

Integrated Pest Management

TEXAS A&M
AGRILIFE
EXTENSION

Agricultural History



Agricultural History | Selective Breeding

NATURAL "CORN", 7000 B.C.

PEEL IT BY HAMMERING
REPEATEDLY WITH A
HARD OBJECT

TASTES LIKE VERY
DRY, RAW POTATO

19 MM

5-10 VERY HARD KERNELS



8 KNOWN VARIETIES



ONLY FOUND
IN CENTRAL
AMERICA



75.0% WATER

1.9% SUGARS

23.1% OTHER
MOSTLY STARCH

ARTIFICIAL CORN, 2014

STEAM COOKS IN
MINUTES

*Sweet,
refreshing
and juicy*



190 MM

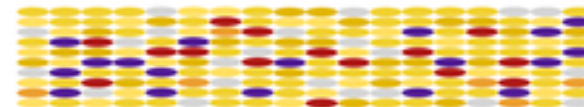
EASY TO PEEL

No Hammer Required!

~1000 Times Larger

AVAILABLE IN
FIVE COLOURS:

WHITE
YELLOW
DARK RED
DEEP PURPLE
BLUE-BLACK



~200 VARIETIES

67-Fold Increase

*Annual Production:
790 Million Tonnes*



*Grown in 69
Countries*



73.2% WATER

2% Less Juicy

6.6% SUGARS

3.5x Sweeter

20.2% OTHER

Still Rich in Starch!

Agricultural History

NATURAL "WATERMELON" ~3000 B.C.

OPEN WITH A HAMMER
OR SHARP OBJECT

EXTREMELY BITTER TASTE
(SOME VARIETIES ARE BITTER-SWEET)

CAUSES INFLAMMATION

18 SEEDS, VERY RICH IN FAT
THEY TASTE NUTTY AND EXTREMELY BITTER



50 MM

6 KNOWN VARIETIES



FOUND IN
NAMIBIA &
BOTSWANA



80.0% WATER

1.9% SUGARS

18.1% OTHER
MOSTLY STARCH
AND FAT

Selective Breeding

ARTIFICIAL WATERMELON, 2014

DIFFERENT SHAPES
AVAILABLE:



*Reduces
inflammation!*

Seedless!

OPEN BY DROPPING
FROM ONE METRE
No Hammer Required!



*Deliciously
sweet & so
juicy that it
sometimes
explodes
when ripe*

AVAILABLE IN
FOUR COLOURS:

- CREAM
- YELLOW
- LIME GREEN
- RED



~1200 VARIETIES
200-Fold Increase

*Annual Production:
95 Million Tonnes*



*Grown in 15
Countries
Most are grown in China*



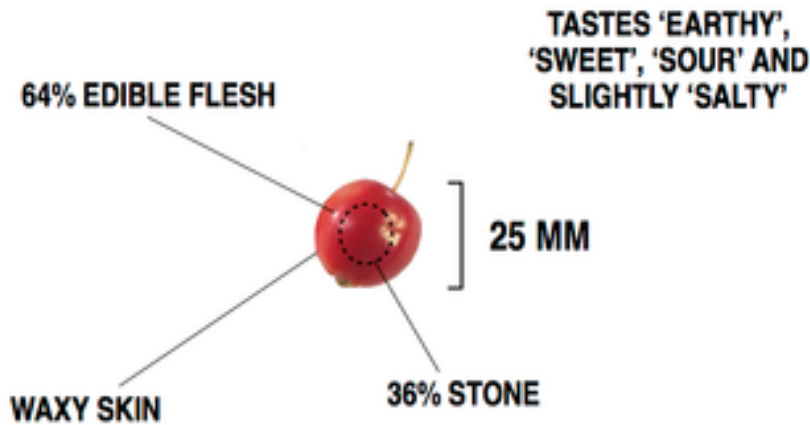
91.5% WATER
14% Juicier

6.2% SUGARS
3.3x Sweeter

2.3% OTHER
*Virtually Fat-Free
and Starch-Free
35x more Vitamin C*

Agricultural History | Selective Breeding

NATURAL PEACH, 4000 B.C.



3 KNOWN VARIETIES

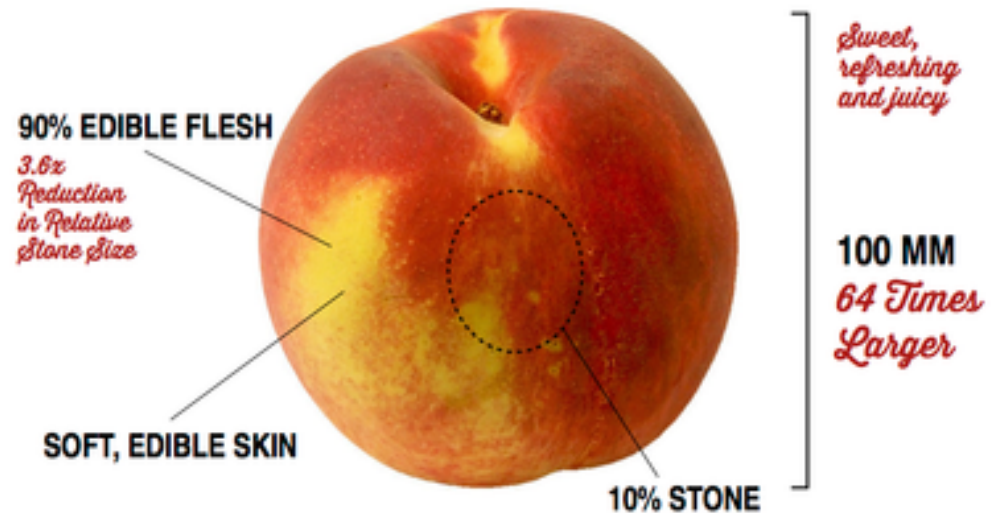


ONLY FOUND
IN CHINA



71.0% WATER 8.1% SUGARS 20.9% OTHER

ARTIFICIAL PEACH, 2014



~200 VARIETIES

67-Fold Increase

*Annual Production
17 Million Tonnes*



*Grown in 13
Countries*

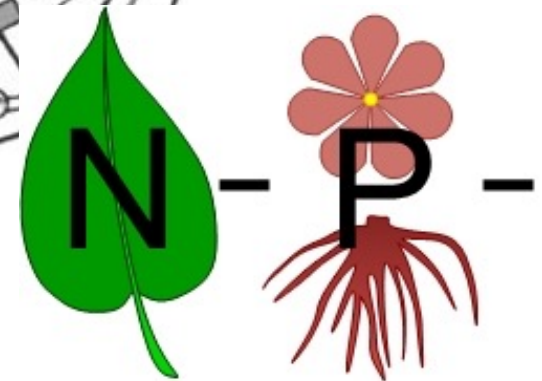
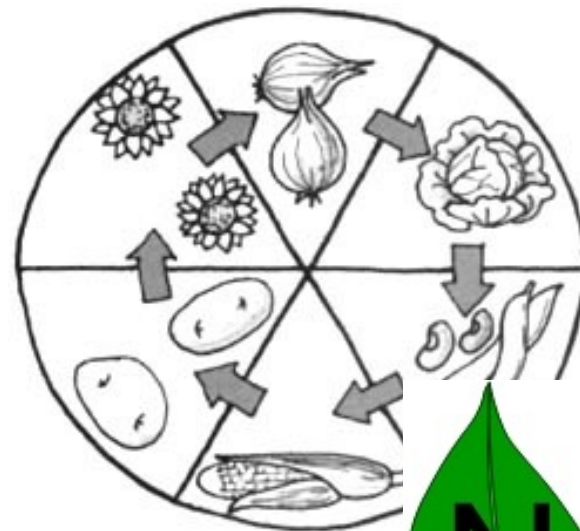
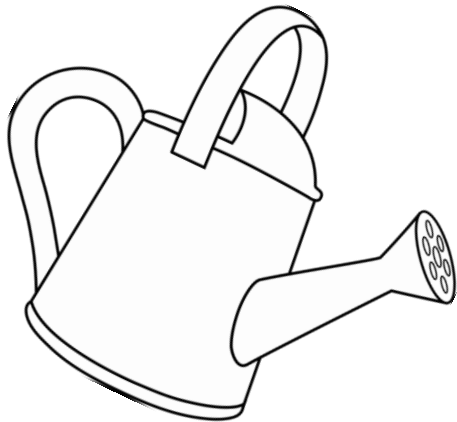


88.9% WATER 8.4% SUGARS 1.7% OTHER

27% Juicier *4% Sweeter*

*63x more Potassium
45x more Calcium
42x more Zinc
3x less Protein*

Agricultural History



Nitrogen

Phosphorous

Agricultural History

The Green Revolution

- Between 1940's - 1960's
- “saved over a billion people from starvation”
- high-yielding varieties of cereal grains
- Expansion of irrigation infrastructure
- Modernization of management techniques
- Distribution of hybridized seeds, synthetic fertilizers, and pesticides to farmers



Norman Borlaug

Agricultural History



Show ▾

Colours ▾

Filters ▾



26 May 2012 20:00

🔥 CO₂ 151,618 t

📦 Containers 14,196,884

⬆️ Dry 548,572 kt

💧 Liquids 397,884 kt

🔥 Gas 68,758,672 m³

🚗 Vehicles 18,297,624 kt



Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

Agricultural History | Invasive species

502 Records
\$ billions in economic impact

Spotted Wing Drosophila
Estimated revenue loss in 2008
\$511.3 million

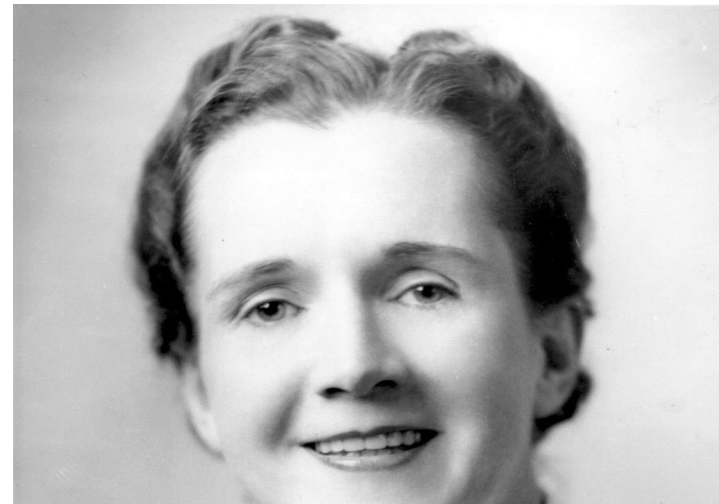
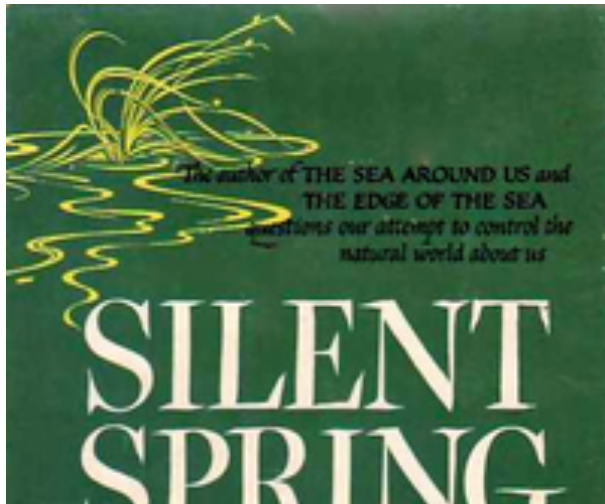
Agricultural History



Agricultural History



Integrated Pest Management



“Why should we tolerate a diet of weak poisons, a home in insipid surroundings, a circle of acquaintances who are not quite our enemies, the noise of motors with just enough relief to prevent insanity? Who would want to live in a world which is just not quite fatal?”



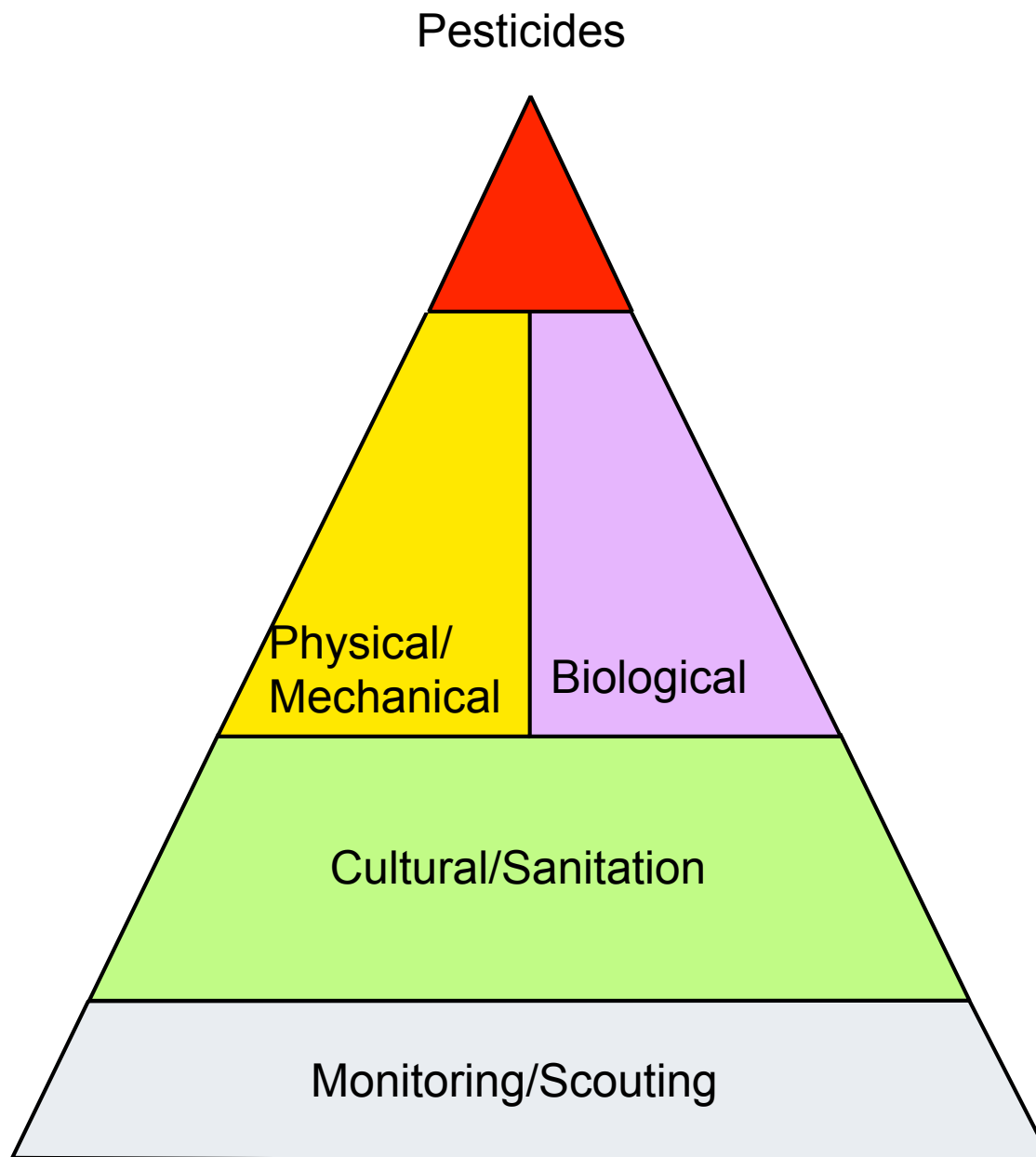
1970's

USDA creates nationwide IPM program in Land
Grant Universities

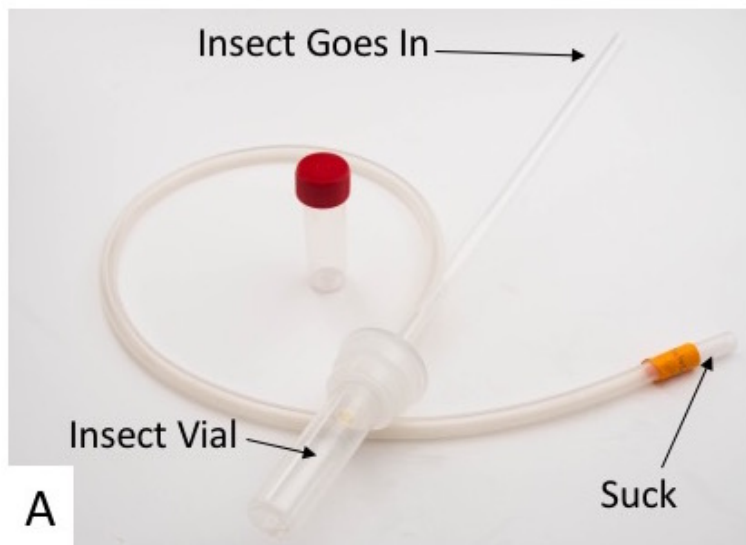
Integrated Pest Management

- Minimize impact on the environment
- Minimize impact on human health
- Maintain or increase soil fertility
- Long-term pest management
- Prevent pesticide-resistant pests
- Strives to maximize long-term returns/savings

IPM Pyramid



Monitoring | Tools of the Trade















Monitoring | Tools of the Trade

“Headband magnifier”



\$17 on Amazon

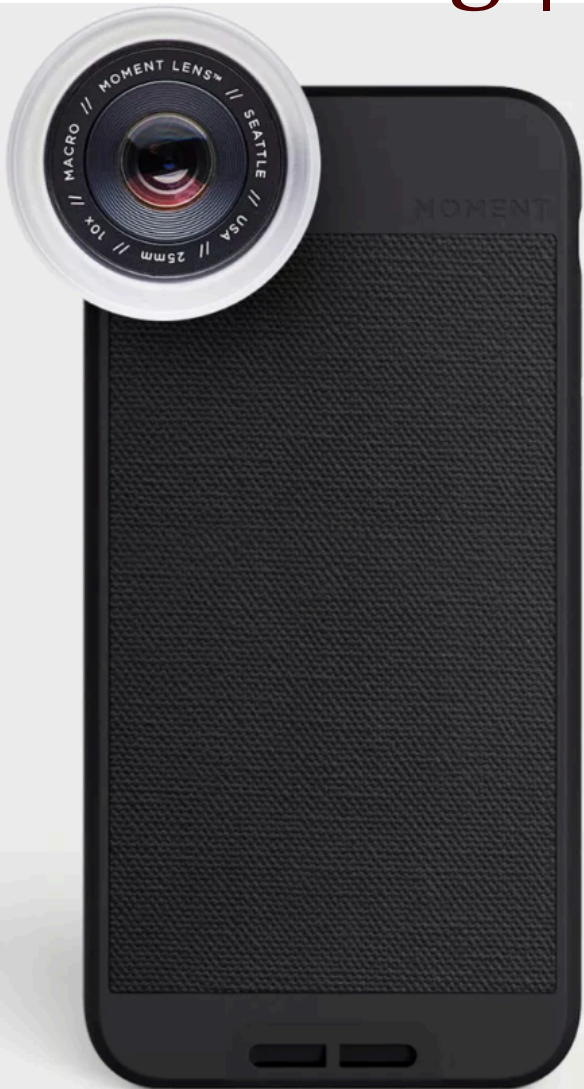
Monitoring | Tools of the Trade

Macro Lens kit for Phone



\$40 on Amazon

Monitoring | Tools of the Trade



Macro Lens kit for Phone



\$130 from shopmoment.com

Monitoring | Tools



Roll over image to zoom in

AmScope SE306R-PZ Forward Binocular Stereo Microscope, WF10x and WF20x Eyepieces, 10X-80X Magnification, 2X and 4X Objectives, Upper and Lower Halogen Light Source, Pillar Stand, 120V

by AmScope

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Branch beating

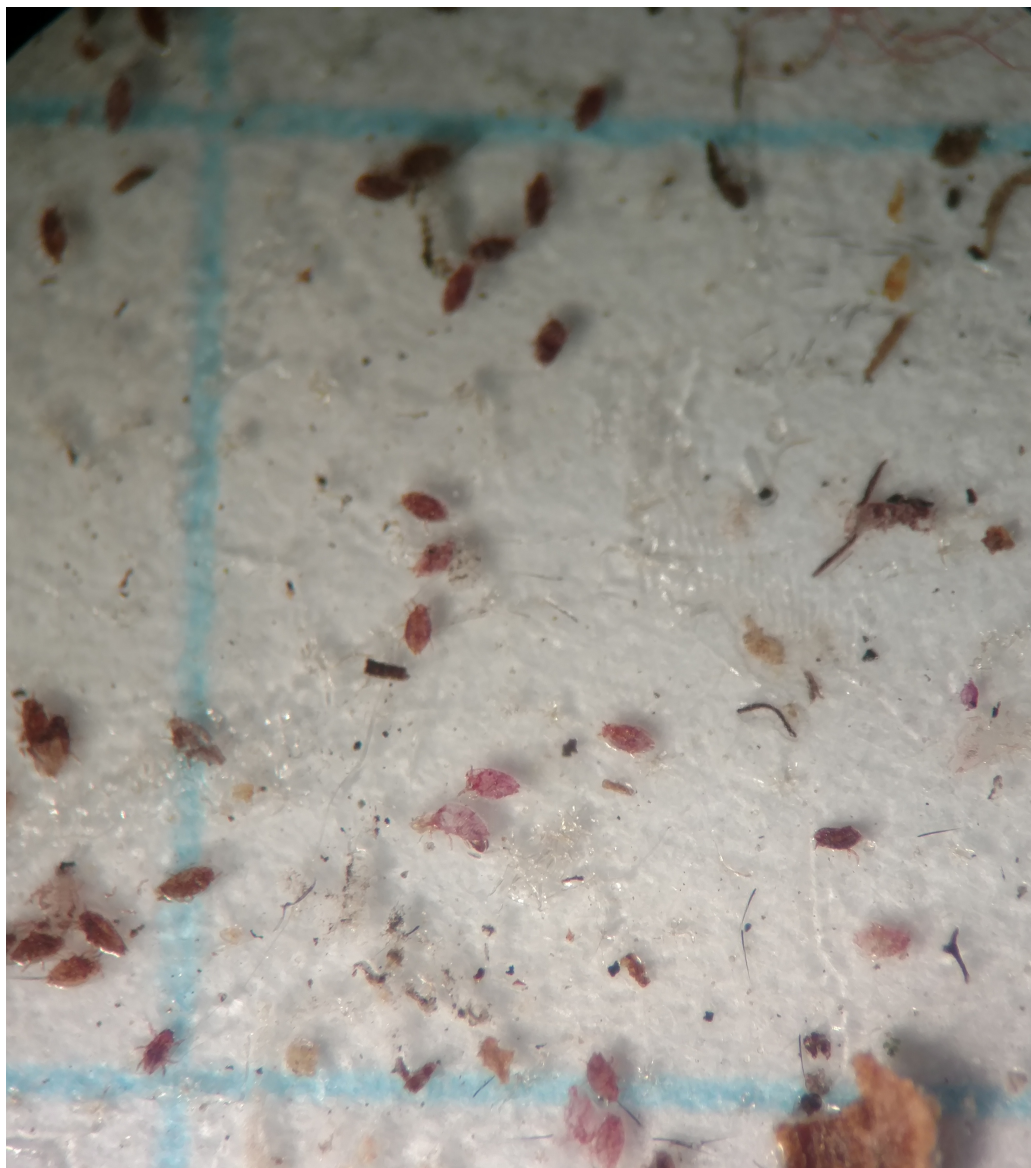
Monitoring | Tools of the Trade

Double-sided sticky tape



Monitoring | Tools of the Trade

Double-sided sticky tape



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Burlap Band



Photo: Bill McNee WI DNR

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Burlap Band



Photo: Bill McNee WI DNR

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Sticky Barrier Band



+

Bug Gum Mastic Barrier

or

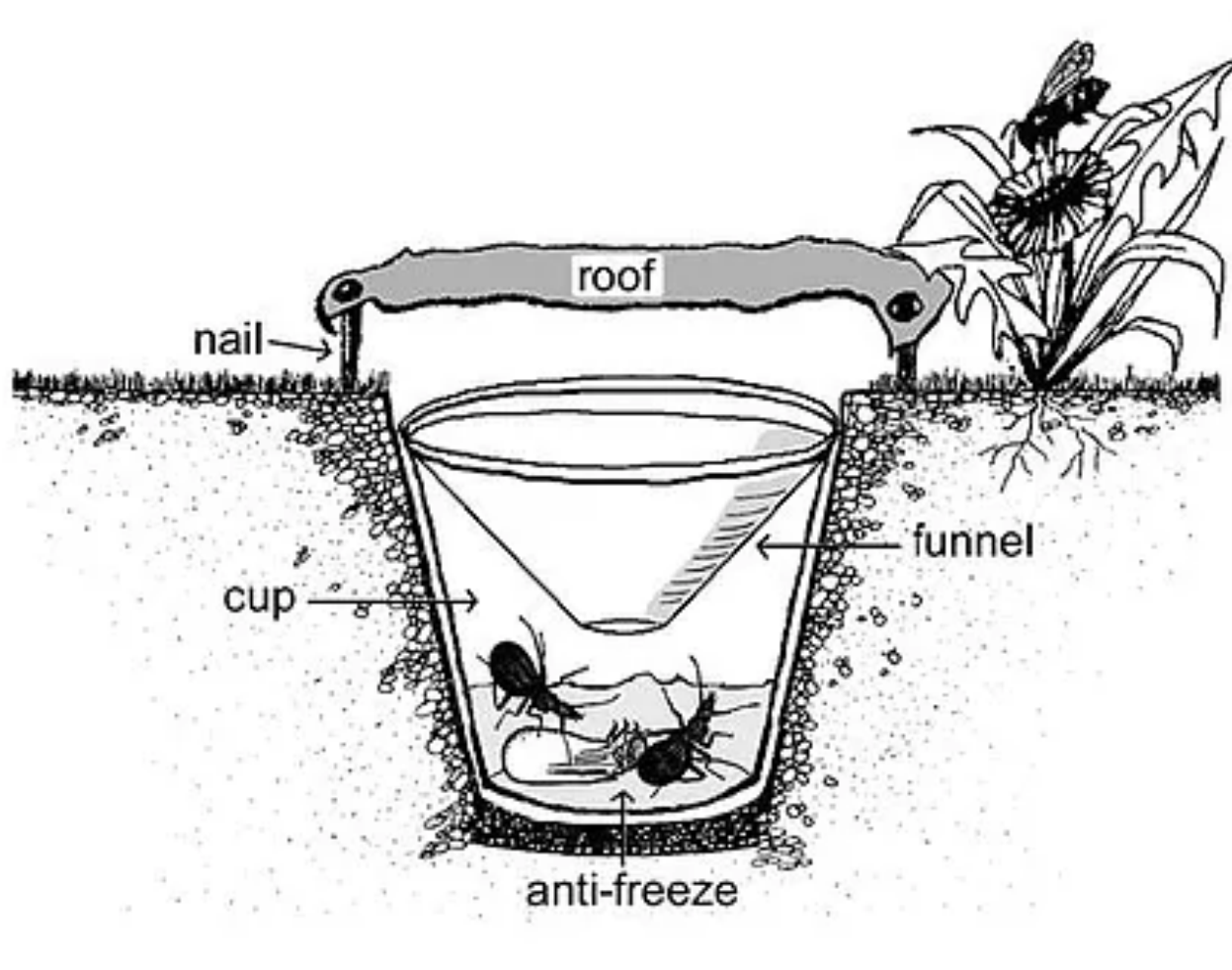
Roxo Bug Glue

or

Tanglefoot

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Pitfall trap



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Pheromone Traps



Video: Chelsea Eby

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Pheromone Traps



Eric Coombs, Oregon Department of Agriculture, Bugwood.org 9

Field bindweed moth (*Tyta luctuosa*)

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Pheromone Traps



Monitoring | Tools of the Trade

Pheromone Traps

- Nantucket pine tip moth
- Peach twig borer
- Lesser peachtree borer
- Clearwing peachtree borer
- Spruce budworm
- Western bean cutworm
- Beet armyworm
- Fall armyworm
- SW Pine Tip Moth
- Squash vine borer
- Gypsy moth
- Sweetpotato weevil
- European Pepper Moth