The Buzz in Pollinators
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• Honeybees and other insects pollinate more than 100 commercial crops in the U.S. at a value about $18 billion dollars per year.

• Pollination by honeybees and other insect pollinators has been in decline since the late 1940’s.

• Bee colony mortality averaged 10-15%
Currently, it is estimated that there are less than 2.5 million honeybee colonies in the United States.

Almost one half of these remaining colonies are owned by hobby beekeepers and are not readily available for commercial pollination practices.
Not Enough Bees!

• This decline is now starting to threaten the economic viability of insect pollination in sectors of the agriculture and other wild flowering plants that need pollinators for their seed production.
• Since 2006 and the advent of CCD, losses in bee colonies have averaged around 30%. Although, in recent years the symptoms of CCD has dropped off the colony loss has stayed too high.

• So far, commercial bee keepers have been able to split the remaining hives yearly and can compensate for most of these bee losses.
STRESS

• Honey bees are affected in many ways by beekeepers, manipulation of colonies for pollination, nutritional imbalances, the environment, pesticides, and pathogens.
• All these other stress factors have become more apparent as causal agents in the decline of pollinators.

• These agents either working by themselves or by acting together in combination or by synergistic activity and have had a hand in the decline of honey bee colonies.
Varroa Mites

#1 Problem

Before mites, hive mortality averaged between 10-15%.

After mites, hive mortality has increased to 20-25% and higher.
Virus

Deformed Wing Virus
**Small Hive Beetle**

Does not feed directly on honeybees but feeds on hive resources of pollen and honey.

Contaminates hive food resources so bees will not eat on infested frames.

*Can transmit Deformed Wing Virus*

Populations of Small Hive Beetles become large enough that bees will abandon colonies.

Will infest Bumble Bee colonies.
Winter Hive Losses

<table>
<thead>
<tr>
<th>Year</th>
<th>Hive Losses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>32</td>
</tr>
<tr>
<td>2009</td>
<td>36</td>
</tr>
<tr>
<td>2010</td>
<td>29</td>
</tr>
<tr>
<td>2011</td>
<td>38</td>
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Nutrition

- This is a desert to honeybees.

- Without other resources to provide additional food resources honeybees will become stressed.

- Bees need pollen. Pollen is protein. Not all plants produce the same kinds/amounts of pollen protein.
Land Fragmentation

Fragmentation is a problem for pollinators that have to travel great distances for food and shelter.

Honeybees will forage an area of 8,000 acres.

Critical for native pollinators.
Insecticides

• Highly toxic insecticides with residual toxicity longer than 8 hours are responsible for most acute bee poisoning incidents.

• Organophosphates: acephate, azinphos-methyl, chlorpyrifos, diazinon, dimethoate, malathion and methamidophos

• N-methyl carbamates: carbaryl

• Neonicotoids: clothianidin, imidacloprid, thiamethoxam

• Pyrethroids: deltamethrin, cyfluthrin and lamda-cyhalothrin

• Chronic issues in honeybees can develop from long term exposure of the colonies to some pesticides.
What Growers Can Do

- Check your spray schedule and establish no spray buffers.
- Talk to your beekeeper about pesticides used before and during the pollination period.
- Control blooming weeds in orchard crops.
- Learn pollination requirements of your crops.
- Scout and use economic thresholds.
- Avoid prophylactic applications.
- When possible use alternatives to pesticides (IPM).
- Use recommended rates.
There is mounting evidence that other materials used by growers such as fungicides, herbicides, acaricides, insect growth regulators, spreaders and stickers are also causing issues with bee longevity, reduced immune functions and mortality.
Native Bees

• Native bees are good to supplement honeybees for pollination in certain crops.
• Have not been extensively studied. Until now, EPA has only looked at acute honeybee mortality in labeling insecticides.
• Native bees need “wild” areas not only for forage but also for shelter and procreation.
• Most native bees (70%) nest in soil and are not available for colony movement between agriculture fields.
• Native bees are highly efficient pollinators.
• Will fly at times when honeybees will not.
• Can visit more flowers per minute than honeybees.
• Most native bees are seasonal or are slow to develop populations.
• Many buzz pollinate.
What Growers Can Do To Protect Native Bees

Provide nesting sites.

• Provide pollen and nectar resources away from treated crops.

• Do not apply pesticides or allow drift to move into adjacent “wild” areas.

• Scout crop areas for ground nests of solitary bees such as squash bees, sweat bees, etc.

• Learn your bees.
WE DO NOT WANT TO POLLINATE FLOWERS BY HAND