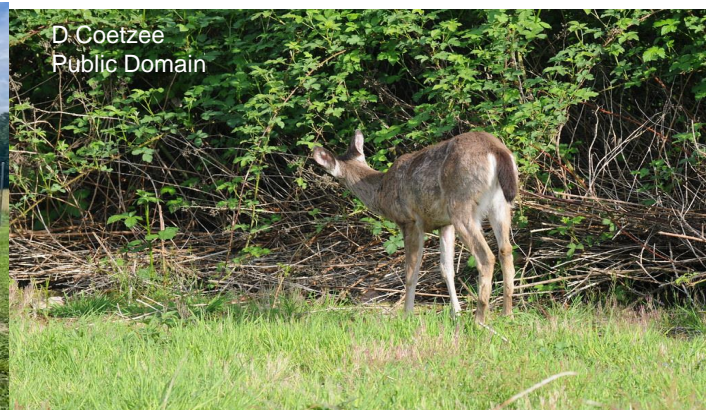
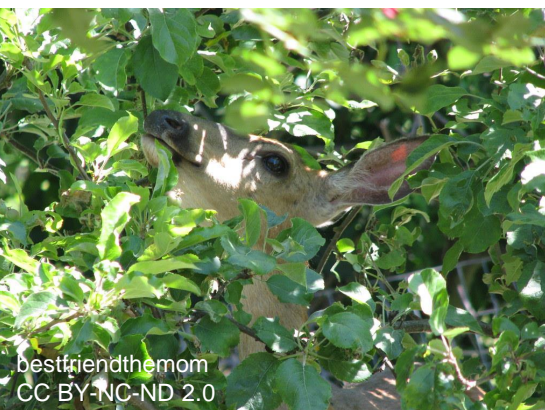


Reducing Deer Damage in the Landscape



Matt Jones

Horticulture Agent

NC Cooperative Extension - Chatham County Center

Tonight's Webinar

- Deer Biology and Behavior
- Management Strategies
 - Repellents
 - Fencing
 - Plant Selection



Additional Resources

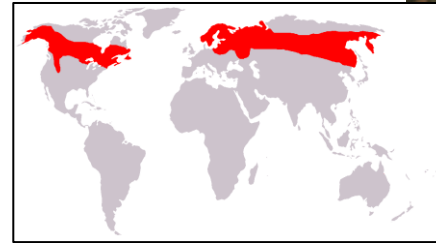
<https://go.ncsu.edu/chathamdeer>



Deer in North America



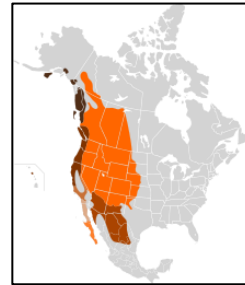
Elk
Cervus canadensis



Moose
Alces alces



Caribou
Rangifer tarandus



Mule Deer
Odocoileus hemionus



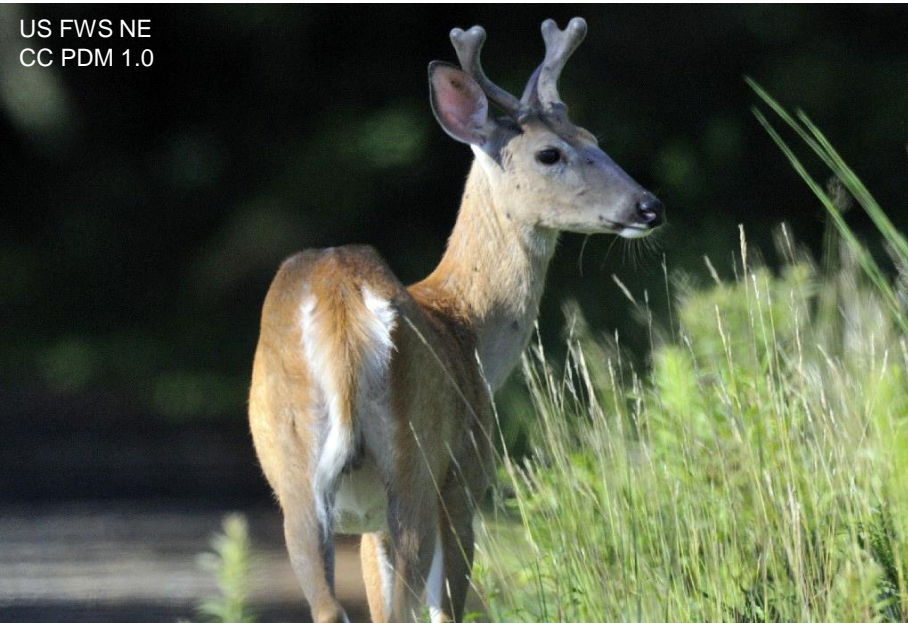
Deer in North Carolina



White-tailed Deer *Odocoileus virginianus*



White-tailed Deer **Identification**



White accents are fashionable *all* year

White-tailed Deer

Reproductive Biology



Rutting (mating) occurs in autumn

White-tailed Deer

Reproductive Biology



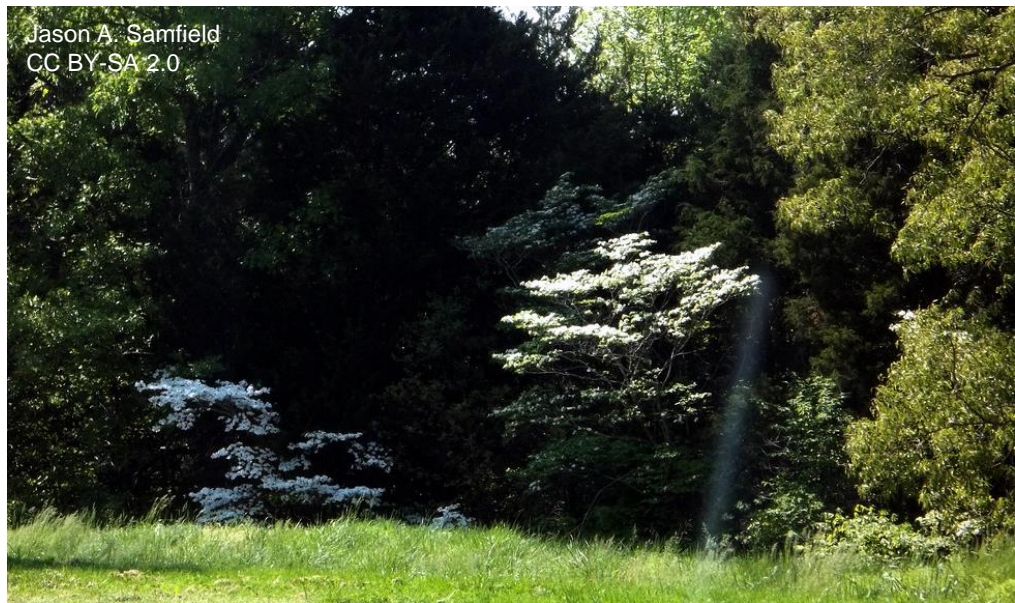
Precocial faun born in spring



Hidden faun are *not* abandoned

White-tailed Deer

Food and Habitat



White-tailed Deer

Feeding Behavior



Reach up to six feet to browse



Ruminants

White-tailed Deer **Feeding Behavior**



blinzo
CC BY-NC-ND 2.0



Martin LeBar
CC BY-NC 2.0

Diet changes with the seasons

White-tailed Deer **Feeding Behavior**

Creatures of habit

- Previous damage often indicates future damage potential
- Follow established trails

Prefer woodland edges

- Want cover (woods) close by when feeding



White-tailed Deer **Feeding Behavior**

- No sharp upper teeth
- Jerk stems – ragged, torn edges
- May strip leaves from stems
- May pull up newly planted annuals, perennials

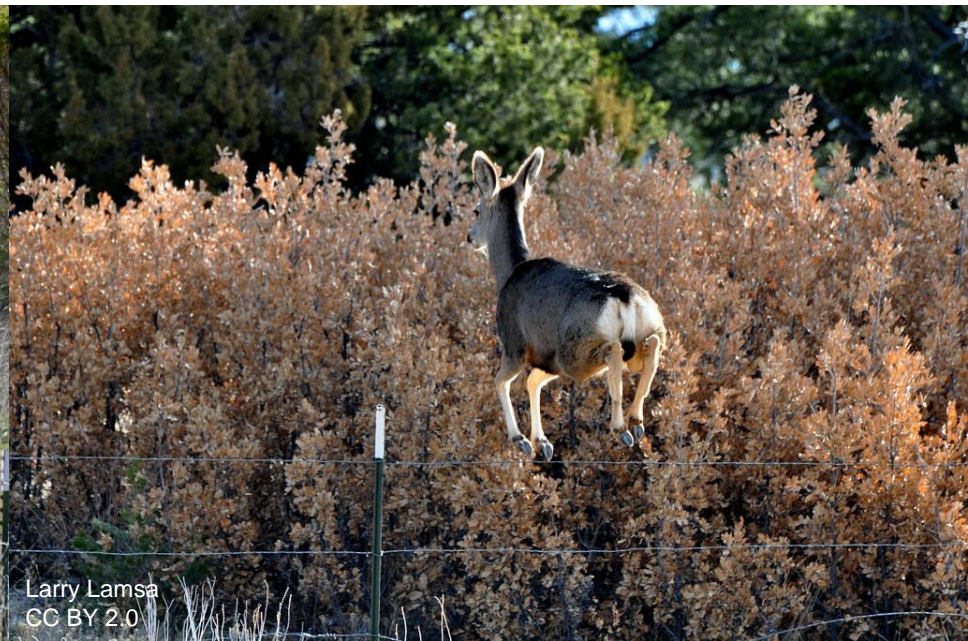
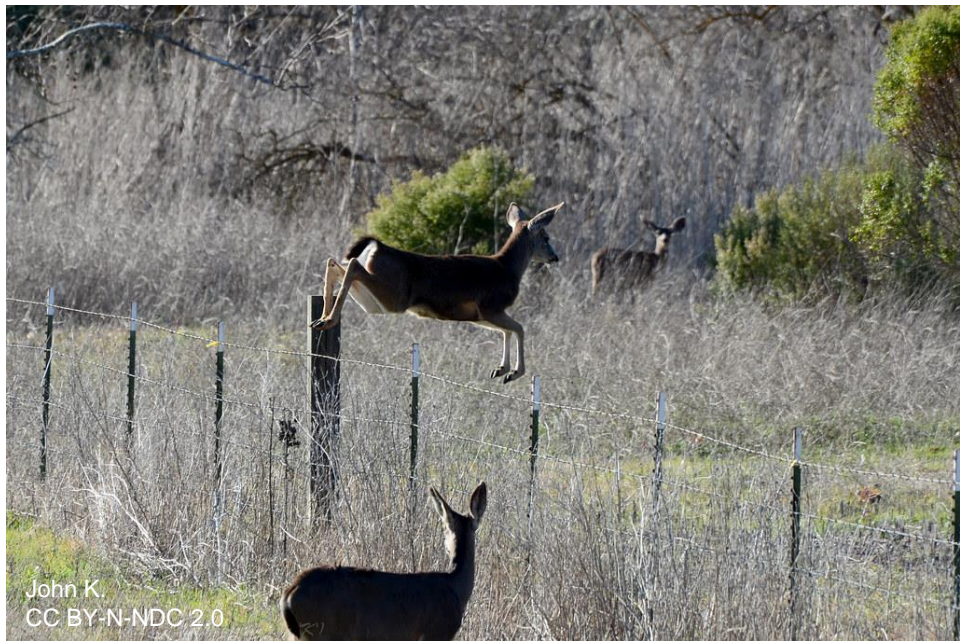


© 2004, RLNielsen, Purdue Univ.

Other Signs of Deer Damage



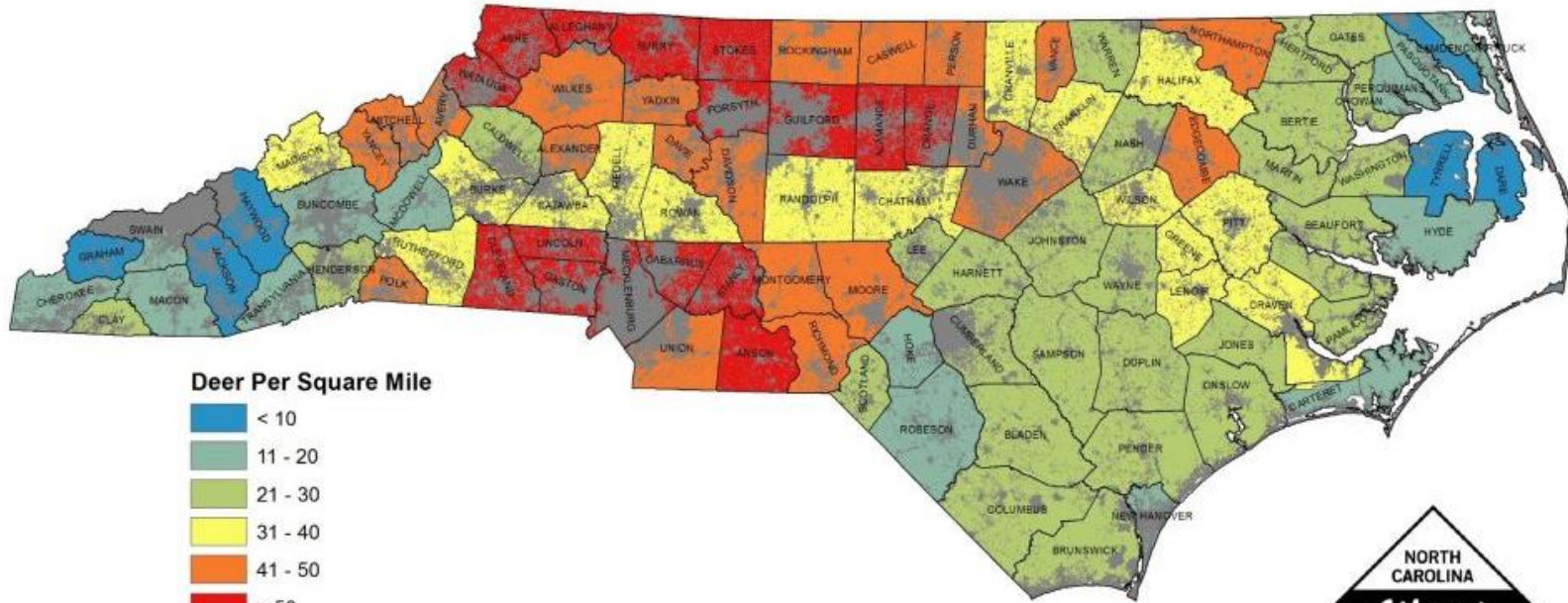
Deer can jump!



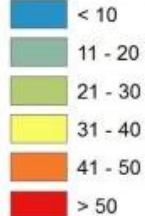
Suburban sprawl creates edge habitats



2020 NC White-tailed Deer Density



Deer Per Square Mile



No Density Estimate

Where harvest data are not available to produce density estimates because hunting is limited or prohibited: includes federal and state parks, municipal boundaries, water bodies, and human density greater than 1 person per 2 acres.

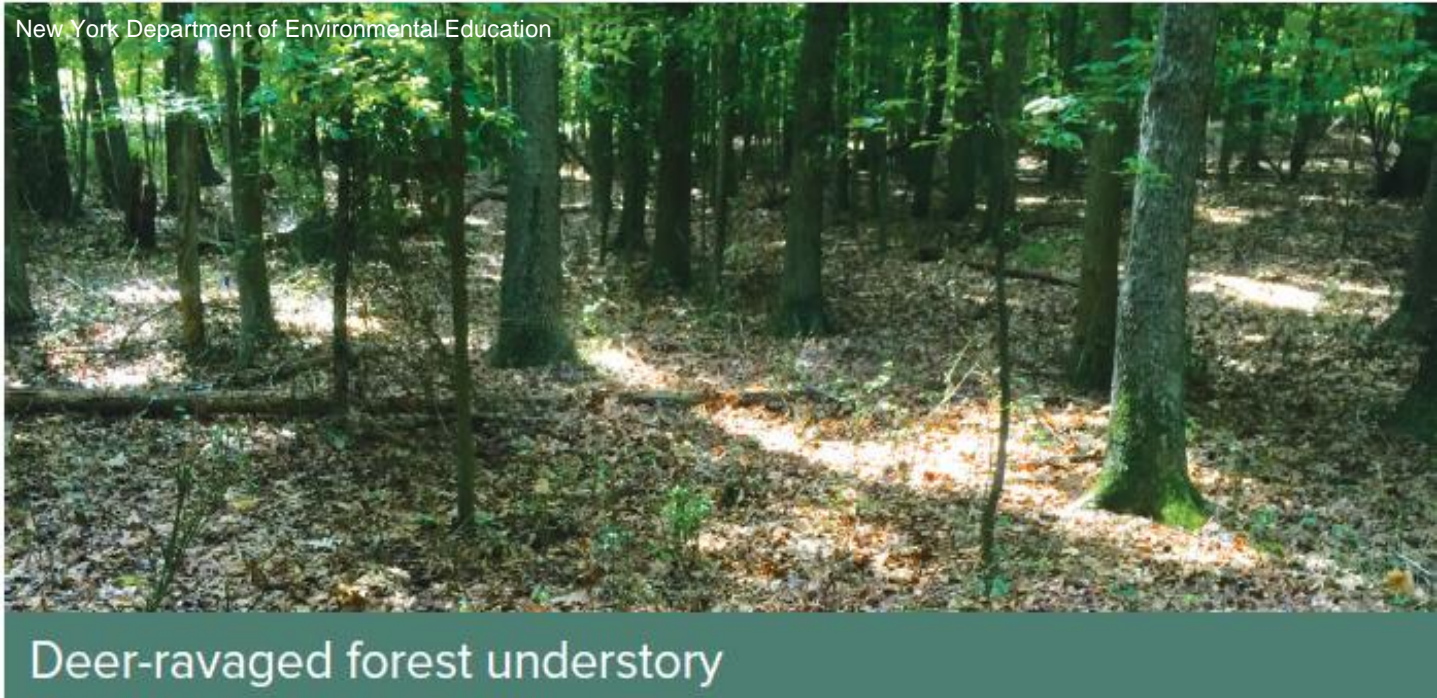


White-tailed Deer Population Trend



Similar patterns in NC

Ecological Effects of Deer Overpopulation



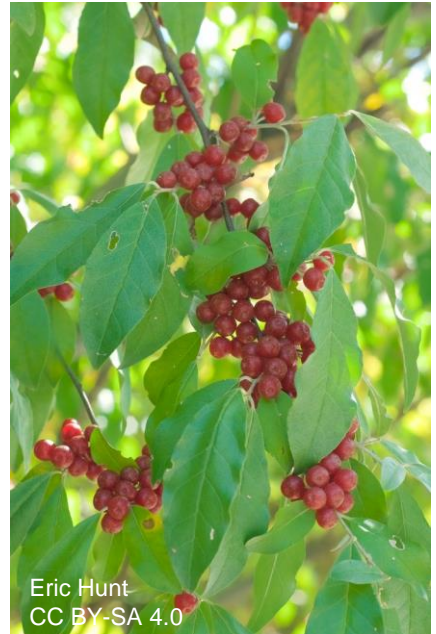
Ecological Effects of Deer Overpopulation

- Inhibit forest reestablishment
- Invasive species



Elaeagnus umbellata

Autumn Olive



Management

Repellents

Fencing

Plant Selection

Zoning the Landscape

High Management Zone

- Closest to home
- Most susceptible plants
- Protect with fencing, repellents

Low Management Zone

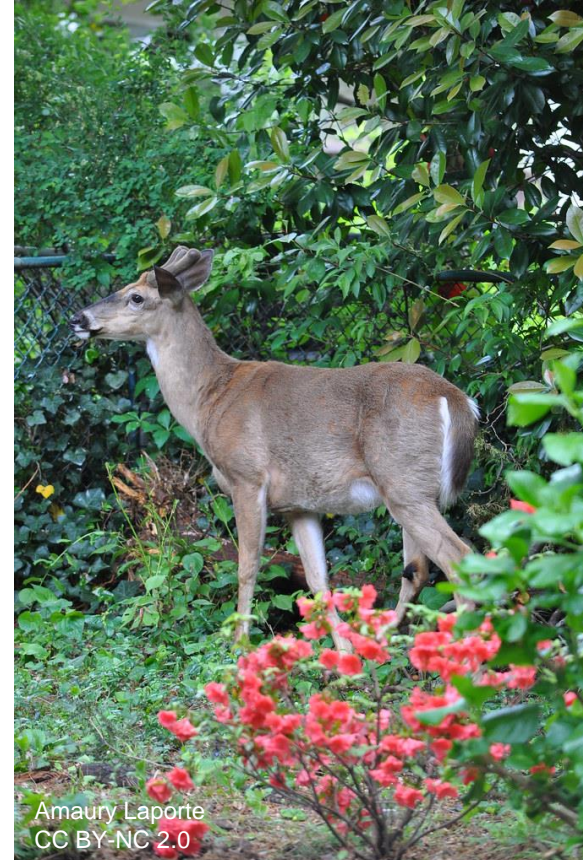
- Perimeter or near woods
- Focus on deer-resistant species
- High plant diversity
- Strategic repellent sprays



Repellents

Ideal Conditions

- Low - moderate population pressure
- Low - moderate signs of feeding damage
- Protecting small areas (\$)
- Deer not habituated
- Alternative forage available
 - i.e. your neighbors



Types of Repellents

- **Commercial vs. Non-commercial**
- **Mode of Action**
 - Taste (direct, contact)
 - Odor (indirect)
 - Combo Taste + Odor
- **Active Ingredient**
- **Formulation**
 - Ready-to-Use
 - Concentrates

Non-Commercial Repellents

Soap

- Some efficacy with low feeding pressure

Human Hair

- No evidence of efficacy

Duke Gardens

- 1 egg mixed 1 gallon water
- Some efficacy
- Cost effective



1 bar of fragrant soap per 1 yd²

Commercial Repellents

Active Ingredients

- Ammonia salts & fatty acids **(o e)**
- Predator urines **(o)**
- Putrescent eggs **(t o)**
- Blood-based products **(c)**
- Garlic oil **(o e)**
- Capsaicin + castor oil **(t e)**
- Thiram fungicide **(c)**
- Denatonium benzoate **(t)**
- Combinations of above



(o) = Odor (t) = Taste (c) = Combo
(e) = Labeled for edibles

Application Considerations

- RTU vs. Concentrate
- No rain for until it dries
- Last from 10 days to 3 months
 - Depends on weather
- Understand feeding patterns
 - E.g. apply in Oct/Nov to reduce winter feeding on twigs and buds
- Follow label directions!
 - Most not labeled for use on edibles
- Cost

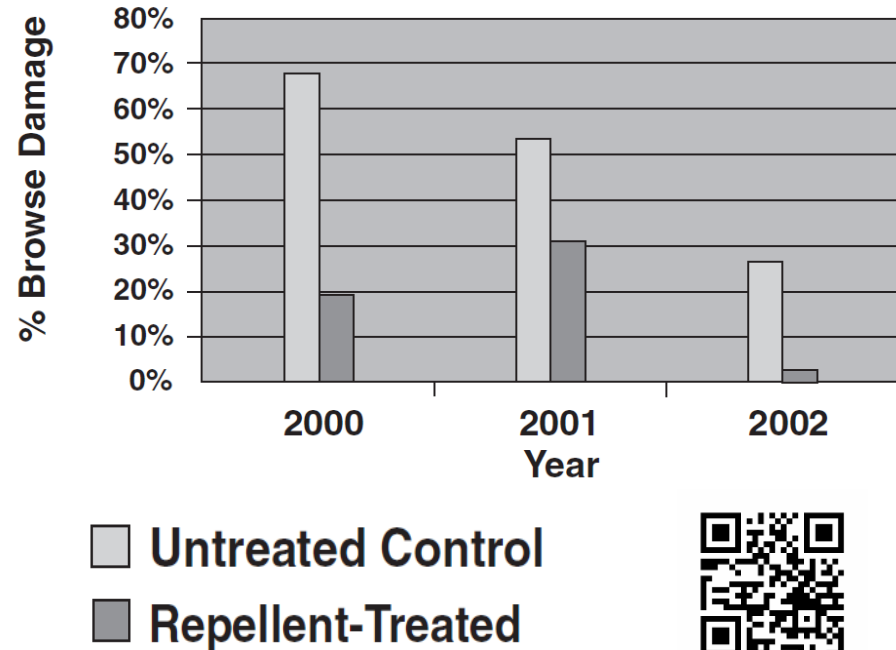


Hungry deer may eat anything!

Using Commercial Deer Repellents to Manage Deer Browsing in the Landscape

University of Maryland Study

- Tested in winter for 3 years
- All products tested reduced deer browsing
- Deer Away BGR (putrescent egg) performed slightly better
- Some products challenging to mix, limited storage life



*An Overview and Cost Analysis of
Deer Repellents for Homeowners & Landowners*

Alabama Extension Study

Table 7. Cost Analysis of Common Commercial Deer Repellents

Repellent Name	Cost/100 sq. ft. area	Cost/100 sq. ft. area/year
Bobbex	\$3.27/ 100 sq. ft.	\$19.62/ 100 sq. ft.
Buck Off	\$1.09/ 100 sq. ft.	\$13.08/ 100 sq. ft.
Deer Off Squirrel, Rabbit, & Deer Repellent	\$0.91/ 100 sq. ft.	\$5.46/ 100 sq. ft.
Deer Out	\$0.25/ 100 sq. ft.	\$1.00/ 100 sq. ft.
Deer Pharm	\$0.09/ 100 sq. ft.	\$2.16/ 100 sq. ft. **
Deer Scram Deer & Rabbit Repellent	\$1.18/ 100 sq. ft.	\$14.16/ 100 sq. ft.
Deer Stopper Plotsaver Deer Barrier System Kit	\$1.00/ 100 sq. ft.	\$4.00 / 100 sq. ft.
Deer Stopper Repellent	\$0.31/ 100 sq. ft.	\$3.72/ 100 sq. ft.
Deerbusters Brand Deer Repellent	\$0.55/ 100 sq. ft.	\$2.20/ 100 sq. ft.
Hinder	\$0.86/ 100 sq. ft.	\$10.32/ 100 sq. ft.
Liquid Fence Deer & Rabbit Repellent	\$0.39/ 100 sq. ft.	\$5.07/ 100 sq. ft.
Miller Hot Sauce	\$19.93/ 100 sq. ft.	\$518.18/ 100 sq. ft.
No Deer Zone*	\$5.99/ 100 sq. ft.	\$23.96/ 100 sq. ft.
Plant Pro-Tec Repellents	\$17.55/ 100 sq. ft.	\$35.10/ 100 sq. ft.
Plantskydd	\$0.35/ 100 sq. ft.	\$1.40/ 100 sq. ft.
Shake-Away Deer Repellent Granules	\$2.49/ linear ft.	\$59.76/ linear ft.
Spotrete F	\$0.09/ 100 sq. ft.	\$1.07/ 100 sq. ft.
Tree Guard*	\$4.80/ 100 sq. ft.	\$14.40/ 100 sq. ft.

*Indicates ready-to-use products

**Calculated for reapplication every 2 weeks



Scare Devices

- Motion Activated
 - Water
 - Sound
 - Light
- May provide some temporary control
- Dogs may work?

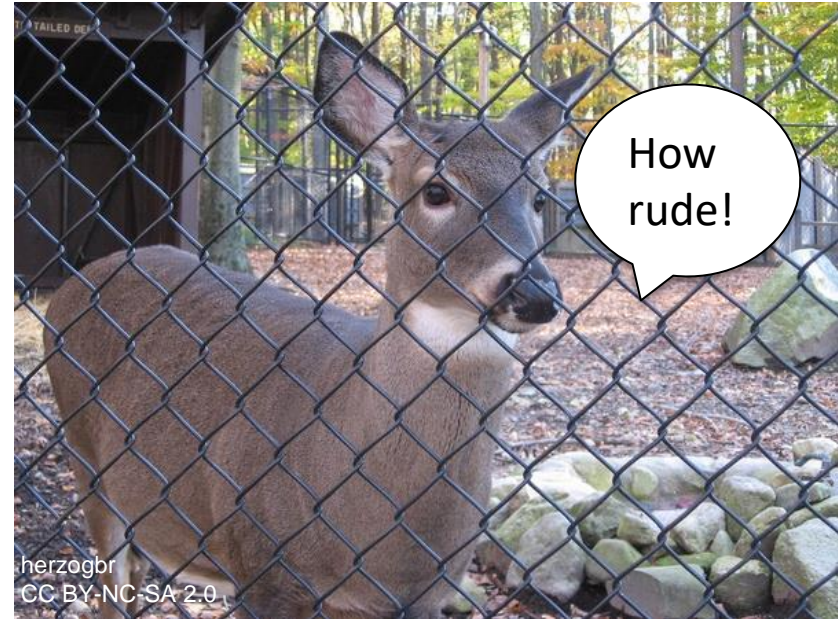


Fencing and Exclusion

Types of Fencing

Most effective method & necessary for edible crops

- Exclusion Fences
- Electric Fences
- Tree Cylinders



Fence Plans and Diagrams

Deer Problems in Residential Areas

<https://go.ncsu.edu/0vdtogq>



Controlling Deer Damage in Missouri

<https://go.ncsu.edu/a4ucsvv>

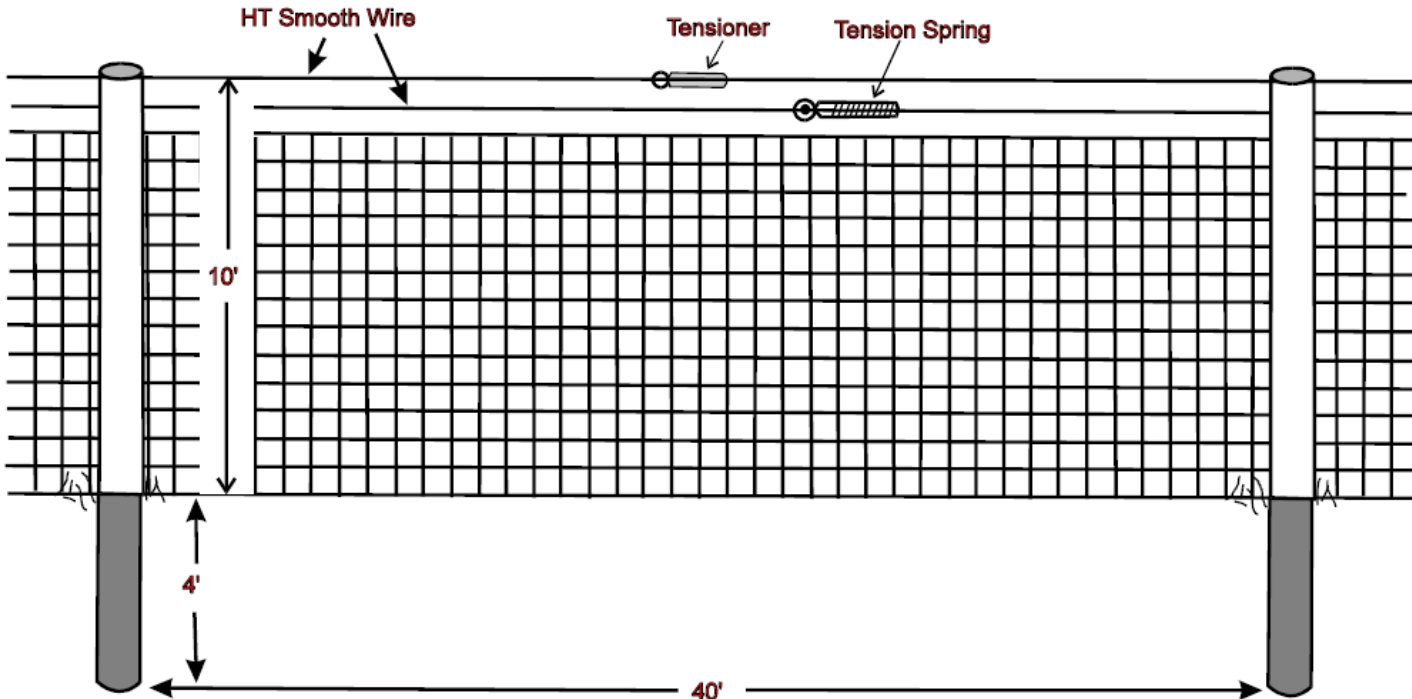


Non-electric Permanent Exclusion Fences

- Wire mesh or solid fencing
- Full coverage from ground to 8' height
 - Unless offset or slanted
 - Deer have bad depth perception!



Permanent Woven-Wire Fence



\$4 per linear foot

Seven-Wire (Vertical) Fence

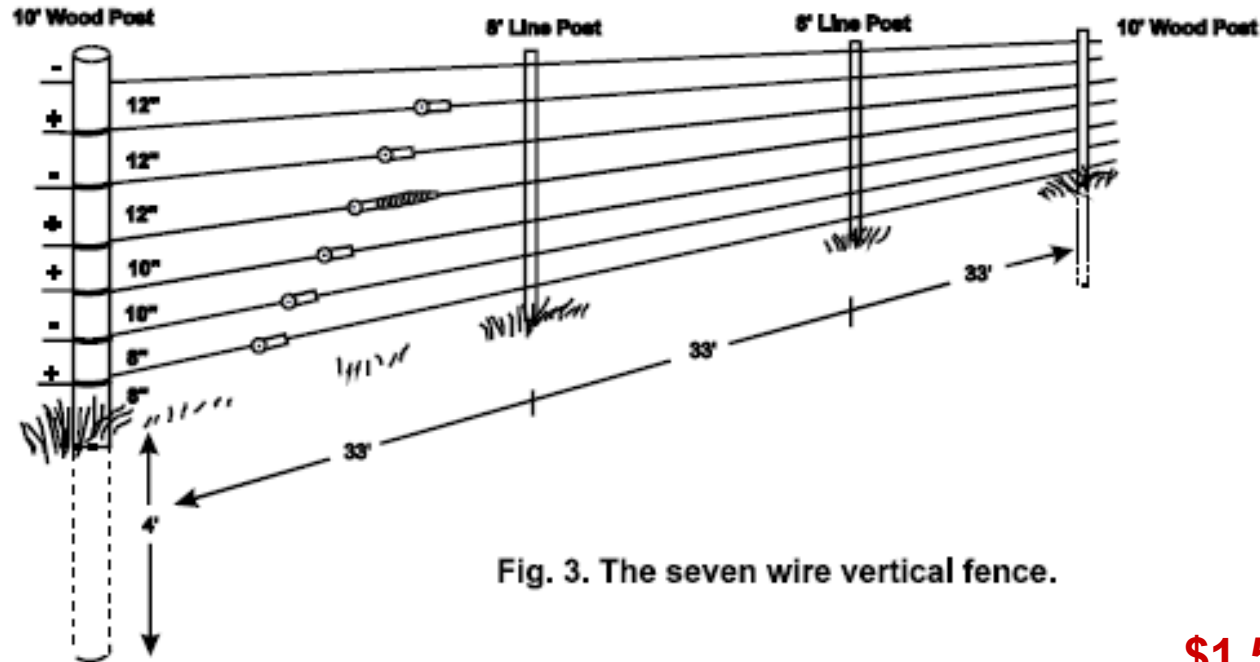
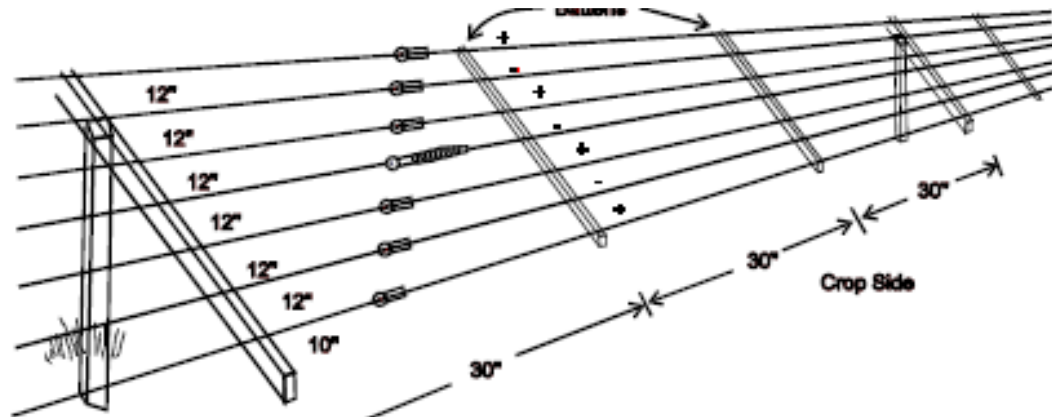


Fig. 3. The seven wire vertical fence.

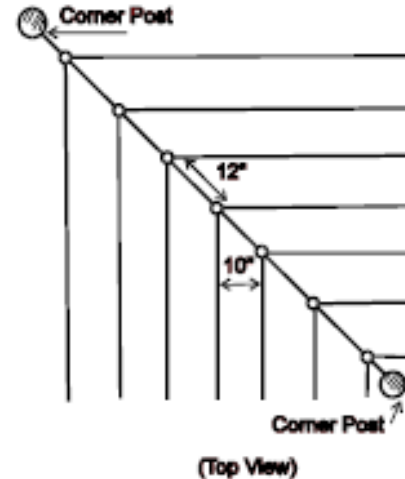
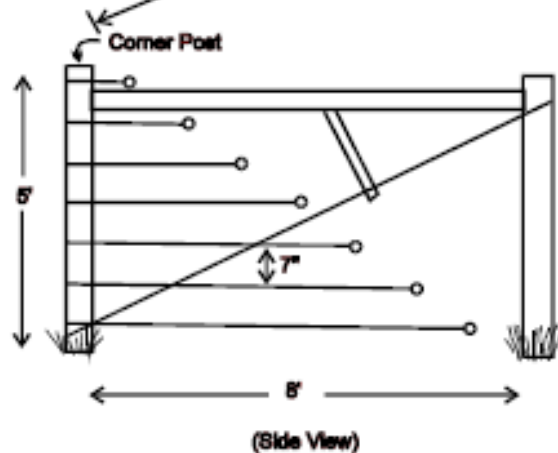


\$1.50 per linear foot

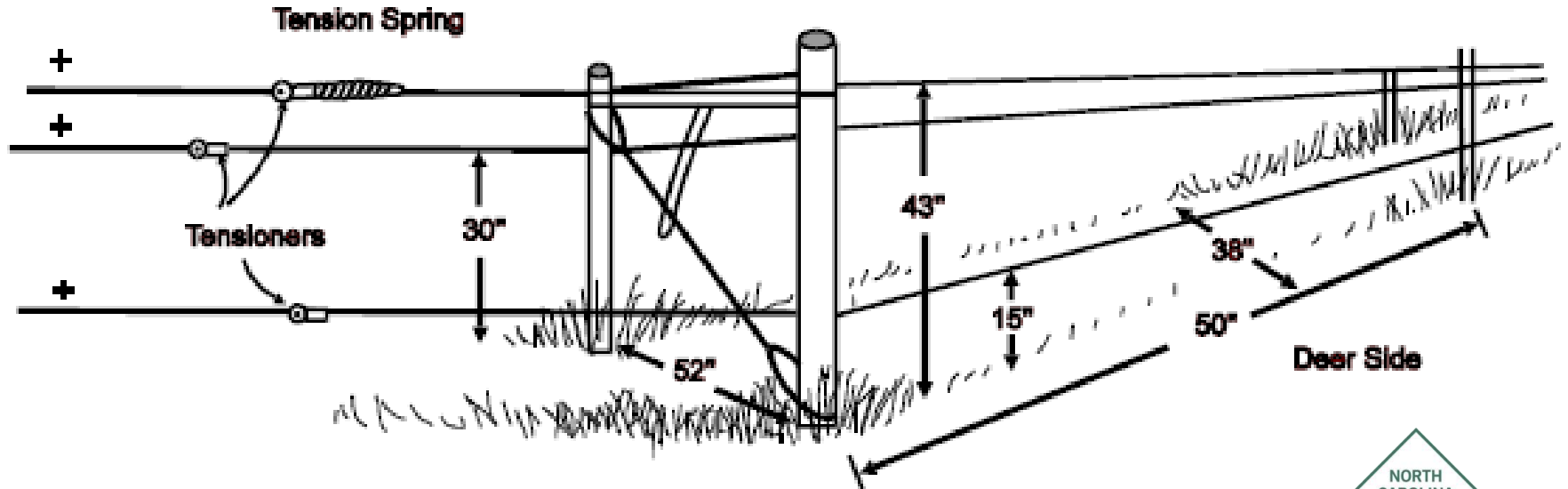
Slanted Seven-Wire Fence



\$2 per linear foot



Offset or Double Fence



\$0.35 per linear foot

Plastic Mesh Fence



NC STATE EXTENSION

Master Gardener | Chatham County



\$5.29 per linear foot

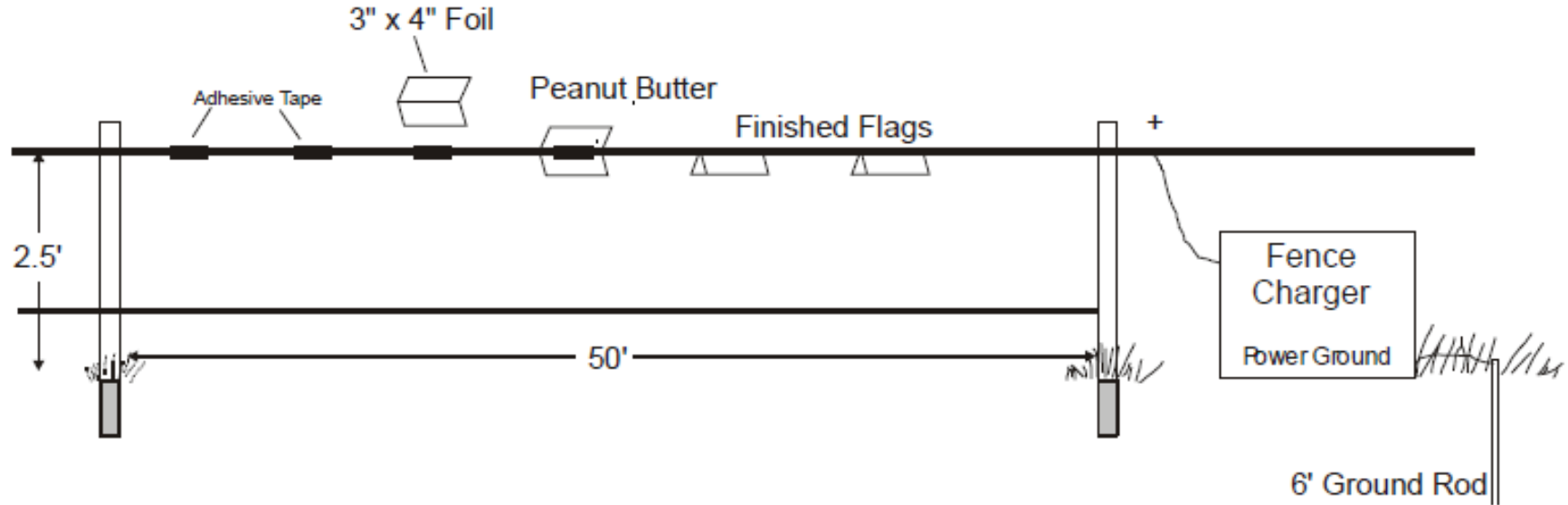
Electric Fencing

- Psychological effect
- Break feeding habits
- Need escape route
- Need a strong energizer
 - High internal resistance
 - 1 joule per 3000' wire



Short-Term Electric Fencing

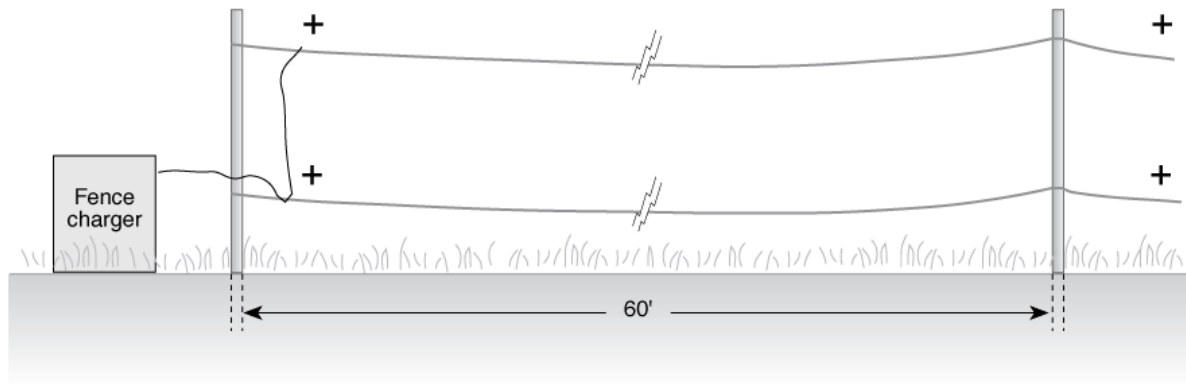
Peanut Butter Fence



\$0.11 per linear foot

Short-Term Electric Fencing

Polywire and Polytape Fences



\$0.18 per linear foot