The Benefits of Supply Chain Companies Engaging in Pollinator Issues

HONEY BEE HEALTH COALITION

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Executive Summary

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- **Honey bees play an important role** in ecosystem health, agricultural system production, and the food we eat. They are responsible for roughly 1/3 of the food we eat and are responsible for over $17 billion in pollination services.
- **Bee colonies are experiencing a variety of stressors**, resulting in higher than average overwinter and annual losses.
- These **stressors** include pests and diseases, poor forage and nutrition, and incidental impacts from pesticides.
- **Supply chain companies have an opportunity** to address forage and nutrition and incidental impacts from pesticides.

Executive Summary

The Honey Bee Health Coalition is asking supply chain companies to engage in the following **four ways**:

1.

Provide flowering pollinator habitat, ground nesting opportunities, and clean water sources for bees.

2.

Work with growers and grower organizations to decrease impact on bees from pesticides by encouraging the adoption of IPM principles and carefully following the label.

3.

Encourage growers and beekeepers alike to open communication lines, such as through developing a beekeeper-grower plan.

4.

Reach out to the Honey Bee Health Coalition for more information and assistance with developing pollinator projects.

Each engagement opportunity has important co-benefits for soil, water, and air!

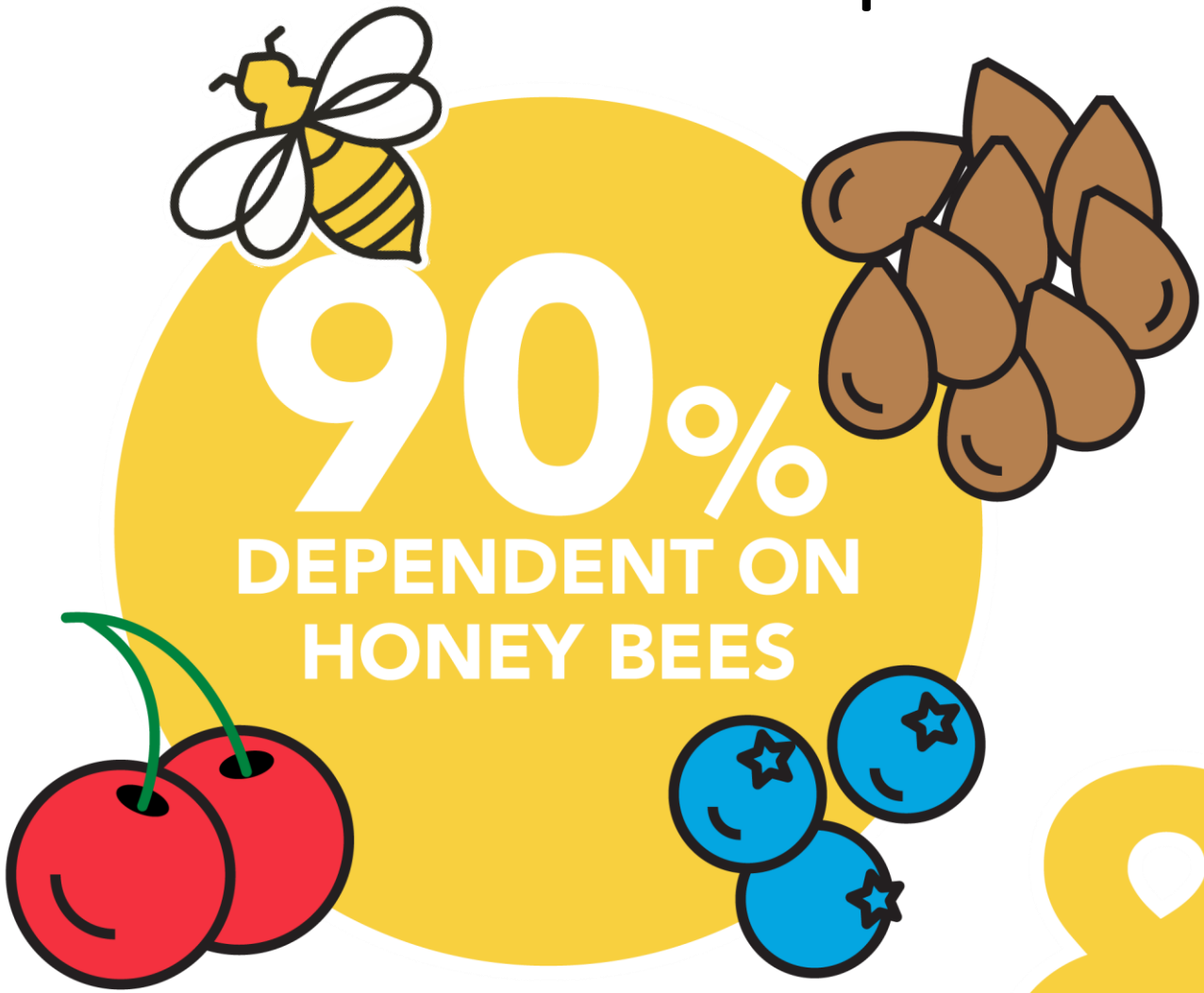
SECTION ONE:

The Importance of Bees in Agriculture

Pollinator Health is Important for Ecosystem Health

Pollinators support plants that provide food, support wildlife, increase diverse root systems, promote soil health, reduce runoff, and improve water quality.

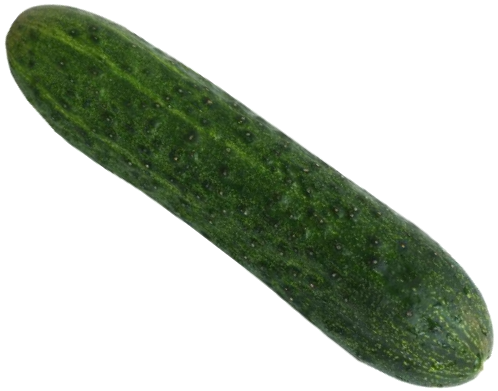
Pollinator Health is Important for Crop Production



&

OILSEEDS

HERBS/SPICES



VEGETABLES

LIVESTOCK FORAGE
& LEGUME

Pollinators Provide Great Benefits to Our Diets and Economy

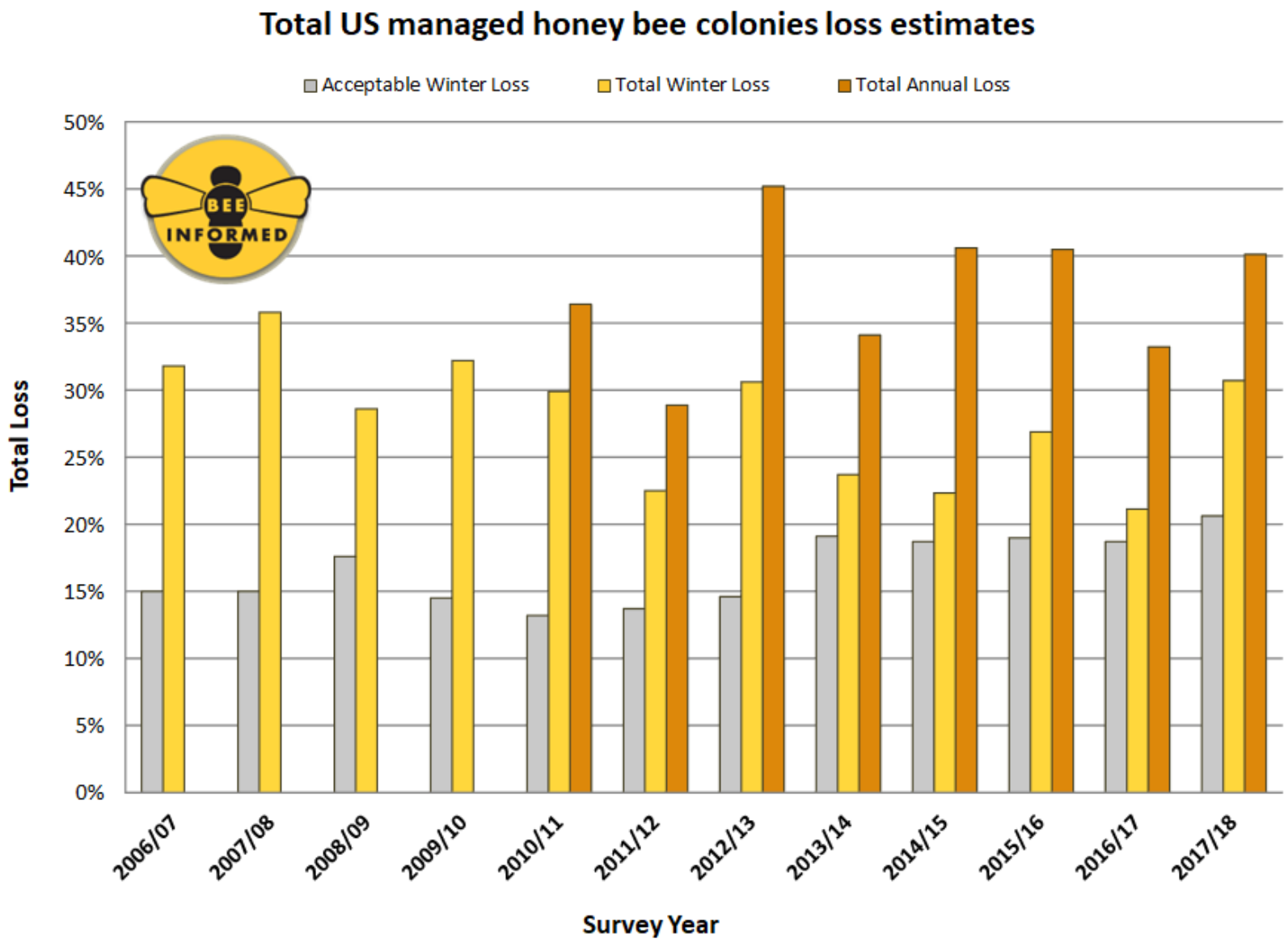
APPROXIMATELY 1/3 OF OUR DIET IS DEPENDENT ON POLLINATION BY INSECTS.

HONEY BEES SUPPORT $19 BILLION ANNUALLY IN THE U.S. THROUGH THE POLLINATION SERVICES THEY PROVIDE.

SECTION TWO:

Problems Facing Pollinators

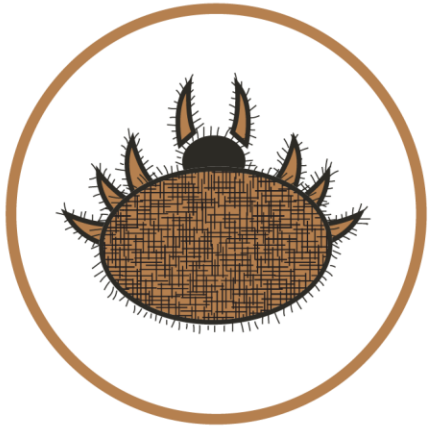
Beekeepers are experiencing higher than average losses



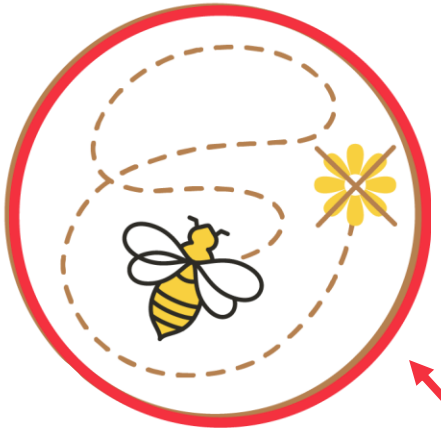
Bee Health Decline has been Linked to a Variety of Factors

Pesticide Impacts

Pests & Diseases



Forage & Nutrition

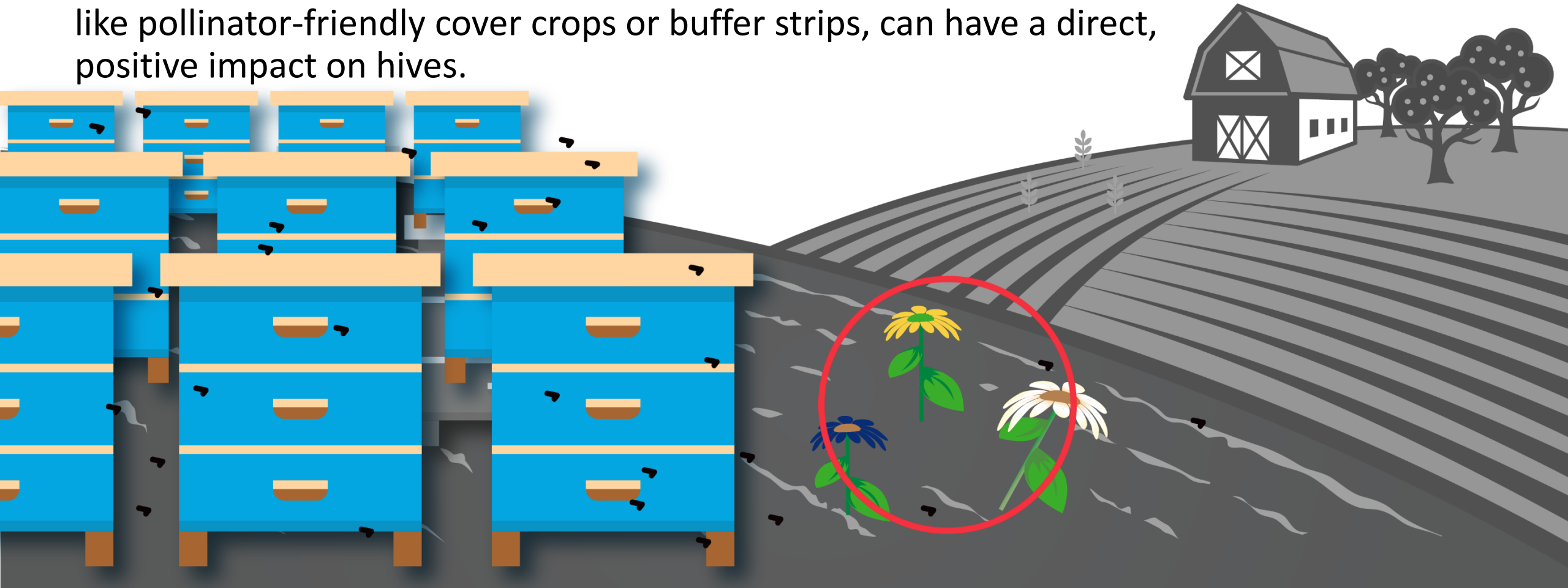


Supply chain companies and their growers have an opportunity to address this!

And this!

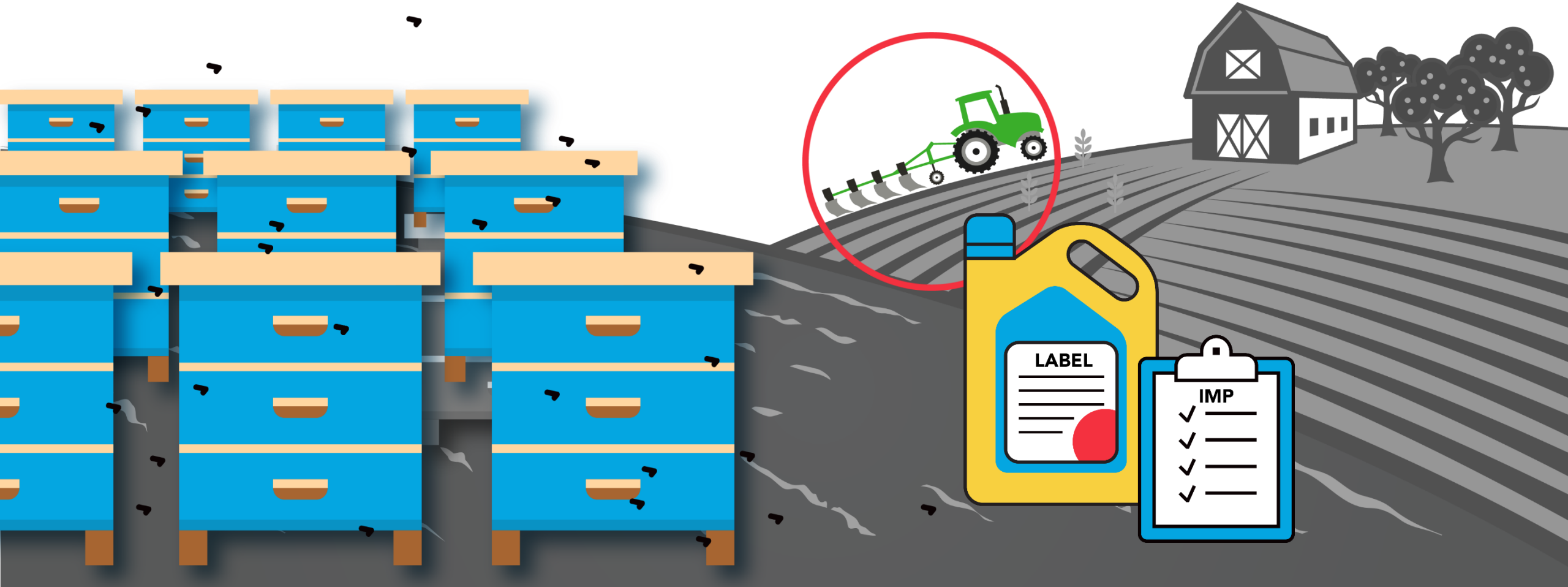
Forage and Nutrition

- **PROBLEM:** Forage and habitat loss, degradation, and fragmentation occur as native vegetation is replaced by roadways, lawns, crops, and non-native gardens.
- **SOLUTION:** A hive with access to a variety of healthy, clean forage is better able to resist other stressors like Varroa, pesticides, and viruses. Forage opportunities, like pollinator-friendly cover crops or buffer strips, can have a direct, positive impact on hives.



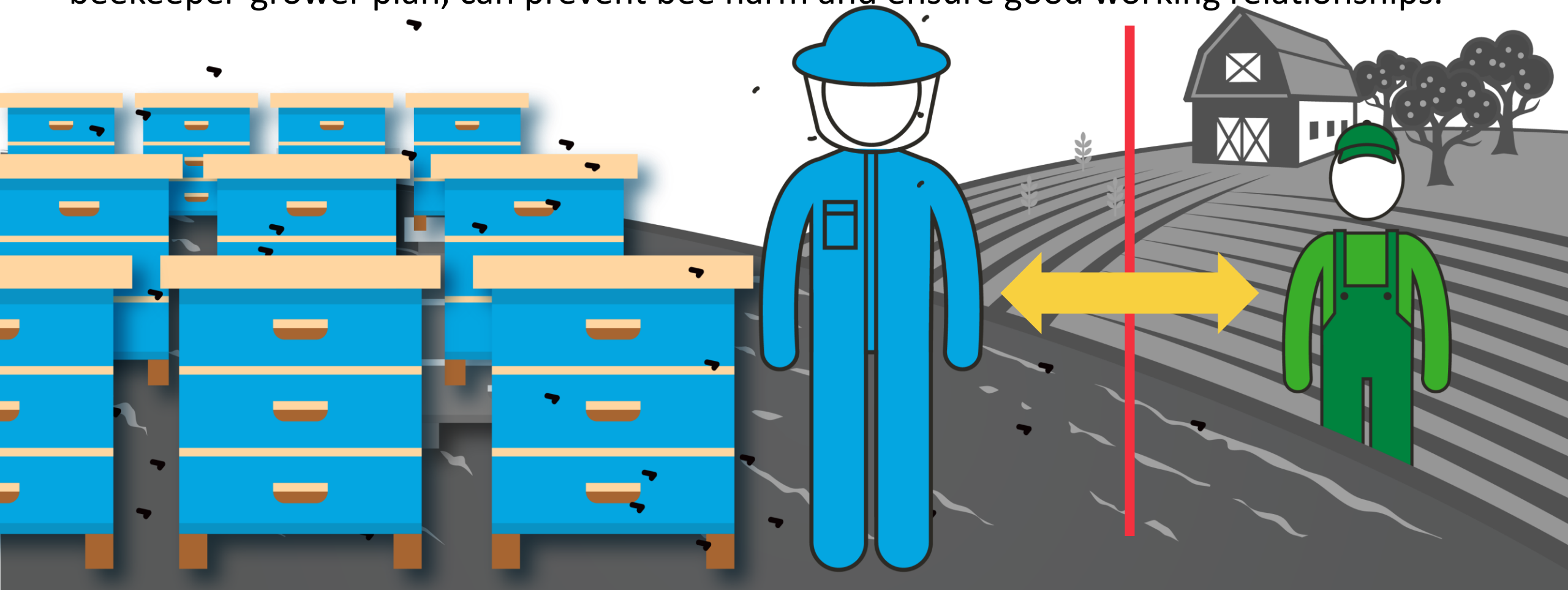
Incidental Pesticide Impacts

- **PROBLEM:** Potential impacts on bees are product-specific (products vary in toxicity and in routes and duration of exposure).
  - Application parameters and environment will influence magnitude and duration of exposure.
- **SOLUTION:** Following labels and IPM principles can reduce risk to honey bees.



Grower-Beekeeper Communications

- **PROBLEM:** Beekeepers and growers often have very different perspectives and may not be aware of each other's work.
- **SOLUTION:** Having beekeepers and producers work together, through development of a beekeeper-grower plan, can prevent bee harm and ensure good working relationships.



SECTION THREE:

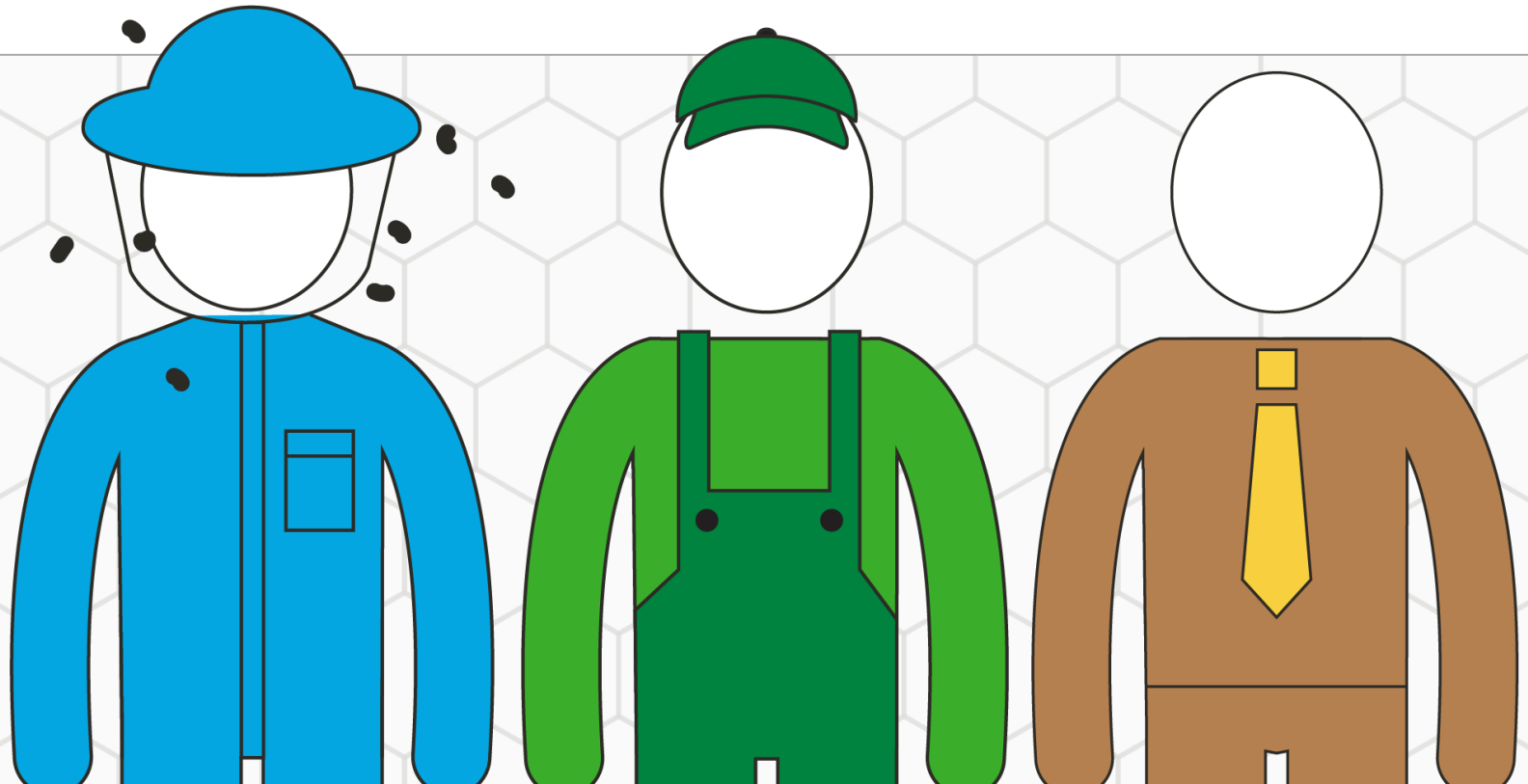
Opportunities for Bee Health Enhancement

HONEY BEE HEALTH COALITION

Mission

HONEY BEE HEALTH COALITION

To collaboratively implement solutions that will help to achieve a healthy population of honey bees while also supporting healthy populations of native and managed pollinators in the context of productive agricultural systems and thriving ecosystems.



HONEY BEE HEALTH COALITION MEMBERSHIP

What We Are Doing

The Bee Integrated Demonstration Project: A project that brings together beekeepers and producers to show them how to implement a suite of best practices to support honey bee health.

Pollinator-Focused Continuing Education: A training module for crop pest consultants and advisors.

(Piloting winter 2018)

The Tools for Varroa Management Guide: A guide for beekeepers on how to identify and treat a common and impactful bee pest: the Varroa mite.

The Bee Nutrition Challenge: A contest to seek creative, practical solutions to accelerate and pioneer the field of honey bee nutrition.

(Selected 4 proposals to fund in 2018)

Crop-Specific Best Management Practices: Work to identify potentially negative impacts of crop agricultural practices, including soybeans and corn, on bees and suggest strategies to mitigate these.

Will you consider incorporating bees into your supply chain sustainability work?

HONEY BEE HEALTH COALITION

What We Are Asking

Supply Chain Companies can do the Following:

1. Provide flowering pollinator habitat, ground nesting opportunities, and clean water sources for bees.

2. Work with growers and organizations to decrease impact on bees from agricultural chemicals.

3. Encourage growers and beekeepers to communicate and work together.

4. Reach out to the Honey Bee Health Coalition for more information and assistance

Addressing the first three of these has important co-benefits for ecosystems, water, air, and soil!

Forage and Nutrition

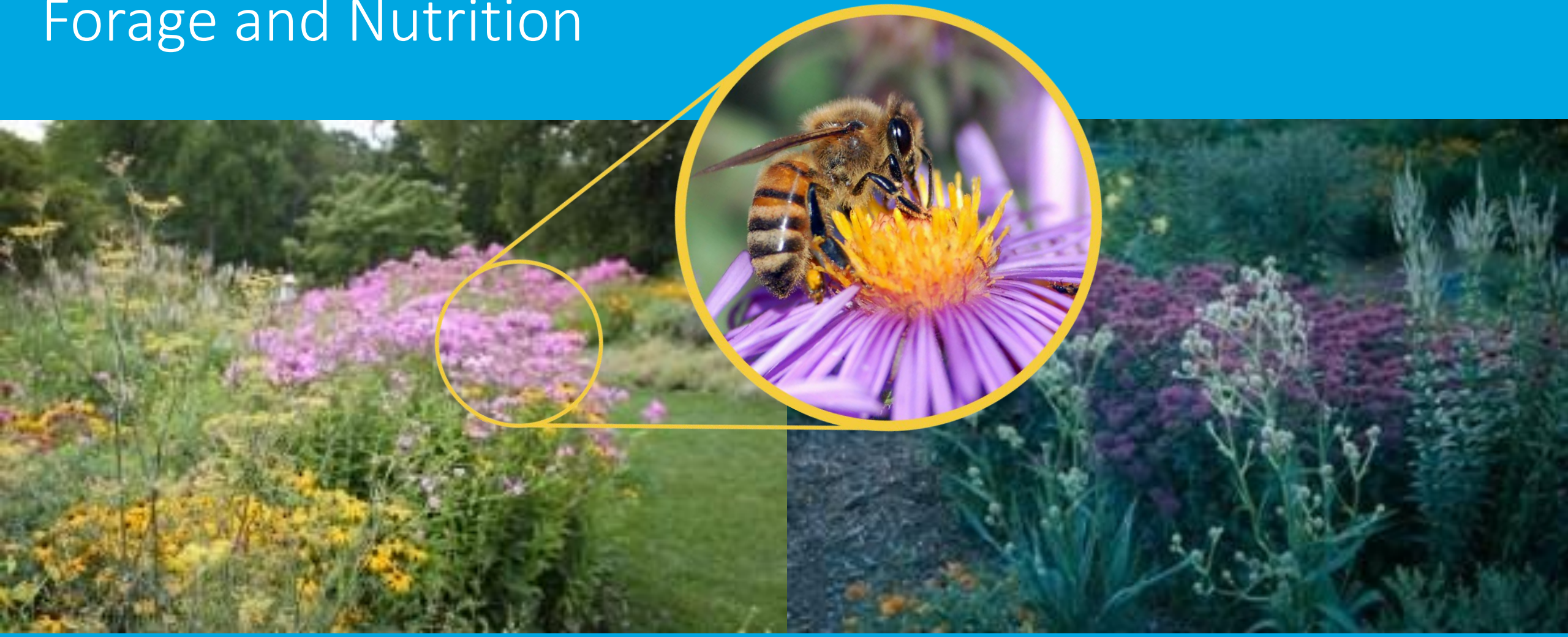


Photo Source: Ohio State University

Photo source: Tom Smith, NPSEC

Forage and Nutrition Projects Take a Variety of Forms

- Enhancing off-field floral resources
- Enhancing on-field floral resources
- Providing nesting habitat for ground bees
- Providing access to clean water

Planting pollinator forage can be integrated into existing sustainability work – like cover cropping, field buffer strips, and natural habitat establishment – by including pollinator-friendly plants or seed mixes in your plant selection.

Forage and Habitat Benefits

Water Quality

- **Water quality protection** (Gillespie et al, n.d.)
- **Increase in the soil's water holding capacity** (Union of Concerned Scientists, 2013)
- **Reduced nitrogen leaching and reduced creation of nitrous oxide in field and downstream** (Union of Concerned Scientists, 2013)

Emissions Reduction

- **Potential for increased carbon storage in soil** (Union of Concerned Scientists, 2013)

Agricultural Benefits

- **Suppression of pests** (Gillespie et al, n.d.)
- **Increased number and diversity of beneficial insects** (CTIC, 2014; Van Sambeek, 2017)
- **Potential crop yield and quality increases** (Fiedler et al, 2008; Gillespie et al, n.d.; Wratten et al, 2012)
- **Weed suppression and weed control savings** (Gillespie et al, n.d.)
- **Reduced need for pesticides, herbicides, insecticides, and fertilizer** (Gillespie et al, n.d.; SARE, 2012)

Forage and Habitat Benefits

Soil Health

- **Soil quality protection** (Gillespie et al, n.d.)
- **Enhanced soil fertility**
  - **Increased soil organic matter**
  - **Reduced compaction**
  - **Increased nitrogen fixing**
  - (CTIC, 2014; SARE, 2015; Union of Concerned Scientists, 2013; Van Sambeek, 2017)
- **Reduced erosion and sediment**
  - **Reduced phosphorous runoff into water sources**
  - (Union of Concerned Scientists, 2013)

Ecosystem Benefits

- **Biodiversity conservation**
- **Enhanced pollination**
- **Improvement of other ecosystem services**
- (Gillespie et al, n.d.; Wratten et al, 2012)

Societal/Economic Benefits

- **Improved farmer economics**
  - **Improved annual cash flow, land asset values, diversification of revenue, and market access**
  - (Muth, 2018)
- **Additional income (if part of a double-crop system or used as animal forage)** (CTIC, 2014; SARE, 2015)
- **Rural prosperity and aesthetics** (Gillespie et al, n.d.; Wratten et al, 2012)

Conservation and Pollinator Work provides Business Benefits

Improving Annual Cash Flow

Farmers identify underperforming areas of fields and use practices to reduce their financial loss.

Practices can **improve average profit by $20 per acre** (3% increase in ROI).

Improving Land Asset Value

Practice can improve average profit and have an **impact of $767/acre on the value of land asset**

Diversification of Revenue

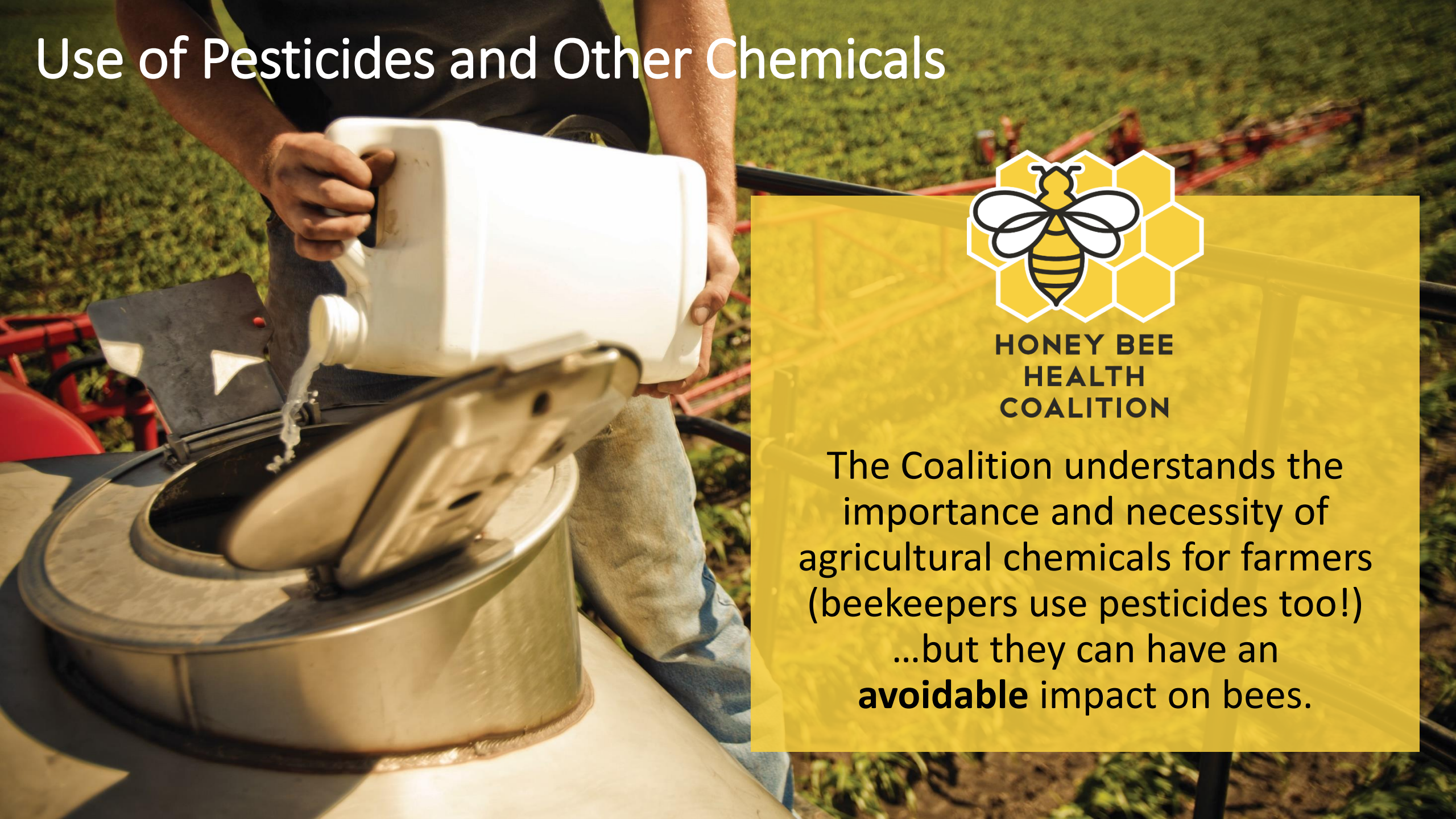
Diversification includes **potential revenue streams** from CRP, forage crops, and alternative crop sales.

Market Access

Potential premium for sustainably-produced crops and/or **guaranteed access to markets** that require sustainability metrics.

Decreasing Impact From Crop Pesticides

Use of Pesticides and Other Chemicals



HONEY BEE HEALTH COALITION

The Coalition understands the importance and necessity of agricultural chemicals for farmers (beekeepers use pesticides too!) …but they can have an **avoidable** impact on bees.

Opportunities to Reduce Impact on Bees: Integrated Pest Management (IPM)

IPM includes:

- Setting Action Thresholds
- Monitoring and Identifying Pests
- Prevention of Pests
- Control of Pests
  - Effective, less risky control methods, like choosing insecticides designed to target specific pests, are chosen first.

Opportunities to Reduce Impact on Bees: Follow the Label

- When applying pesticides, following the label is an important part of avoiding unnecessary impacts.

Photo source: Chazzbo Media

Other Precautionary Steps Include:

- Creating buffers from pesticide exposure
  - Install non-flowering hedgerows or tree lines in areas with high pesticide use to act as a buffer
- If feasible, not spraying pesticides on crops when they are in bloom
- Mowing down nearby flowering weeds and forage before spraying so bees don’t forage on habitat containing agricultural chemicals

Following These IPM Principles Can Reduce Impact on Bees While Benefitting Farmers

Benefits include:

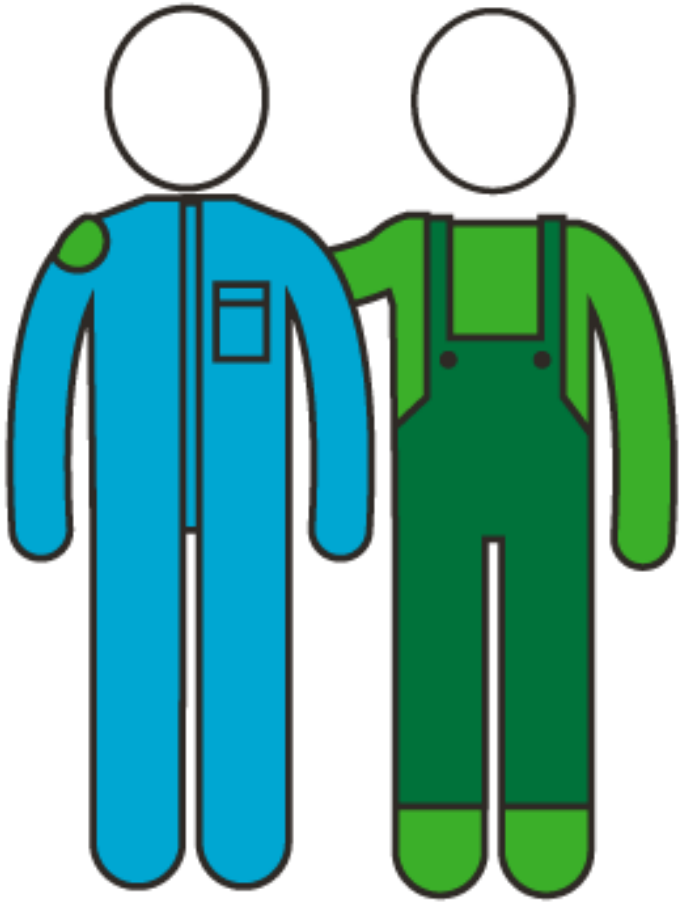
- Reduction in number of pests (EPA, 2017)
- Reduction in number of pesticide applications (EPA, 2017)
- Money savings while protecting human health (EPA, 2017)
- Reduction in producer's economic risk (USDA, n.d.)
- Reduction of environmental risk associated with pest management (USDA, n.d.)
- Reduction in risk to the public (USDA, n.d.)

Beekeeper-Grower Communications

Communication between Beekeepers and Growers

- Communication between **beekeepers** and **growers** can enhance collaboration, decrease conflict, and avoid unnecessary bee harm

The **beekeeper** has knowledge of their bees and the stressors the bees are facing.



The **crop pest advisor** or **applicator** has knowledge of their products and pest issues.

The **land owner** or **farm manager** has knowledge of their landscape and field.

Beekeeper-Grower Plans

Formal & informal plans may include:

- Contact details
- Hive locations
- Timing of crop blooms
- Timing of applications
- Notification before applications made in area (48 hrs)
- Bee protection guidelines for applications
- Protection of water sources
- Protocols for bee kill investigations

Companies can encourage their growers to initiate the development of a beekeeper-grower plan

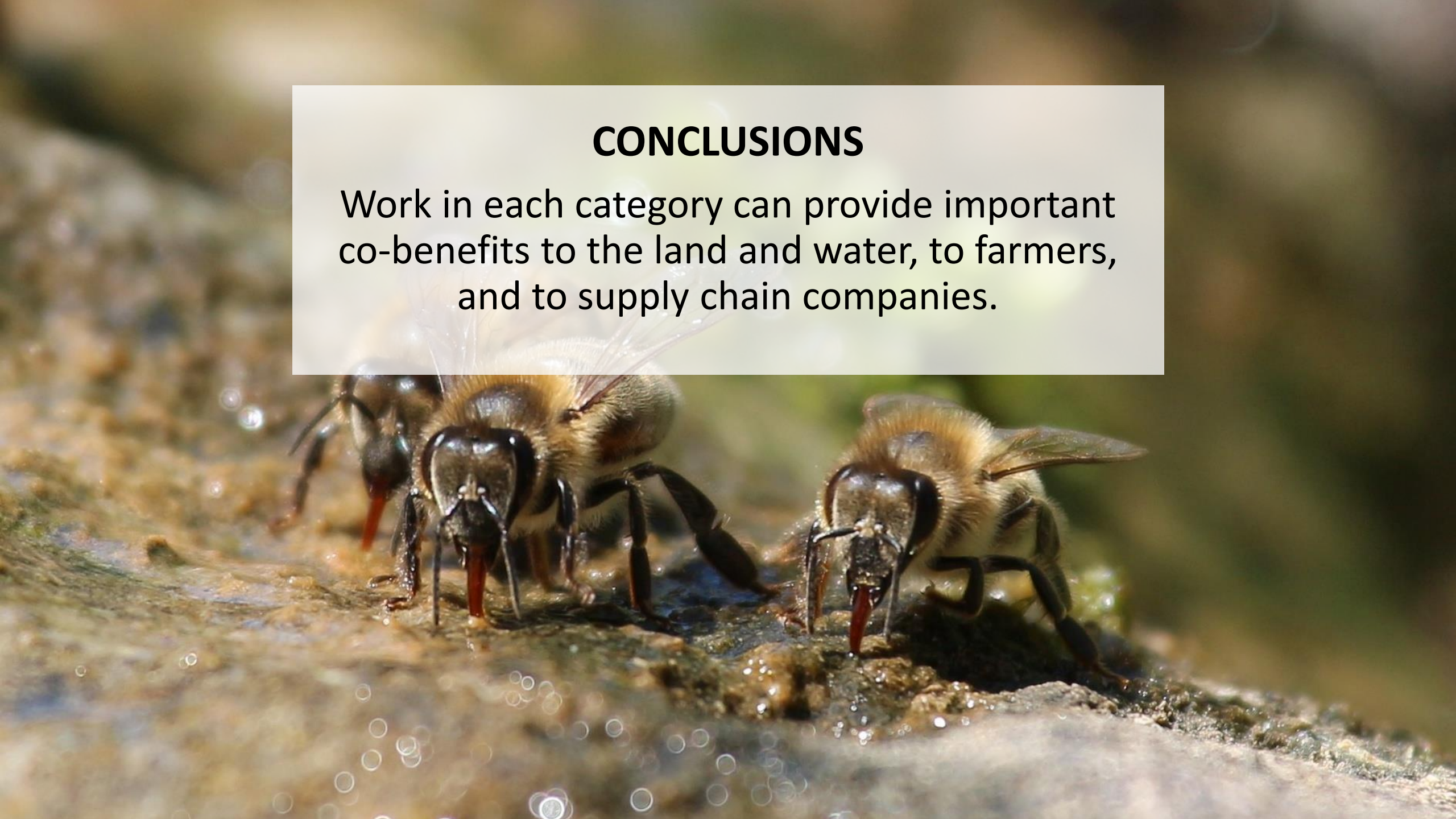
CONCLUSIONS

Supply chain companies have an opportunity to work with their growers on pollinator health in three broad categories:

1. Providing forage/nutritional opportunities
2. Decreasing impact from pesticides
3. Increasing communication between beekeepers and other agricultural players

CONCLUSIONS

Benefits to bee health can be achieved by incorporating an additional focus on pollinators into existing work instead of designing new projects



CONCLUSIONS

Work in each category can provide important co-benefits to the land and water, to farmers, and to supply chain companies.

Supply Chain Companies can do the Following:

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Addressing all three of these has important co-benefits for ecosystems, water, air, and soil!

Questions

HONEY BEE HEALTH COALITION

‘TO GO FAST, GO ALONE.
TO GO FAR, GO TOGETHER.’

-AFRICAN PROVERB

www.honeybeehealthcoalition.org

HONEY BEE HEALTH COALITION

Further Resources

Sources of Economic Assistance

- Using 2014 Farm Bill Programs for Pollinator Conservation https://directives.sc.egov.usda.gov/opennonwebcontent.aspx?content=38006.wba
- Conservation Reserve Program https://www.fsa.usda.gov/programs-and-services/economic-and-policy-analysis/natural-resources-analysis/pollinators/index
- Bee and Butterfly Habitat Fund's Seed a Legacy Program http://beeandbutterflyfund.org/habitat-programs/seed-a-legacy-program
- Project Apis m. Seeds for Bees program https://www.projectapism.org/seeds-for-bees-home.html

Cover Crop Resources

- USDA Land Use Guidelines https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/crops/?cid=stelprdb1077238#Guidelines
- Managing Cover Crops Profitably https://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition
- Cover Cropping for Pollinators and Beneficial Insects https://www.sare.org/Learning-Center/Bulletins/Cover-Cropping-for-Pollinators-and-Beneficial-Insects

Further Resources

- Iowa STRIPS program
  https://www.nrem.iastate.edu/research/STRIPS/
- Farmers for Monarchs
  http://farmersformonarchs.org/
- Monarch Collaborative Resource List
  http://www.keystone.org/wp-content/uploads/2018/01/Monarch-Resource-List-Final.pdf

Appendix

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