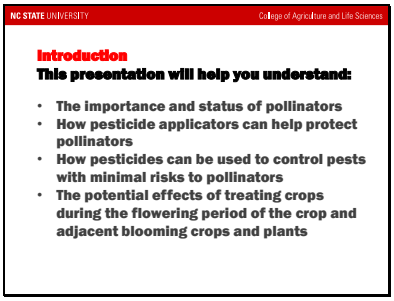
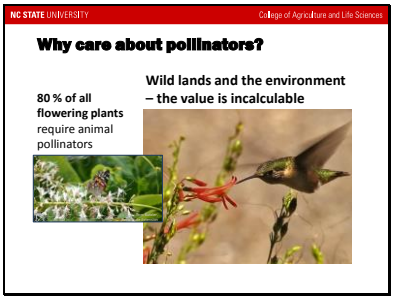
Slide 1

Slide 2

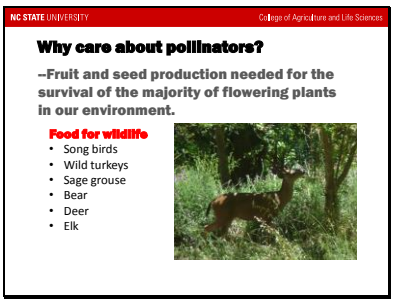


Slide 3



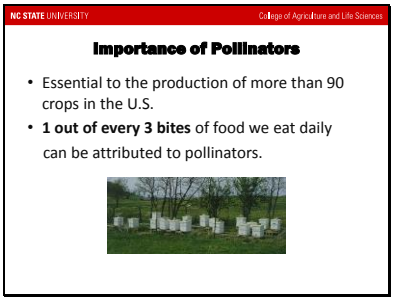
The value of pollinators to our environment is incalculable. Pollinators visit flowers in search of pollen and/or nectar, and in the process, the pollen grains often stick to their bodies and are carried from flower to flower. In this way, they facilitate the process we call pollination.

Slide 4



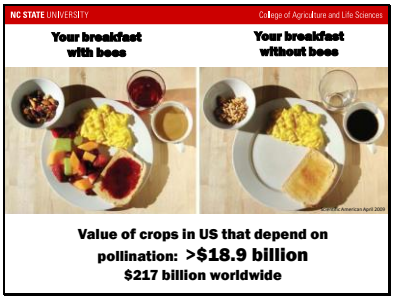
Without pollination, seed and fruit production in animal-pollinated plants can not be successful, not only for our food crops, but for wildlife diets, too.

Slide 5



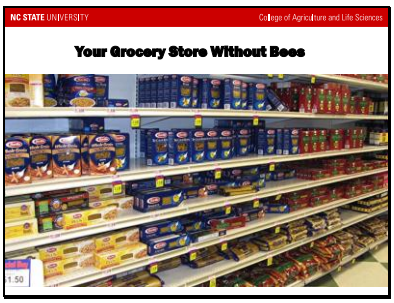
Humans depend on pollinators for our well being. An estimated 1 out of every 3 bites of food we eat each day result from the work of pollinators.

Slide 6



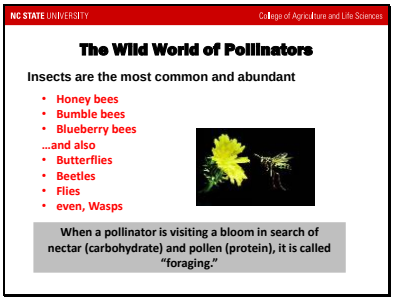
Case in point: your breakfast with and without bees.

Slide 7



Undoubtedly, our grocery store shelves would look quite different without bees pollinating our crops. We are left with mostly grains and starches.

Slide 8



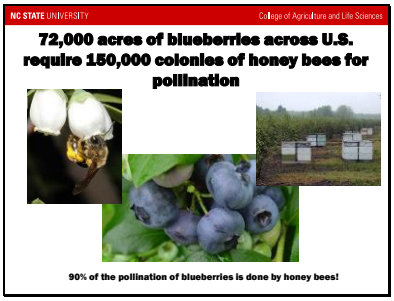
Slide 9

Honey bees are the most important pollinator for food crops

Slide 10

Some crops, like almonds, are completely dependent upon honey bees for pollination. 80% of the world's supply of almonds comes from California.

Slide 11



One of NC's most important crops, blueberries, also requires honey bee pollination.

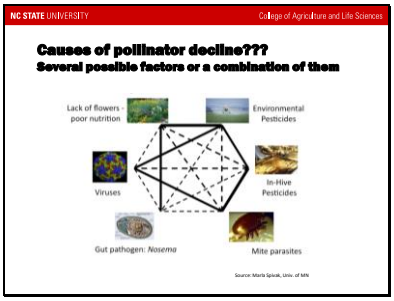
Slide 12

Besides blueberries, other important crops grown in NC are highly or somewhat dependent on honey bees for pollination. For some crops, like cucumbers, lack of honey bee pollination causes misshapen or underdeveloped fruit.

Slide 13

Some pollinators, such as bees, are suffering losses both in population sizes and in species numbers. This is putting stress on our ability to produce food and ensure environmental stability.

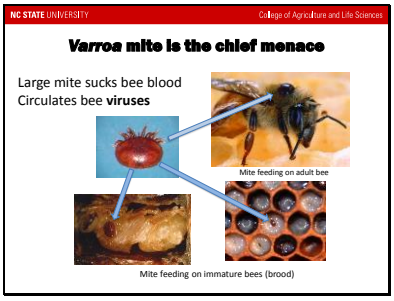
Slide 14



It is believed that pollinator (especially, honey bee) declines can be caused by a combination of factors including predatory mites and parasites, pathogens, nutritional stress, and pesticides, though the exact combination and impact of each factor remains uncertain.

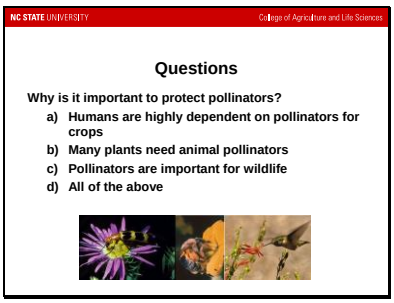
As you might imagine, pollinators can be highly sensitive to many pesticides, especially insecticides.

Slide 15



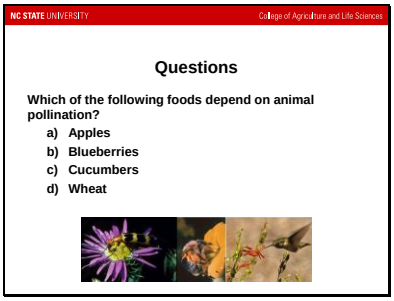
The Varroa mite is a large mite that behaves much like a tick. It sucks the blood of adult and immature bees. Immature bees are called brood. The mite is also capable of passing several viruses as it feeds.

Slide 16



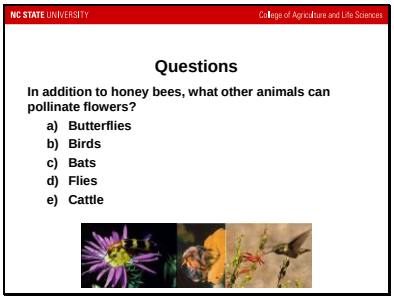
d) All of the above

Slide 17



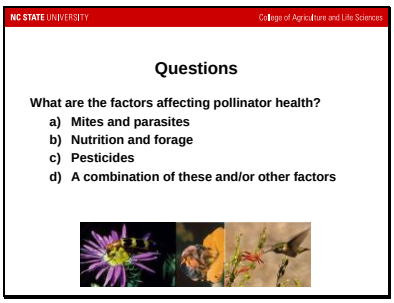
a), b), and c)

Slide 18



All but cattle

Slide 19

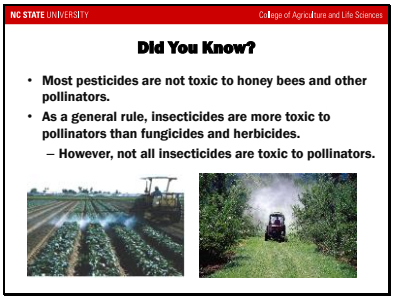


d. is correct

Slide 20

As a pesticide applicator, it's important that you understand how pesticides can harm bees, recognize the daily habits of bees, read the label to help select appropriate pesticide materials, and consider application methods and strategies (such as IPM and BMPs) to minimize exposure to bees.

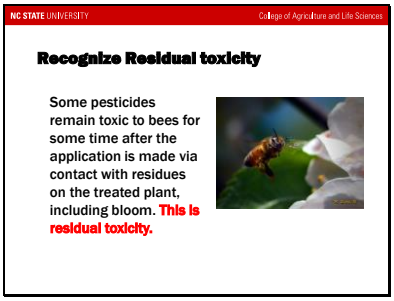
Slide 21



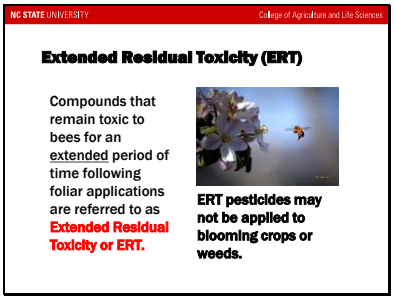
Slide 22

Those pesticides that are toxic to bees can cause harm in one or more of the following ways:

Slide 23

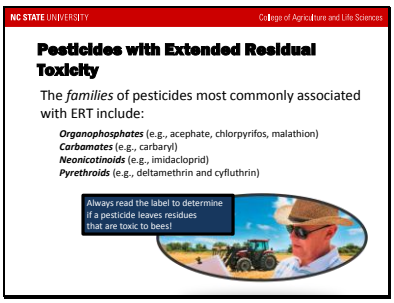


Slide 24

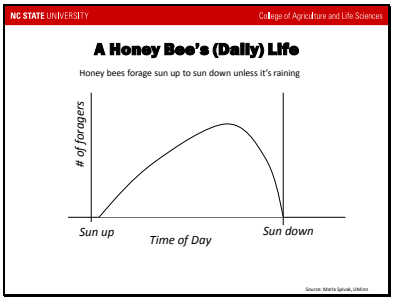


If products remain toxic for an extended period of time following foliar application the product is referred to as having an Extended Residual Toxicity or ERT. ERT pesticides may not be applied to blooming crops or weeds when pollinators are present or will be visiting soon after application.

Slide 25

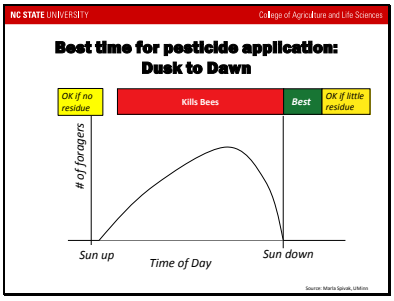


Slide 26



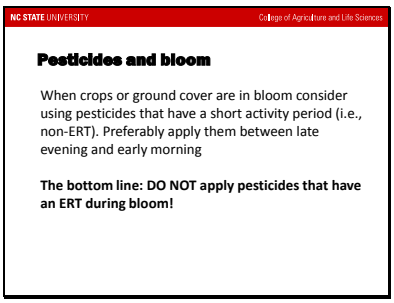
Most pollinator poisoning occurs when bee-toxic pesticides are applied to crops during bloom. This is a time when pollinators are most likely to be attracted to the crop while actively searching for pollen and nectar. A honey bee will take to flight when temperatures are 55 degrees or above. They are most active from late morning through mid afternoon.

Slide 27

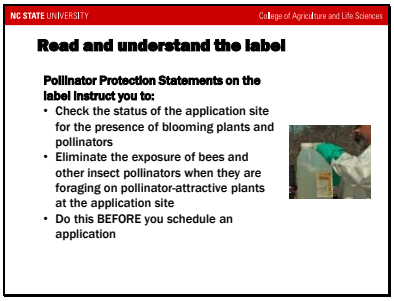


The worst time of day to apply bee-toxic pesticides, therefore, is from late morning through early afternoon. Some bee-toxic pesticides can be applied from dusk till dawn as long as little or no toxic residue is left behind.

Slide 28



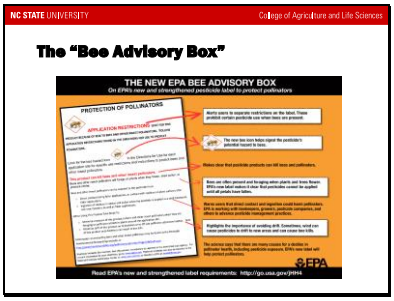
Slide 29



Pollinator Protection Statements on the label instruct you to:

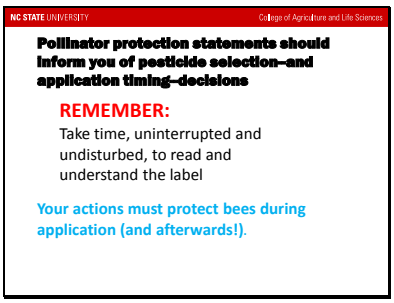
- Check the status of the application site for the presence of blooming plants and pollinators
- Eliminate the exposure of bees and other insect pollinators when they are foraging on pollinator attractive plants at the application site
- Do this BEFORE you schedule an application

Slide 30



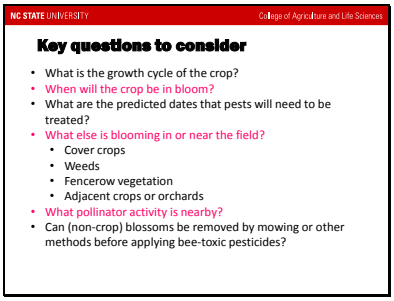
For several newer insecticides on the market, there is a "Bee Advisory Box" in the Environmental Hazards section of the label. On pesticides determined to be highly toxic to honey bees the label language may not be exactly like what is depicted, it will be similar and follow the same principles.

Slide 31



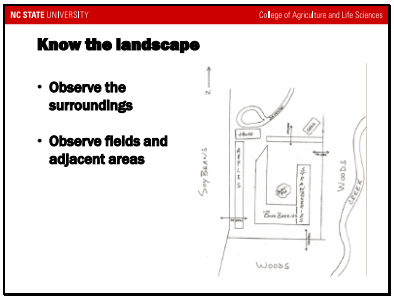
As the applicator, it is your responsibility to follow all statements and instructions on the label. Pollinator protection statements are called by a variety of names – “Bee Caution”, “Bee Hazard”, “Bee Warning” among others. These statements are based on the evaluated risk to honey bees. Don’t assume that all pollinator protection statements are the same. READ and FOLLOW label restrictions. Watch closely for label changes.

Slide 32



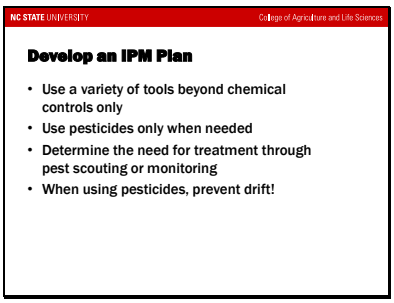
With this information in mind, there are a number of key questions to consider when using pesticides in or near crops that are attractive to bees.

Slide 33



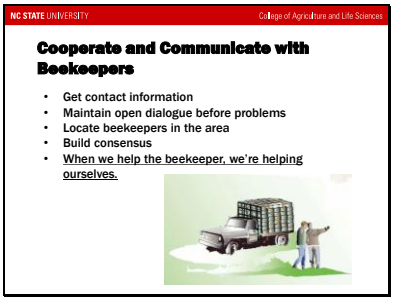
Be familiar with your fields and the surrounding areas so you will know which areas may have potential pollinator activity. Note what other plants (weeds, plants in hedgerows, in drainage ditches, etc.) are present and may be blooming.

Slide 34



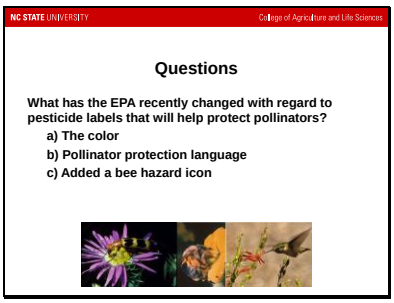
Develop an Integrated Pest Management plan and consider other methods of pest prevention or control. Be sure you have a pest problem before applying pesticides through scouting or monitoring for the presence of pests in damaging numbers. Use pesticides wisely and prevent drift.

Slide 35



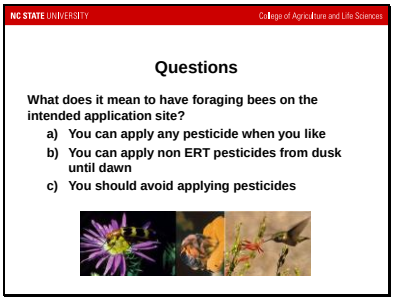
To protect pollinators, communication is key. The underlying cause of most bee poisoning incidents is a lack of information or awareness, rather than intent to do harm. Most pest management programs can be modified so that little or no be poisoning occurs, without undue cost or inconvenience to the grower. Both beekeepers and pesticide applicators benefit from forming working relationships and familiarizing themselves with each other's management practices. The more you learn from others, and educate others, the better off you will be. Good communication will help you avoid problems from occurring.

Slide 36



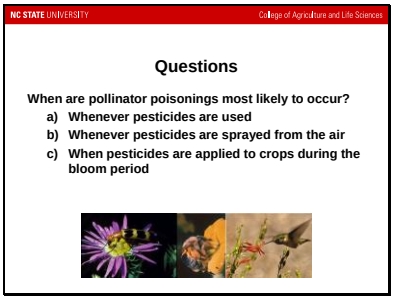
B and C

Slide 37



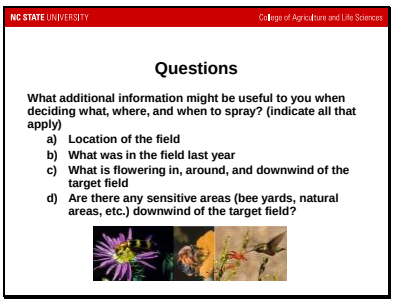
b) You can apply non ERT pesticides from dusk til dawn

Slide 38



c. When pesticides are applied to crops during the bloom period

Slide 39



A, C, and D

Slide 40

Slide 41