JACOB STEVENS

NSWAA STATE CONFERENCE MAY 2021

INTRODUCTION

- May 2019-June 2019
- 4 Weeks
- 30 Aussie Beekeepers
- From QLD, NSW, SA and VIC
- Covered 11 States
- 20 Beekeeping Operations

US BEEKEEPERS

Beekeeper Guides- well respected US Beekeepers- Dave Mendes and Dave Hackenberg

BEEKEEPERS VISITED

- Adee Honey Farms
- Agrisotre Cold Storage
- Browning Honey Bee
- Miller Honey Farm
- Jackie Park Burris Queens
- Stayers Queens
- Hiekiems'Honey
- Sunburg Apiaries
- Mannlake Beekeeping Supplies
- Olivarez Honey Bee
- CF Koenen and Son
- Rufers Apiaries Inc.
- Ruby's Honey and Pollination
- Minnesota Bee Lab
- Hackenberg's
- Munroe (Canada)
- Parkers (Canada)

US PRODUCTION SYSTEM

- Large scale up to 80,000 hives, many 20,000-40,000
- Based on significant supplementary feeding
- Tracheal and Varroa mites has changed management significantly
- Generally migratory for pollination- Bees are moved long distances by truck drivers and not beekeepers
- Very few tree species produce honey- ground cover and shrubs are relied on for honey production
- In the northern states where the majority of honey is produced the snow melt provides moisture for the summer honey crops and breeding conditions

US PRODUCTION SYSTEM CONT.

The focus of the Commercial Industry is:

1. Pollination
2. Bees- Sale of Hives, Bulk bees and Queens
3. Honey Production

Some operators went so far as to say that

producing honey was a nuisance

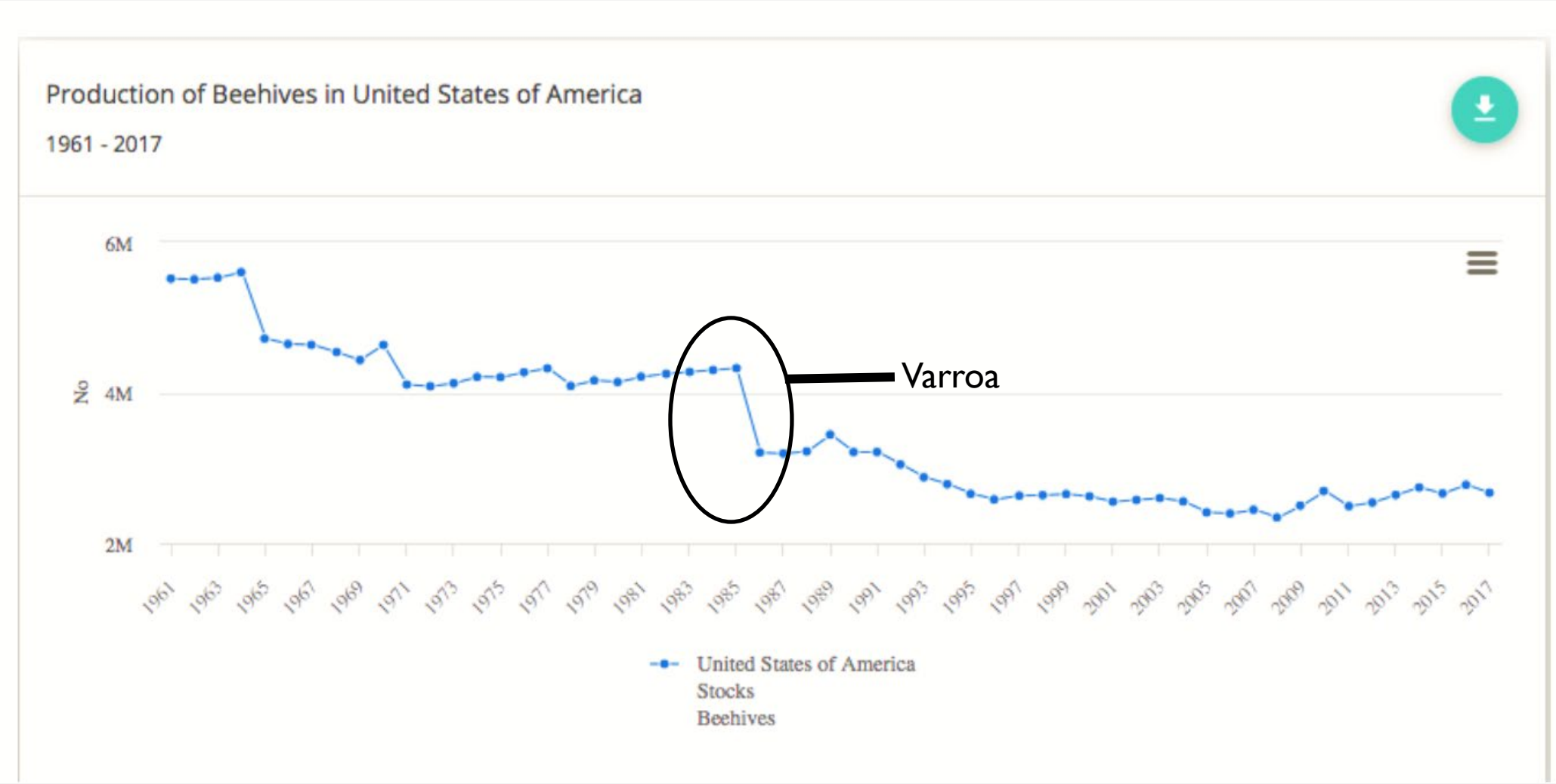
US HONEYBEE MIGRATION

Source: https://beehealth.bayer.us/learn-about-pollinator-health/pollinators-and-the-food-supply/apiculture-in-transition

US PRODUCTION SYSTEM- CHANGES OVER TIME

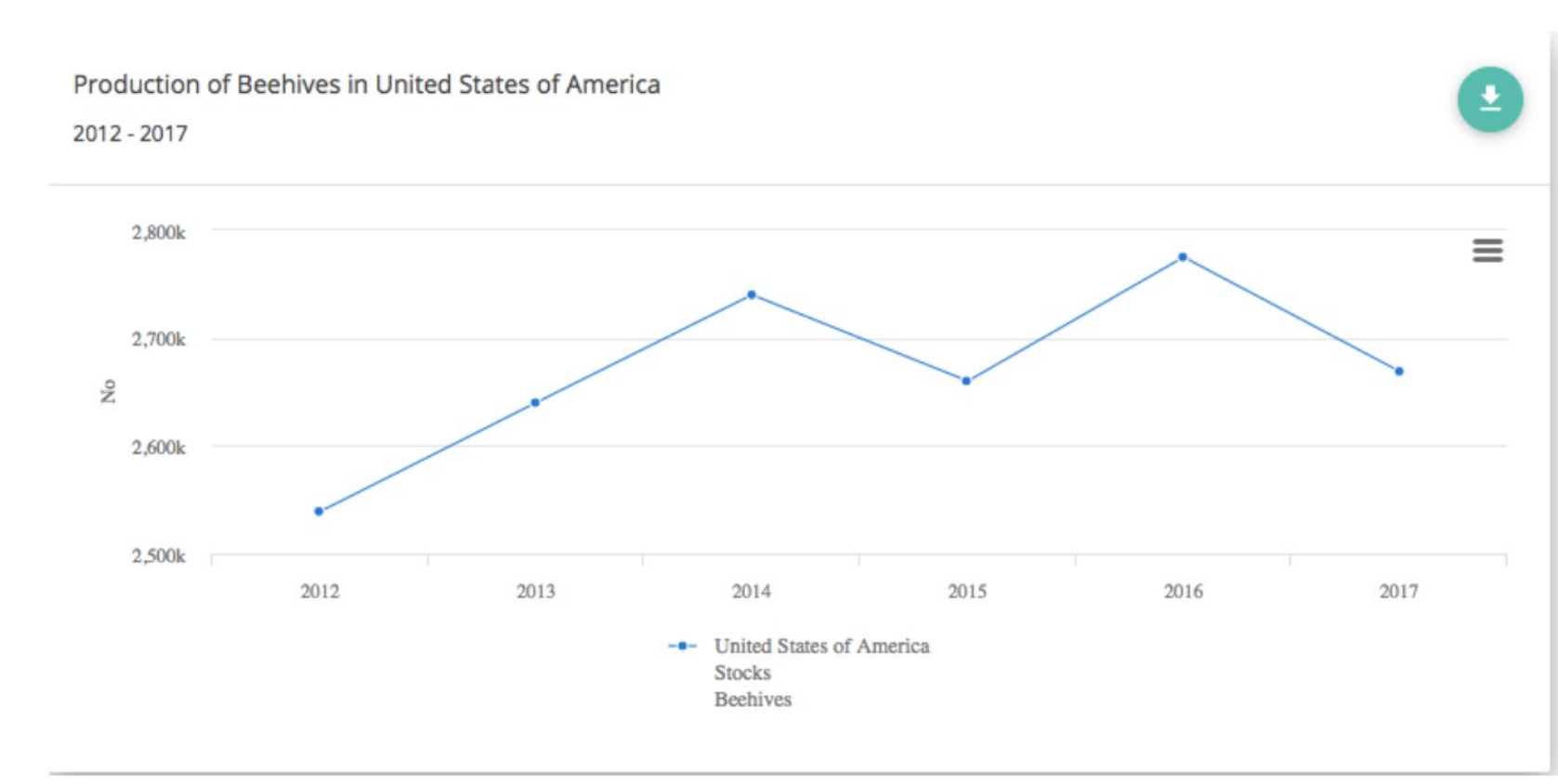
- There has been significant growth in pollination dependent industries, particularly Almonds
- The establishment of Varroa since its first detection in 1987
- The change in land use and the intensification of Agriculture
- The change and increased chemicals that are harmful to bees

US HIVE NUMBERS 1961- 2017



Source: https://adventuresinbeeland.com/2019/01/14/how-many-honey-bees-are-there-a-2019-update/

US HIVE NUMBERS 2012-2017



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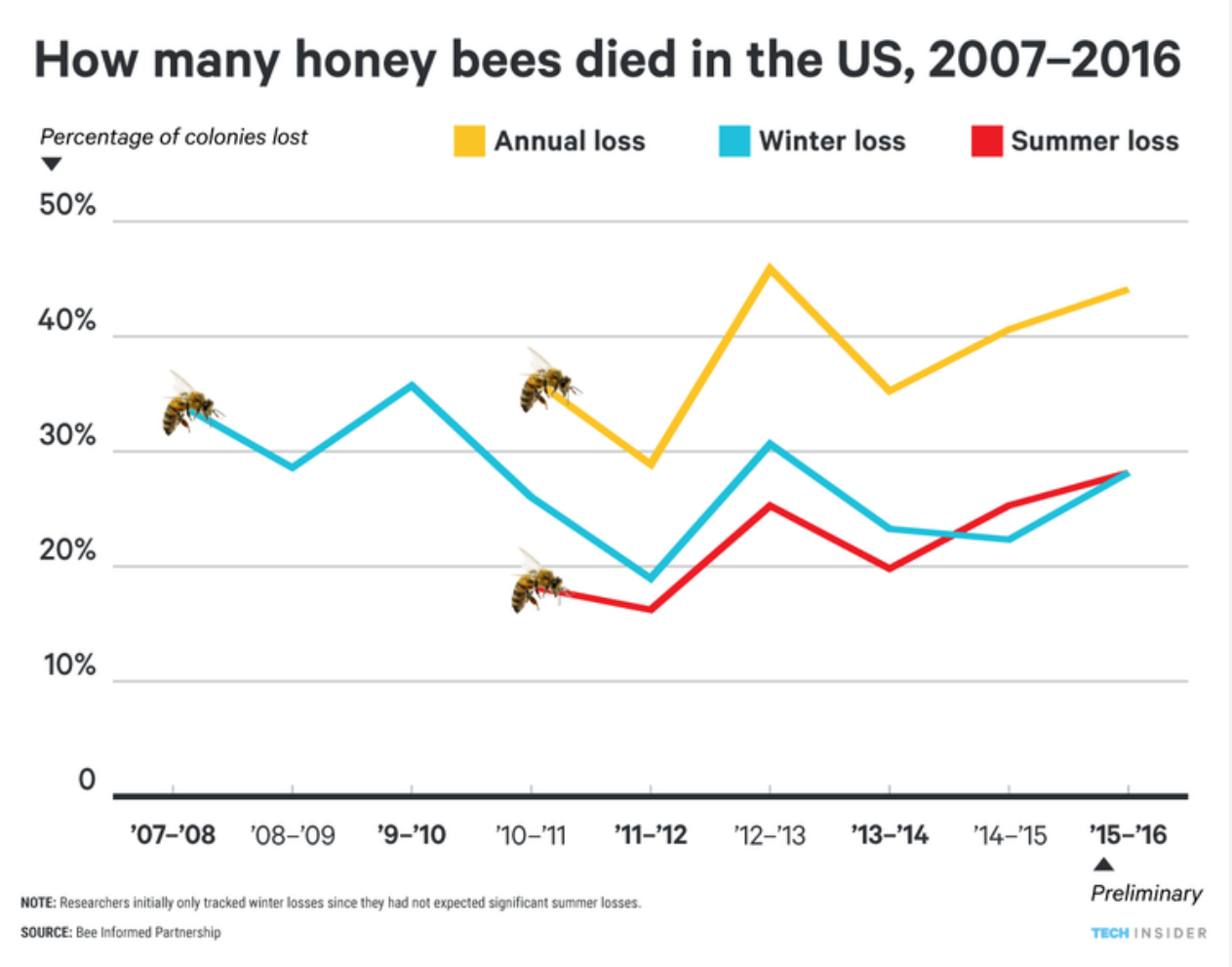
ANNUAL HIVE LOSSES 2017-2016



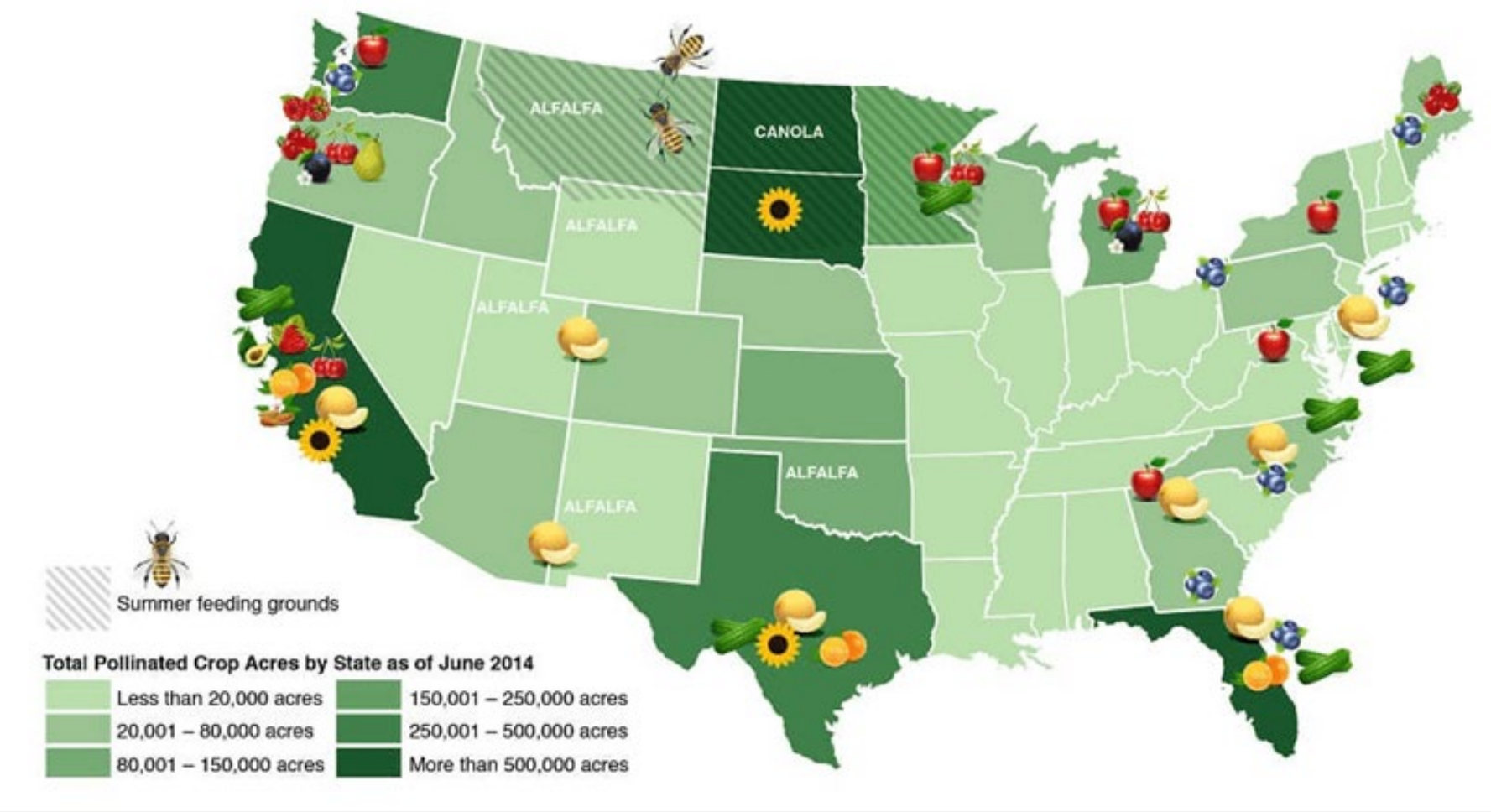
Source: Bee Informed Partnership

POLLINATION

- Pollination was for most large operations there top source of income
- Almonds by far the biggest between 1.6 - 2 million hives in California
- Other Crops Include- sunflowers, canola, grapes, apples, sweet cherries, watermelons, stone fruits, cultivated blueberries and avocados
- These Crops account for 96 percent of all U.S. pollination fees
- Bees are drawn into California from every corner of the country and can spend up to 4 days on a truck



US HONEYBEE POLLINATED CROPS



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QUEEN BREEDING

- Large scale commercial Queen Breeding is focused in California there are early queens produced in Texas and other areas in the south east
- Mini mating nucs of different variances are used- many are made up with bees, comb and sugar inside sheds before being placed out in the fields
- Artificial stimulation of some description is widely used with most nucs having in built feeders
- Several Californian Queen breeders have in excess of 50,000 mini nucs
- Every hive may not be re-queened each yeah in commercial operation
- Drone management is vital to ensure proper mating- large amount of drone comb in support hives or even moving bees in and out of the queen breeding areas from better breeding conditions



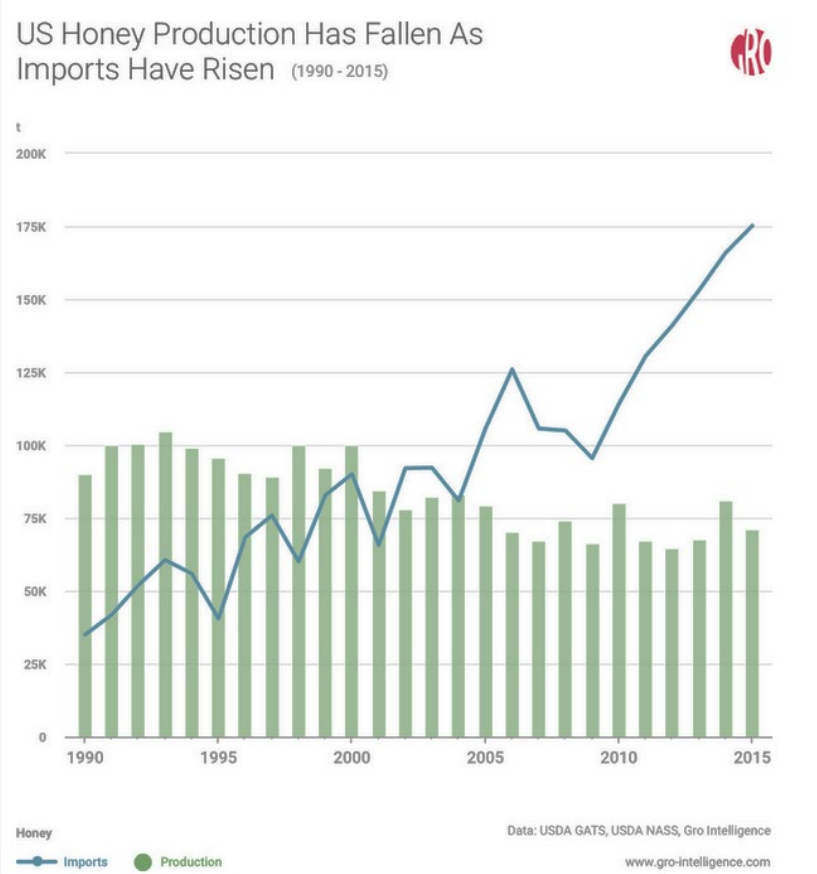

HONEY PRODUCTION

- Honey production is generally limited to the spring and summer
- Generally one honey crop is produced, bees are supered up and all honey removed at once
- Pre the 1990's crops of up to 200lbs with averages exceeding 100lbs but common modern averages are reported to 40 lbs
- Common for average yields to have decreased by 50%
- It did seem that the larger the operation the lower yield per hive
- There has been a big change in agricultural land use that has had a significant impact on honey production

HONEY PRODUCTION CONT.

US HONEY PRODUCTION AND IMPORTS

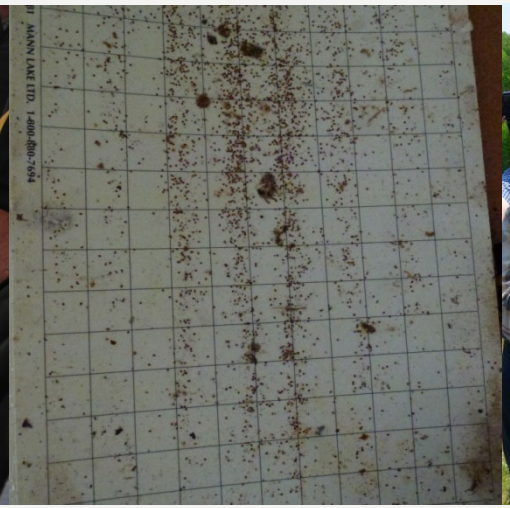
- The US used to produce a great deal more honey then they imported now they import twice as much as they produce



Source: https://gro-intelligence.com/insights/articles/us-honey-production

VARROA - IDENTIFYING

- Alcohol Washes were by far the most preferred method of detecting mites-
  - Around the world they are considered to be the most sensitive way of detecting mites and mite loads
- An ‘ether roll’ where by bees where killed with ethanol spray and mites become dislodged and stick to the jar was a quick management tool
  - this was often followed by an alcohol wash if a certain number of mites are found
- Sugar shakes were not considered to be as consistent
  - They were conducted differently to what they are here in Australia
  - They were considered to be the easiest to be done incorrectly,
- It is very important to get accurate results for determining treatment levels
- Drone Uncapping was another useful quick tool that if mites were considered to be high were followed by alcohol washes
- When treatments were conducted the uses of sticky mats was very important to check the efficiency of the chemical as there has been significant resistance reported to may chemicals



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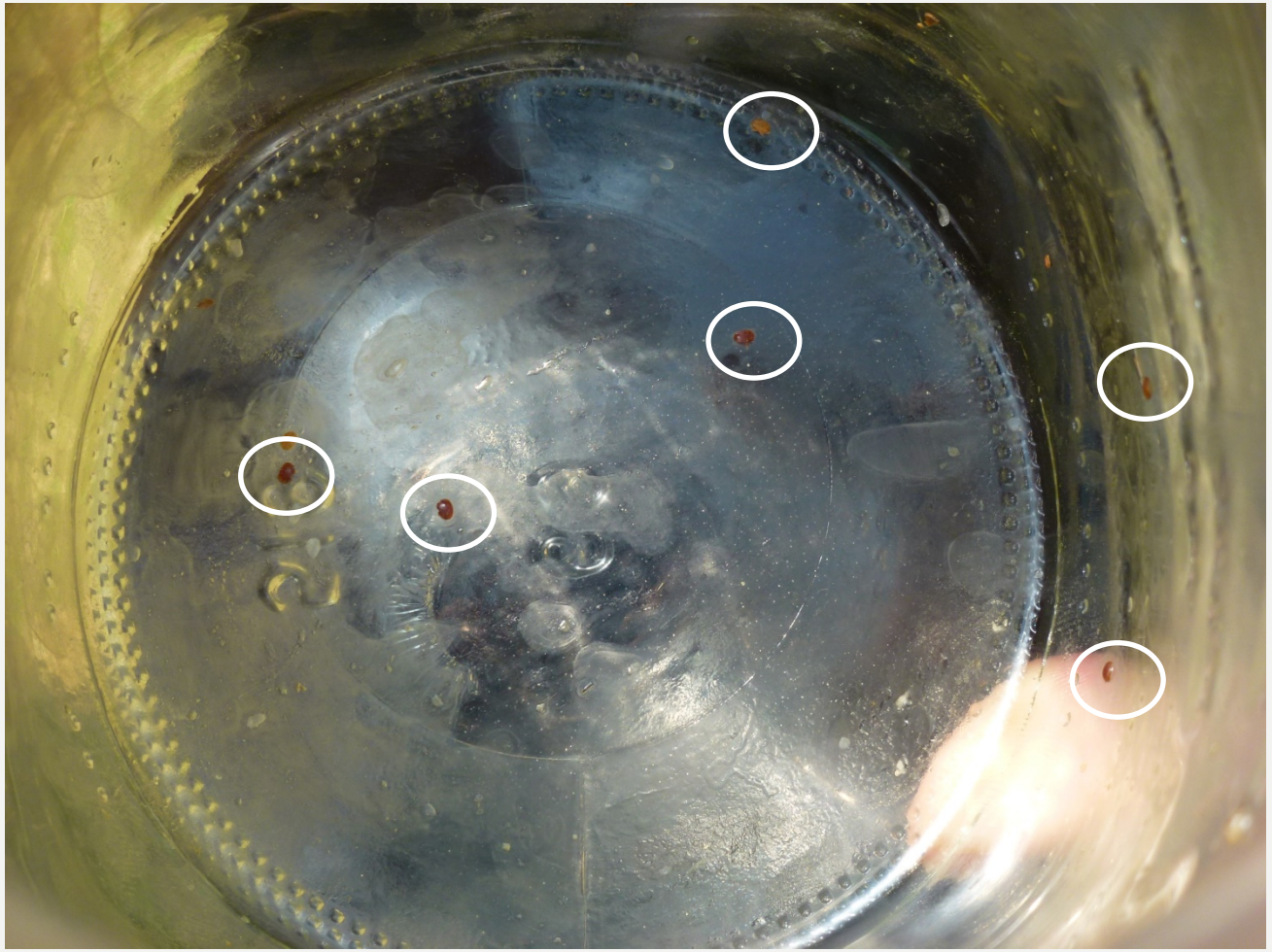

VARROA - MITE LOADS

- In Early Spring 1-2 mites per hundred is acceptable any higher would be a concern
- End of Summer 3 Mites per hundred is considered high because as the Queens slows down the mite load continues to increase and the bees will begin to struggle
- You really only see 1 in 20 mites with the naked eye - Quite often they can be under the folds in the abdomen and hard to see
- Testing 5% often for varroa is better than 20% occasionally
- 9 mite per 100 the bees will often be too difficult to save- often due to the increased viral load

VARROA- TREATMENT

- 3 mites per 100 was a trigger for treatment across most of the beekeepers visited
- There are very limited options for treating hives during honey production
  - the aim was to have very low mite loads starting honey production and then to remove honey a treat immediately
- Varroa has built resistance to many commercial available products
- Chemicals based on **Amitraz** were widely being relied on at the time
- **Thymol** was widely used in different forms
- Beekeepers were experimenting and trial new products all the time to try and best manage there treatment

VARROA-MANAGEMENT

- Long-term management- Genetics- VSH- Varroa Sensitive Hygiene
- Having the bees recognise the specific pheromone that is produced when the larvae are under stress,
- The aim would be for the bees to keep the mite load under 2% (2 mites per 100 bees) all of the time then they should be able to deal with it
- Cold storage again before honey production
- IPM- Integrated Pest Management-

  Chemical, Breeding, Hive Management

COLD STORAGE

- Cold Storage Facilities are increasing in popularity- Older Buildings where traditionally potatoes cellars- some more recent concerns have been raised about chemicals
- Mainly in the Northern States- "cold climates" which increase efficiency
- In many places in the north the conditions inside the shed is better than those outside
- Bees are stored inside for up to 2 months
  - during to the coldest months
  - then are trucked out to California and fed for a few weeks before almonds
- Capacities of the facilities visited ranged from 5,000 to 40,000 with a 90,000 hive facility in Bakersfield and plans to build facilities up to 100,000 hive capacity
- Recent Social Media video- Tom and Zac Browning- was a facility we visited



LEARNINGS

Key Learnings

- Sugar Shake vs Alcohol Wash
- Genetic Selection and Breeding-VSH

Questions

- Change in Bees Foraging Behaviour
- Genetic Diversity
- Antibiotic Usage

CLOSING QUOTES

Daryl Rufer

"3 types of Beekeepers in the USA

- Ones that manage bees well and don't have issues
- Ones that mange bees well and have occasional issues
- Ones that don't manages well and always have issues 'you could beat them around the head with a stick and they still wouldn't get it"

Zac Brownings

"You could be the best manager of Varroa in the world,

but if you neighbour isn't doing a good job there is no point"

CONCLUSION

- Excellent Learning Opportunities
- Built great relationships with Beekeepers on the trip and in the USA
- See first hand Varroa and Varroa management
- Great opportunity to learn from the Aussie beekeepers on the tour
- Networking has continued in Australia

QUESTIONS