

# A Crime Against Plants

## A Botanical Crime Scene Investigation: Exploring how we can know events of the past

### Teacher Information

This activity was developed in response to the claim from some quarters that science cannot know what happened in the past unless a person was there as a witness. The crime scene investigation model seemed an effective way to refute these claims.

This activity aligns with the History and Nature of Science (9-12) of the National Science Education Standards. It also can be used to meet specific content goals in Life Science and Earth and Space Science.

### Botanical Crime Scene Timeline

**1965** - Pontiac Motor Division produces hubcap in question (#PON992 from hubcaps.com). This is the only year this style hubcap was produced.

**1965-1995** - The hubcap came to rest at the site at some time during this time period. Most likely, the hubcap was in position when the seedling began to grow. After 1995 the sapling would have been too large for the hubcap to fall or be placed over it without causing significant damage to the sapling.

**1989-1990** - Victim began to grow at the location where it was ultimately found. Based on ring count from cross section.

**2000-2001** - Victim dies based on amount of decay found on victim.

**2002** - Victim was found.

### Cause of death

Trees increase in diameter as the cambium divides and lays down new tissue, xylem to the inside and phloem and cortex to the outside. As the sapling began to “fill” the space available it came in contact with first the long sides of the opening in the hub cap then finally with the short sides of the opening. Contact with the long sides of the opening did not cause the death of the sapling since the tree was able to grow tissue that extended well over the metal of the hub cap (Photos 4 and 6). Enough food and nutrients were able to continue to move through the areas of the stem not yet in contact with the metal of the hubcap. Once the stem of the plant filled the space available to it, any increase in diameter resulted in a severing of the bark, cortex, and phloem. When these tissues were completely severed the tree was no longer able to move food between the leaves and roots and between the roots and the leaves.

**A possible cause of death** would be that the severing of these tissues might have occurred in the summer of 1999 or 2000. That fall the tree was unable to send adequate food reserves to its roots. That winter the roots may have died due to lack of food. If the roots did not die during the winter they would have been unable in the spring to supply the developing shoots with the required energy. In either case, the tree would die.

**A second possible cause of death** might be infection. As the tree came in contact with the hubcap, the metal “cut” into the plant’s tissue. This open wound may then have served as a point of entry for an eventually lethal invasion of bacteria and/or fungi.

**A third explanation** could involve both the previous two. The tree began “starving” as its tissues were severed. The tree, weakened by starvation then fell prey to bacteria and/or fungi that entered through the open wound caused by overgrowing the hubcap.

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