

# What's eating my garden?

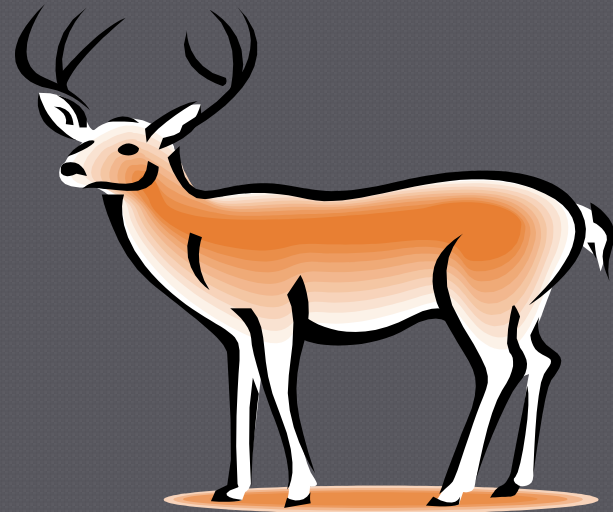
An application of the scientific method



# Animals that target your plants

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- ◉ Chipmunks
- ◉ Deer
- ◉ Groundhogs
- ◉ Moles
- ◉ Rabbits
- ◉ Squirrels
- ◉ Voles
- ◉ And more



# Brainstorm

- Can you think of any plants in your landscape that are targeted by animals?



# Deer Grazing

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- A common problem for landowners who witness the destruction of
  - Landscapes
  - Vegetable Gardens
  - Container gardens
  - Trees
  - And more

# Grazing Identification

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- One of the first things that a landowner must learn is how to accurately identify the deer damage (Baugher et al., 1985).
- According to these authors, most deer damage occurs at night, so the landowners should confirm deer browsing by looking for tracks and deer droppings.
- Deer do not have upper incisor teeth, and when eating they pull or tear the part being eaten as opposed to rabbits or woodchucks who leave clean cuts on the plants (Baugher et al., 1985).

# Example



# Example



# Example

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# Deer Grazing Habits

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- White-tailed deer are extremely adaptable (*Odocoileus virginianus*), both in habitat and diet selection (DeNicola et al., 2000).
- The adaptability of deer makes landscape or garden sustainability difficult.

# The Scientific Method Review

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1. Observe an aspect of the universe or identify a problem
2. Formulate question(s)
  - Organize facts through a review of the literature
3. Develop a hypothesis
4. Make predictions
5. Collect and analyze results
6. Report the results

# Applying the Scientific Method

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## 1. Identify the problem

- Customers seek solutions to damage on landscapes and gardens



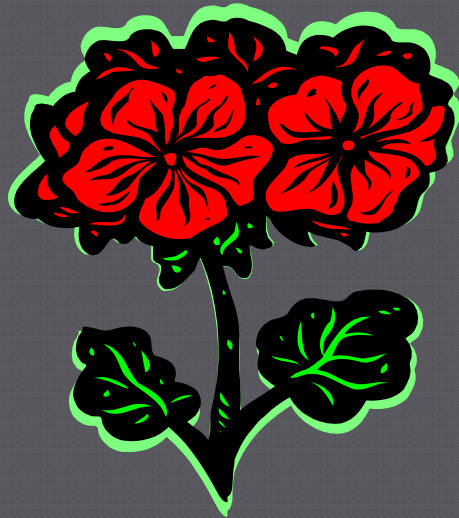
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## 2. Formulate questions

- What plants do deer target
- Is there a preference of plant species
- Are any plant species “deer resistant”

### 3. Hypothesis

- Deer will have a preference of plants species



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## 4. Making predictions

- When using 5 plant species selected for garden and landscape popularity, plants will have different levels of herbivory
- When referencing extension publications Lantana will have a small amount of deer herbivory and Euonymus will have large amounts

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## 5. Collect and analyze results

- During a 6 month period damage will be assessed 3 time a week
- Amounts of deer herbivory will be tallied monthly and at the conclusion of the project
- Statistics will be used to analyze the differences between plant herbivory

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## 6. Report the results

- There are several ways to accomplish this
  - Published research papers in a journal
  - Extension publications
  - Symposiums
  - Etc.



# Mrs. Gaertner's Research Project

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## ○ Goals of the research

- Determine if selected plants are “deer resistant” or untouched
- Evaluate selected plants to determine clear preference of the deer or if all plants were equally attractive

## ○ Result

- Advise homeowners on plants that can be planted without deer disturbance

# The Project

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- Create four research plots

- Identical in:
  - plot size
  - plant quantity
  - plant species
  - plant size
  - accessibility for deer

- Assess plots for plant damage

- Inspect three times a week
- May 14, 2010 through October 22, 2010

# Materials and Methods

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- Five species of plants were selected, all commonly used in home landscapes.
  - Lantana 'Confetti' (*Lantana camara*)
  - Echinacea 'Big Sky Sunrise' (*Echinacea hybrid*)
  - Zonal Geranium 'Allure Lilac Chiffon' (*Pelargonium hortorum*)
  - Azalea 'Snow' (*Rhododendron mucronatum*)
  - Golden Euonymus (*Euonymus japonicus*)

# Materials and Methods

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- Project Site - 520 Patrick Henry Drive, Blacksburg High School
- Property lies between the high school and a neighborhood - small grassy area with one section adjacent to a chain link fence and another section adjoining a wooded area



# Materials and Methods

## Design for the plots

- Three replications of five plant species were randomly assigned to a location in each 4'x6' plot.



# Materials and Methods

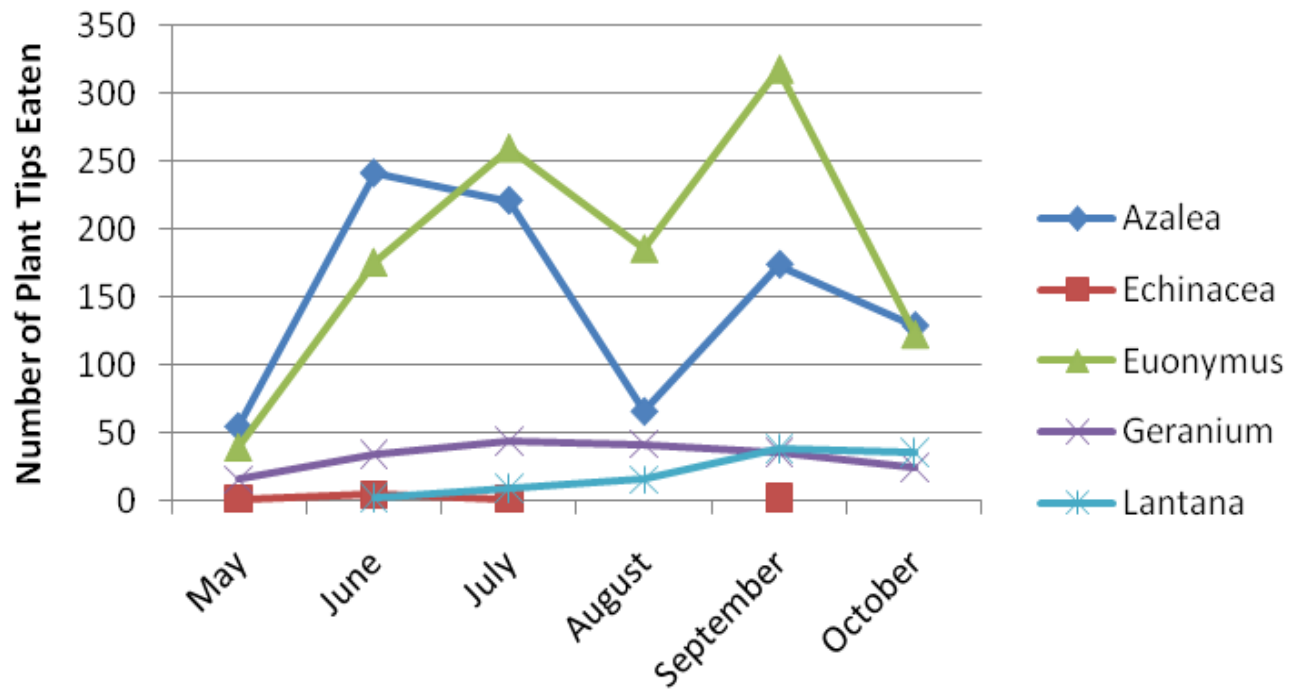
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## ○ Data Collection

- Plots assessed three times a week
- Each was plant was counted individually
- Tips eaten were totaled per species to yield results
  - Per month
  - Over the duration of six months

# Results

## Grazing Trend Totals



# Results

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- Deer damage was most abundant on Euonymus and Azalea plants, followed by Geranium and Lantana plants, and the least herbivory occurred on the Echinacea plants



# Research Activity

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- Grab a handout from Mrs. Gaertner

# Your Turn!

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- With the provided information the class will broaden research on deer herbivory in landscapes and gardens
- Let's investigate deer grazing in the Blacksburg community!



# Your Task

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- Identify the plants in your landscape or garden
  - Use class resources if plants are unknown to you
- Use the scientific method to write up your research project
- For the 7 week period you will survey your garden and landscape for deer grazing
  - Identify what plants were grazed
  - Count the amount of tips that were eaten per plant
  - Submit findings at the end of the grading period with a poster presentation