

Mitigation of Bee Exposure to pesticides inside and outside of the hive



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Presentation Outline

Mitigation inside the hive

Corn dust BMP (PMRA)

Historic colony strength in almonds

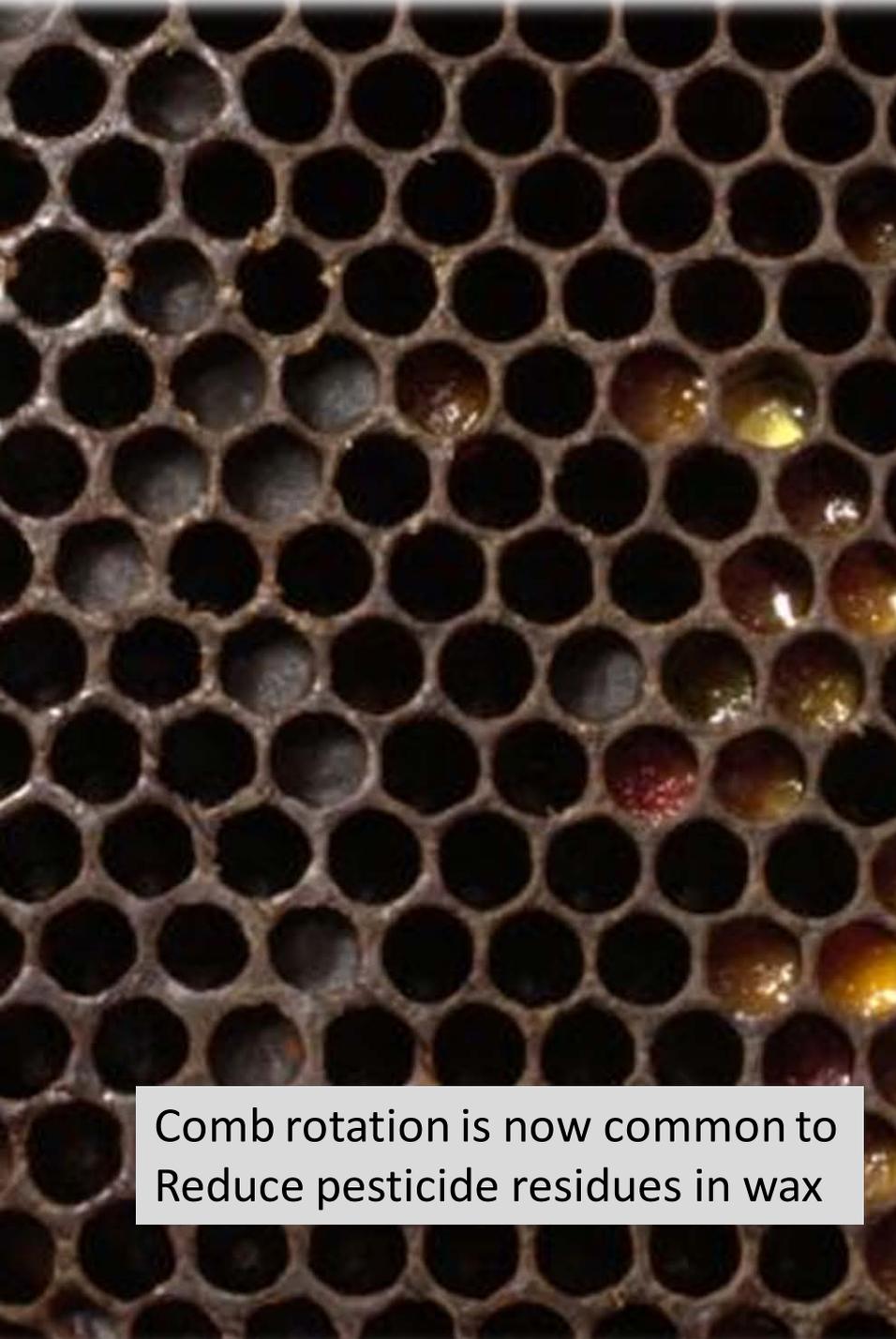
**Areawide program and bees in diverse
and less diverse areas (ND)**

**Current status of bee colonies
in CA almonds this year**









Comb rotation is now common to
Reduce pesticide residues in wax



Background Events



Mitigation Measures

An aerial photograph showing a tractor pulling a large agricultural implement, likely a planter or seeder, across a field. The tractor is moving from the bottom right towards the top left, and a large plume of dust is being kicked up behind it. The implement has multiple rows of planting units. Another tractor and implement are visible in the background, also kicking up dust. The scene is set in a large, open field under bright, warm lighting.

It's getting a little dusty...

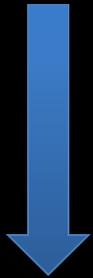
Best Management Practices



It just might be too windy to plant today...

Best Management Practices

Use this



to communicate this



Protect Pollinators





The Bee Informed Platform

*Be included,
Be involved,
Bee informed*

www.beeinformed.org



United States
Department of
Agriculture

National Institute
of Food
and Agriculture







USDA-ARS Areawide Program
USGS Jamestown, ND
Univ. of Minnesota

North Dakota, 6 apiaries (n=24 colonies/ apiary)



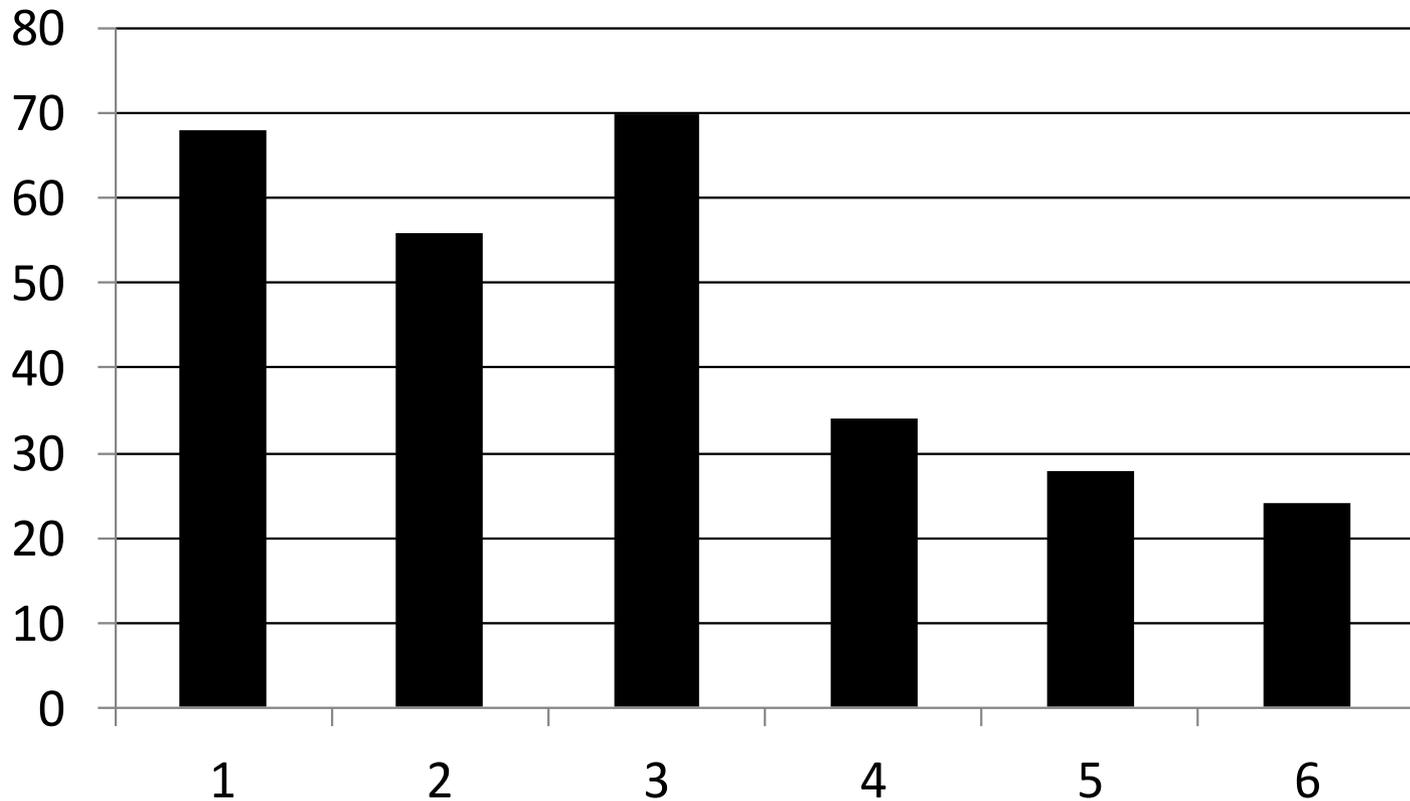


Honey production from 6 apiaries in ND (2009),

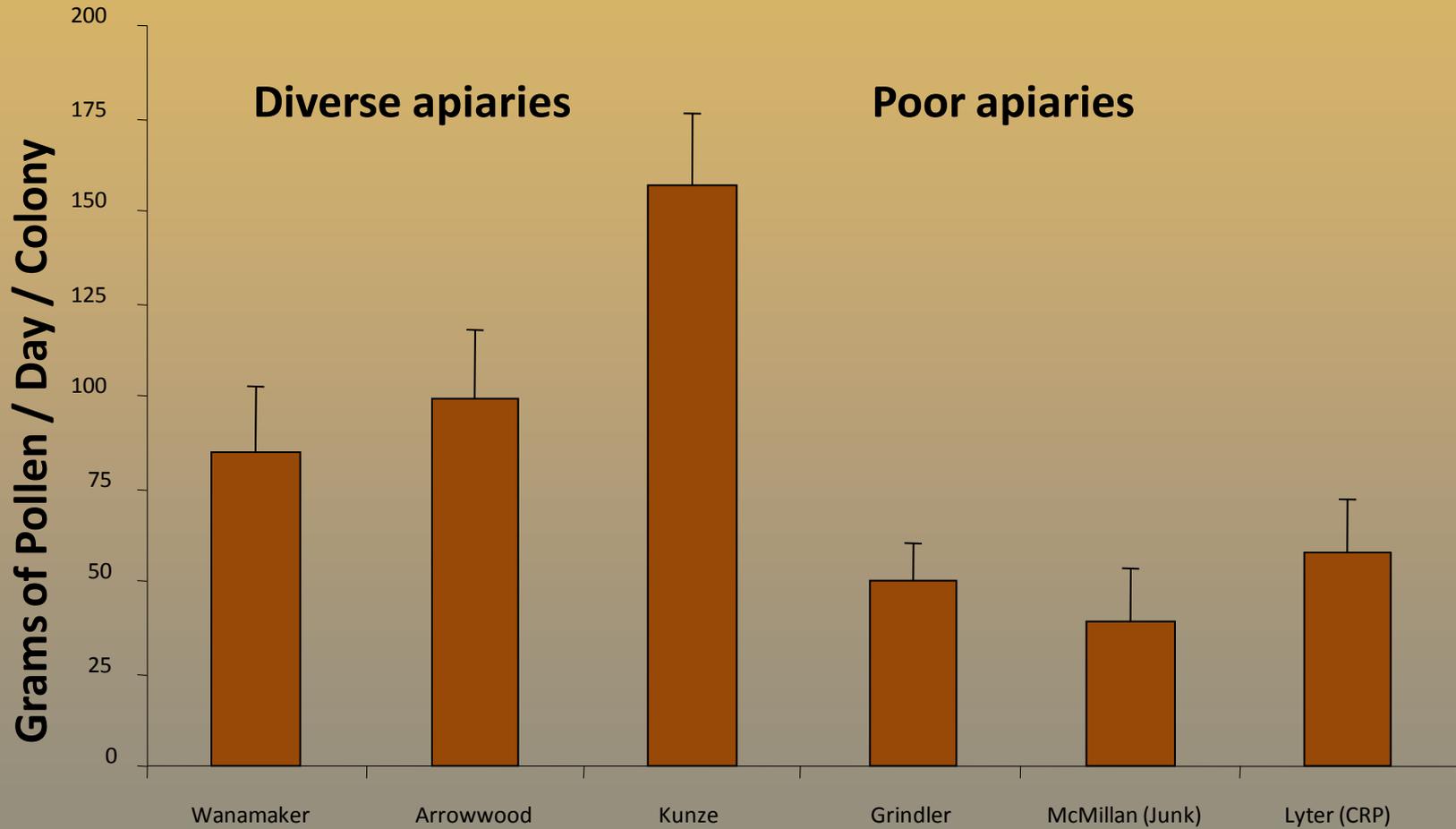
3 low diversity

3 high plant diversity

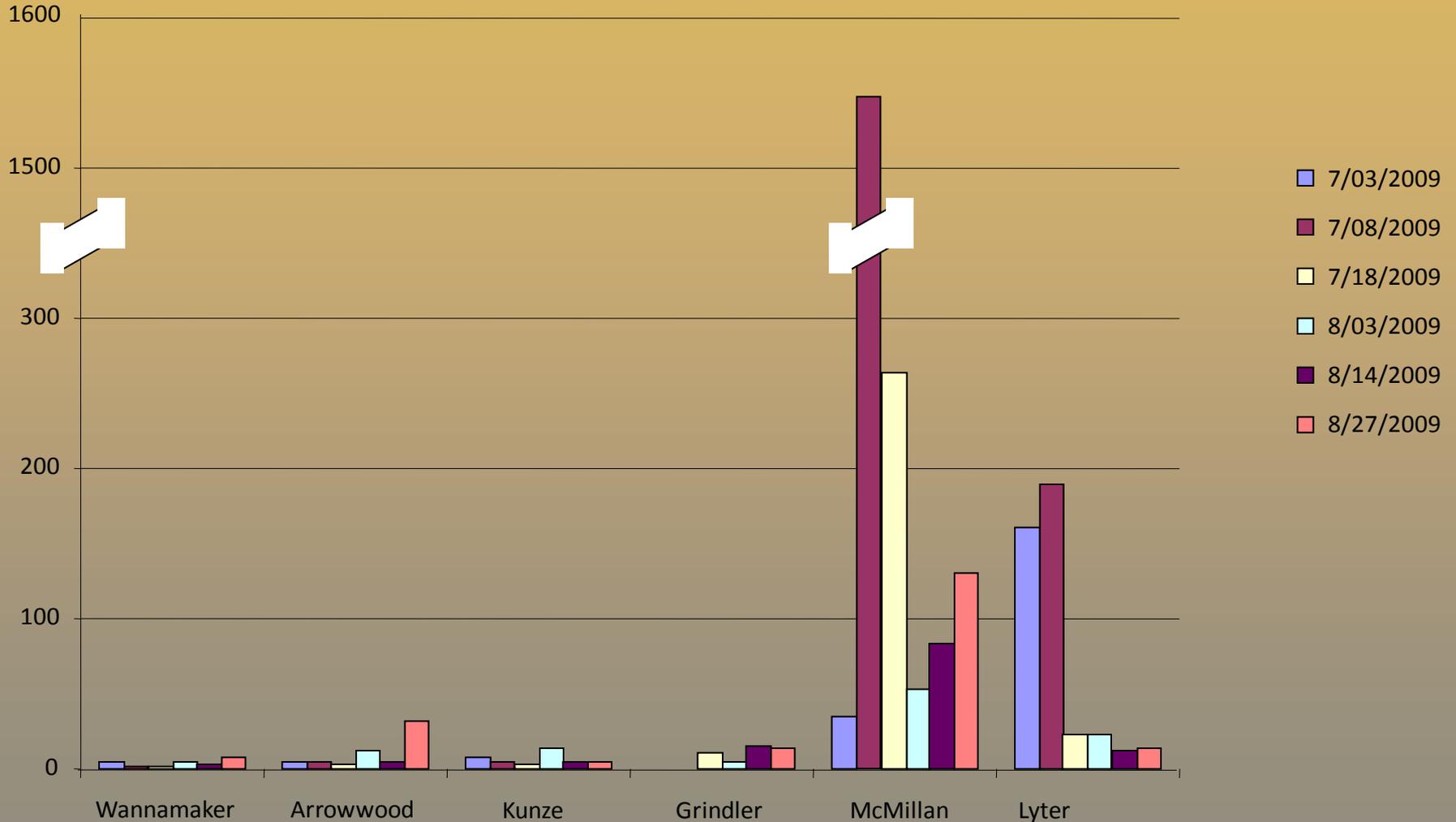
Honey production (lbs/colony)



Pollen Collection in 6 North Dakota Apiaries

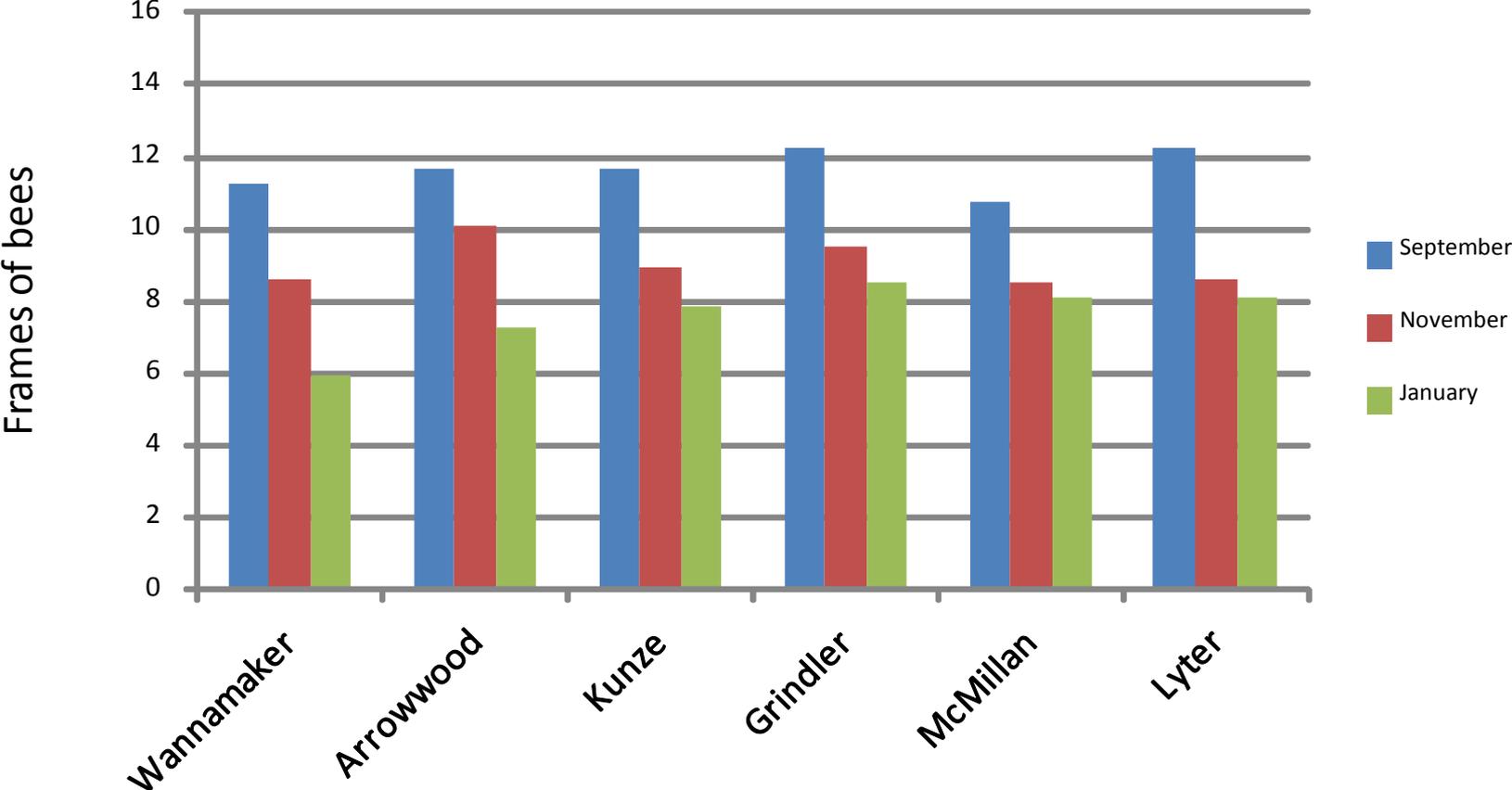


Chlorpyrifos in Collected Pollen (ppb) in North Dakota

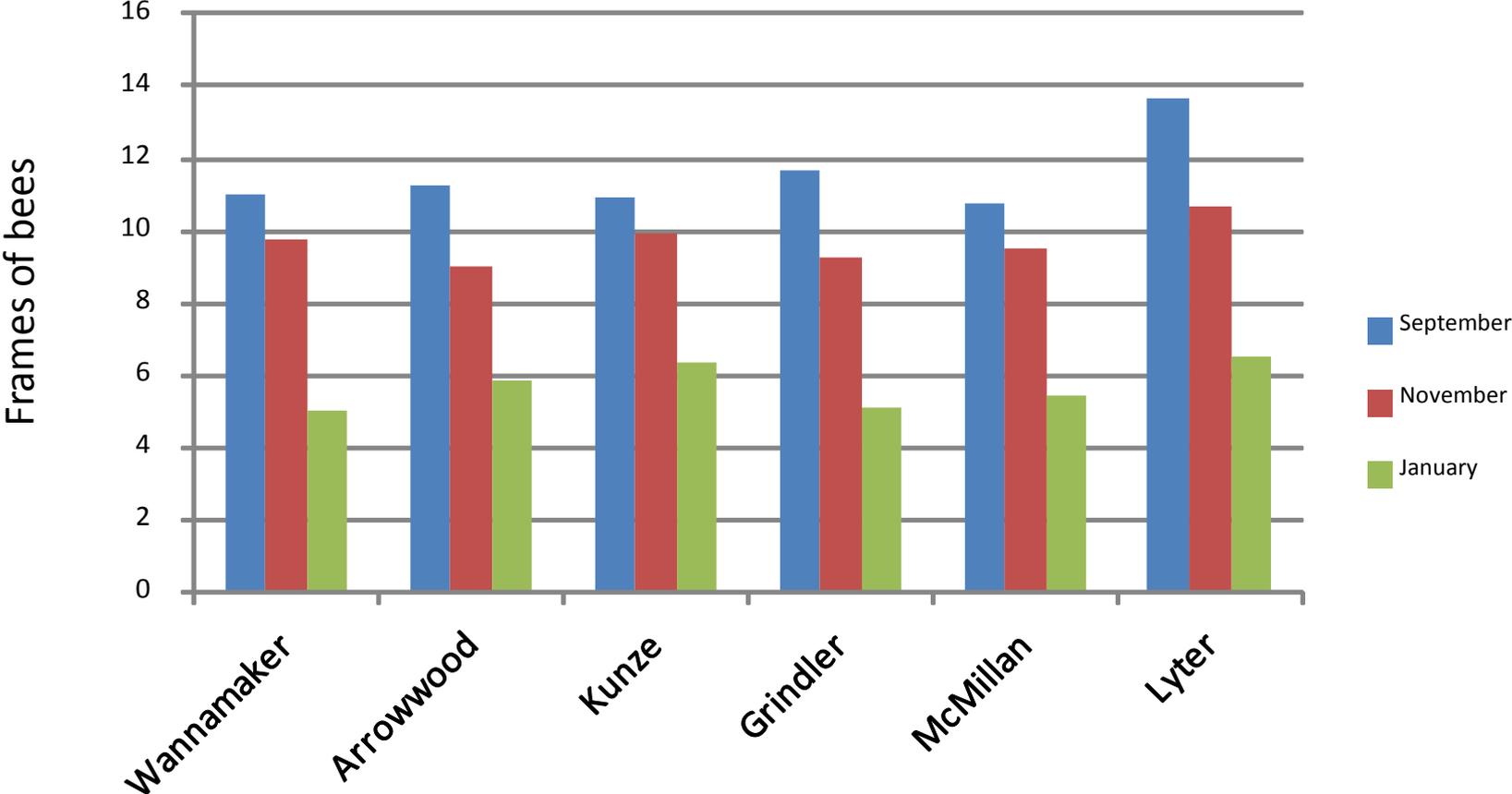




North Dakota Apiaries 2011



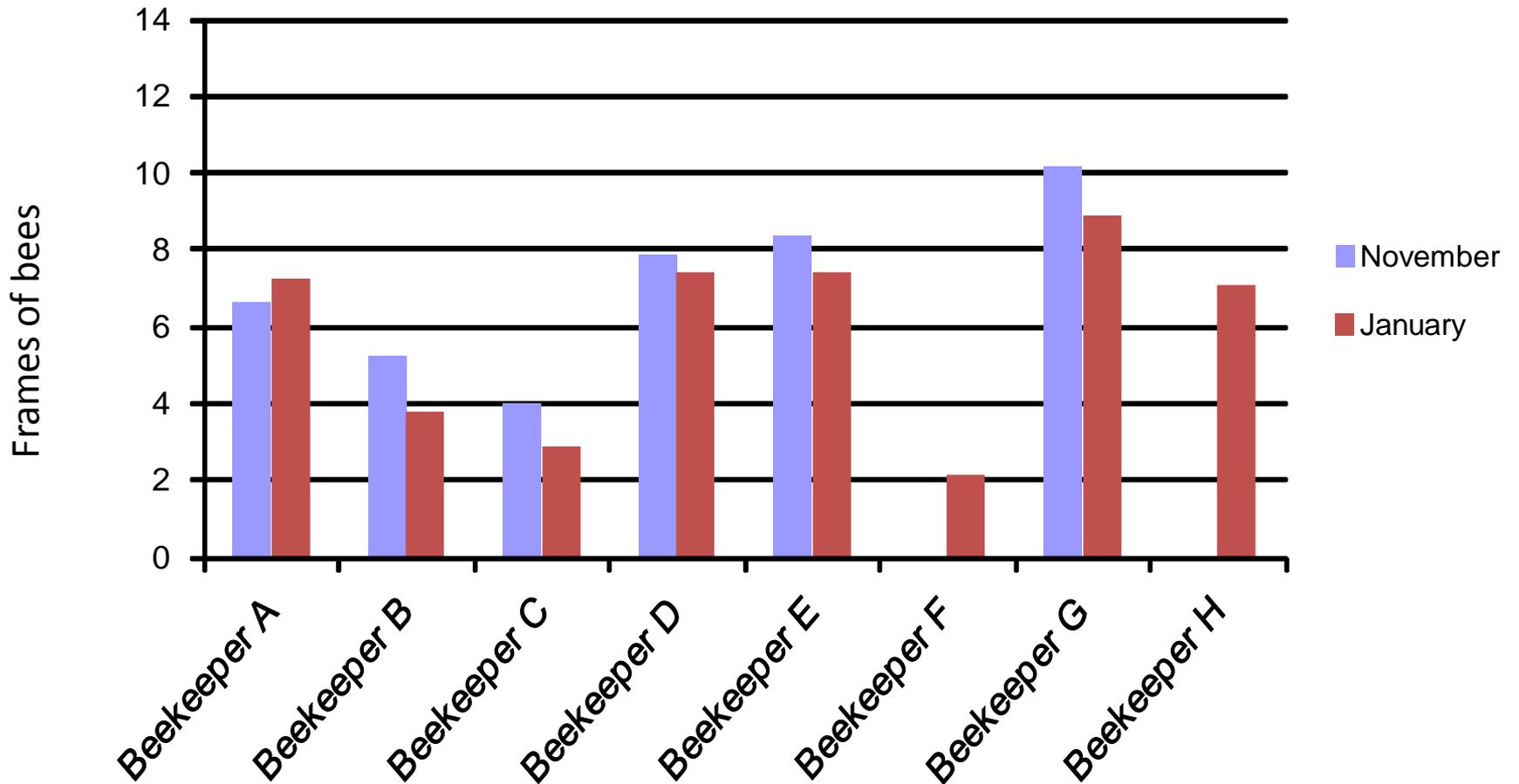
North Dakota Apiaries 2012



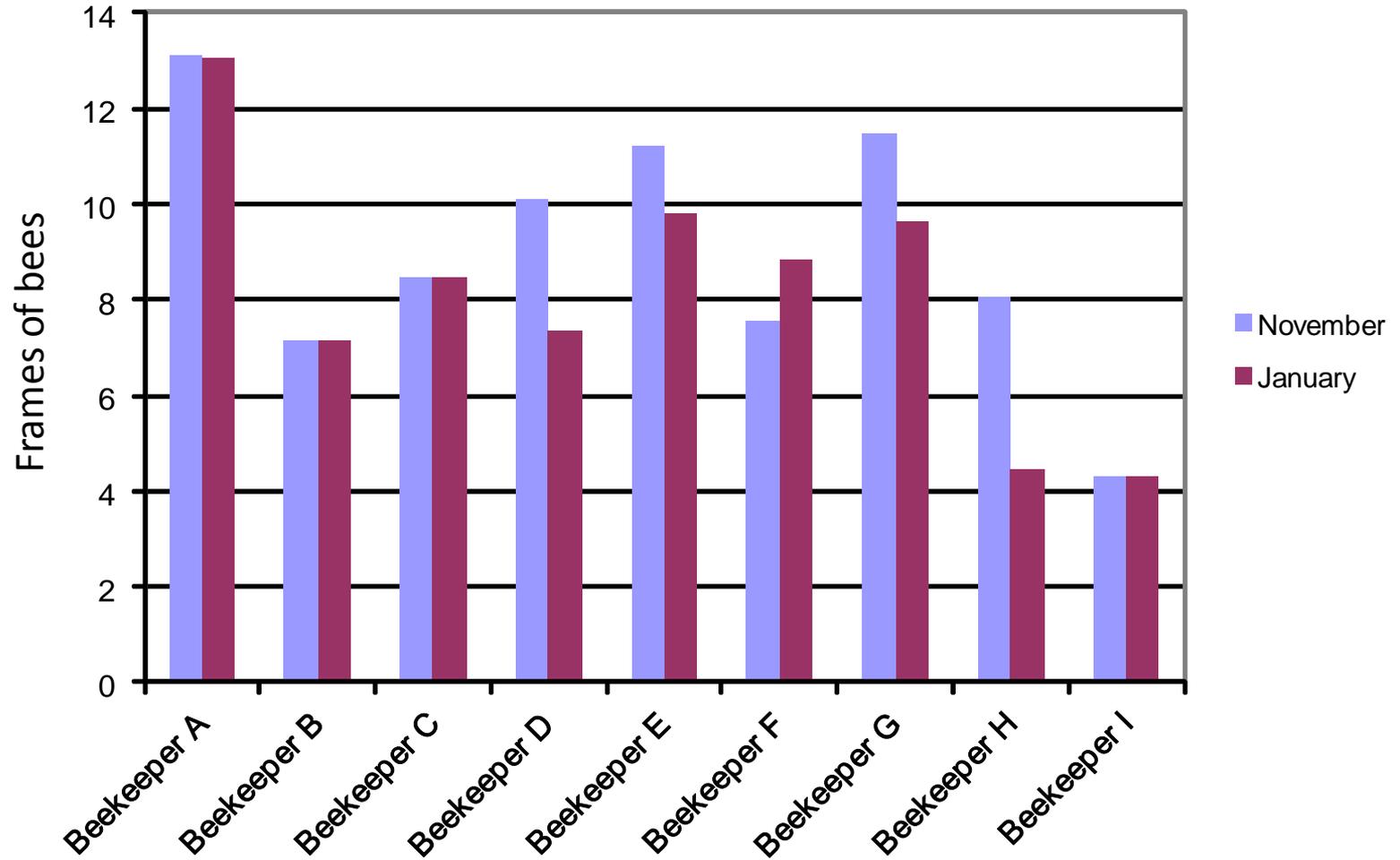
Surveyed 8-10 commercial operations, 20 hives/beekeeper, in Nov. and Jan. in advance of almond bloom over three years



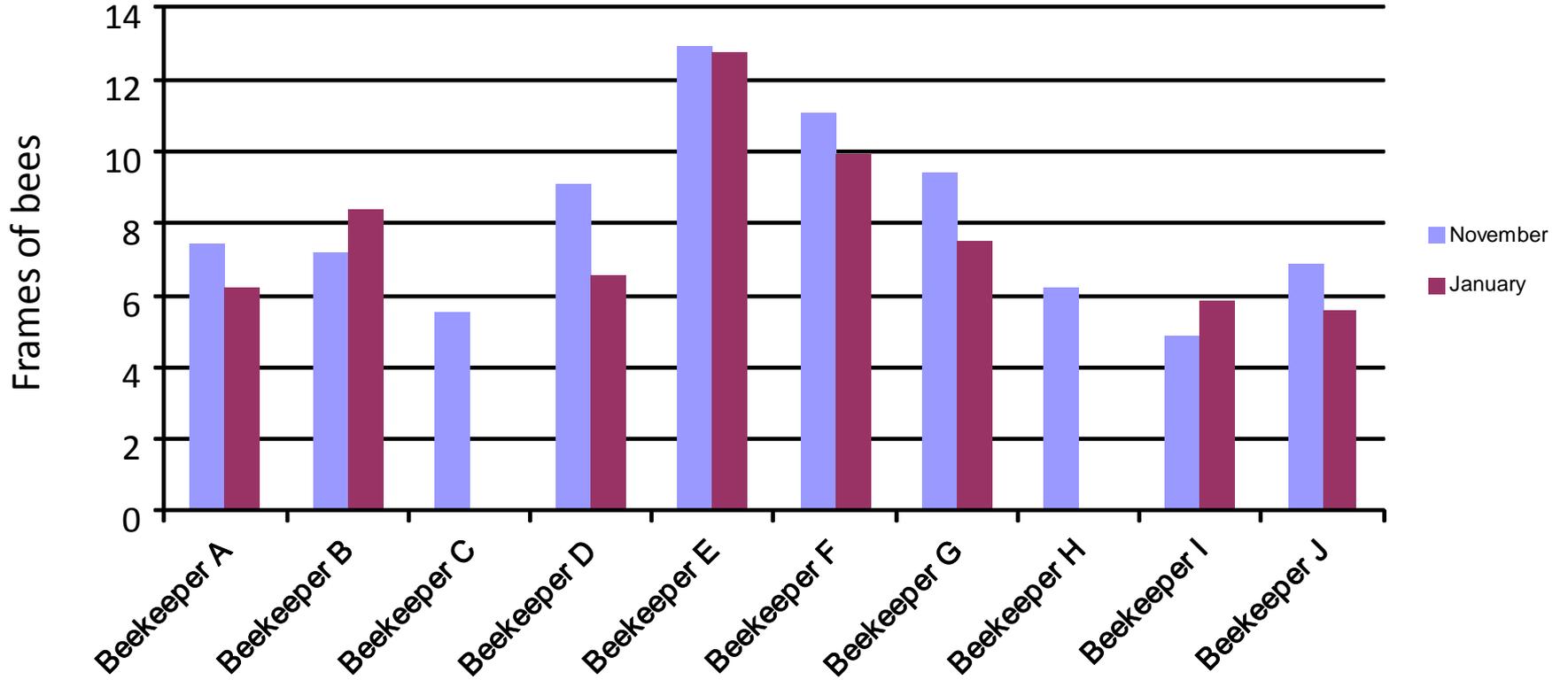
Commercial Beekeeper Survey 2008



Commercial Beekeeper Survey 2009



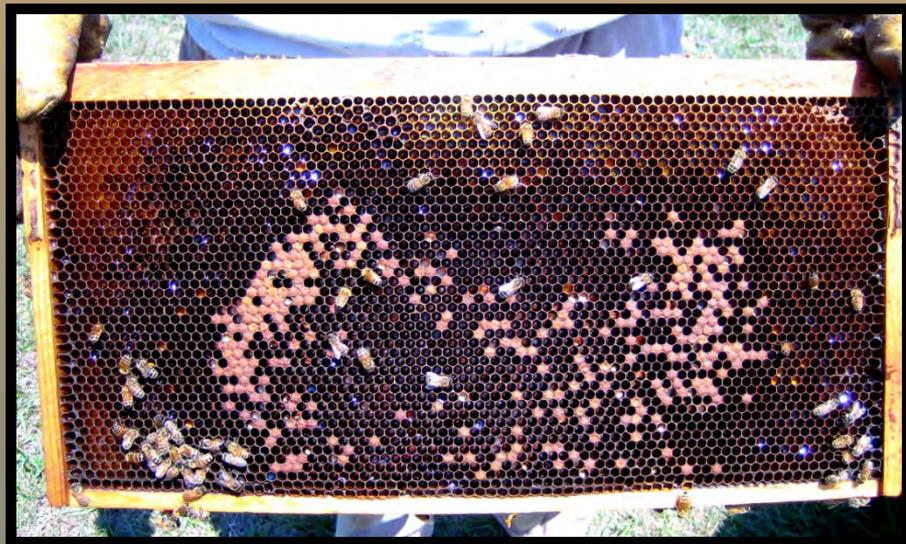
Commercial Beekeeper Survey 2010





Feb. 2013, Sampled and rated 12 colonies
in each of 5 operations, FL, NC, MN, WI, ND,

Florida, Apr. 07

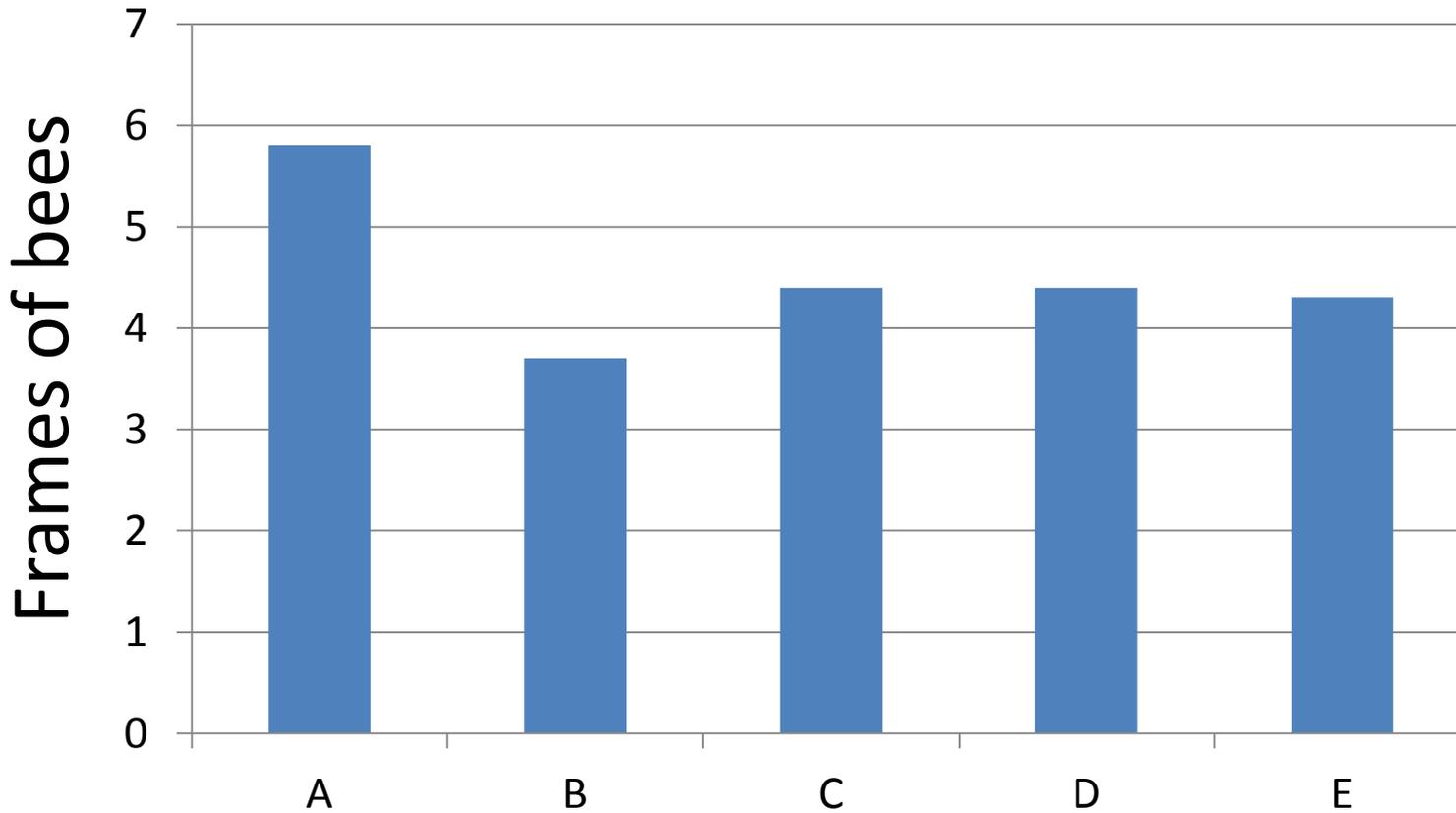


Georgia Mar. 07



Five Commercial Operations in Almonds. Feb 27 2013

Frames of Bees









Average frames of bees
for this group of bees
= about 2

Industry standard = 8







Package Bees



A word cloud featuring various terms related to agriculture, environmental science, and technology. The words are arranged in a dense, overlapping layout. The most prominent words are 'Nosema' and 'nutrition', both in large red font. Other significant words include 'Varroa' in dark red, 'viruses' in olive green, 'pesticides' in orange-red, and 'pathogens' in dark green. Smaller words include 'contrails', 'GMOcrops', 'SmallHiveBeetles', 'transportation', and 'cellphones'. The word 'TheRapture' is written vertically in small black text near 'pathogens'. The background is white with a faint, light blue circular glow behind the central text.

viruses
Varroa
pathogens
pesticides
Nosema
nutrition
contrails
GMOcrops
SmallHiveBeetles
transportation
cellphones
TheRapture

TheRapture
Varroa
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GMOcrops
pesticides

TheRapture SmallHiveBeetles
transportation contrails
pesticides
pathogens
viruses
GMOcrops
nutrition
Nosema
cellphones
pollution
Varroa

nutrition

pesticides

GMOcrops

pathogens

viruses

transportation

Nosema

cellphones

Varroa

contrails

pollution

SmallHiveBeetles

TheRapture





Honey bee colony strength is worst this year than the past 6 years
Good flight weather may prevent pollination failure in almonds

