

Holistic Sprays



Future Resources:

Resources/Recordings on our Website

Orchard GroupMe

Growing Summit (March 15th)

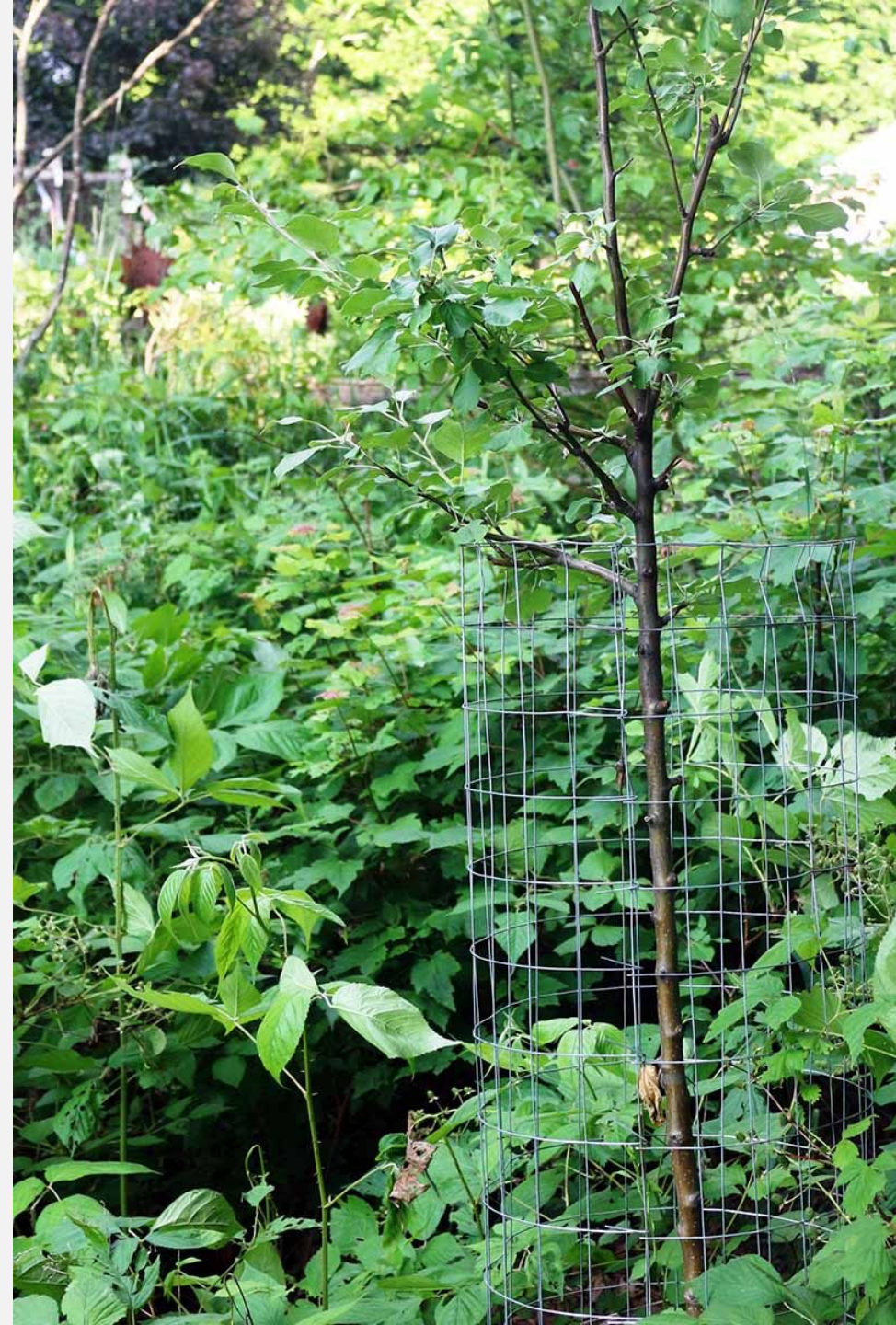
Public Workshops:

1. Grapes (March 10th)
2. Permaculture and Native Orchardring (March 17th)
3. Small Fruits and Berries (March 24th)

Holistic Orchard Care Overview

What is holistic orchard care?

- orcharding with systems as a whole
 - developing healthy trees
 - focusing on cultural practices rather than chemical
 - relying on nature's systems to do your work
 - fostering a healthy ecosystem



Benefits

- overall healthiest for our ecosystem
- the cheapest way to garden/orchard
- relies on the natural systems, information driven way of gardening

- cons: you need to know what you're doing!



Maintain a Healthy Ecosystem

- Plant resistant varieties
- Choose good planting sites
- Maintain well - water frequently, prune, thin, & mulch
- Sanitize your tools and orchard
- Foster beneficial insects
- Keep an eye on your orchard



Pest/disease recognition

Learn how to ID diseases and pests to respond appropriately!



Where does spraying come in?

What is spraying for?

Different chemicals do different things!

But generally spraying is to:

- improve tree health
- attack pest populations
- deal with certain diseases
- prevent problems before they arise

Spraying Calendars

1. Follow a calendar and regimen
 - a. commercial regimens
 - b. holistic regimen
 - c. (more expensive and time intensive, but easier to follow)

1. Spray in accordance with what's going on in your orchard
 - b. (cheaper, but more involved)

1. Or a mix of both! Spray for prevention with extra sprays for specific issues.

Rules of Thumb

Rules of Thumb

1. Label is the law
2. Don't spray on windy days and use the correct droplet size when possible
3. Understand application type:
4. For foliar sprays: Spray to point of runoff (when droplets just start to fall off the leaf) and with full coverage
5. Understand timing for how to spray with most effectiveness

Label is the Law

Labels

- Will typically include
 - product name (this is just what the manufacturer calls it, has nothing to do with active ingredients or use)
 - product type
 - active ingredients
 - signal word
 - storage and disposal information
 - precautionary statements
 - environmental hazards
 - directions for use

Product Type

PESTICIDE	WHAT IT CONTROLS
Acaricide	Ticks, Mites
Bactericide	Bacteria
Fungicide	Fungus
Herbicide	Plants
Insecticide	Insects
Miticide	Mites
Molluscicide	Mollusks (slugs/snails)
Nematicide	Nematodes
Rodenticide	Rodents (mice/rats)

Action

Action of Pesticide	What It Does
Growth Regulator	Controls pest by disrupting its development. An insecticide may prevent the insect from molting, while an herbicide might make a weed grow so quickly it dies.
Repellant	Repels the pest so it does not attack the plant
Defoliant	An herbicide that causes the leaves to fall off.
Bait	Pesticide mixed with food or another attractant. The pest eats the bait and is killed by the pesticide
Desiccant	Kills by disrupting an insect's exoskeleton. The insect becomes dehydrated and dies from loss of water.
Systemic (Extra Attention!)	A pesticide that is absorbed by one part of the plant and transported to another part where it kills the pest. A systemic herbicide may be absorbed by the leaves, then move into and kill other parts of the plant. A systemic insecticide might be absorbed by plant roots, then move to the leaves, which are eaten by the insect pest.
Contact	A pesticide that kills when it touches the pest. It does not need to be eaten by the insect or circulated in the plant.
Protectant	A pesticide that protects a plant from a pest

Active Ingredient

- This is the ingredient that is effective in the chemical
- Often it lists by percentage
- May list the active ingredient by scientific or common name

Signal Words

This tells the product's toxicity to humans!

SIGNAL WORD	LEVEL OF TOXICITY
Danger Poison	Extremely toxic
Danger	Highly toxic or corrosive to skin and eyes
Warning	Moderately toxic
Caution	slightly toxic
Caution or none	very low toxicity

Storage and Disposal

usually store between 40 and 100 degrees

Chemicals don't usually list expiration dates, so write down when you bought it on the container or keep a log somewhere

Depends on the chemical how long it maintains efficacy, extension recommends not using products over two years old

Precautionary Statements/First Aid

- what level of PPE (personal protective equipment) to wear!



Environmental Hazards

- this will tell you what environmental hazards may be caused by the chemical
- toxicity to fish, birds, bees, etc
- tells you how to use the product safely to avoid detrimental environmental effects
- even if a product is certified organic, it may have detrimental environmental effects

Directions for Use

- this will tell you how to use it!
 - what pests are controlled
 - which plants it can be used on
 - appropriate dilutions
 - application rates
 - how often to apply
 - if you need to wait to re-enter the application area
 - how long to wait to harvest afterwards (also called days to harvest)

Ready to Use v. Concentrates

Ready to Use - already mixed (the active ingredient is appropriately diluted), more expensive in long run, great for small home application, often have a sprayer in the packaging

Concentrate - less expensive in the long run, will need to mix the product yourself, and likely only need it if you spray often or have a lot of garden

Active Ingredients

This is a list of the most common ingredients and their uses.
This is not exhaustive!

Neem

Neem Oil is an insecticide and fungicide

- provides amino acids, vitamin e, and omega 3 fatty acids to the tree
- cold-pressed should be in the label
- apply to deal with foliar feeders (anything eating the leaves)
 - aphids, mites, leafhoppers, etc
- also apply to deal with egg-laying
- insect growth regulator
 - this is less fast-acting (over the course of a week or two)
- Does affect pollinators - don't spray during bloom times
- Solidifies at room temperature typically, except brand Rango
- other brand: Ahisma

Capsaicin

- this is what makes food spicy
- can be sprayed to deal with aphids, deer, rabbits, squirrels, thrips, leafhoppers

Kaolin Clay

- pest repellent
- forms a particle film on the plant, which prevents pests from feeding and laying eggs and pushes flying insects to find somewhere else to land
- only utilize if you'll keep up with applications, otherwise the insects will return
- spray at midday so it can dry on the leaves

Bt

- breaks down in 3-5 days because it degrades in sunlight
- attacks caterpillars, moth larvae, (leaves bees and beneficials alone) through digestion (kills insects within a day)
- great for codling moth
- can also add molasses to the spray as an attractant

Spinosad

- deals with moth caterpillars, sawflies, thrips, leafminers, maggot flies, curculio
 - attacks through digestion or contact
 - kills insects in 1-2 days
- (many do affect bees)
- 10 day application
- only lasts three years on the shelf

Pyrethrum

also called pyrethrins

dried, powdered flower heads of chrysanthemum

broad use insecticide, definitely affects beneficials and bees

can be utilized for targeted applications

Liquid Fish

Liquid fish fertilizer (hydrolysate)-

- has not been pasteurized and therefore still has fatty acids and enzymes to boost beneficial microbes
- boosts nitrogen
- foliar feeder
- feeds bud set to improve fruit quality

Not the same as fish emulsion

- liquid waste, have been heat-treated, less effective

Refined fish oil

- can be used to protect Bt from sun degradation

Brands: Dramm, Neptune's Harvest

Effective Microbes

BioAg is a lacto-fermented LIVE bacteria

- Must be stored above 40° and below 100°
- Helps colonize the plant surface
- Helps with calcium absorption

Can make more by mixing $\frac{3}{4}$ cup of probiotic and $\frac{3}{4}$ cup unsulphered molasses with a gallon of water - let ferment 7-10 days

- Brands: SCD BioAg or Teraganix

Horticultural Oil or Dormant Oil

- typically petroleum based
- can be used at any point in the season
- smothers insects and spores
- does not add any nutrition to the tree
- typically used by organic home growers



Monterey Fruit Tree Spray Plus

- Can either apply on a weekly or biweekly basis or apply as problems arise
- (apparently) treats all insects and disease issues
- main active ingredients are neem and pyrethrins,
- can harvest afterward
- **IS TOXIC TO BEES** (do not apply during flowering)

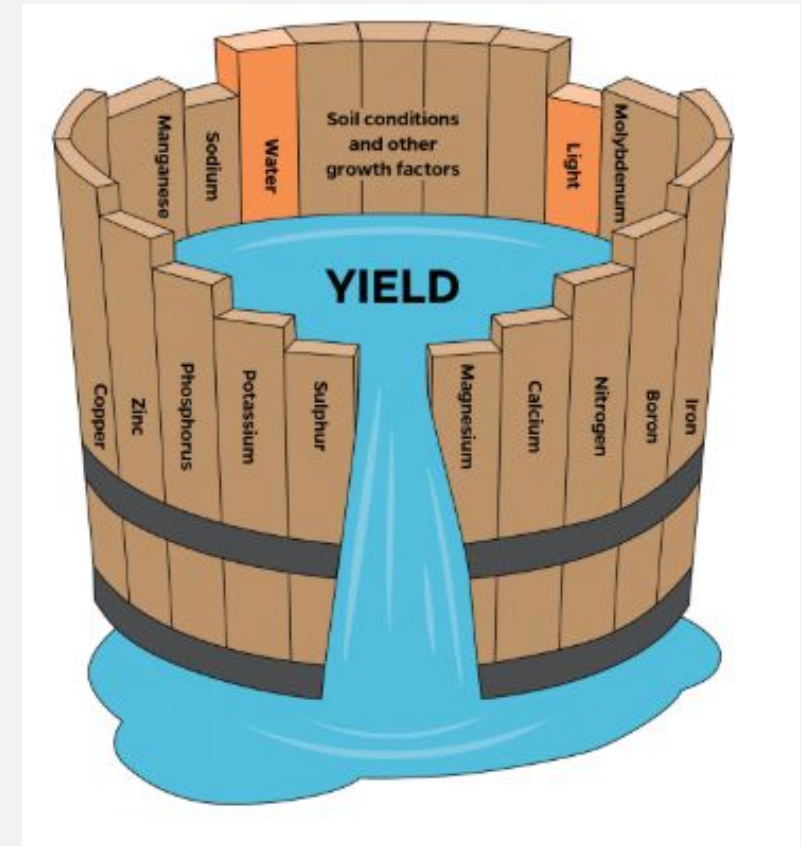


Copper

- can be used in a targeted manner for fungal issues
- does not exactly fall within holistic care, as it can affect soil health, return bloom, beneficial insects, & fruit yield
- Neem is a less effective fungicide with less of these issues
- Copper can be utilized in a pinch

Seaweed/Kelp Meal

- provides powdered minerals (like boron, copper, iron, zinc, cobalt, manganese and selenium)
- Brands: Coast of Maine, Maxicrop, Dr. Earth
- Liebig's Law of the Minimum



Schedule

Holistic Spray

- this is a spray regimen developed by Michael Phillips
- meant to boost tree health while also holding some ingredients to deal with common pests/diseases
- foliar feeder - apply at dawn/dusk when stomata are most open
- best to apply on cloudy days if possible (neem can burn leaves with high temperatures/direct sunlight)

Schedule

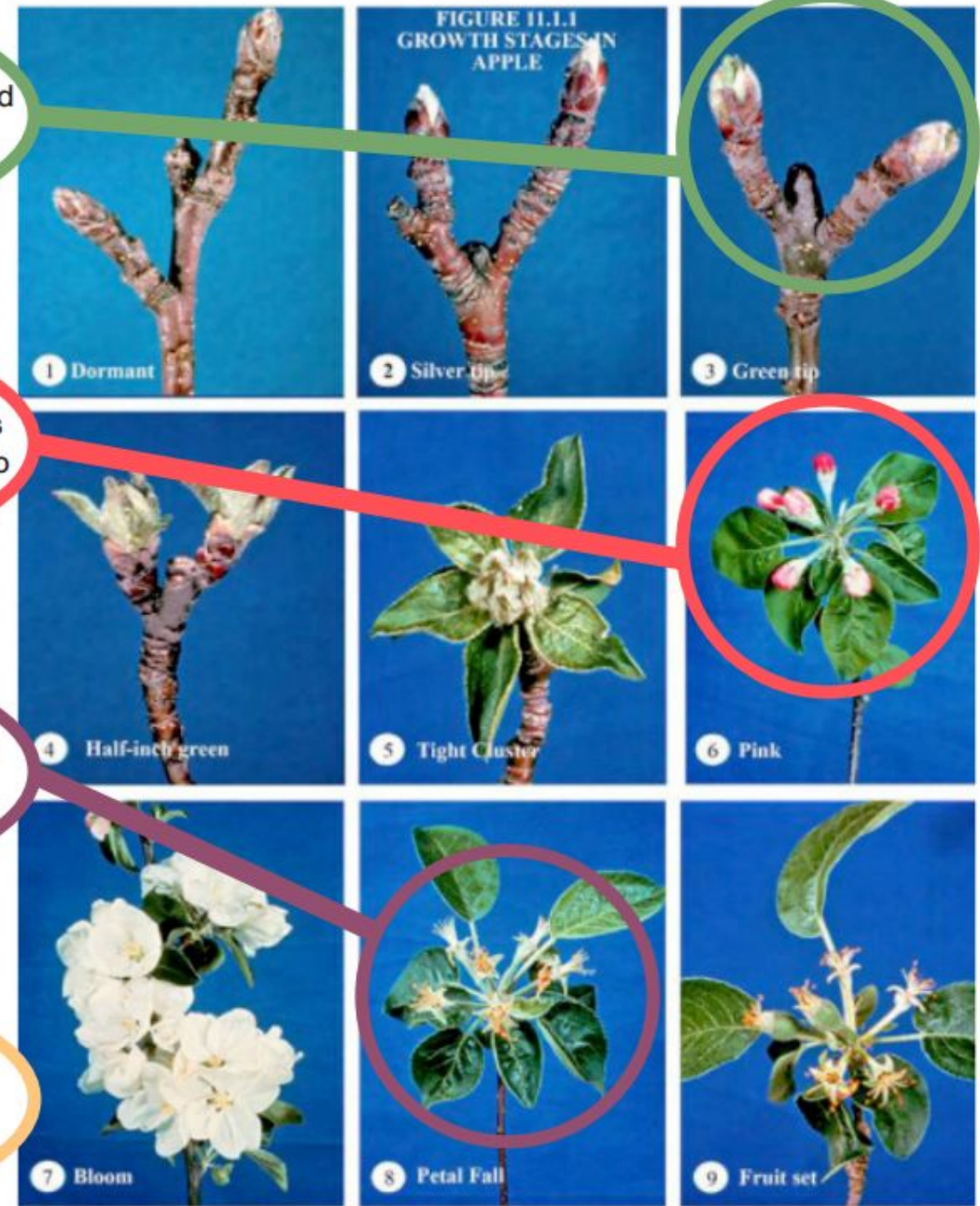
If you can't make all four sprays, the first and fourth are the most important!

Spray #1- When green tip of bud is 1/4-1/2" visible.

Spray #2- When leaf tissue has filled out and pink buds begin to show

Spray #3- When flower petals have fallen off of the fruit bud.

Spray #4- Spray 10-14 days after Spray #3.



*Spray #5 will be used in the fall, late October to December.

Bud Break

Bud break will be different for different cultivars and different types of trees!

Keep a map of which ones have been sprayed and which order

Recipe for 1st and last spray

Per 1 Gallon of Water:

- 2.25 Tbsp Neem
- 1 tsp liquid dish soap (Dr. Bonner's or Dawn recommended)
- .5oz kelp/seaweed
- 3 Tbsp (1.5oz) BioAg probiotic (effective microbes)
- 5 Tbsp (2.5 oz) liquid fish (in fall, double fish amount)

If neem has been in a cool area, warm up overnight

Combine neem and soap and stir vigorously

Add liquid fish and BioAg

Add warm water last and shake vigorously

Spray whole tree! In fall, also spray leaf/tree matter on the ground

Recipe for 2nd, 3rd, and 4th sprays

For 1 gallon of water

- 1.25 Tbsp (.6 oz) of Neem
- ½ tsp liquid dish soap (Dr. Bonner or Dawn recommended)
- .5 oz kelp/seaweed
- 3 Tbsp (1.25 oz) BioAg probiotic
- 5 Tbsp (2.5 oz) liquid fish

If neem has been in a cool area, warm up overnight

Combine neem and soap and stir vigorously

Add liquid fish and BioAg

Add warm water last and shake vigorously

Sprays can include additional ingredients from above

- Can substitute karanja for neem if you're concerned about pollinators - or for pears (more likely to be burned by neem)
- Can add kaolin clay after bud break sprays to deal with plum curculio/codling moth

Resources

- Extension is a difficult resource for orcharding holistically, they will often recommend intensive spray regimens
- Holistic Orchard by Michael Phillips is an intense but helpful book

Sprayer?

1 gallon covers approx 5 baby trees, 2 mature trees

manual versus battery is based on preference!



Any questions? Any feedback?



Feedback Form



Orchard Talk GroupMe