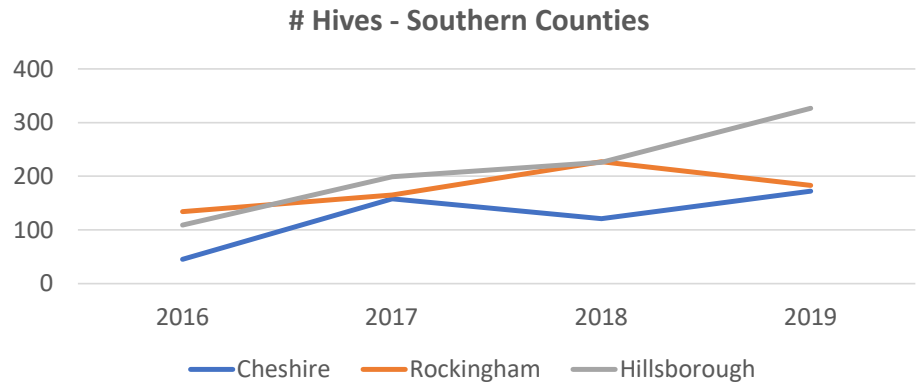
By County Analysis

Survey Participation Over the Years – By County

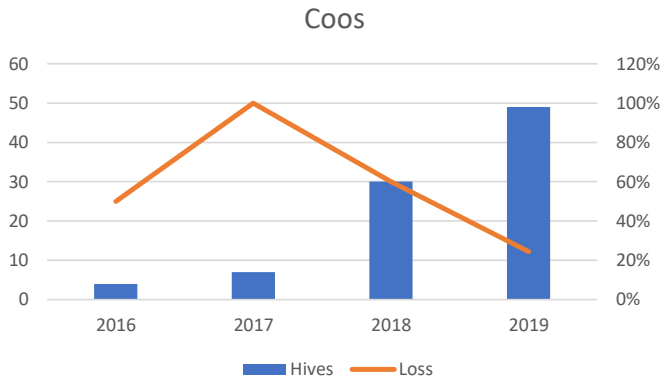


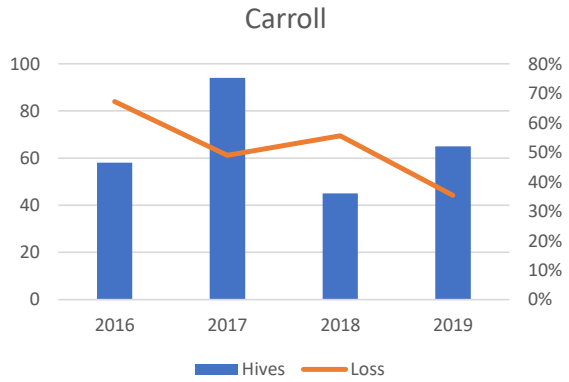
	2016	2017	2018	2019
Belknap	49	110	80	60
Carroll	58	94	45	65
Cheshire	45	158	121	172
Coos	4	7	30	49
Grafton	93	136	216	230
Hillsborough	109	199	226	327
Merrimack	197	204	241	224
Rockingham	134	165	227	183
Strafford	84	81	93	69
Sullivan	216	126	113	121
MA	13	14	15	12
VT	2	8	9	12
ME	2	3	9	0

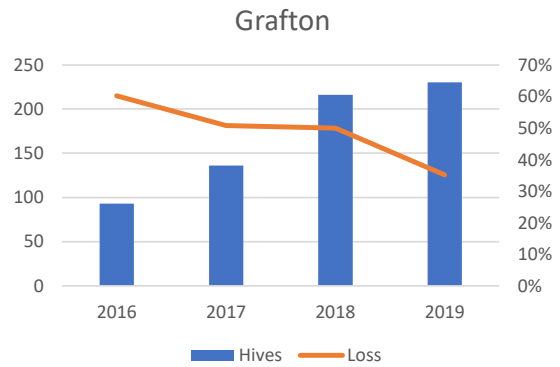


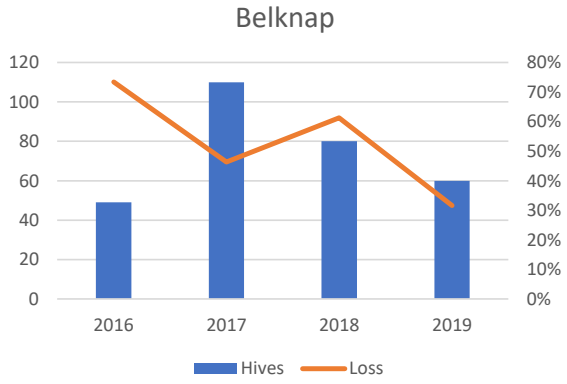


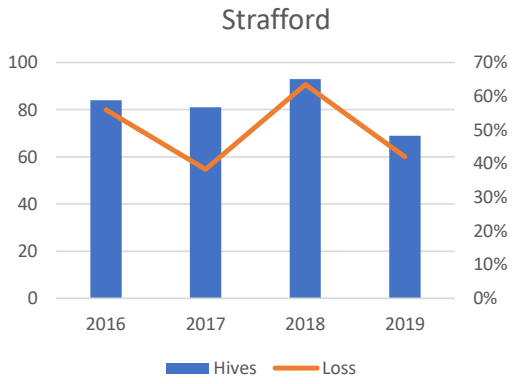
Hives Reported & Loss Rate Year to Year (by County)







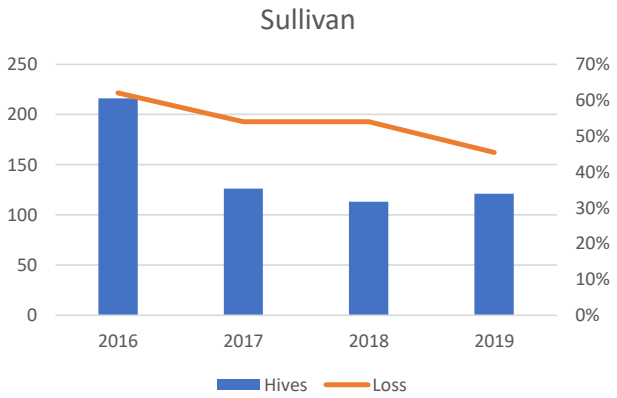


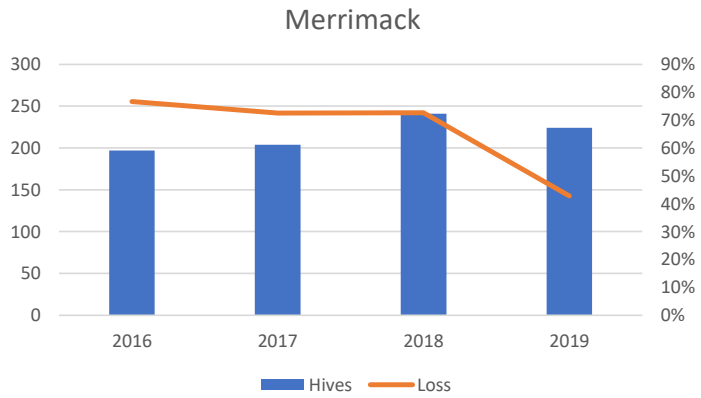


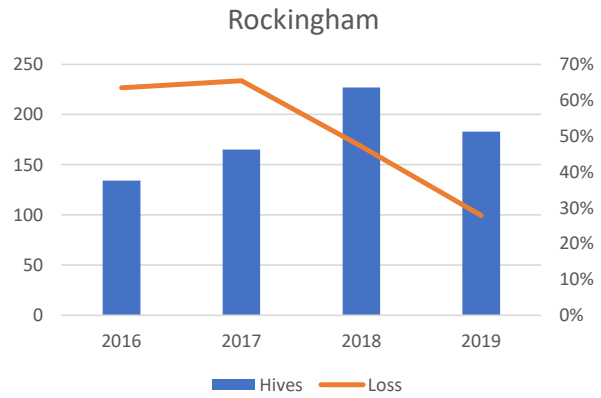
# of hives :

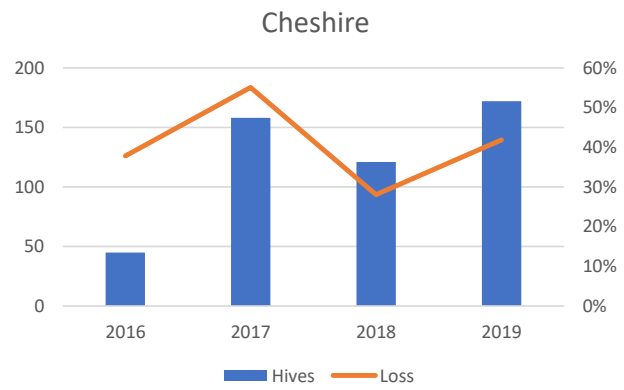
Hive loss :

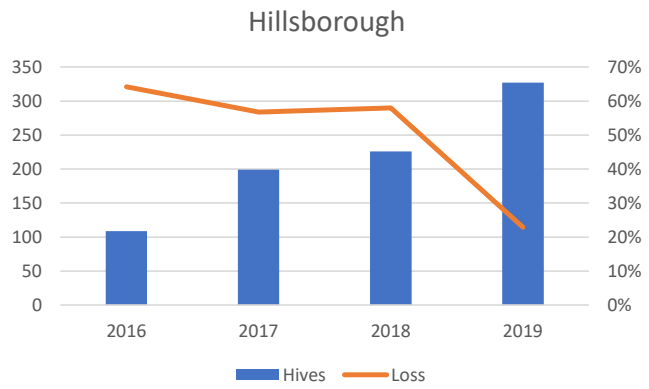
Hives Reported & Loss Rate Year to Year (by County)







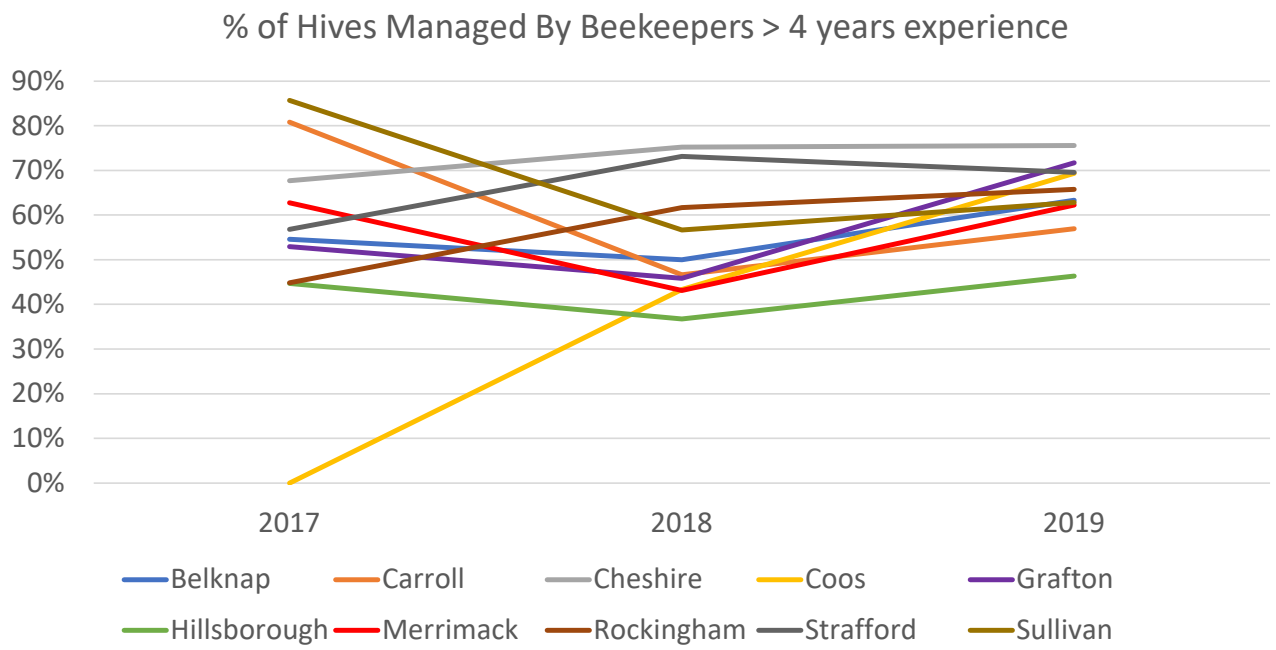




# of hives :

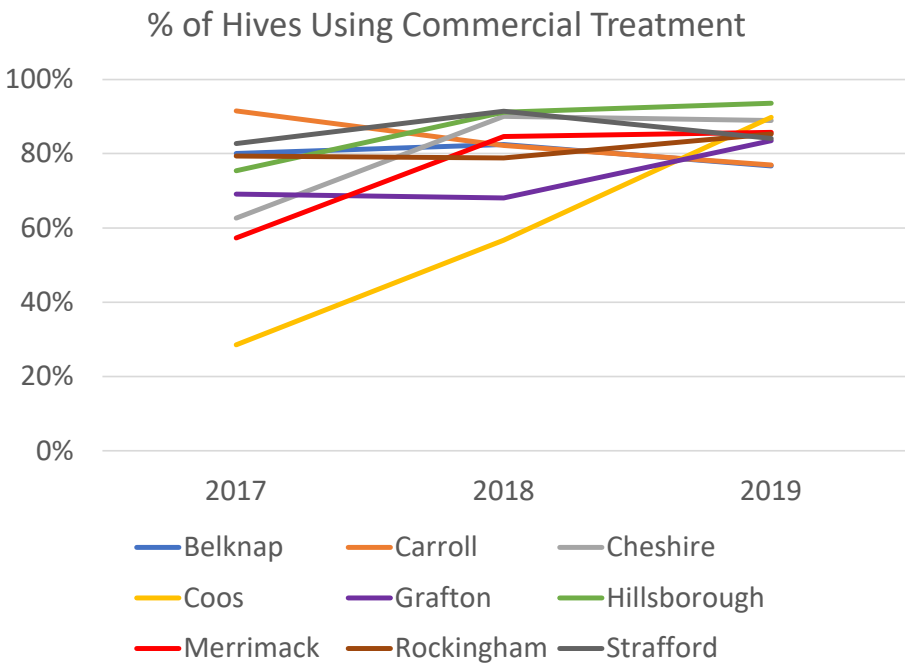
Hive loss :

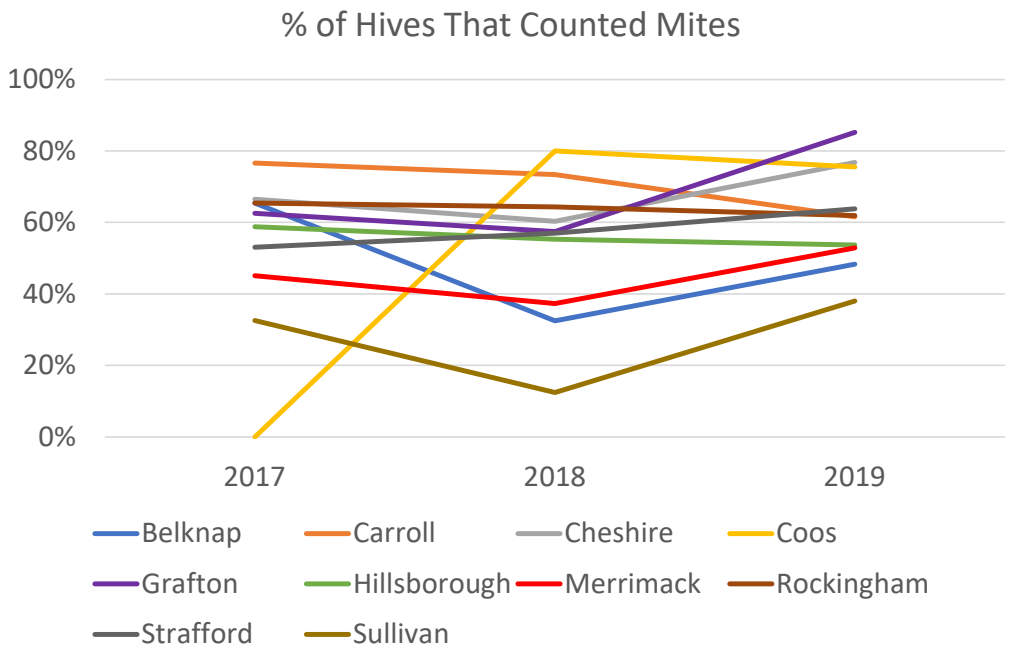
Years of Experience
By County



Hillsborough consistently has the lowest percentage of beekeepers with 5 or more years of experience

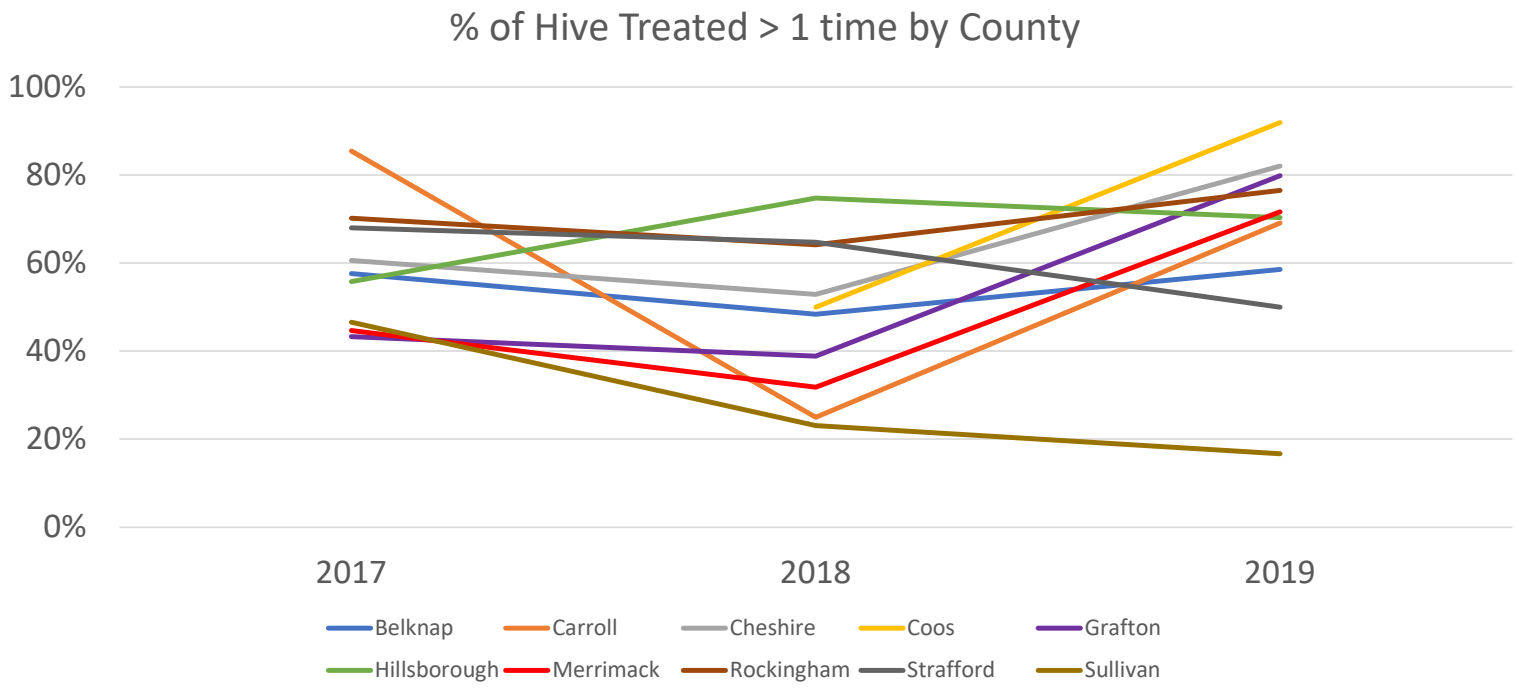
Varroa Management By County





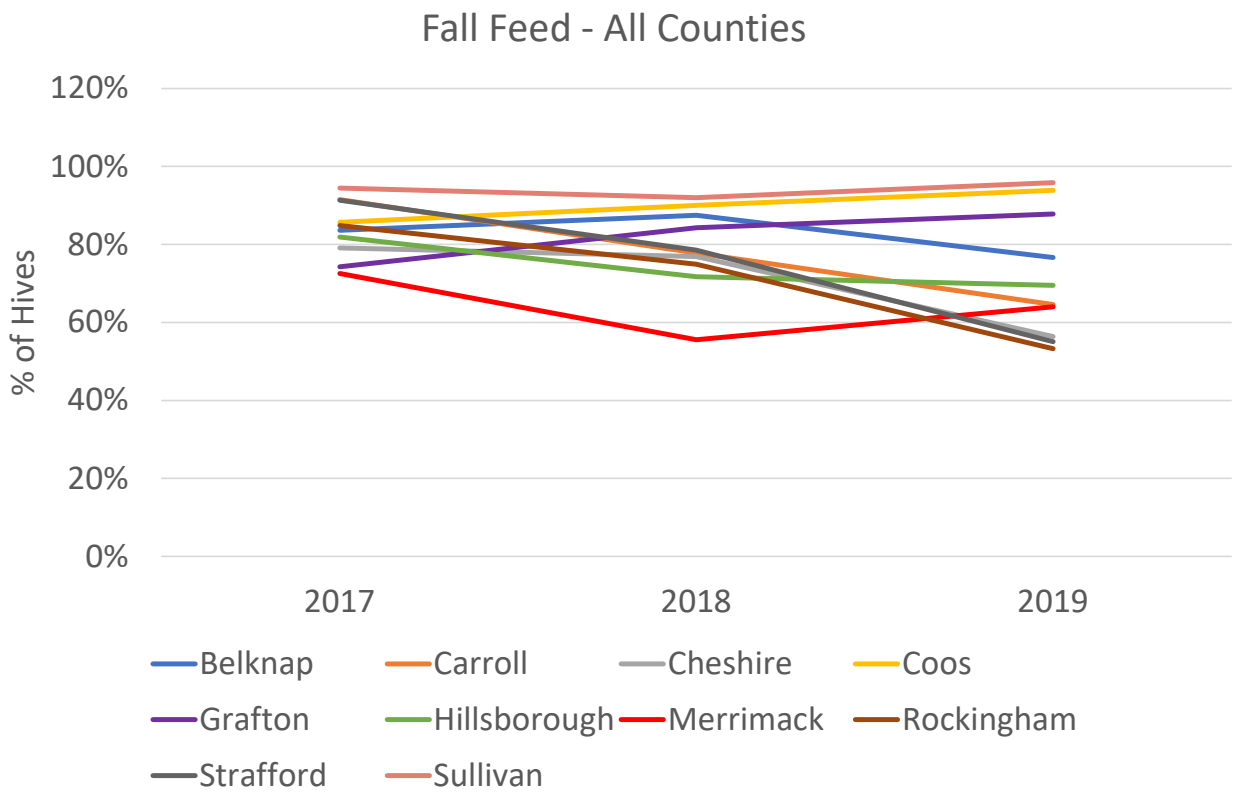
- 2017-2018 in Merrimack in bottom 3 for counting mites.

Varroa Management By County



- Merrimack County is in the bottom 3 in 2017-18
- Also note the Dip in 2018 on several counties

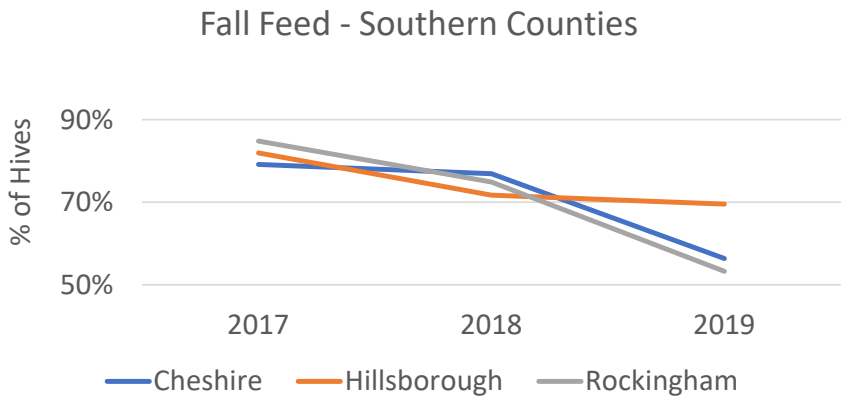
% of Colonies Fed in Fall By County

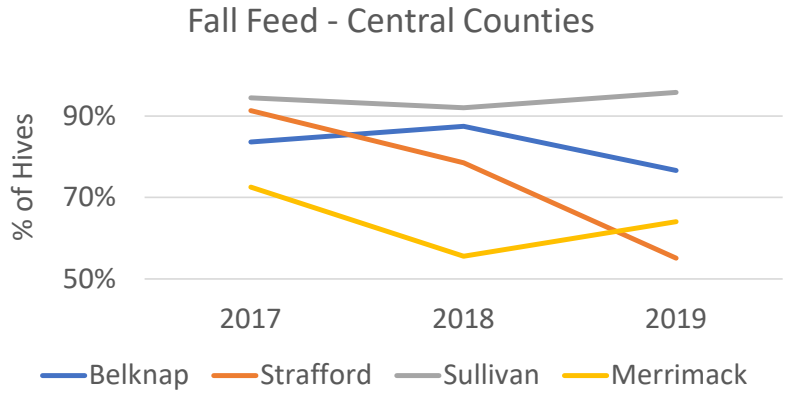


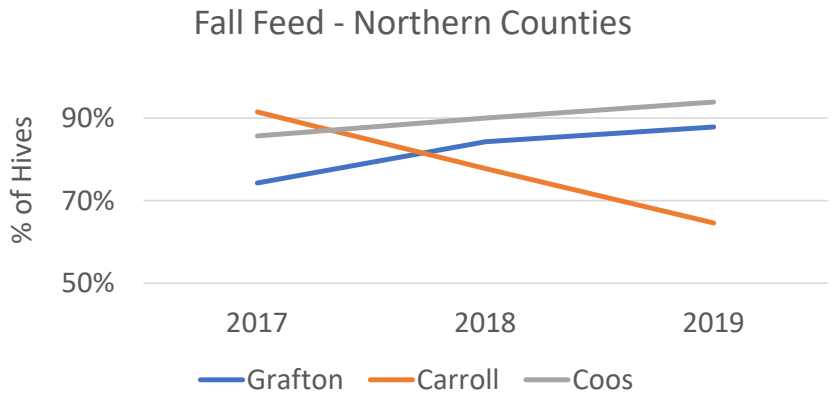
*In 2019 & 18 – Northern/Central counties (Sullivan, Coos, Grafton, Belknap) fed more than the more southern counties

*Merrimack County had the lowest feeding rates in 2017-2018 – Could this be a link to the high loss rates in those years?

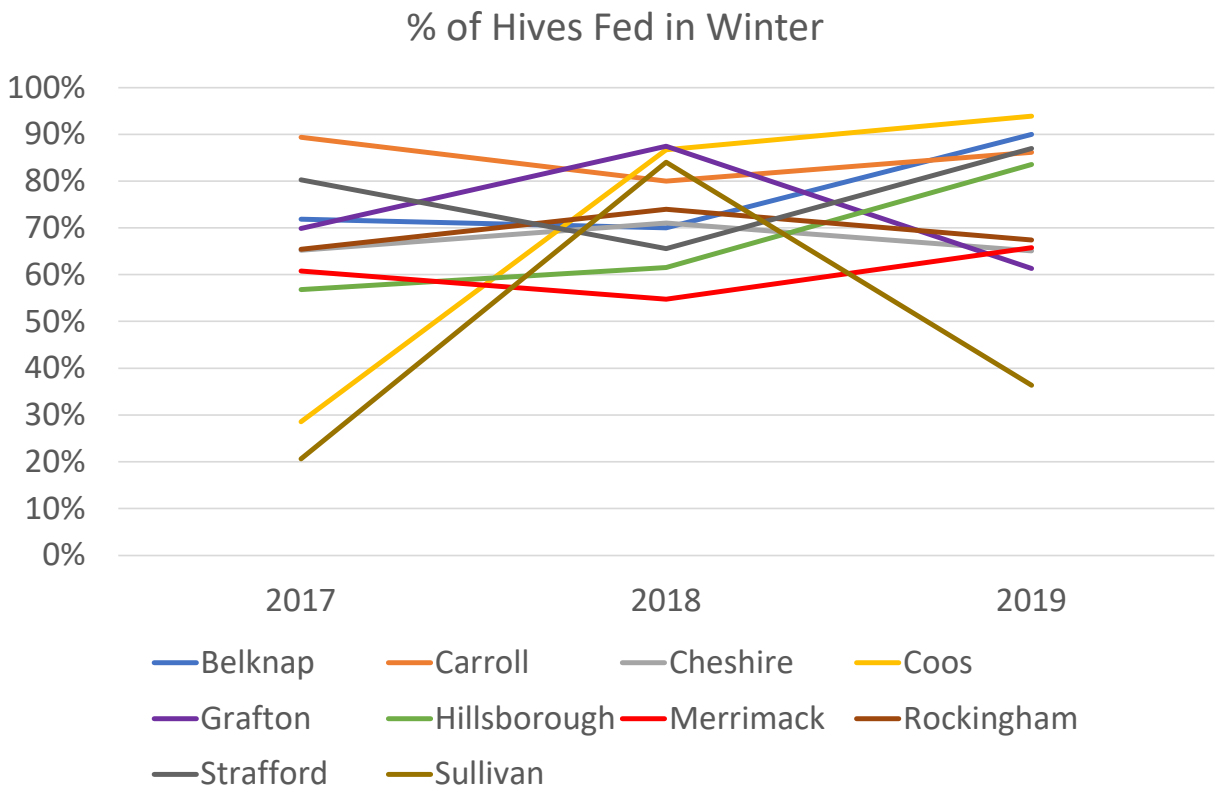
% of Colonies Fed in Fall By County





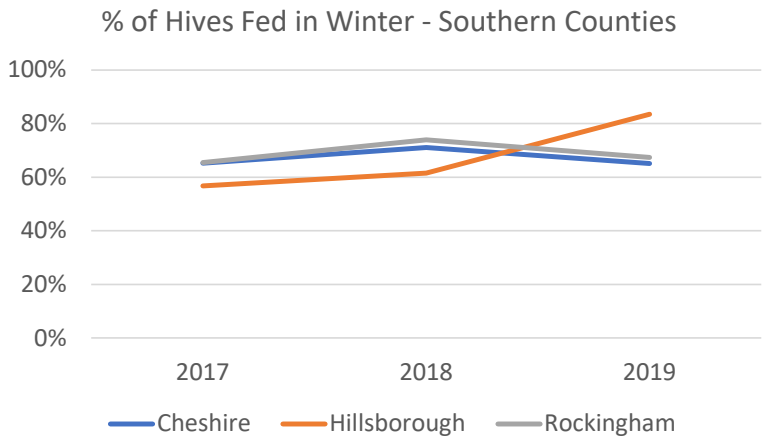


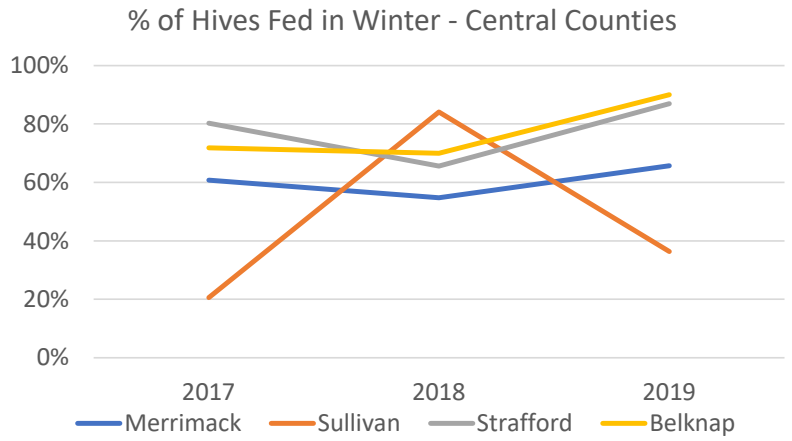
% of Colonies Fed in Winter – All Counties

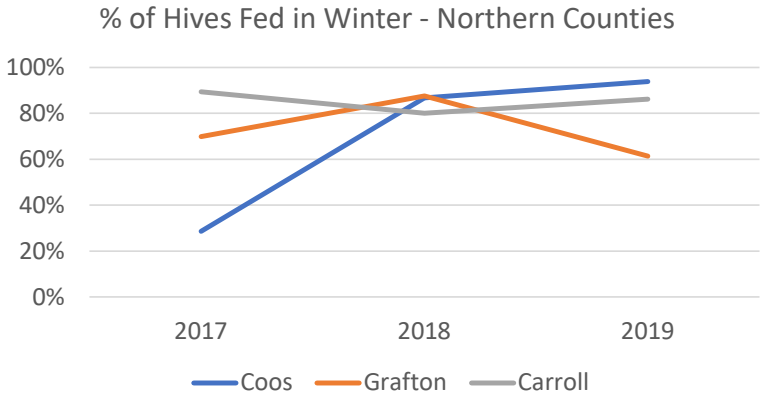


*Merrimack County had the lowest feeding rates in 2017-2018 – Could this be a link to the high loss rates in those years?

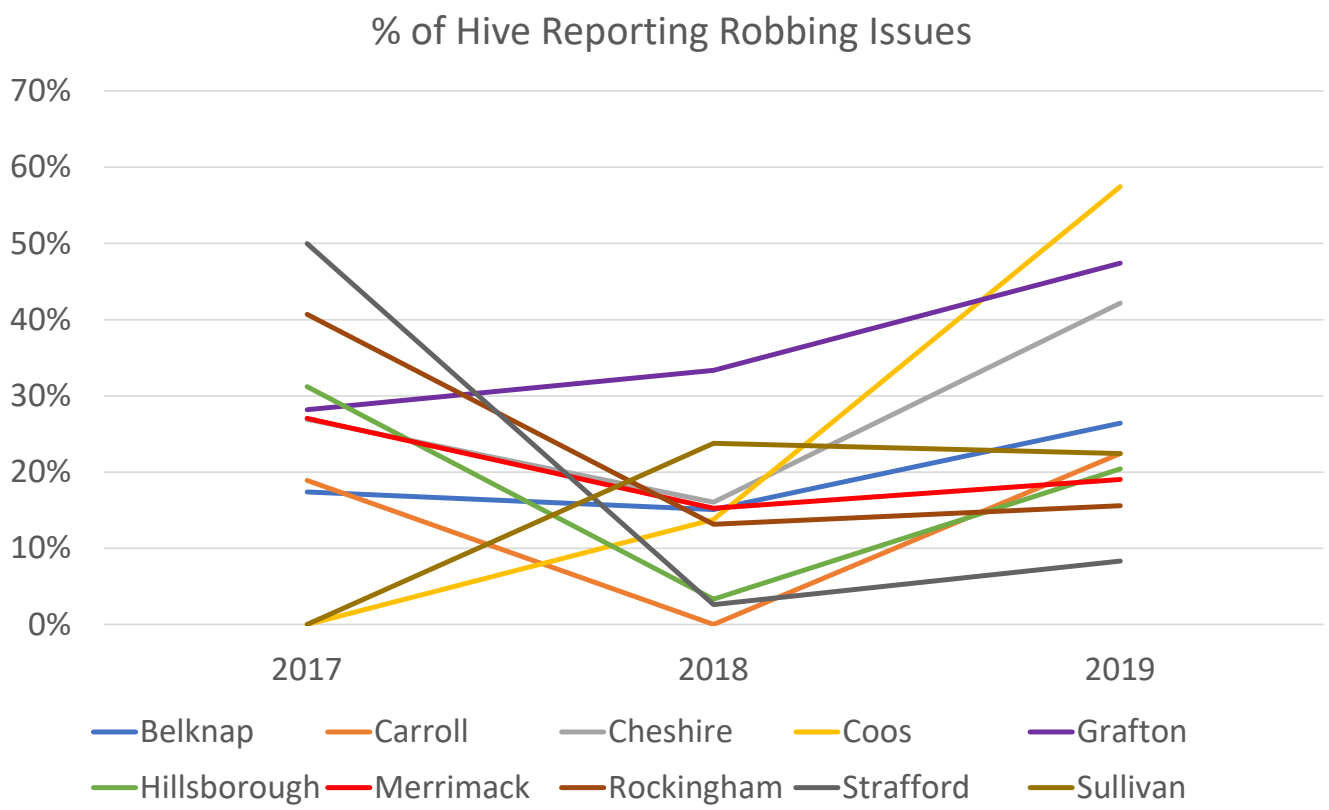
% of Colonies Fed in Winter By County





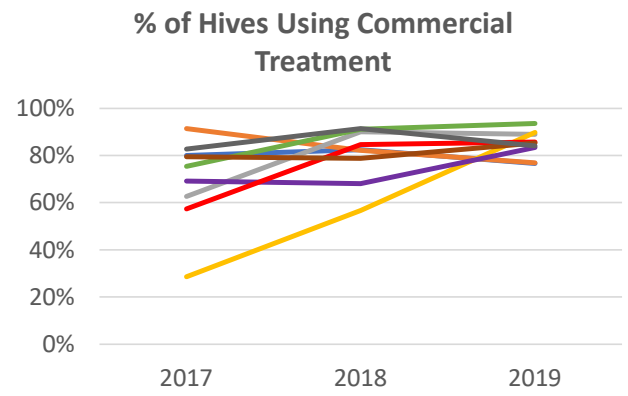


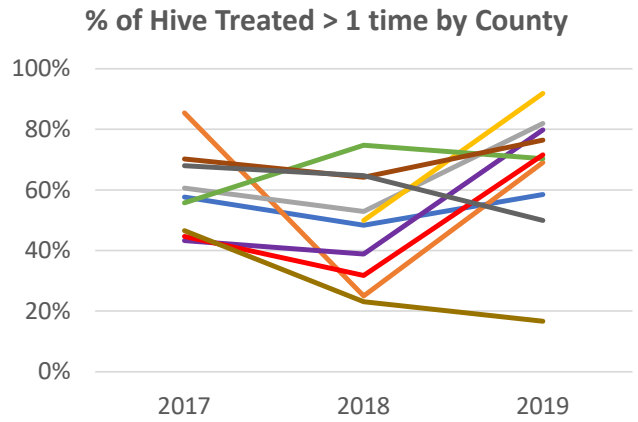
Robbing – All Counties

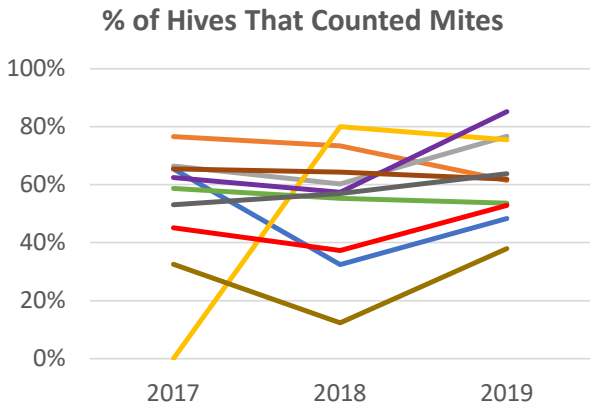


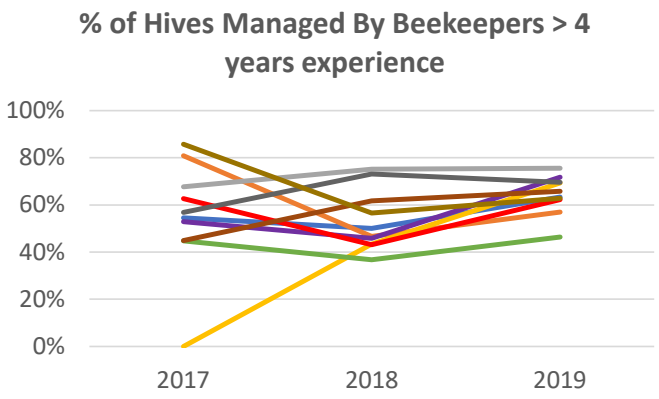
Most counties saw an increase
In robbing in 2019

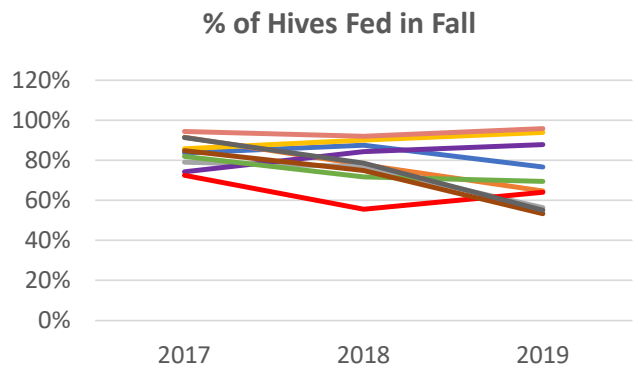
Management Trends by County – What do you Notice?

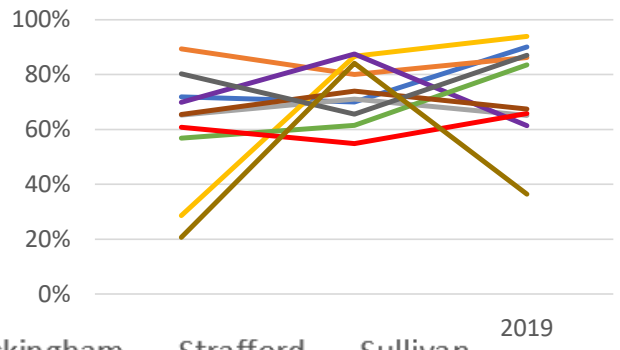












2019-20 Survey Executive Summary

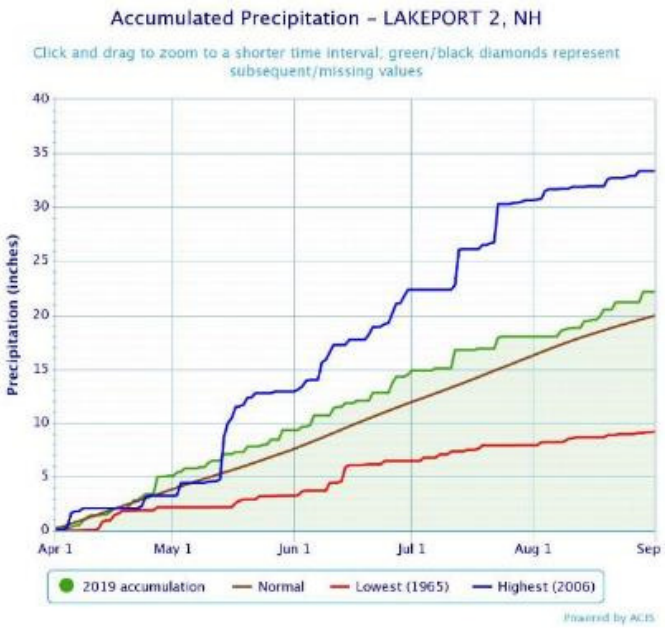
- **2019-20 Winter Survival is the best we've seen since doing the survey : 65% (35% loss)**
  - 75% of respondents have between 1-10 hives.
- Survey covered the period from Oct 1, 2019-Mar 31, 2020
- 6% increase in the number Hives & NUCs over last year.
- Queen Issues were in the top 5 reasons for loss for the first time
- Notable management practices changes
  - ¾ of apiaries used commercial varroa treatment at least 1 time
  - More varroa mite testing being done
  - More Apiaries (62%) treated for varroa mites multiple times
  - Increasing number of comments/notes about hives being in a building for the winter
  - Less fall feeding done in 2019
- County Level Analysis Gives insights into some interesting trends.

Additional Information

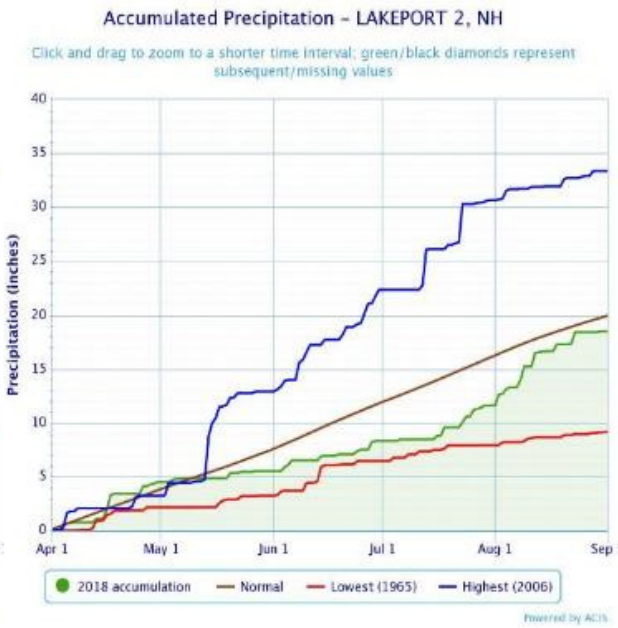
Notes

- Hive & NUC Loss per month – If there was more than 1 month listed, I assume that the hives/NUCs were lost equally across the months.. Ex: If 2 hives were lost & 2 months were listed, I applied 1 hive loss in month1 and 1 hive loss in month 2
- For “survival by Type” graphs, I only used the data for apiaries with 1 race of bees, because I had no way to know the split of which hives survived and which died when there were multiple races reported in a given apiary.
- For “survival by treatment type” graphs, I only used the data for apiaries that used 1 type of commercial treatment because I had no way to know the split of what products were used on which surviving hives in a given apiary

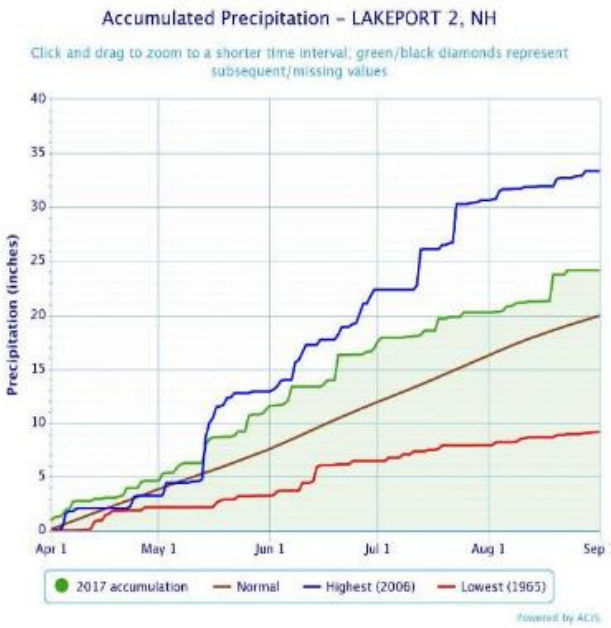
Precipitation (Laconia area)



2019 – slightly wetter than normal



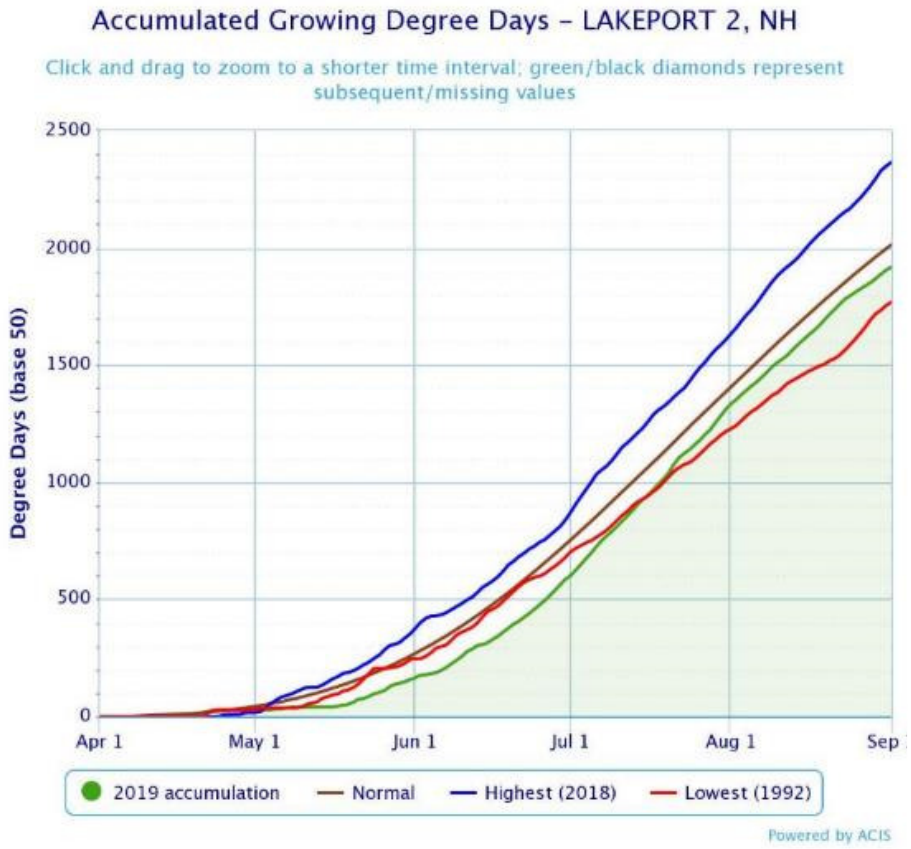
2018 – dryer than normal



2017 – much wetter than normal

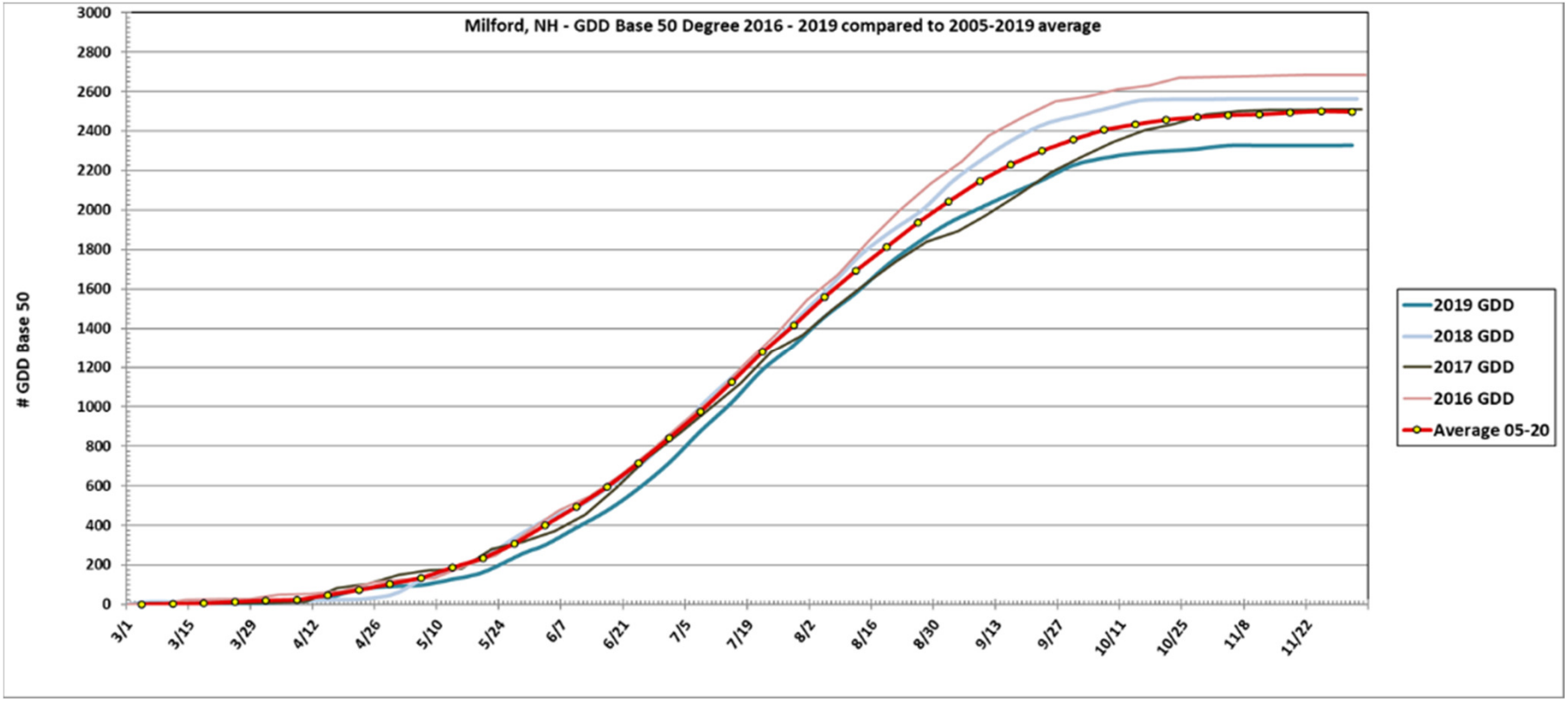
Source :NOAA

Growing Degree days – 2018 vs 2019 (Laconia area)



Source :NOAA, GDD base 50

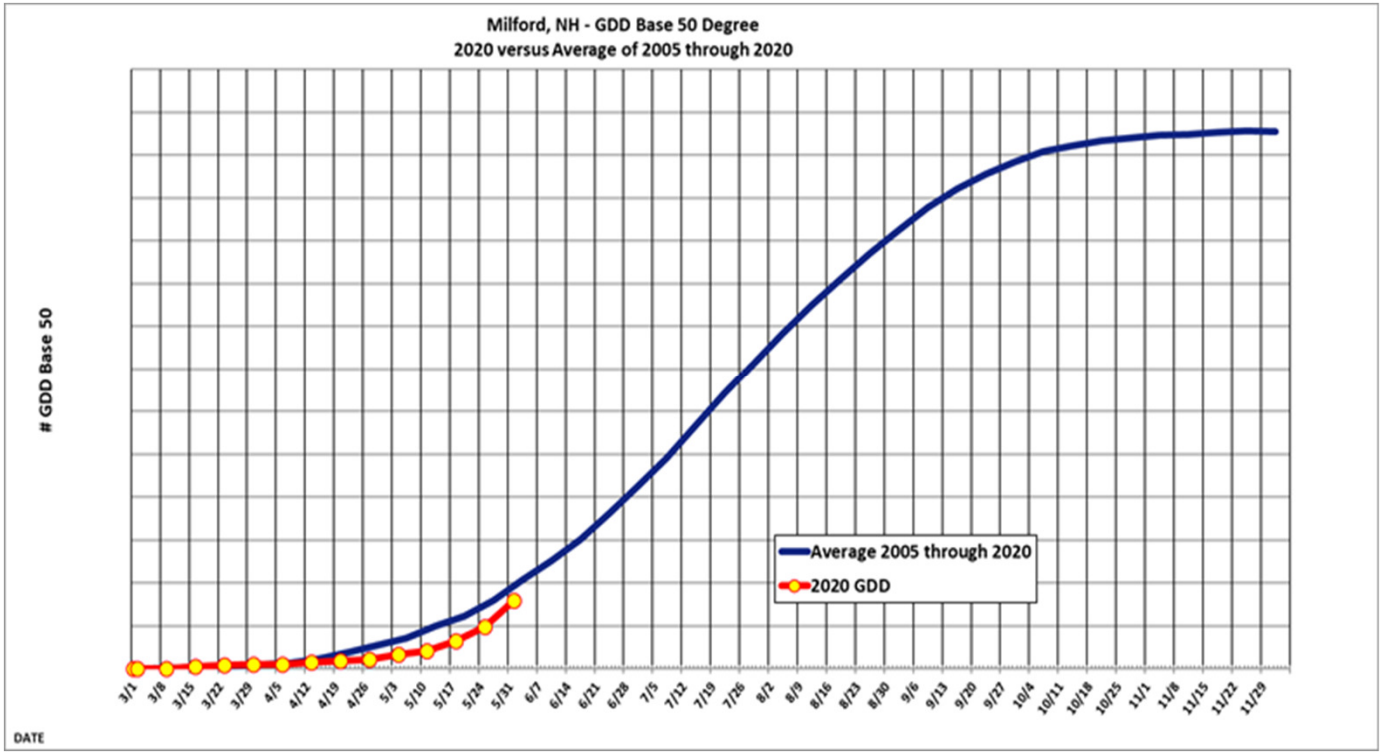
Growing Degree days – 2016-2019(Milford area)



Source :George Hamilton, UNH Coop Extension

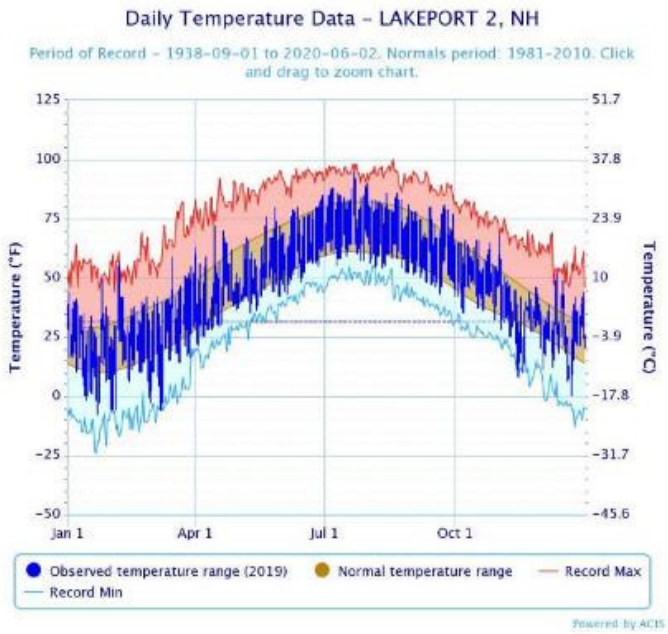
Interesting that 2019 was so much lower than the average of other years

Growing Degree days – 2020(Milford area)

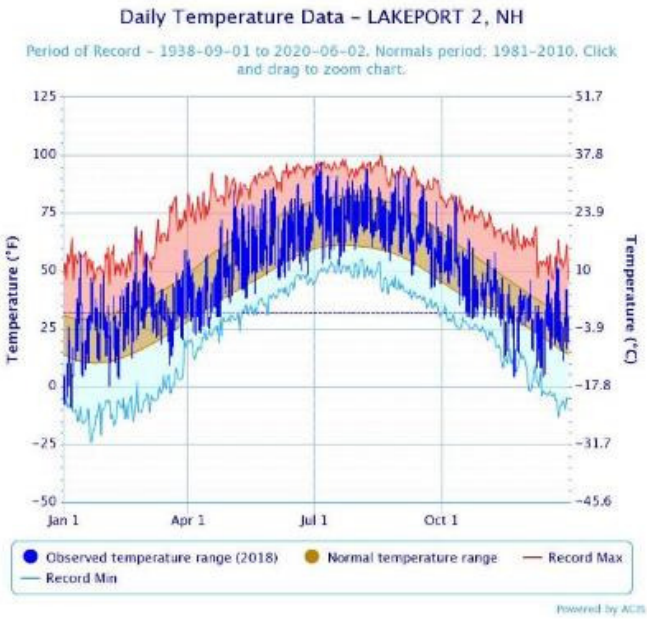


Source :George Hamilton, UNH Coop Extension

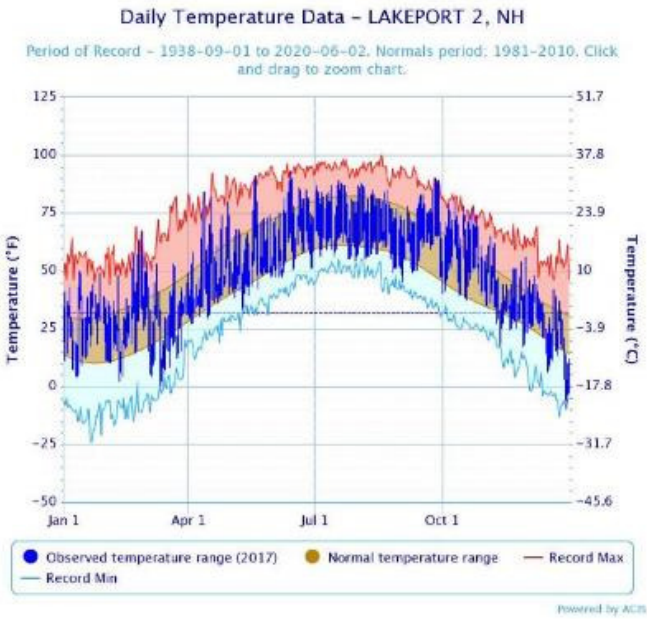
Temp (Laconia area)



2019



2018



2017

Source :NOAA