

## WHEN NAPALM ISN'T AN OPTION:

Developing a management strategy for invasives on your property

Photo: U.S. National Archives

## “What’s the problem with invasive plants?” U.S.

Fish and Wildlife Service “Volunteers and invasive plants” training module  
<https://www.fws.gov/invasives/volunteers/training/module/nrsystem/invasives.html>

1. Decrease biodiversity
2. Change ecosystem processes such as fire, nutrient flow and flooding
3. Hybridize with native plants and cause a loss of genetic material
4. Threaten agriculture and livestock
5. Hinder efforts to restore threatened and endangered species
6. Reduce recreation opportunities
7. Expensive to control

UGA2132062  
 Photo: Johnny Randall, NC Botanical Garden for Bugwood.org

## The Nichols tract Montgomery County, NC

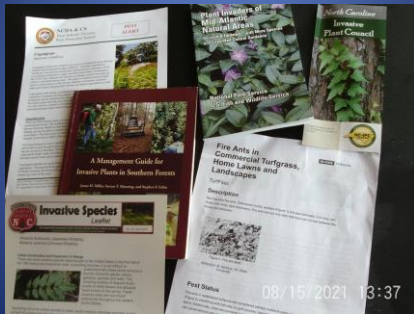


## The Four Commandments

- I. Know your adversary.
- II. Choose your weaponry.
- III. Show no mercy.
- IV. Endeavor to persevere.

## The First Commandment: Know your adversary.

With the Oriental bittersweet project slated for early 2019, the first step was to learn more about it.



There are numerous reputable and authoritative sources of information to help with identifying and managing invasive plants and animals (primarily insects)

- *A Management Guide for Invasive Plants in Southern Forests*, USDA-FS General Technical Report SRS-131, revised 2015. Free download, <https://www.srs.fs.usda.gov/pubs/36915> or <https://www.fs.usda.gov/treearch/pubs/36915>
- *Plant Invaders of Mid-Atlantic Natural Areas*, National Park Service and US Fish and Wildlife Service, 5<sup>th</sup> edition 2017. Free download, <https://www.invasive.org/eastern/midatlantic/>

## North Carolina Cooperative Extension Service: Extension Gardener Plant Toolbox

<https://plants.ces.ncsu.edu>

## North Carolina Forest Service fact sheets

<https://ncforestservice.gov/publications.htm>

## North Carolina State University "Going Native: Urban Landscaping for Wildlife with Native Plants"

<https://projects.ncsu.edu/goingnative/howto/mapping/invxse/index.html>

## Southeast Exotic Pest Plant Council

<https://www.se-eppc.org/weeds.cfm>

## The Second Commandment: Choose your weaponry.

Our research has indicated that there are several types and methods of control.

- Cultural
- Manual
- Chemical
- Mechanical
- Biological

The North Carolina Forest Service maintains lists of licensed contractors who apply forestry pesticides using various methods.



## Chemical application methods



What's wrong with *this* picture?

## The Second Commandment: Choose your Weaponry.

What criteria are important for the Nichols site?

1. Selectivity
2. Cost-effectiveness
3. Timing
4. High level of control



So, what tools will we use to do battle with this scourge?

## The Second Commandment: Choose your Weaponry.

Prescribed fire (*cultural method*)



Herbicide (*chemical method*)



Cut-stump treatment (*manual + chemical*)



## Do I need a pesticide license?

“The North Carolina Pesticide Law of 1971 requires the registration of pesticide products in the state, the licensing and certification of commercial and private applicators and pest control consultants, the proper handling, transportation, storage and disposal of Pesticides, and the licensing of dealers selling restricted use pesticides.”

<https://www.ncagr.gov/SPCAP/pesticides/Authority.htm>

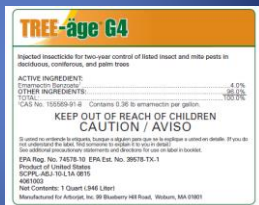
**Licensing** is required for 1) commercial applicators applying any type of pesticide for compensation, 2) public operators working for a state or local government who apply pesticides in their course of work, 3) dealers selling restricted use pesticides, or 4) pest control consultants making recommendations for pesticide treatment of pest problems.

**Certification** is required for farmers (private applicators) wishing to apply restricted use pesticides to an agricultural commodity.

<https://www.ncagr.gov/SPCAP/pesticides/license.htm>



Same active ingredient, but different concentrations.  
“Restricted Use Pesticide” labeling details reasons for labeling, in this case, acute toxicity to humans.



## Pesticide labels

**THE LABEL IS THE LAW.** Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), all statements on pesticide labels have the force of law, with civil and criminal penalties for violations. The NC Pesticide Law of 1971 regulates certification and licensing of pesticide applicators, consultants and dealers in North Carolina.



## (some) Label elements

Product name

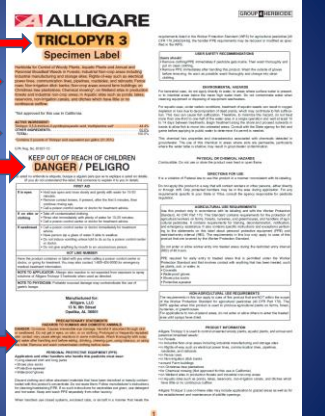
General uses and specified locations approved for use

Active ingredient(s) and amounts; a.i. in pounds per gallon

SIGNAL WORD: Caution, Warning, Danger, Danger-Poison

EPA registration number; sometimes facility number

Precautionary statements: what, if anything, makes it harmful; what care should be taken with it?



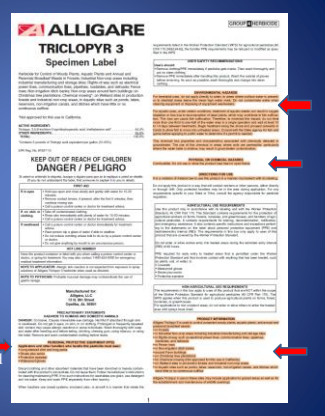
## (some) Label elements

PPE--note specification of protective eyewear due to corrosiveness

Environmental hazards

Physical/chemical hazards: reactivity, combustibility, etc.

Directions for use: this makes up the bulk of any label, and specifies exactly how much product can be used, where it can be used, what time of year it is most effective, some or all of the plants (or animals) it controls or partially controls, tank mixing directions, whether to use a surfactant, maximum annual use amounts, and other information. These can be very lengthy, or surprisingly short.



## Pesticide labels

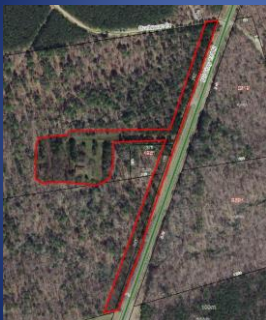
## Pesticide resistance

- Repeated use of same pesticide or same group of pesticides
- Plays to pests' natural mutations
- Risk minimized by judicious use and by varying chemical classes and chemical groups



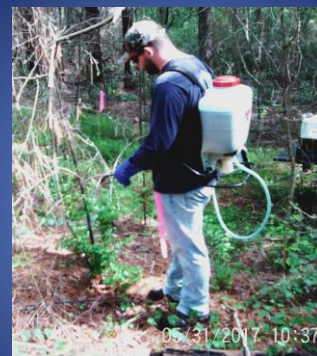
Did I forget to mention that “The label is the law”??

## The Third Commandment: Show No Mercy.



Phase 1: 2019 foliar chemical application to approximately 6 acres

Time: growing season  
Method: backpack spot-spray, utility vehicle-mounted electric pump sprayer (35-40 PSI) with wand for vines in canopy around house  
Herbicide mix: 3% triclopyr amine + 0.5% nonionic surfactant, in accordance with resource materials



Backpack sprayer in use (not on bittersweet)



treated vines in canopy, 14 days post-treatment

### The Third Commandment: Show No Mercy.



Phase 2: cut-stump herbicide application to climbing vines in canopy

Timing: winter (Dec. 2019-Jan. 2020)

Method: cut-stump; loppers, hand shears, chainsaw, squirt bottle

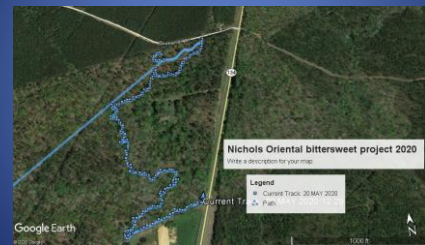
Herbicide mix: 50% glyphosate in water with dye



Post-treatment photo showing "window" cut. Note vine stumps at base of tree with blue dye.

### The Fourth Commandment: Endeavor to Persevere.

2020: new treatment boundaries are identified...



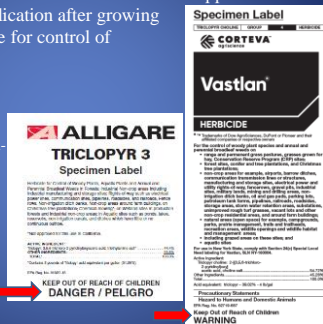
### The Fourth Commandment: Endeavor to Persevere.

...and further research and discussions with other applicators indicates that foliar application after growing season is more effective for control of perennial plants.

Timing: mid-July through mid-August

Method: backpack spot-spray

Herbicide mix: 3% triclopyr amine OR 2.25% triclopyr choline + 0.5% nonionic surfactant

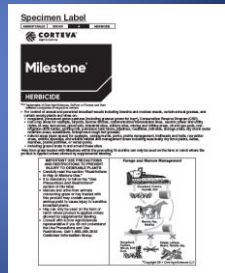


### The Fourth Commandment: Endeavor to Persevere.

2021: the battle continues...with added assistance and a revised plan.



- Consulted with NC Cooperative Extension and Corteva re efficacy of Milestone® herbicide on Oriental bitterweet
- Increased strength of triclopyr in spray solution
- Set up basic experiment to test efficacy of Milestone® against Oriental bitterweet



The Fourth Commandment: Endeavor to Persevere.

2022

Results of experiments

--early July: 94% control vs. 77%

Further research

--USFS Fire Effects Information System report

Making adjustments

--target image adjustment, core area

Existing and new invasive insect pests;  
emerging threats

- Red/black imported fire ants
- Hemlock woolly adelgid
- Emerald ash borer
- Spotted lanternfly
- Elm zigzag sawfly ?

QUESTIONS?