

Managing Risks in Beekeeping

Understanding the Apiculture Rainfall Index Insurance Program



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Topics

- What is Apiculture Insurance Rainfall Index Insurance (API) and how does it work?
- API use in the U.S.
- Exploring enrollment approaches using the USDA RMA online decision tool for API



Risk Management Agency

U.S. DEPARTMENT OF AGRICULTURE



Apiculture Rainfall Index Insurance

- Crop insurance program offered by USDA Risk Management Agency
 - Available in contiguous U.S. since 2018
- Provides producers with insurance against drought-like conditions which would affect honey production and/or colony health
 - Payments offset increased costs of production or decreased revenues
- 3.7 million colonies enrolled in API in 2025

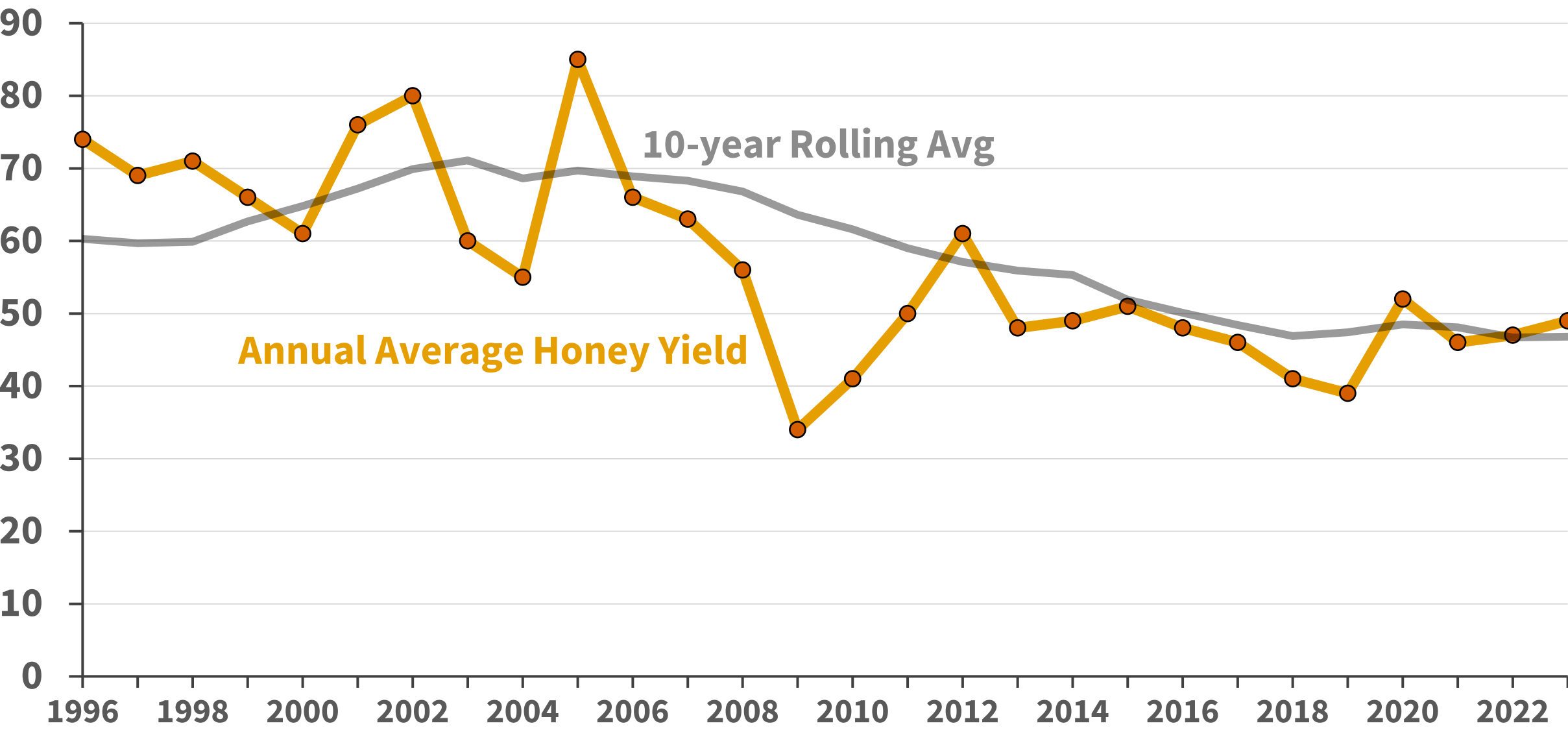


Risk Management Agency
U.S. DEPARTMENT OF AGRICULTURE

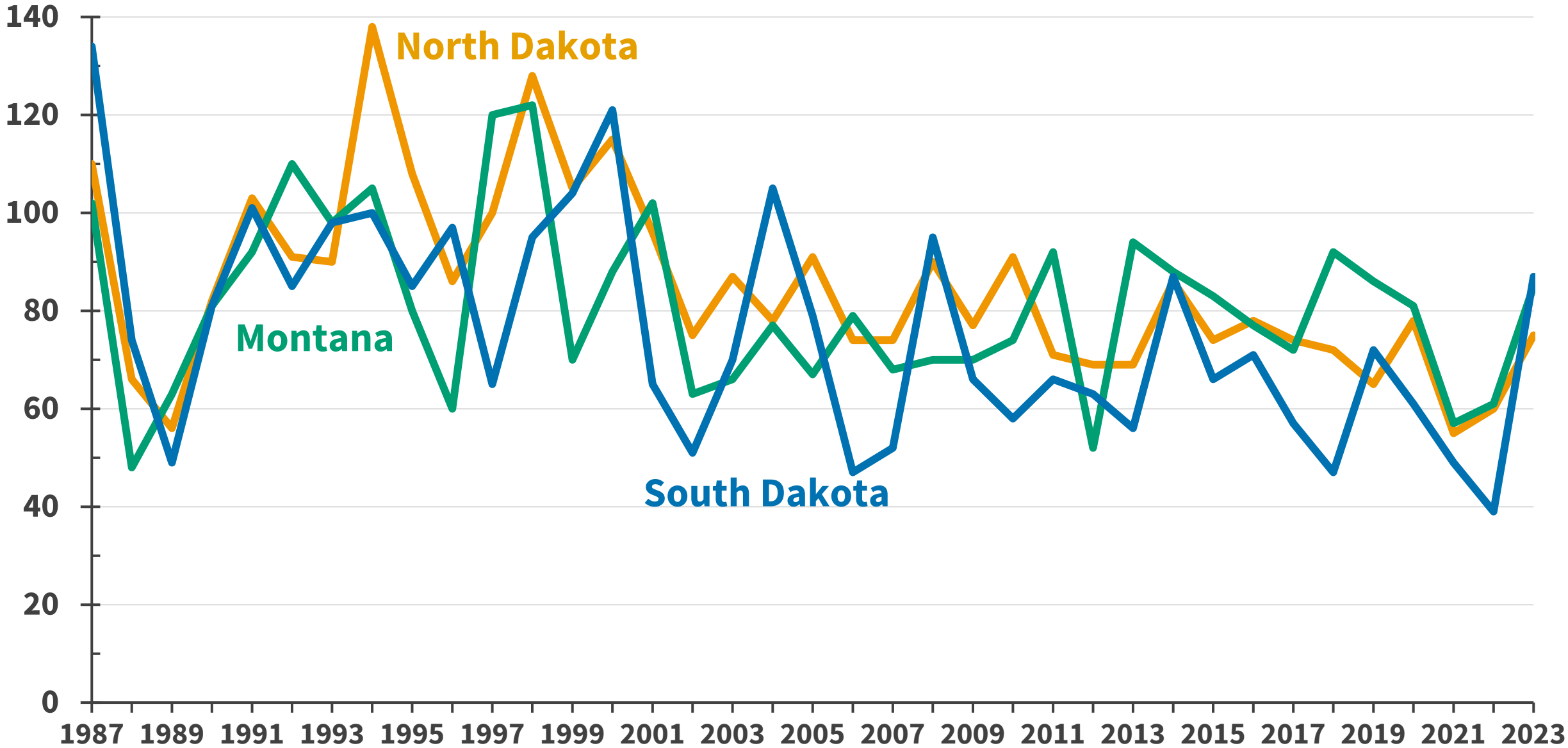
Why do beekeepers need API?



Illinois Honey Yield in pounds per colony

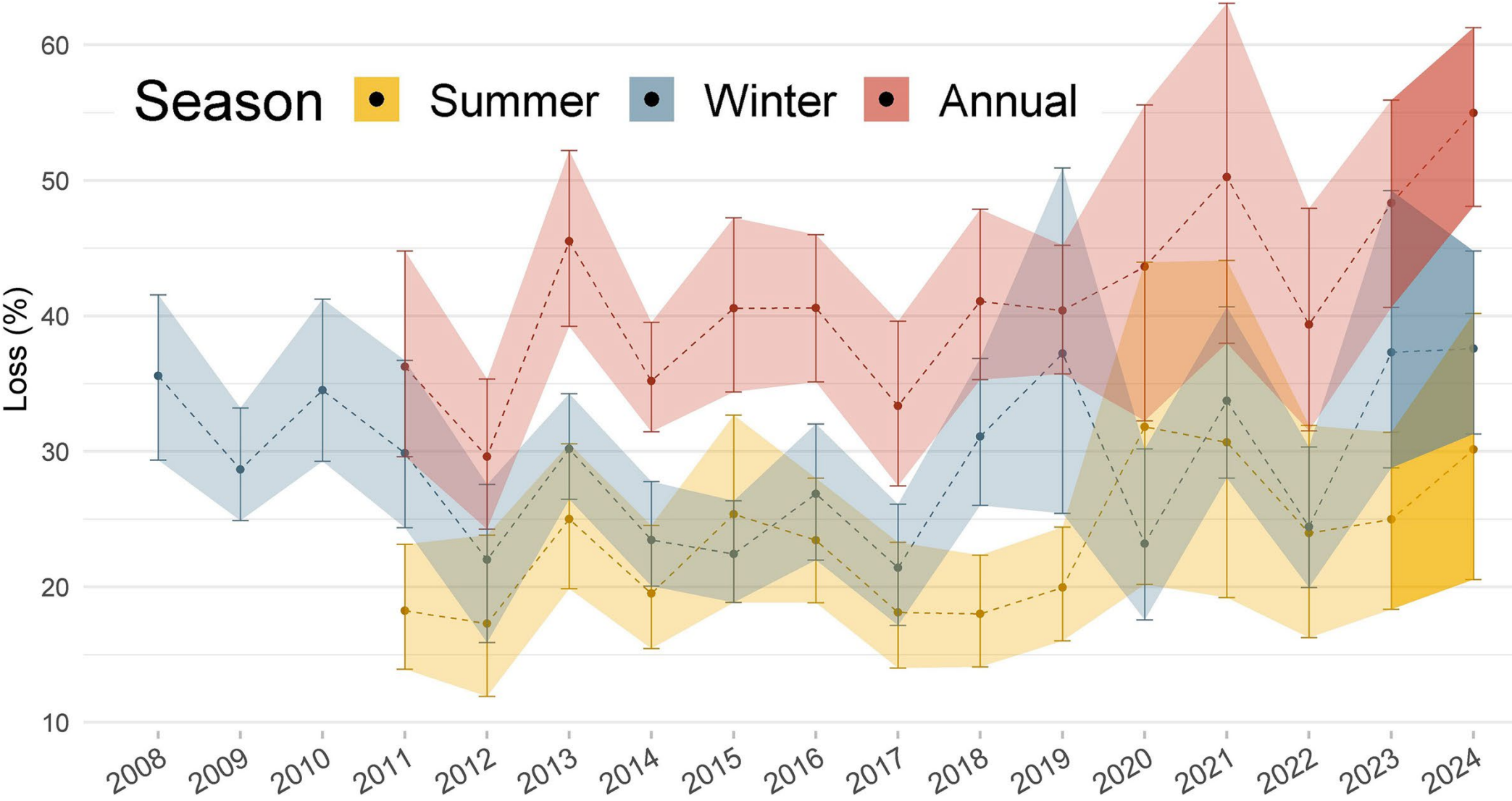


Honey Yield in pounds per colony by State

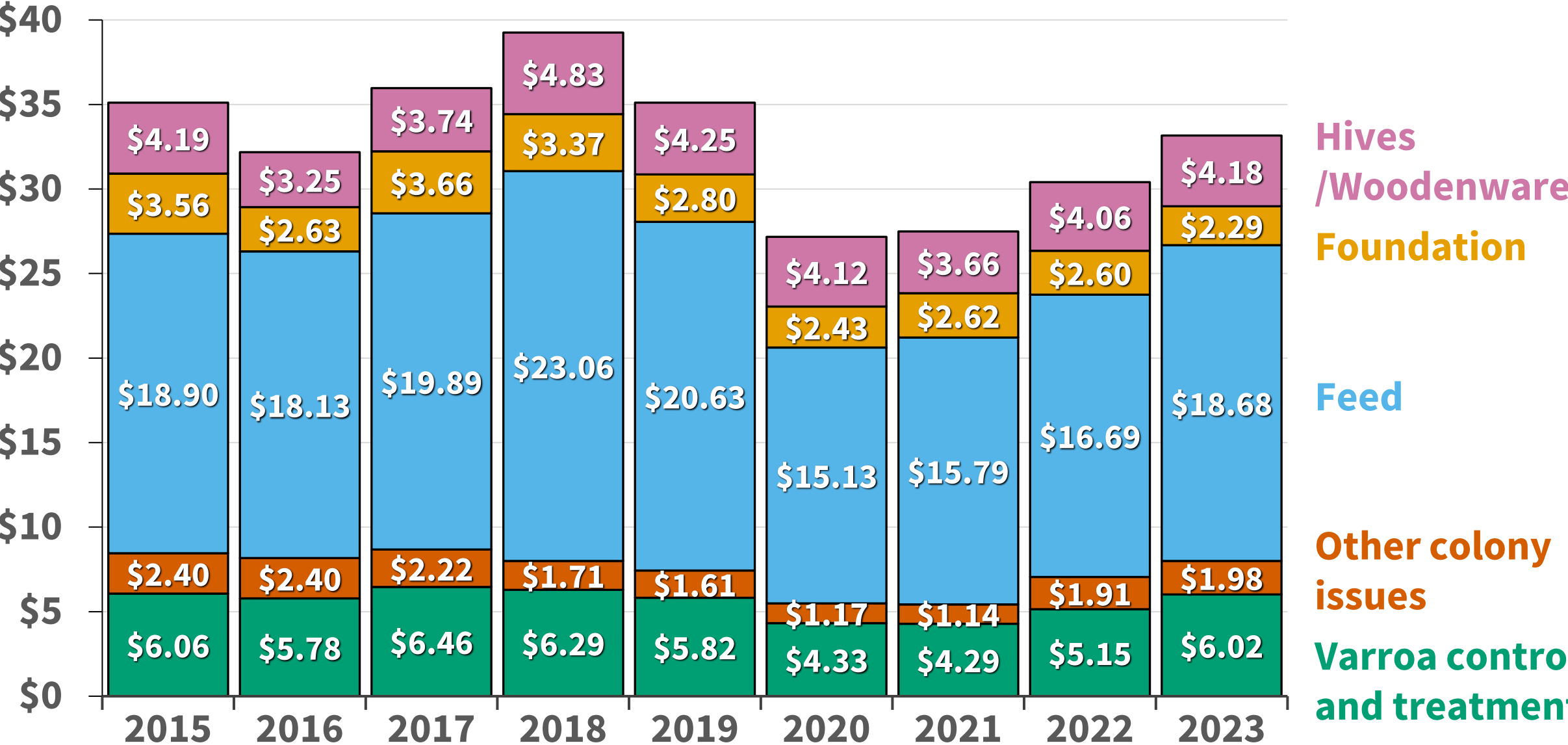


US Beekeeping Survey of all beekeepers

2024-2025 managed colony loss rates added to historic rates



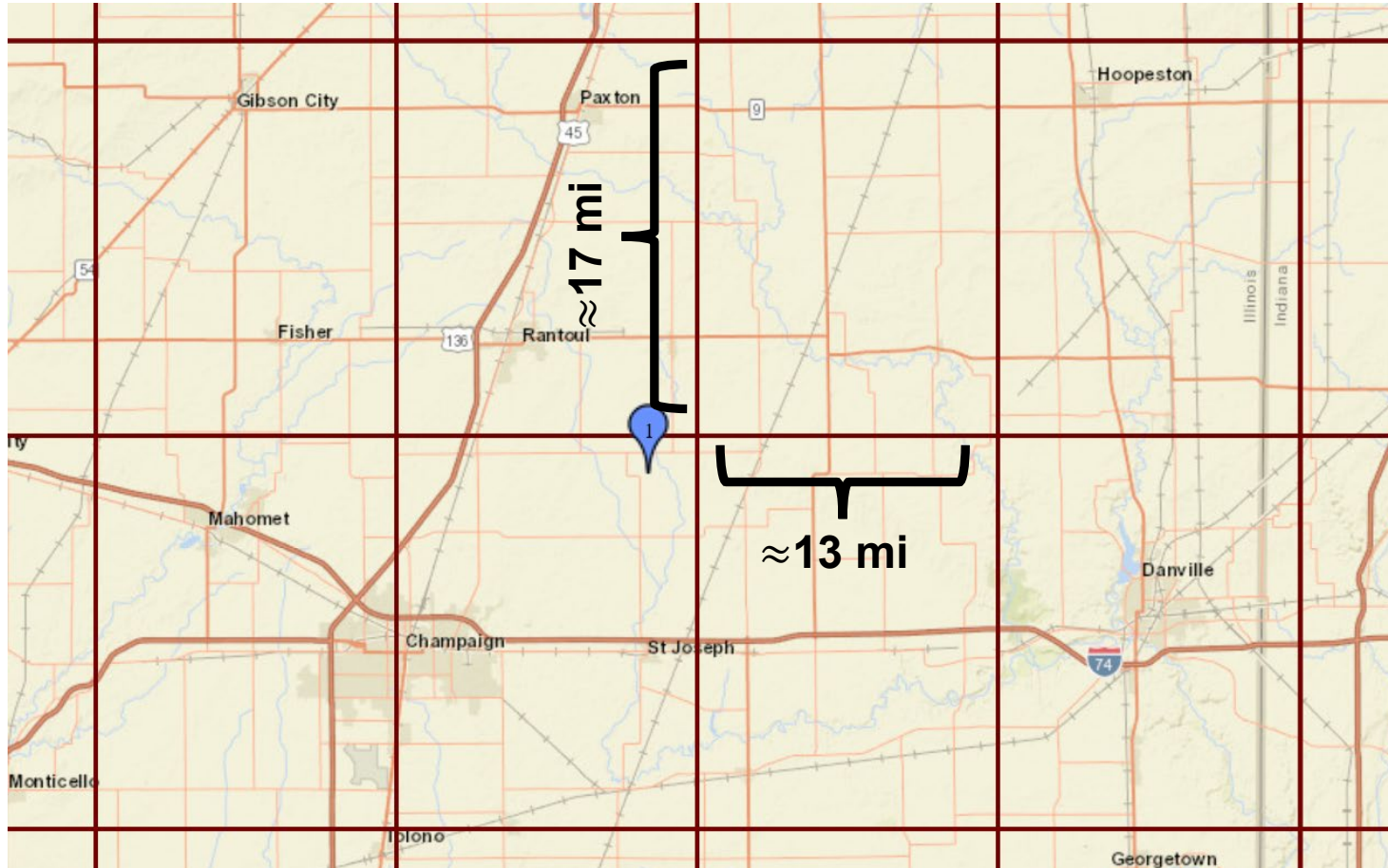
Expenditures in dollars per Honey-producing Colony



Hives
/Woodenware
Foundation
Feed
Other colony
issues
Varroa control
and treatment

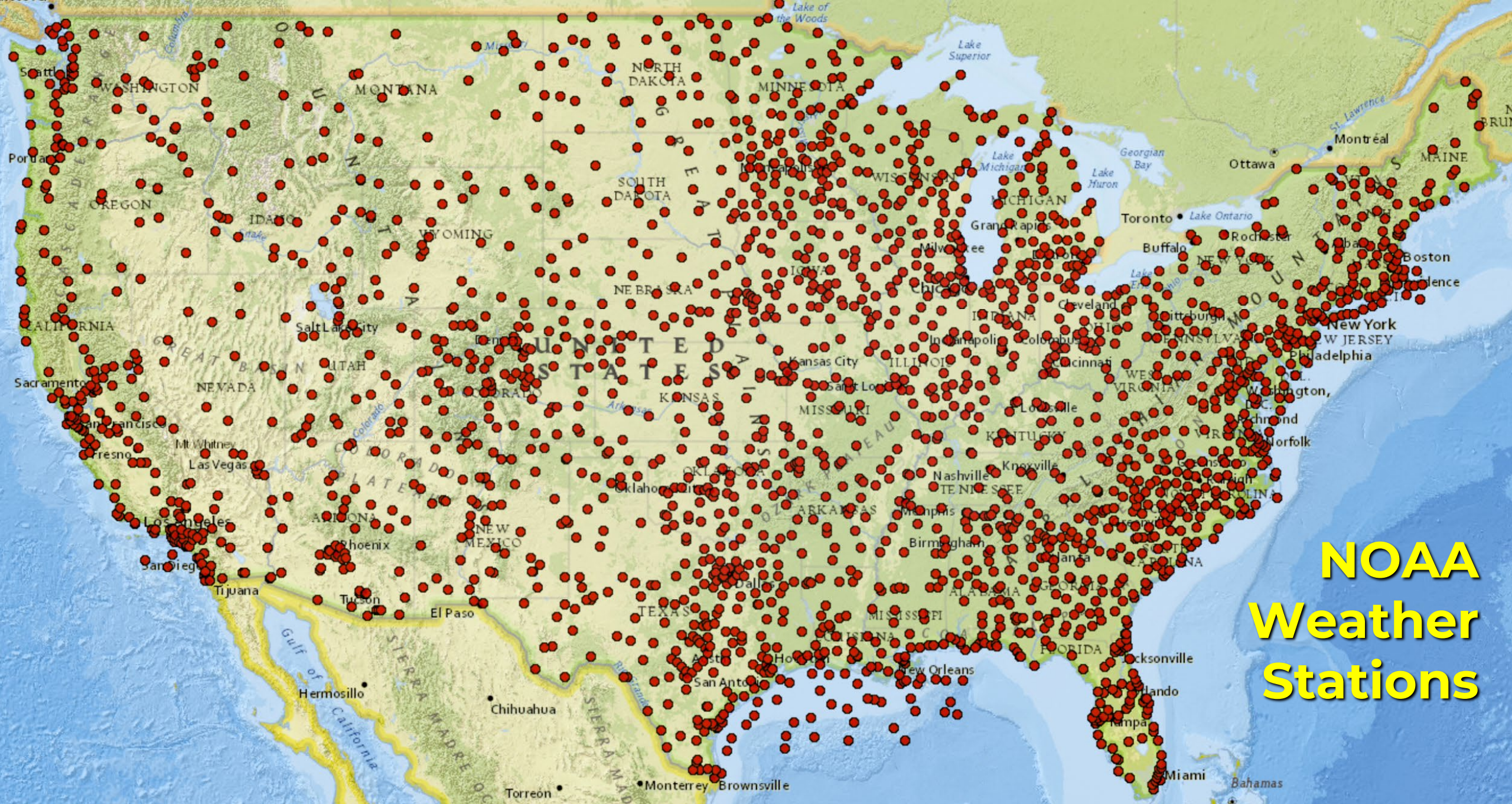
What is Apiculture Rainfall Index Insurance?

API is Area-Based Insurance



Not based directly on honey yield or colony losses

- Uses National Oceanic and Atmospheric Administration (NOAA) grid system to measure rainfall index and payment
- **Rainfall index:**
Weighted average of 4 closest weather stations to grid



NOAA Weather Stations

API Basics

- Insured value of policy based on estimated colony value by county
 - 5-year average honey production and prices from USDA NASS
- Choose to insure 1 colony up to operation max
- Guarantee from 70% to 90% of historical average rainfall

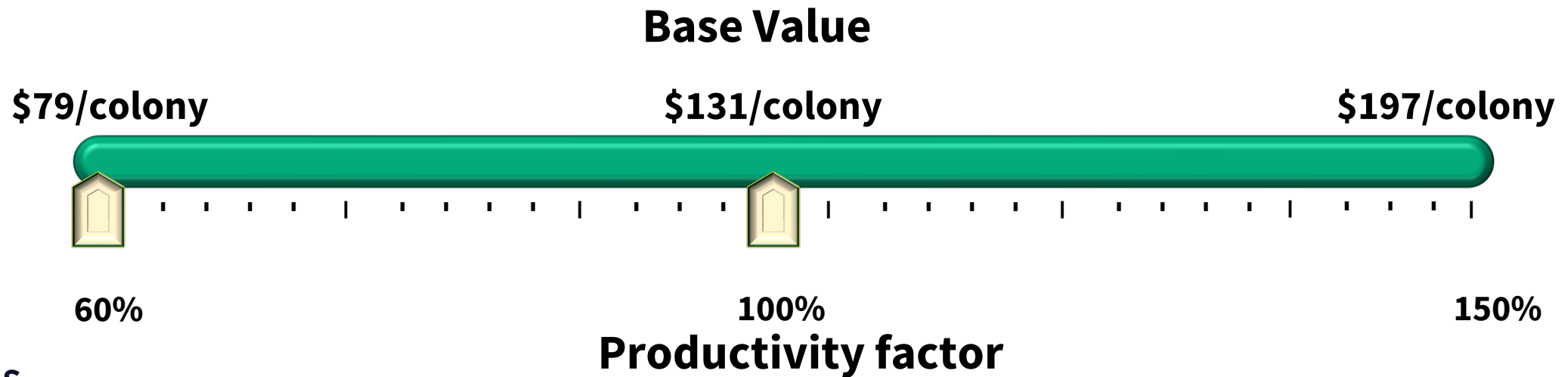


API Decisions: Productivity Factor

Are your colonies more or less productive than other colonies in your area on average?

- 60-150% used to adjust county value
- Higher %= Higher premium
 - Higher payout if low rainfall

Example: Colony value in Champaign County, IL: \$131/colony



API Decisions: Coverage Level

At what percentage of average rainfall do you want the payments to kick in?

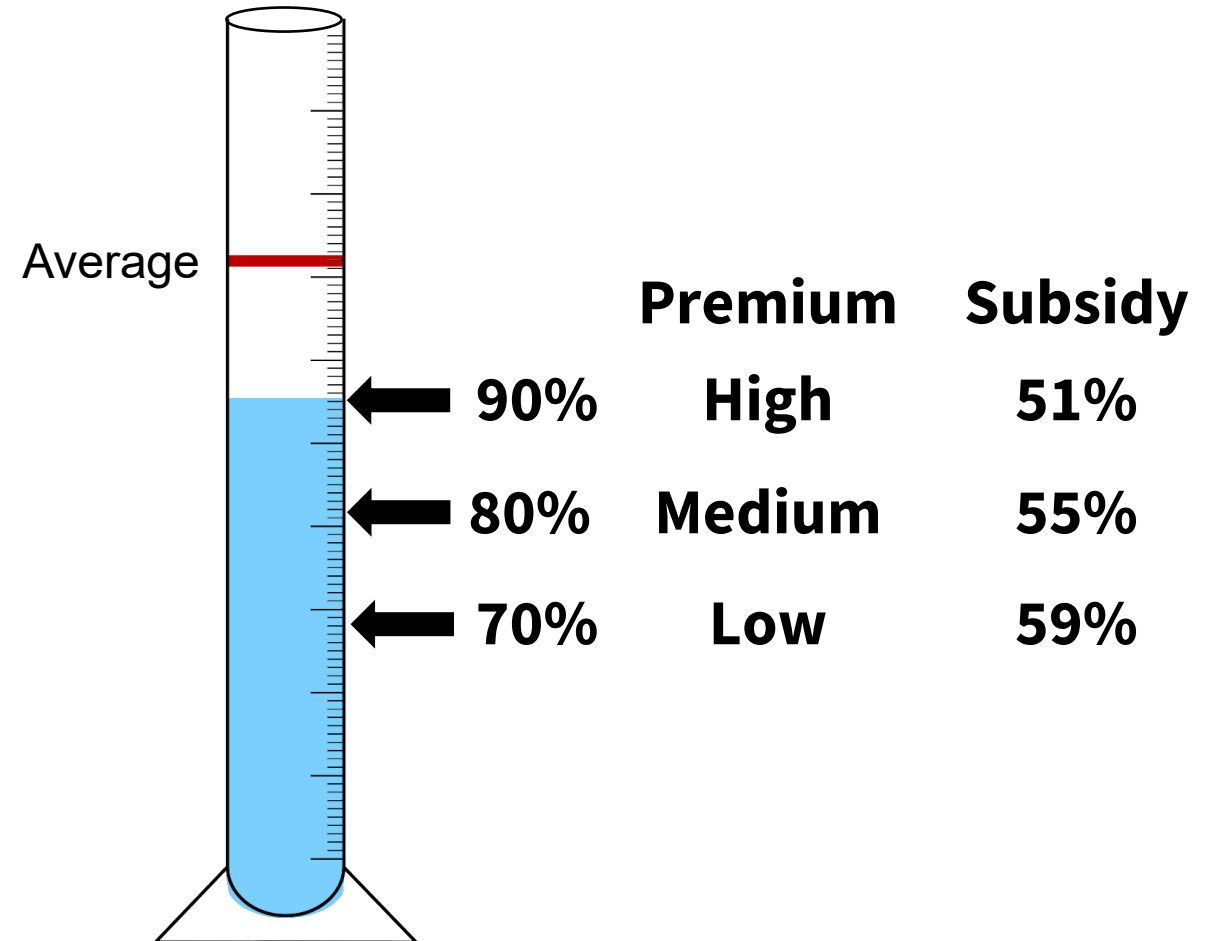
70, 75, 80, 85, or 90%

Higher % = Higher cost of insurance

Higher likelihood of payout

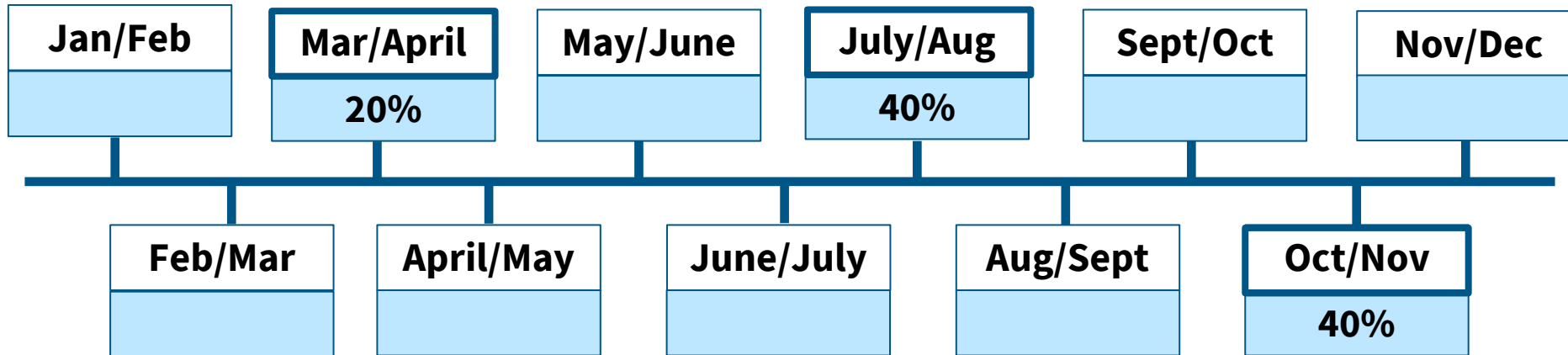
**Subsidy levels vary
with coverage levels (51-59%)**

**Lower coverage levels
receive highest subsidy (59%)**



API Decisions: Two-month intervals

Placing 20% in a two-month interval means insuring 20% of total policy value against low rainfall during those months

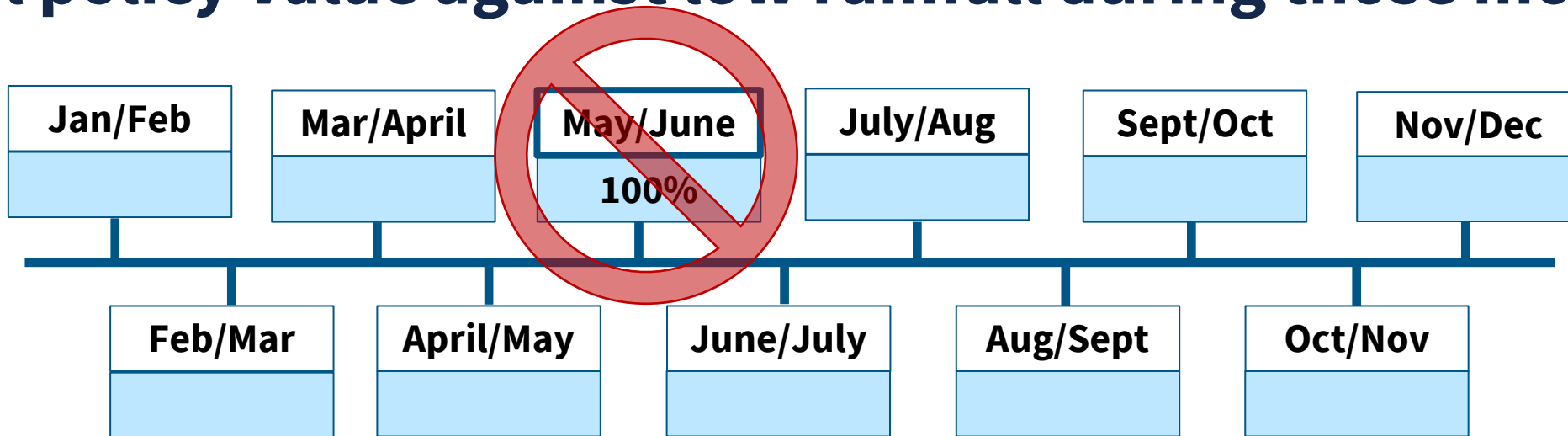


$$20\% + 40\% + 40\% = 100\%$$



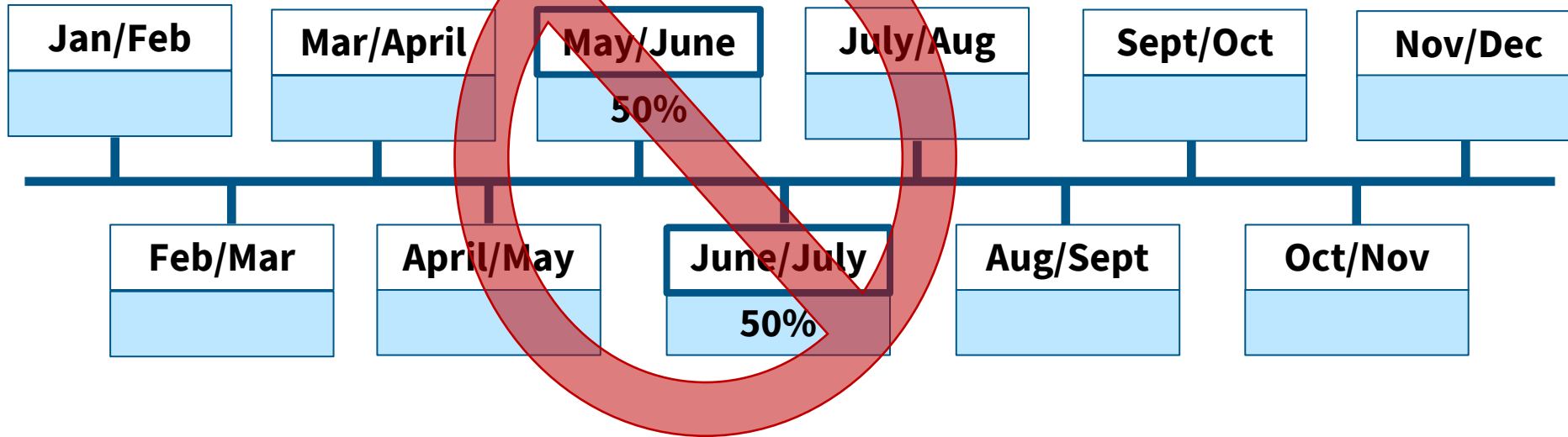
API Decisions: Two-month intervals

Placing 20% in a two-month interval means insuring 20% of total policy value against low rainfall during those months



API Decisions: Two-month intervals

Placing 20% in a two-month interval means insuring 20% of total policy value against low rainfall during those months



API Decisions: Two-Month Intervals

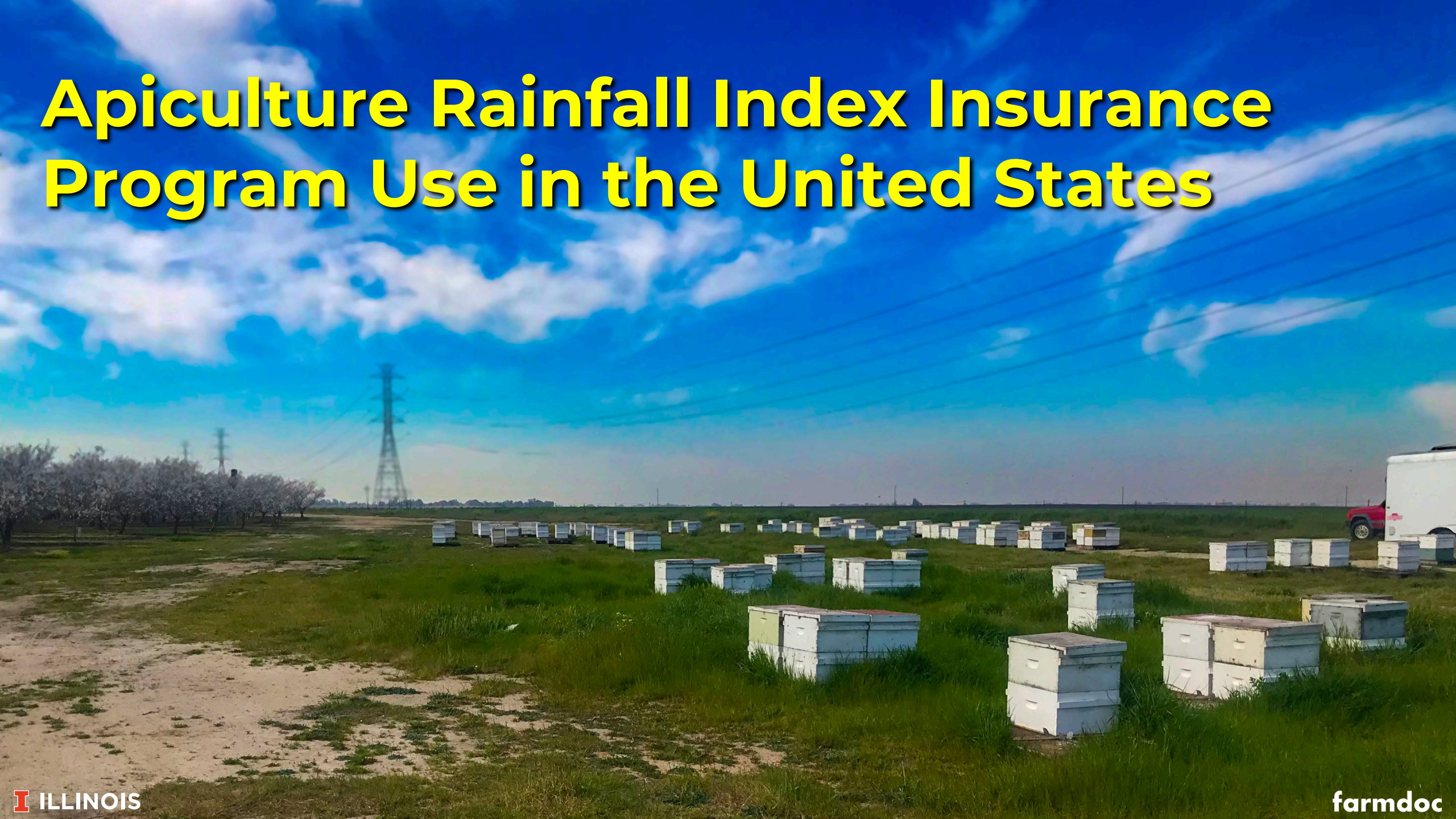
API designed to be actuarially fair

- Over time
indemnities paid out $\approx$ premiums paid in
- Intervals with higher rainfall variability
 - Higher likelihood of indemnity payout
 - Higher premiums
- Two-month interval premiums vary by grid

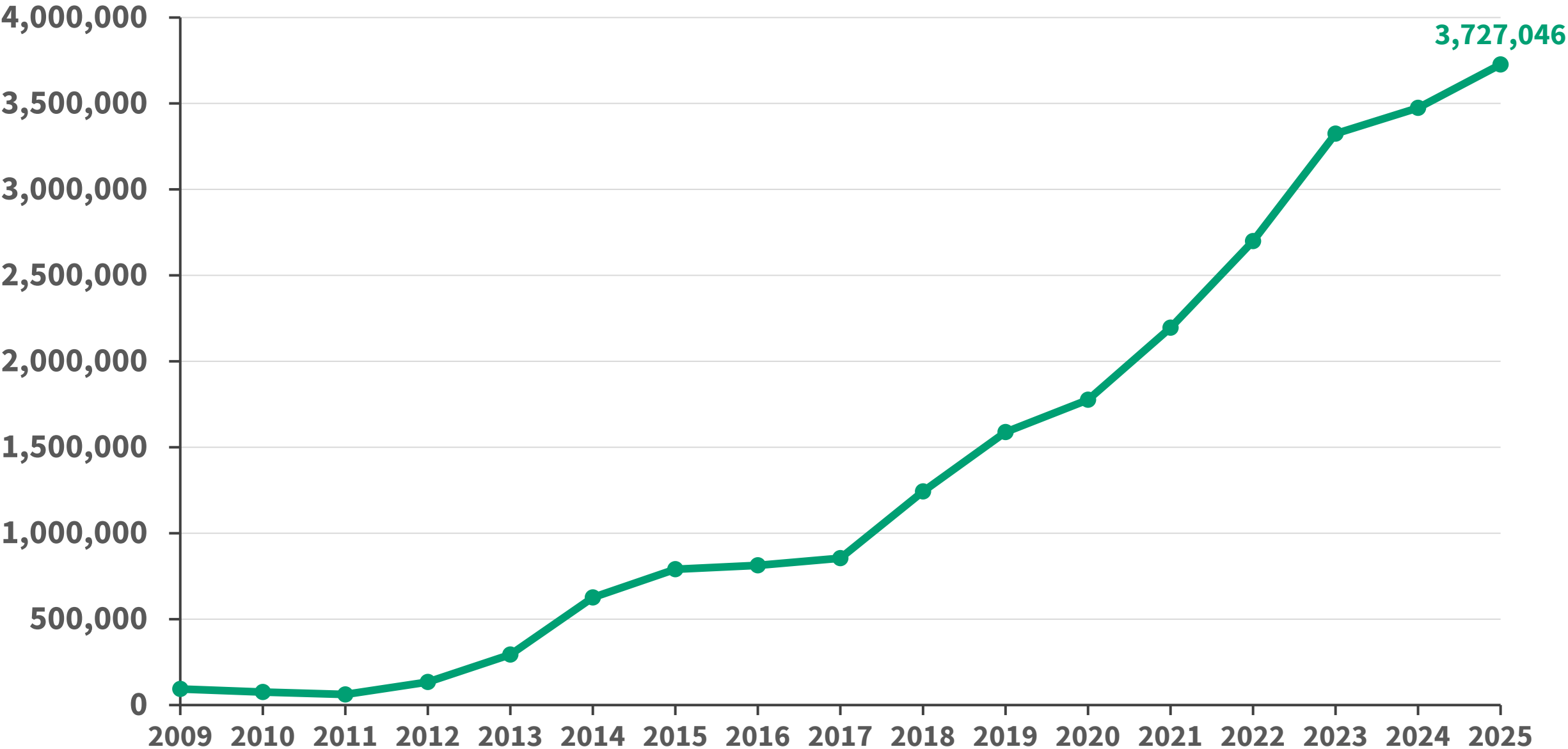
Grid 24168 in Champaign, IL
90% Coverage Level

Index Interval	Premium Rate per \$100
Jan-Feb	\$16.75
Feb-Mar	\$12.98
Mar-Apr	\$10.66
Apr-May	\$11.26
May-Jun	\$13.22
Jun-Jul	\$13.61
Jul-Aug	\$12.63
Aug-Sep	\$14.03
Sep-Oct	\$14.56
Oct-Nov	\$12.02
Nov-Dec	\$16.08

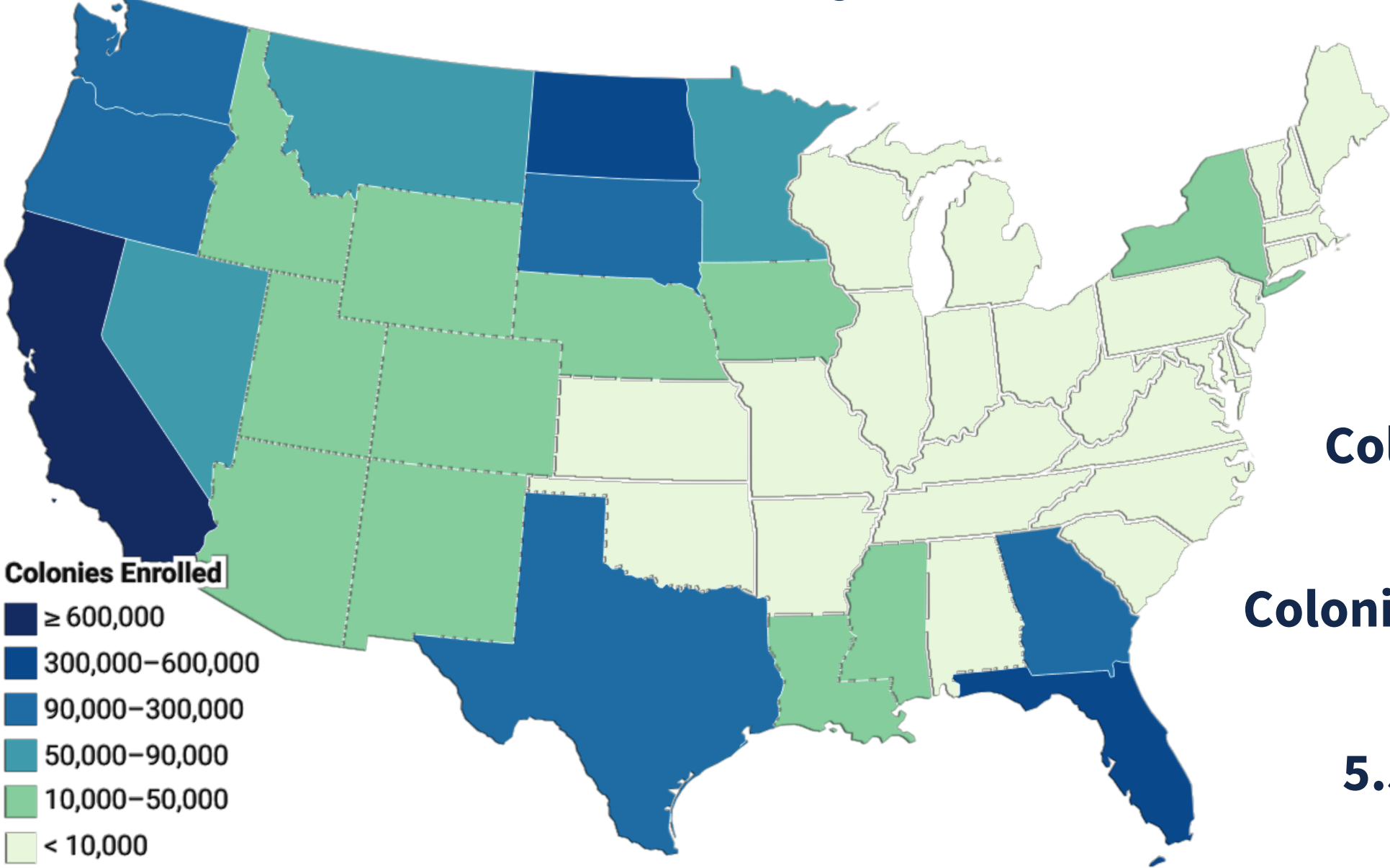
Apiculture Rainfall Index Insurance Program Use in the United States



U.S. Colonies Enrolled in API



Colonies Enrolled in API by State, 2025



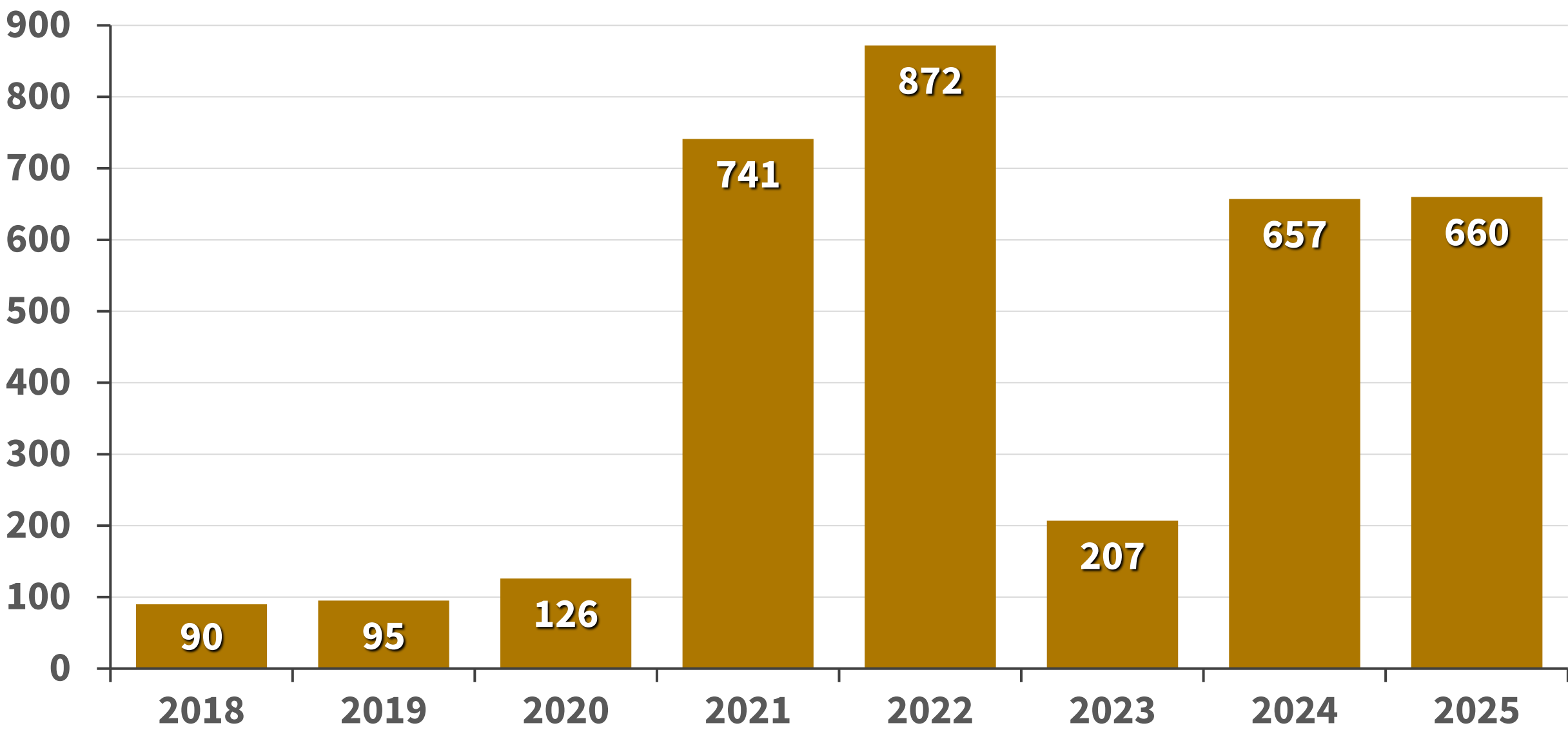
Illinois

Colonies enrolled
660

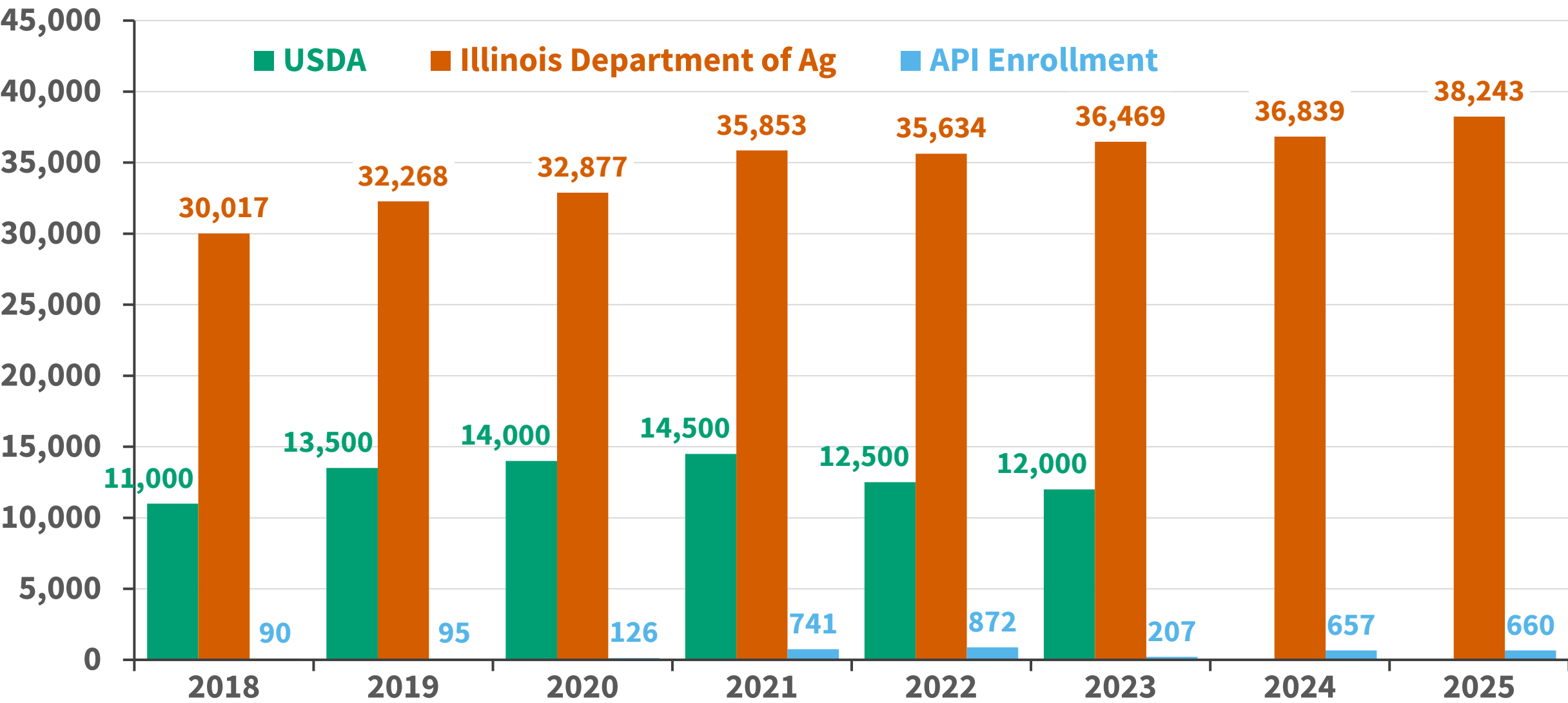
Colonies July 1, 2023
12,000

5.5% enrollment

Illinois Colonies Enrolled in API

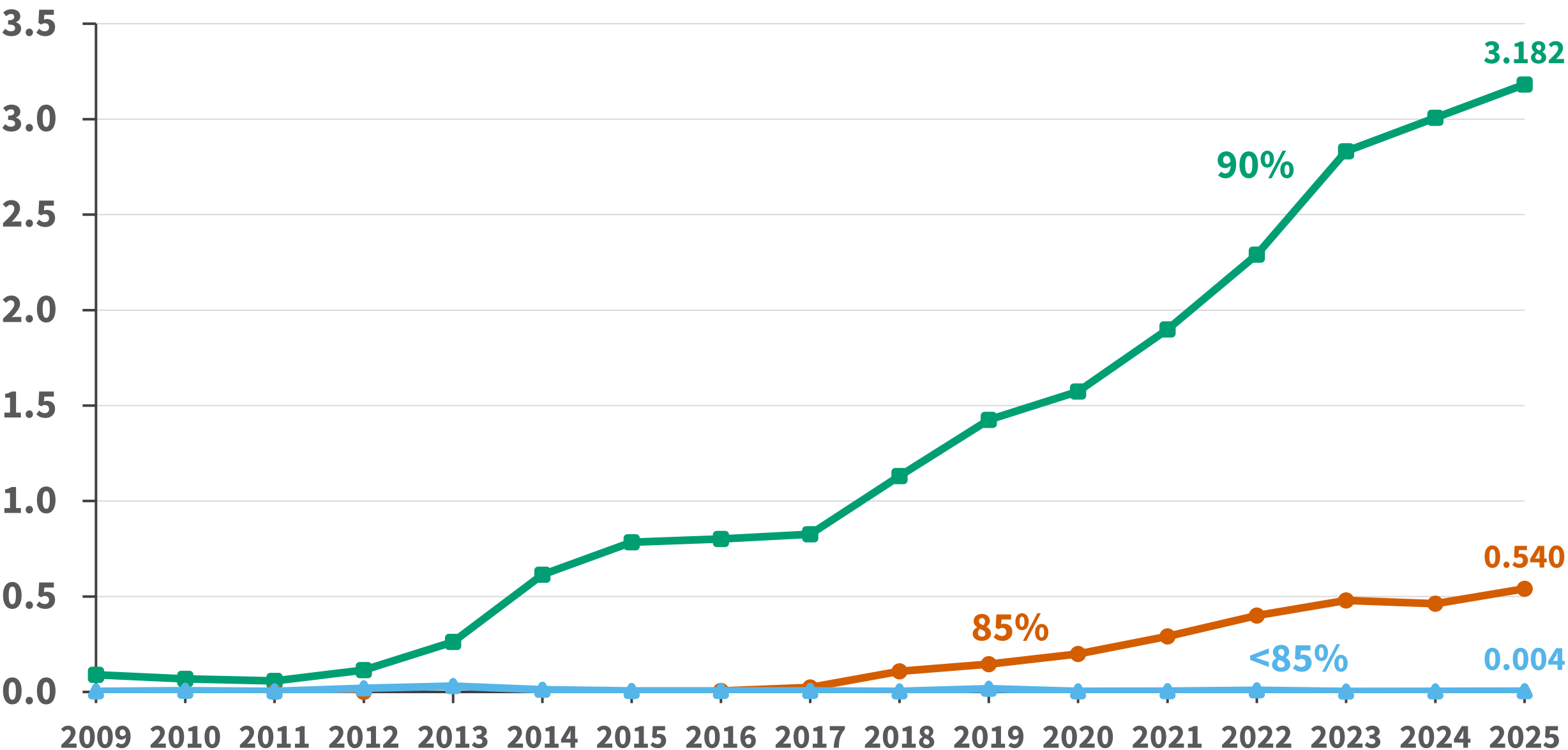


Illinois Total Colonies and Colonies Enrolled in API



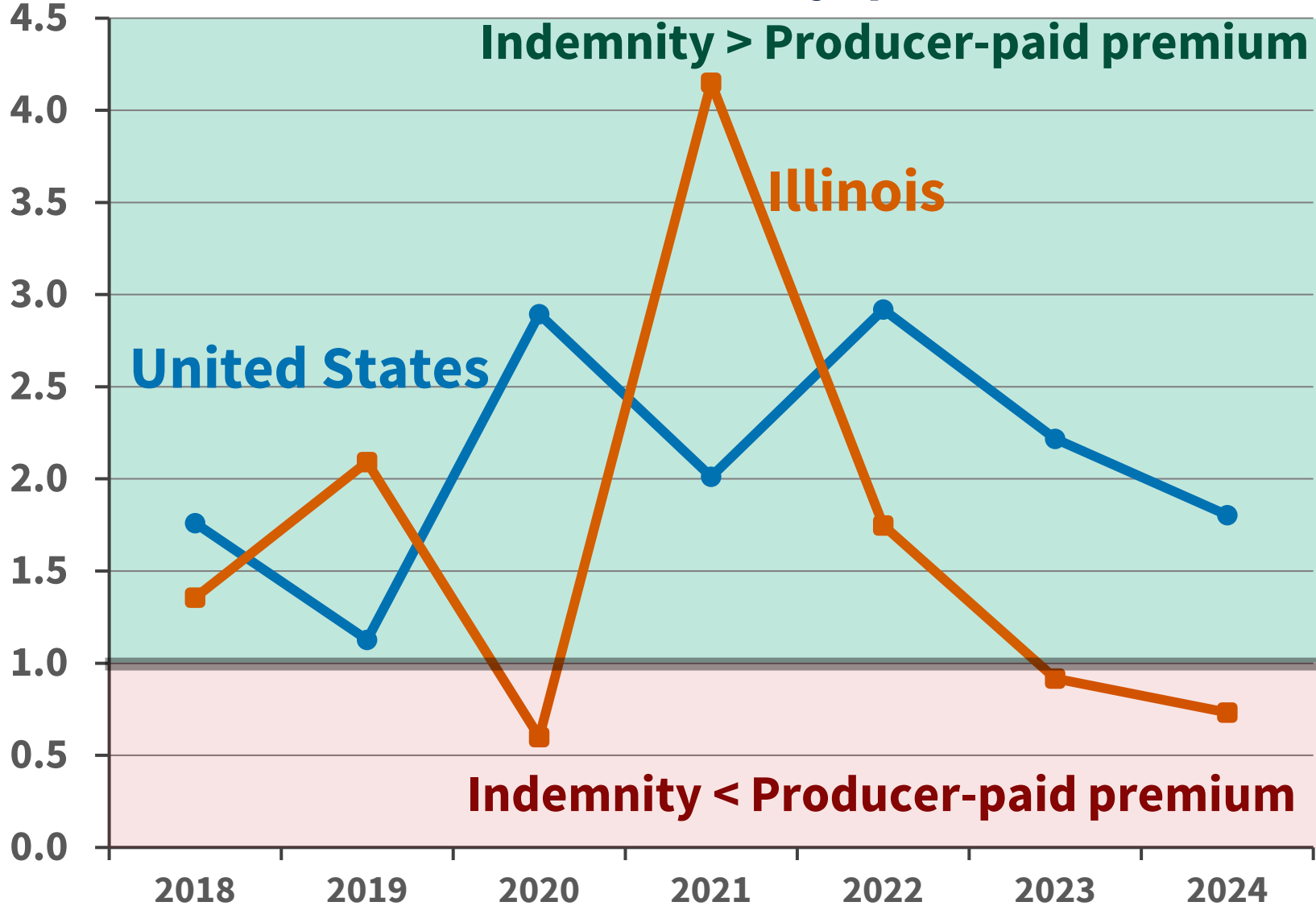
Sources: USDA Honey Bee Colonies Reports, Illinois Department of Agriculture Apiary Inspection Annual Reports, USDA Risk Management Agency Summary of Business
Notes: USDA colony numbers are for July 1 each year. Illinois Department of Agriculture colony numbers are measured at the end of the fiscal year (June 30) each year

Millions of U.S. Colonies Enrolled in API by Coverage Level



2018-2024 Producer Gain Ratios

Producer Gain Ratio Indemnity/(Premium-Subsidy)



Producer Gain Ratio

$$\frac{\text{Indemnity}}{\text{Premium} - \text{Subsidy}}$$

Indemnity = Producer-paid premium

Selecting Two-month Intervals

Using the USDA
RMA decision
tool to inform
API decisions

The screenshot shows the 'Grid Locator Apiculture' web application. At the top, there is a search bar with the text 'Find a Location:' and a 'Search' button. Below the search bar, there are tabs for 'Vegetation' and 'Rainfall'. To the right of these tabs are checkboxes for 'Grids' (checked), 'Counties' (unchecked), and 'Marker Info' (checked). There are also radio buttons for 'Degrees' (selected) and 'Decimal'. A 'Google Maps' dropdown and a 'Print' button are also visible. The main map area shows a map of the United States and parts of Mexico, with various cities labeled. A 'Map' button and a 'Satellite' button are at the top of the map. A 'Zoom to Grids' button is also present. On the left side of the map, there is a 'Current Location' section with fields for 'Grid ID', 'Latitude', 'Longitude', 'County', 'State', and 'Address'. Below this is a 'Grid Tools' section with links for 'Decision Support Tool', 'Historical Rainfall Indices', 'View Actuarial Info', and 'View Cost Estimator'. At the bottom left, there is a 'Steps' section with a numbered list of instructions. The bottom of the page features a footer with the text 'This website is a product of AgForce, GMS, and RMA.' and the 'AgForce' logo.

Grid Locator Apiculture

Find a Location: Search

Enter name, address, or latitude/longitude values. [More Info](#)

Vegetation Rainfall

Grids: ☒ Labels: ☐ Counties: ☐ Labels: ☐ Marker Info: ☒ ☒ Degrees ☐ Decimal Google Maps Print

Map Satellite

Current Location

Grid ID: -
Latitude: -
Longitude: -
County: -
State: -
Address: -

Grid Tools:

[Decision Support Tool](#)
[Historical Rainfall Indices](#)
[View Actuarial Info](#)
[View Cost Estimator](#)

Steps

1. Enter nearest town or address
2. Click Search
3. Navigate to property
4. Click a point on property
5. Print view for records
6. Note the Grid ID
7. Choose grid tool to view data

United States

Mexico

Guatemala

Google

Keyboard shortcuts Map data ©2024 Google, INEGI Terms

This website is a product of AgForce, GMS, and RMA.

AgForce

<http://maps.agforceusa.com/api/ri>

Which intervals should I enroll in?

Profit-maximization approach

Enroll in intervals with highest rainfall variability

- Due to subsidies these are most likely to pay an indemnity and result in net gains
- Indemnities may be unrelated to honey production/bee health

Risk management approach

Enroll in intervals when a lack of rainfall will have most impact on honey production/bee health

- Indemnities should be related to honey production/bee health



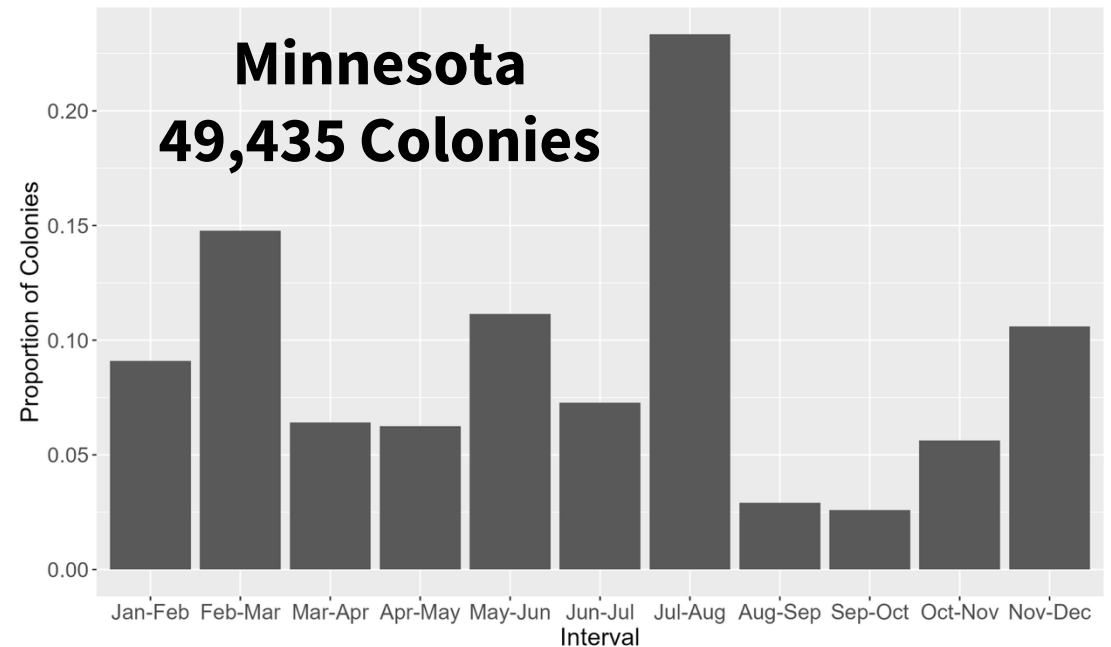
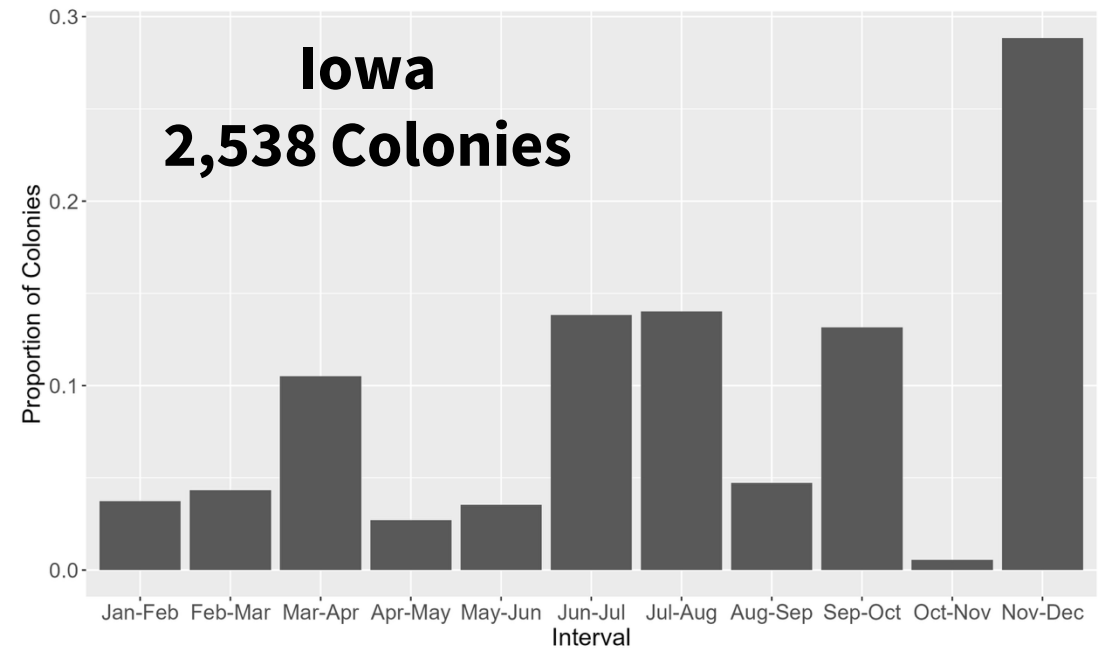
2024 API Interval Choices by State

Midwest States



Source:
USDA Risk Management Agency Summary of Business

Note:
Not all colonies enrolled in API represented due to confidentiality

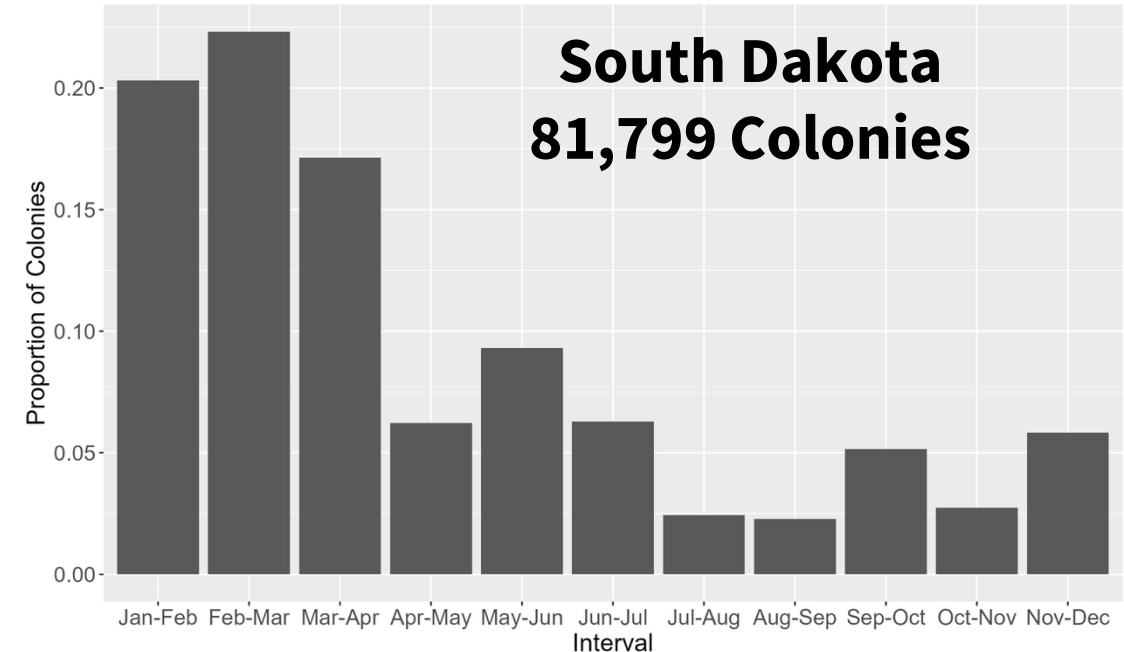
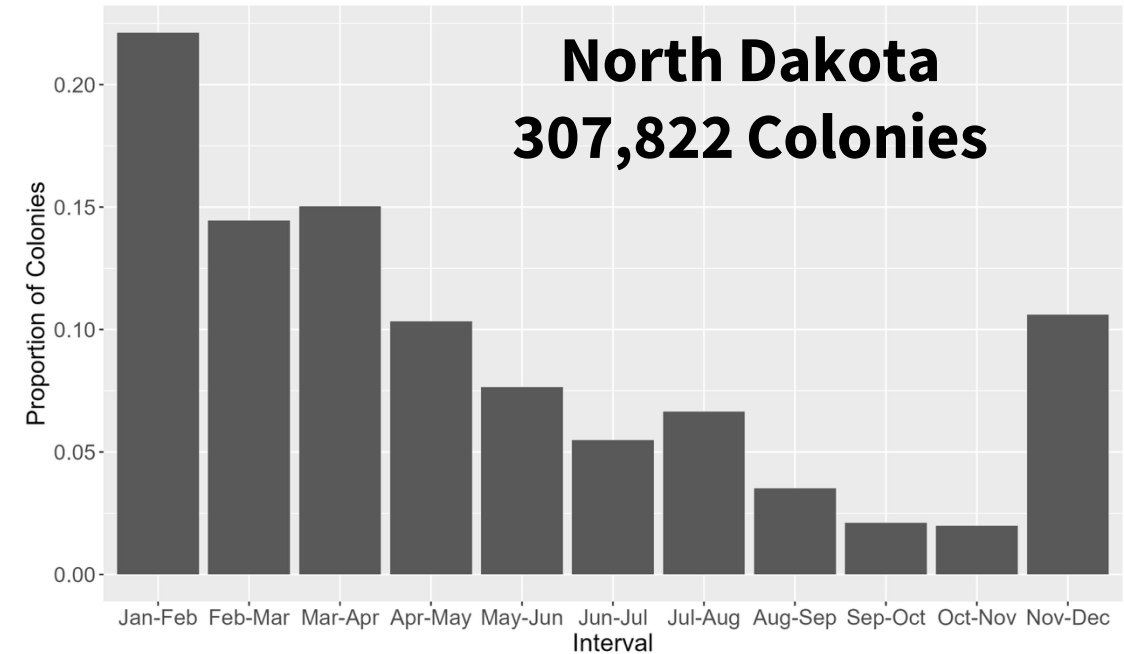


Major Honey Producing States



Source:
USDA Risk Management Agency Summary of Business

Note:
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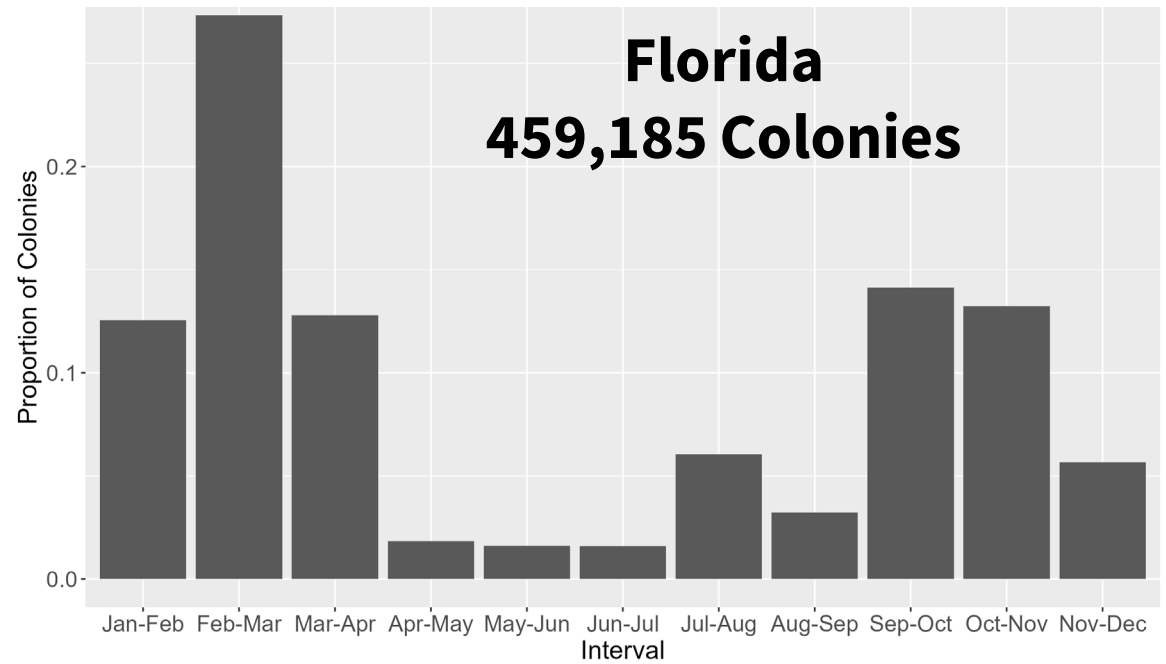
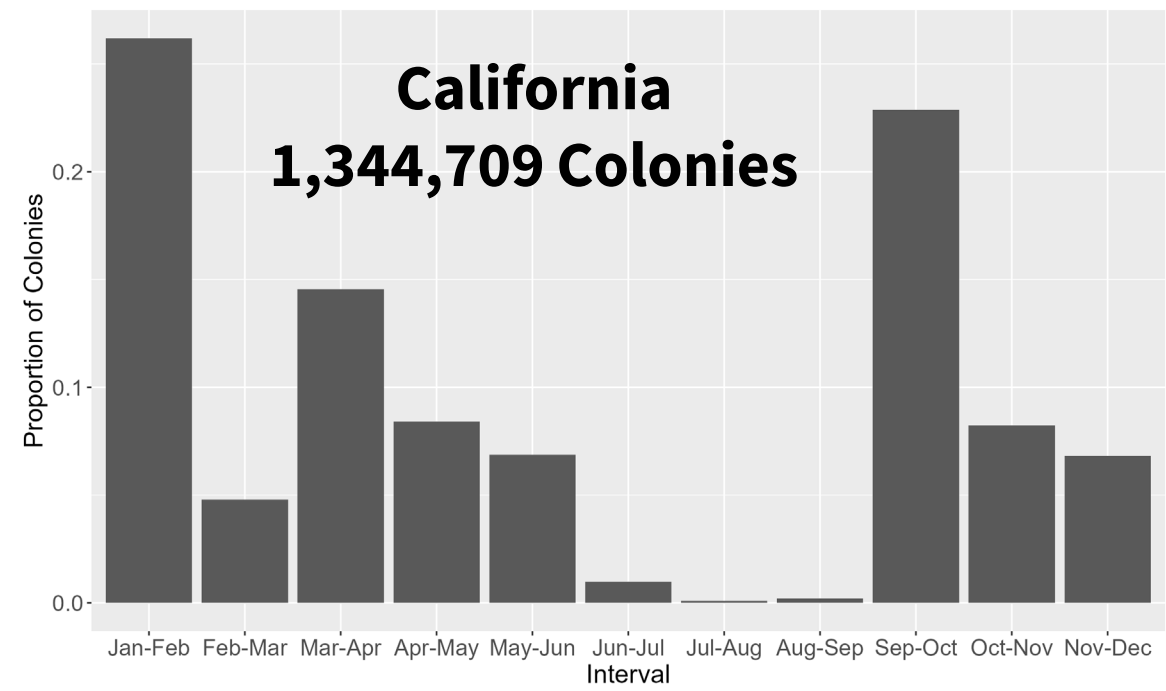


Major Honey Producing (and Pollination) States



Source:
USDA Risk Management Agency Summary of Business

Note:
Not all colonies enrolled in API represented due to confidentiality





Which intervals should I enroll in?

Preferred approach will depend on individual preferences

- Profit-maximization approach
- Risk management approach



Comparing the two approaches

Example using API decision tool for Grid 33119, Sheridan County, ND

Risk management

Approximate honey production season in ND

			33%		33%		34%			
Jan-Feb	Feb-Mar	Mar-Apr	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec

Note: These are for illustration purposes only and do not indicate optimal profit-maximization or risk management strategies for any individual policy.

Comparing the two approaches

Example using API decision tool for Grid 33119, Sheridan County, ND

Risk management

Approximate honey production season in ND

			33%		33%		34%			
Jan-Feb	Feb-Mar	Mar-Apr	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec
33%		33%							34%	

Highest variable intervals (based on premium rates)

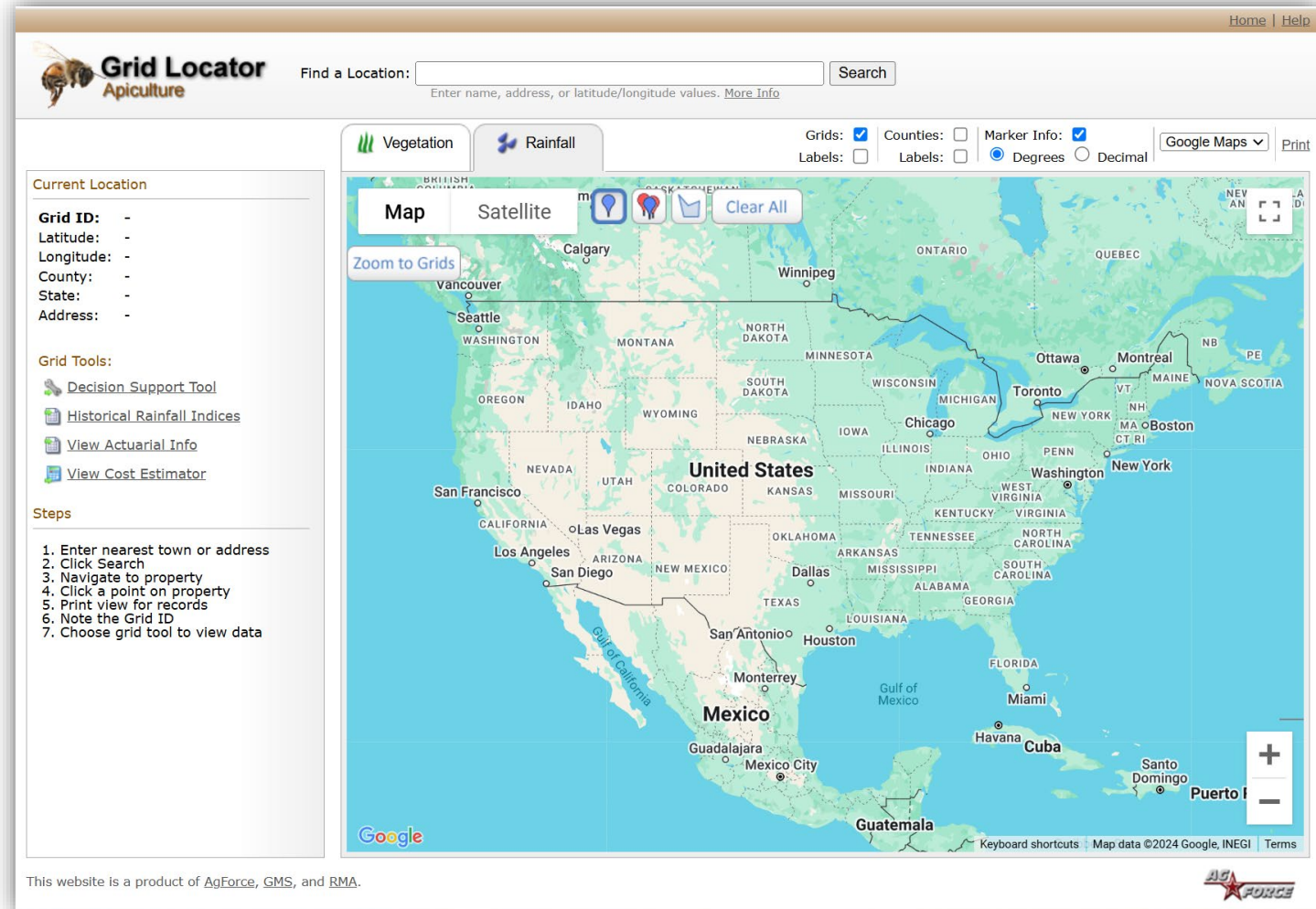
Profit maximization

Note: These are for illustration purposes only and do not indicate optimal profit-maximization or risk management strategies for any individual policy.

Index Interval	Premium Rate per \$100
Jan-Feb	\$21.72
Feb-Mar	\$21.17
Mar-Apr	\$22.33
Apr-May	\$17.26
May-Jun	\$12.26
Jun-Jul	\$10.44
Jul-Aug	\$13.70
Aug-Sep	\$18.79
Sep-Oct	\$22.76
Oct-Nov	\$28.53
Nov-Dec	\$22.77

Comparison Steps

1. Enter Risk Management approach into USDA RMA decision tool
2. Collect data on historical indemnities
3. Repeat for Profit Maximization approach
4. Compare outcomes



<http://maps.agforceusa.com/api/ri>



Find a Location:

Enter name, address, or latitude/longitude values. [More Info](#)

Vegetation Rainfall

Grids: ☒ Labels: ☐ Counties: ☐ Labels: ☐ Marker Info: ☒ ☒ Degrees ☐ Decimal

Current Location

Grid ID: 33119
Latitude: 47° 32' 21.11" N
Longitude: 100° 17' 3.85" W
County: Sheridan
State: North Dakota
Address: GPQ8+M6 Denhoff, ND, USA

Grid Tools:

[Decision Support Tool](#)

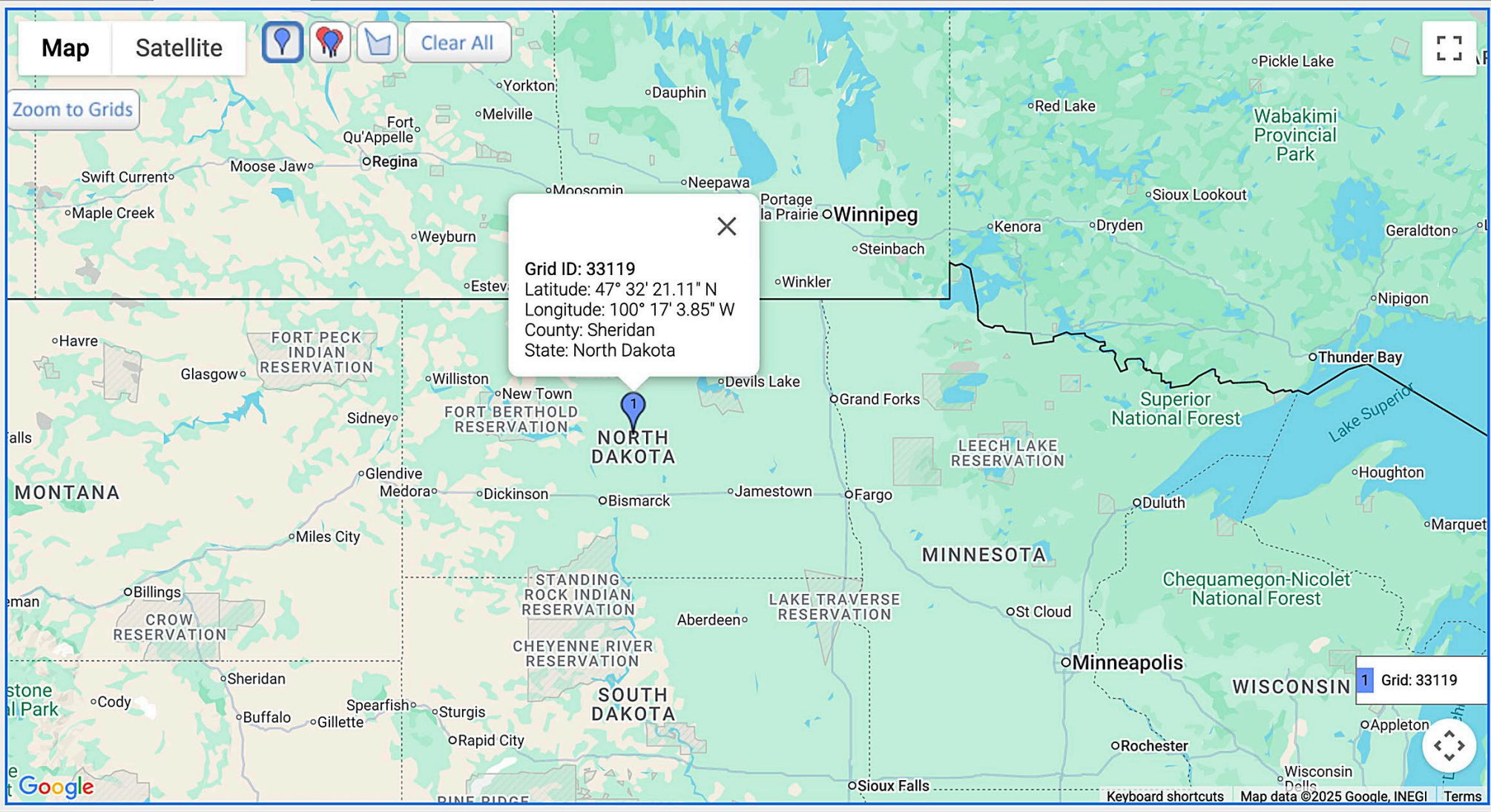
[Historical Rainfall Indices](#)

[View Actuarial Info](#)

[View Cost Estimator](#)

Steps

1. Enter nearest town or address
2. Click Search
3. Navigate to property
4. Click a point on property
5. Print view for records
6. Note the Grid ID
7. Choose grid tool to view data



Decision Support Tool

Apiculture

This tool is for illustration purposes only. Your actual information may differ.
For additional information, please [click here](#).



Rainfall



Vegetation

Please Select a Location:

State: North Dakota

County: Sheridan

Grid: 33119



Grid Locator



Print

Protection Information

Coverage Level (%): Please Select

Productivity Factor (%): 150

Insurable Interest (%): 100

Insured Colonies:

Sample Year: 2024

Graph

Type:

☒ Index Values ☐ Estimated Indemnities

Range:

Start 2020 End 2024

Intervals:

- ☒ Jan-Feb
- ☒ Feb-Mar
- ☒ Mar-Apr
- ☒ Apr-May
- ☒ May-Jun
- ☒ Jun-Jul
- ☒ Jul-Aug
- ☒ Aug-Sep
- ☒ Sep-Oct
- ☒ Oct-Nov
- ☒ Nov-Dec

Table

Index
Interval

Percent of Value (%)

Clear

Jan-Feb

Feb-Mar

Mar-Apr

Apr-May

May-Jun

Jun-Jul

Jul-Aug

Aug-Sep

Sep-Oct

Oct-Nov

Nov-Dec

Per Colony

Policy

Total

Policy
Protection
per Unit

Premium
Rate per
\$100

Total
Premium

Premium
Subsidy

Producer
Premium

Actual
Index
Value

Indemnity

N/A

N/A

N/A

N/A

0

N/A

N/A

County Base Value

Dollar Amount of Protection

Total Insured Colonies

0

Total Policy Protection

Subsidy Level

Maximum Percent of Value per Index Interval

70.0%

Calculate

Decision Support Tool

Apiculture

This tool is for illustration purposes only. Your actual information may differ.
For additional information, please [click here](#).



Rainfall



Vegetation

Notice:

The year selected has not been completed. Policy total indemnities are provided as a courtesy, but indemnity values from intervals where such information is not available have not been included in the calculation of the totals.

Please Select a Location:

State: North Dakota

County: Sheridan

Grid: 33119



Grid Locator



Print

Protection Information

Coverage Level (%): 90

Productivity Factor (%): 100

Insurable Interest (%): 100

Insured Colonies: 1

Sample Year: 2024

Graph

Type:

☐ Index Values ☒ Estimated Indemnities

Range:

Start 1970 End 2024

Intervals:

- ☒ Jan-Feb ☒ Feb-Mar ☒ Mar-Apr
☒ Apr-May ☒ May-Jun ☒ Jun-Jul
☒ Jul-Aug ☒ Aug-Sep ☒ Sep-Oct
☒ Oct-Nov ☒ Nov-Dec

Table

Graph

Interval	Percent of Value (%)	Policy Protection per Unit	Premium Rate per \$100	Total Premium	Premium Subsidy	Producer Premium	Actual Index Value	Indemnity
Jan-Feb		\$0	21.72	\$0	\$0	\$0	48.7	\$0
Feb-Mar		\$0	21.17	\$0	\$0	\$0	97.2	\$0
Mar-Apr	N/A	\$0	22.33	\$0	\$0	\$0	127.7	\$0
Apr-May	33	\$47	17.26	\$8	\$4	\$4	142.9	\$0
May-Jun	N/A	\$0	12.26	\$0	\$0	\$0	118.2	\$0
Jun-Jul	33	\$47	10.44	\$5	\$3	\$2	73.5	\$9
Jul-Aug	N/A	\$0	13.70	\$0	\$0	\$0	84.3	\$0
Aug-Sep	34	\$49	18.79	\$9	\$5	\$4	105.2	\$0
Sep-Oct	N/A	\$0	22.76	\$0	\$0	\$0	N/A	\$0
Oct-Nov		\$0	28.53	\$0	\$0	\$0	N/A	\$0
Nov-Dec		\$0	22.77	\$0	\$0	\$0	N/A	\$0
Per Col	N/A	N/A	N/A	\$22.23	\$12.00	\$10.23	N/A	\$9.00
Policy Total	1	\$143	N/A	\$22	\$12	\$10	N/A	\$9

County Base Value	\$159.18
Dollar Amount of Protection	\$143.26
Total Insured Colonies	1
Total Policy Protection	\$143
Subsidy Level	51%
Maximum Percent of Value per Index Interval	70.0%

Calculate

Decision Support Tool

Apiculture

This tool is for illustration purposes only. Your actual information may differ. For additional information, please [click here](#).

Rainfall

Vegetation

Notice:

The year selected has not been completed. Policy total indemnities are provided as a courtesy, but indemnity values from intervals where such information is not available have not been included in the calculation of the totals.

Please Select a Location:

State: North Dakota

County: Sheridan

Grid: 33119

Grid Locator

Print

Protection Information

Coverage Level (%): 90

Productivity Factor (%): 100

Insurable Interest (%): 100

Insured Colonies: 1

Sample Year: 2024

Graph

Type:

☐ Index Values ☒ Estimated Indemnities

Range:

Start 1970 End 2024

Intervals:

- ☒ Jan-Feb
- ☒ Feb-Mar
- ☒ Mar-Apr
- ☒ Apr-May
- ☒ May-Jun
- ☒ Jun-Jul
- ☒ Jul-Aug
- ☒ Aug-Sep
- ☒ Sep-Oct
- ☒ Oct-Nov
- ☒ Nov-Dec

Table

Graph

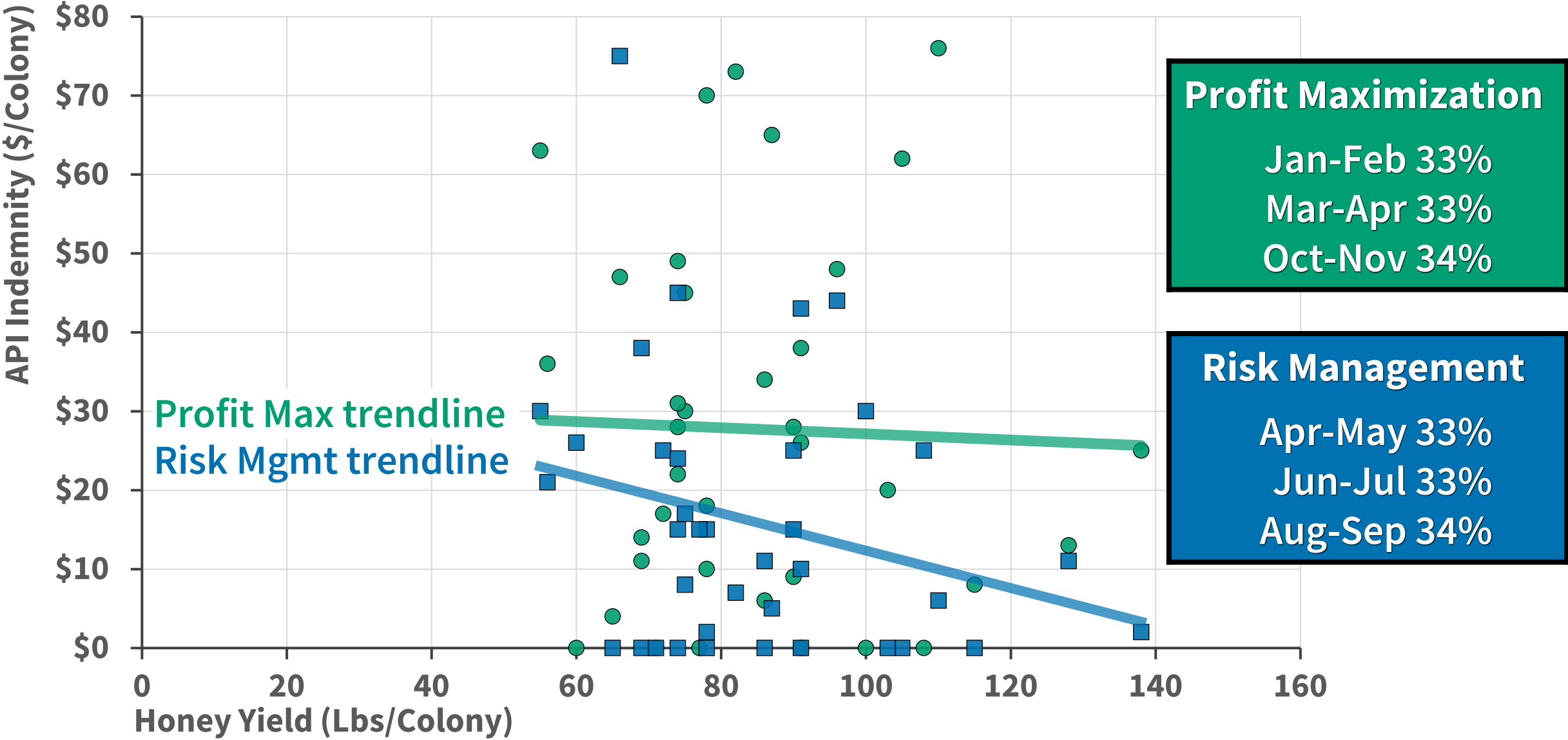
☐ Graph View ☒ Chart View

Year	Jan-Feb	Feb-Mar	Mar-Apr	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec
2024	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A	N/A
2023	27.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2021	32.0	0.0	31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020	26.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	0.0
2019	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2018	16.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2017	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	33.0	0.0
2016	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
2015	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2014	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0
2013	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2008	7.0	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.0	0.0
2006	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0
2005	10.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0
2003	16.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	0.0

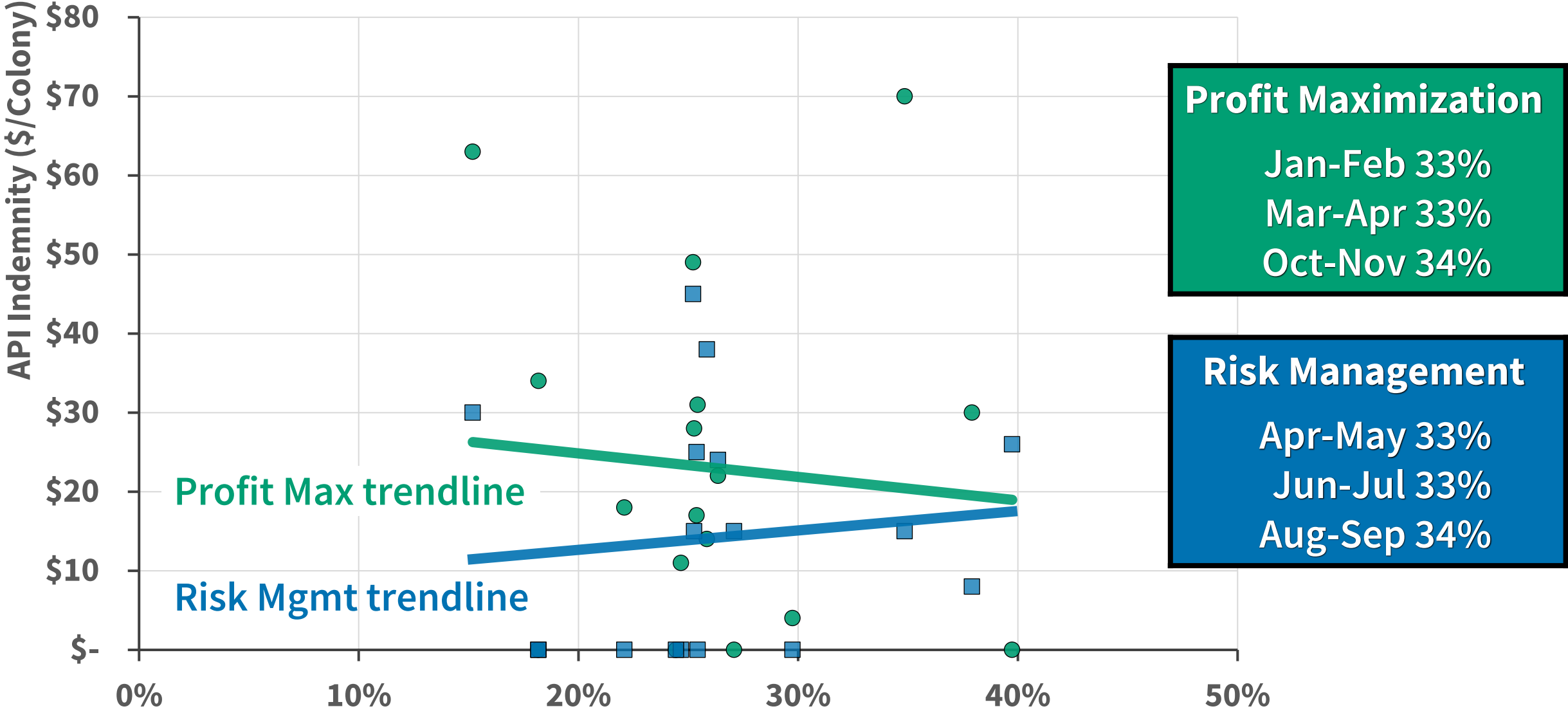
	Profit Maximization	Risk Management
	Jan-Feb 33% Mar-Apr 33% Oct-Nov 34%	Apr-May 33% Jun-Jul 33% Aug-Sep 34%
Average Indemnity (1987-2023)	\$28/colony	\$16/colony
2024 Policy Premium	\$35/colony	\$22/colony
2024 Premium Subsidy	- \$17/colony	- \$12/colony
2024 Producer Premium	= \$18/colony	= \$10/colony
Average net producer gain (Avg. indemnity-producer premium)	\$10/colony	\$6/colony

	Profit Maximization Jan-Feb 33% Mar-Apr 33% Oct-Nov 34%	Risk Management Apr-May 33% Jun-Jul 33% Aug-Sep 34%
Average Indemnity (1987-2023)	\$28/colony	\$16/colony
2024 Producer Premium	= \$18/colony	= \$10/colony
Average net producer gain (Avg. indemnity-producer premium)	\$10/colony	\$6/colony
Correlation coefficients between API Indemnity and:		
ND average honey yield (1987-2023)	-0.03	-0.26
ND average winter loss rates (2007/08-2023/24)	-0.09	0.11

Relationship: ND Honey Yield and API Indemnity



Relationship: ND Winter Mortality and API Indemnity



Winter Mortality Rate

Sources: USDA API Decision Tool, US Beekeeping Survey Data

Note: Used weighted average winter mortality for all ND operations in 20/21 and 23/24. In all other years, used weighted average winter mortality for only ND multistate operations.

Apiculture Insurance Enrollment

<https://www.rma.usda.gov/tools-reports/agent-locator>

2026
Enrollment deadline
December 1, 2025

Premium
payment due
September 1, 2026



An official website of the United States government

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Risk Management Agency
U.S. DEPARTMENT OF AGRICULTURE



Agent Locator

Finding Insurance Agents

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Locate an Insurance Agent

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Note: Agents may reside or have an office in one state/county, but sell and service policies in other states/counties. An agent authorized to sell livestock policies is not required to sell crop policies, and vice versa.

Apiculture Rainfall Index Insurance: An Insurance Product for Beekeeping Operations of All Sizes

[Brittney Goodrich](#)

Department of Agricultural and Consumer Economics

University of Illinois

October 15, 2025

farmdoc daily (15):190

The Apiculture Rainfall Index Insurance program (API) is a crop insurance product underutilized by Illinois beekeepers. According to U.S. Department of Agriculture (USDA) estimates, fewer than 2% of Illinois colonies were enrolled in API in 2023. Like other Federal crop insurance programs, API is heavily subsidized. Since 2009, API has returned an average of \$2.11 in payments for each \$1.00 in U.S. beekeeper-paid premium. There is no minimum number of colonies required to buy an API policy, so even small Illinois and Midwest beekeepers should consider using API as a risk management tool.

API Use in Illinois and Nationwide

Concluding thoughts

- API should be considered by U.S. beekeepers
 - Starting in 2026 beginning and veteran beekeepers receive additional premium subsidies
- Flexible policies allow for customization to many different beekeeping systems
- Producers influence amount of risk protection with two-month interval choices
- Other government programs for beekeepers
 - Emergency Assistance for Livestock, Honey Bees, and Farm-raised Fish (ELAP) through Farm Service Agency (FSA)
 - Farm loan programs through FSA





For additional almond
pollination resources
[www.brittneygoodrich.com
/almond-pollination.html](http://www.brittneygoodrich.com/almond-pollination.html)

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