



**Homestead
Orcharding
Is A
S.N.A.P.**

Learn how to grow a Simple, Natural, And Poison-Free Orchard in your backyard

**By
Brian L. Mello
of
Winter Cove Farm**

What is the simple? Building a food forest in an ecosystem creates “Least effort for maximum efficiency” Fukuoka Problems cannot be understood in isolation, they are systemic problems which means they are all interconnected and interdependent. The questions we usually get are, how do I fix XYZ issue. The answer is, what is missing from your ecosystem? To try and fix every problem that happens with fruit only leads to frustration and band-aid solutions. Creating a complete ecosystem is the only way to resolve the disparity in the situation and

Who we are...

When you have children, there's little you won't do for them. After waiting 9 years for our second child, we never dreamed we'd have a third. When Joshua, our third, arrived, it was a very joyous day. Little did we know how this wonderful little man would open our eyes to the issues that affect our food supply.

When Josh turned a year, we turned him onto strawberries. As a May baby, his 13th month comes straight on the heels of strawberry season.

He LOVED them. Devoured as many as we could give him. Strawberries were his new favorite word. Obsession better describes his feelings for them.

We soon found out that his body didn't love, like, or even tolerate them.

The strawberries turned my sweet child into a pile of tears and tantrums

. They left rashes all over his body. They changed my sweet son into a very angry toddler. He turned to hitting and screaming like we had never seen. I didn't know what to do and it took a wonderful doctor to open our eyes to what was causing this for my boy.

Now there's nothing odd about a toddler and tantrums, but these were no normal tantrums. He really couldn't control what was happening in his body. We stopped feeding strawberries and my sweet and healthy boy returned. Strawberry allergies and intolerances are not abnormal, so we figured that he just couldn't eat them.

Having dealt with other food allergies in our family, we knew that avoidance was the key.

So avoid we did.

Shortly after our realizing that Josh could not tolerate strawberries, our own, naturally grown strawberries grew ripe. This was super exciting! Our first fruits from our new orchard! So we warned the older kids not to let Josh eat them and they complied. None of us wanted to see him suffer again. He was just a bit over a year old at this point and loved exploring the farm.

One afternoon, after hanging laundry in the wonderful warm sun, I wandered the garden. It was a perfect early June day, with warmth but not heat, not a cloud in the sky. The epitome of the perfect Maine summer day.

You can only imagine the distress I felt when I came upon my young son sitting on the ground, happily eating strawberries. I was VERY upset! How could I let this happen? I felt overwhelming sadness and fear of how to deal with this impending disaster. My mom instincts kicked in and I grabbed out of the strawberry patch as fast as I could. Not wanting to scare him, I just moved him to the sandbox while I figured out how to deal with it.

What happened next changed our lives. Do you know what happened? NOTHING! NADA! ZILCH! The child went on being himself, sweet, happy and content. No rashes, no sore bottom, nothing...

Now, I'm a woman who questions everything. For much of my life, this has made things more challenging. But this time, WHY turned our lives, and our mission, to changing the food system.

For these reasons, we are a Family with a passion for growing and helping others grow Poison-Free Fruits simply and easily. This led us to search for ways to grow

fruit without any of these chemicals. We've found success avoiding all of the "cides" with our Simple, Natural, and Poison-Free methods, growing healthy fruit on our 13 acres in Winterport, Maine.

Our Mission:

To offer personally tested fruit and nut plants that grow in zone 2 through zone 6 for the home orchardist. To share the Simple, Natural and Poison-Free methods that we use to make your fruit growing easy.

What we do:

We offer Sustainably-Grown, Cold-Hardy Fruit Trees & Plants.

We utilize permanent agriculture (permaculture) principles in our S.N.A.P. (Simple, Natural And Poison-Free) methods, looking to God's creation for information as to what conditions each plant needs in each location.

Our nursery carries only cold-weather varieties that we have personally tested on our farm.

We work with beyond organic principles, concentrating on soil health and balancing the ecosystem. We've found a way to grow healthy, nutritious food within an ecosystem, without using chemicals, intensive management or doing damage to the environment.

We teach others how to do the same; whether you have 1/10th of an acre or 100 acres. We do this through our classes throughout the growing year.

We want to enjoy the earth and share what we have learned with you, it's not about the paycheck.

We believe that we are meant to be in community and working together to create sustainable orchards and food security throughout our communities towards the restoration of the earth and the people within it.

The Simple, Natural, and Poison-Free Orchard System

There have been books written, courses costing thousands of dollars created, and tons of articles written online for growing the perfect orchard. After studying permaculture methods and then attempting to put them into practice within our own orchard, we realized that a method that values nature, and replicating it, was making it much more complex than nature.

Today we're going to show you how to grow a healthy orchard without poisons or spending lots of hours in your yard. We have become successful by utilizing all the permaculture, agroforestry and organic orcharding information out there, finding the absolute best ideas in it, and then simplifying it and we will show you these tips, tricks and secrets. In a nutshell, SNAP Orchards are created and set up by mimicking nature.

Simple Orchards:

We're guessing that for you, this may not be the first time you're looking at growing fruit. The first thing we want to say is if you've struggled in the past, it's not your fault. There's a lot of info out there and it can be confusing. Many times the information overload keeps you from success. It's okay.

If you've been concerned in the past that you just can't succeed with growing fruit without a lot of time or spraying poisons, we want to put these fears to rest. You can do this. You just need the right person to explain it to you.

The big nurseries, orchards and chemical companies want you to think you need to have a degree in agriculture or buy into their spray programs to be successful. We're here to tell you that they're wrong. They have their own reasons for wanting you to think that, but it's not true.

If you've ever thought that some nurseries want you to fail, you're probably right. They don't benefit from you succeeding. They want you to feel like you need to buy the "right" sprays or the "right" tree, keeping you coming back for more. The difference with us is that we actually care about your success and truly want to see

you growing the best, healthiest, cold-hardy fruit without poisons or all your free time.

So, that's what we're here for. We know you want to change what you eat, have better food security, and grow healthy poison-free fruit all while saving money and time.

Our goal for beginners is to give you the basics you will need to get your trees in the ground and begin growing a healthy ecosystem that will support your trees naturally.

For more experienced growers, we want to give you more depth of knowledge and how to put it all together in a systemized manner.

The ONLY way to grow healthy, nourishing, poison-free fruit in less than 2 hours a week is through a permaculture system.

The easiest and most complete blueprint for growing fruit is our S.N.A.P. Orchard system.

Natural Orchards:

Look to nature for inspiration on planting and maintaining your orchard. When looking to a natural design, you will see that there are no monocultures, instead there are multiple species in any given area and the edges are where the most life and variety is found.

Poison-Free Orchards:

*For us and for our children, the Poison-Free aspect of a SNAP Orchard is the most important part. I cannot emphasize enough how destructive most pesticides, herbicides and fungicides are to the environment and our lives. We've found that natural sprays, basically ones you can make yourself, are the best and only ones needed in our orchard. Will every fruit be perfect? No! But every fruit **will** be healthy and that reason alone is worth spending time and energy growing your own orchard.*

Nature doesn't require sprays and protection from insects and disease. Most farming today is handled in an allopathic manner, meaning when there is an issue it is attacked with sprays and manual intervention. We prefer to look to

naturopathic methods to support the health of the plants and soils, building the health of the ecosystem to help ward off attacks.

The main sprays that we make for our trees include water kefir, garlic oil and liquid composts, everything except the garlic oil can be made at home. The garlic oil is inexpensive and lasts a very long time, especially for the benefits you'll receive for it.

We even suggest avoiding all organically approved sprays. Chemicals like Rotenone and Pyrethrin, approved for organic use, have known neurological issues for humans, very high toxicity to fish, high toxicity to birds and swine, are slightly toxic to wildfowl, and residues are persistent in the environment. Just because a chemical is made from a "natural" product does not make it okay for organic growing.

Create Your Own SNAP Orchard:

Growing your own fruit need not be complicated or expensive. Look to what you see in the natural world and attempt to replicate it in your backyard. Plant a variety of plants and trees, and don't plant all the same type together.

Choose hardy and disease resistant varieties that are proven in your climate. Use natural sprays that you grow and make yourself to build the health of your plants and the soil. Growing through SNAP methods, you too can have a simple and healthy ecosystem that feeds you right outside your back door.

We utilize multiple indigenous bacteria and fungi to improve the plant health and resistance to disease, equal to utilizing a naturopathic approach to human health. If we have to till, we add in Water Kefir, Kelp Meal and Compost Tea to the soil, immediately improving the soil health which, in turn improves the plant health.

Instead of row cropping which requires tilling continuously or running the risk of invasive grasses, we utilize multiple layers of plants which work harmoniously to create a natural mulch, keeping the area directly under the canopy low in weeds.

Traditional farming uses a monoculture, or large areas of one crop, approach. We incorporate a polyculture planting style. By intercropping annuals with permanent trees, shrubs and plants, we are able to reduce pest loads. Nature rarely produces a monoculture as this style of farming provides a perfect harbor for pests and disease.

By planting many different types of plants, we mimic nature, making pests and disease have to work harder and reducing the issues that we experience with them. If a crop does not grow well after trying multiple different solutions to resolve the issues, we chose not to grow it or utilize it only as a trap crop.

What is Permaculture?

I was intrigued the first time I heard that word, Permaculture. The term combines the word permanent and agriculture, utilizing the permanent nature of tree crops as the basis of an agricultural system.

Permaculture is, in its most basic form, working with nature, not against it. It is a design of systems utilizing what is found in nature. It focuses on local production of all the materials each individual requires, the exact opposite of the current world-wide agricultural system in place today. It is the ultimate Locally Grown!

How does it work?

Permaculture utilizes the systems found in nature which most adherents break down into five zones. The zones are divided up based on usage, The lower the number, the more it's frequented or used.

- Zone 1 is the most used, includes the residence and areas visited multiple times a day such as your kitchen garden.
- Zone 2 is where one still needs to visit at least once a day, such as animals requiring daily attention and high-maintenance fruit crops.
- Zone 3 is less visited and set up, normally, for animals with self-feeders/waterers as well as less intensive crops like apples.
- Zone 4 would be areas that are managed lightly, a wood lot or no-maintenance yearly crops like black walnuts.
- Zone 5 is an undisturbed area of nature.

How to Mimic Nature and Incorporate into a Backyard Orchard

- Diversify your species: Don't plant only one or two items, plant many! A healthy forest doesn't have just one type of tree, it has multiple species of trees, shrubs, vines, plants, ferns, fungi, and lichen which draw in all sorts of birds, insects, mammals, reptiles, and more.
- Create Symbiotic Relationships: Many plants and animals grow better with each other. The 3 Sisters method of planting corn, beans and squash are a wonderful example of this. Companion plantings are beneficial in many ways to each party in the relationship
- Ensure Balance: In nature if something gets out of balance, another species comes in to take advantage of this. Currently in Maine, we hear about the Spruce Budworm and White Pine Blister, which kill profitable forests that were planted without the balance of multiple species. The result of a monoculture is another species can easily move through it to take advantage of this.
- Resiliency: Simply put, grow many different types of the same species. If one does not flourish, another may. When it comes to food we ensure a longer season and a good harvest with growing many of the same.
- Go Vertical: Nature is not one dimension, utilize the variations of height you see in the forest to take advantage of the land you have. Add trees, vines, shrubs, herbaceous plants, ground cover and fungi.
- Mimic Nature: Know your soil, shade and moisture levels, find plants that like them, and plants lots of them.
- Succession: In different seasons you will see different plants growing and taking up space in natural ecologies. Emulate this by planning to have no

dead space at any point in the year. Plant annuals to take up land space where your new perennials are growing. Plan plants to put in when early, mid, and late season ones are finished. Cover your garden with mulch to mimic the forest floor.

- Regenerate: Utilize all "waste" product right on your own property. Compost, animal manure, grass cuttings and tree cuttings are all used to increase fertility and do not need to be thrown out.
- Stop tilling: Utilize mulching, compost, cover crops, lasagna gardening, and hugelkulture. Lay down organic matter and allow the earth's own organisms to do the work for you.

Benefits of Permaculture for You

- Costs Lowered: It reduces your costs by utilizing all the natural components of the local environments, such as composting food wastes and spilled feeds, into useful organic matter saving money from buying compost or fertilizers.
- Waste Reduced: It reduces waste and pollution as we recycle, which also reduces costs. Utilizing items such as recycled pallets and upcycled roofing, lowers your costs and keeps the items out of the waste cycle.
- Zoning: An important part of Permaculture is zoning. Zoning means arranging the usage depending on what ripens first and what needs more attention. Following this ideal, the ripe fruits and vegetables are plucked first and the latter ones when they ripen.
- Sustainable: Growing what one needs by utilizing what we have on hand, such as making compost from scraps and growing an abundance in it. If there is surplus we preserve it or feed it to animals that then provide more food or compostable manure.

- Adaptability: We can apply the principles to existing systems and change them to better function. It's systems will adapt to utilize non-traditional farmlands into productive systems, such as forest farming.

What Defines a Healthy Ecosystem?

Using the healthy eco-system as our example, it is:

Durable and sustainable: Cut & Grow back model

Limited monocultures: Staghorn sumac and pine groves

Lots of different plant growth at Forest's Edge: Biodiversity thrives here

Reclamation without intervention

Does not need us to water or feed it

Always in motion, very dynamic activity

Determine the current conditions

Environmental conditions play a very important role in fruiting. These conditions are usually referred to by sun/shade, dry/wet, sandy/clay, etc. Indicator plants help us identify conditions.

Wet/moist soil weeds:

Moss Joe-pye weed

Spotted spurge

Knotweed

Chickweed

Crabgrass

Ground ivy

Violets

Sedge

Dry/sandy soil weeds:

Sorrel

Thistle

Speedwell

Garlic mustard

Sandbur

Yarrow

Nettle

Carpetweed

Pigweed

Heavy clay soil weeds:

Plantain

Nettle

Quack grass

Hard compacted soil weeds:

Bluegrass
Chickweed
Goosegrass
Knotweed
Mustard
Morning glory
Dandelion
Nettle
Plantain

Poor/low fertility soil weeds:

Yarrow
Oxeye daisy
Queen Anne's lace (wild carrot)
Mullein
Ragweed
Fennel
Thistle
Plantain
Mugwort
Dandelion
Crabgrass
Clover

Fertile/well-drained, humus soil weeds:

Foxtail
Chicory

Horehound
Dandelion
Purslane
Lambsquarters

Acidic (sour) soil weeds:

Oxeye daisy
Plantain
Knotweed
Sorrel
Moss

Alkaline (sweet) soil weeds:

Queen Anne's lace (wild carrot)
Chickweed
Spotted spurge
Chicory

Replicate an ecosystem at home

In the orchard, add in as many different types of trees, shrubs, and plants to replicate an edge of woodland system. Then create the underground ecosystem to feed them.

Healthy trees require a good foundation in a balanced system which feeds the tree and provides the ecology, which encourages the holistic health of you orchard.

It is is the horsepower below the ground not the horsepower above that counts

Healthy Orchard Soil = edge of woods style healthy ecosystem with many flowering plants.

How to get there:

- Mulching your trees out to their dripline is a good start toward healthy soil which contributes strongly to their health.
- Mulch around your trees with natural wood mulches such as the ones found at landscape suppliers. Stay away from rubber tires, dyed mulches, cedar mulches, or any other synthetic mulches or mulch ingredients.
- Include many companion plants, as described in the Companion Planting section, in your mulch bed under the tree to help develop a healthy ecosystem.
- Prune out broken and/or dead wood allowing the tree to direct energy to fruit producing limbs.

- Avoid pesticides, herbicides, fungicides or biocides to keep the natural order in balance.

There are instances in which utilizing allopathic methods to save a well-loved fruit tree. A bad outbreak of disease, such as fireblight, calls for strong medicine and it is best to resolve the issue than allow the disease to ravage the orchard or the local community of trees.

Building Healthy Soil

Healthy soil has a lot of moving parts. It should include:

- *Bacteria* - can have over 75,000 beneficial types that provide localized nutrients to plants
- *Fungi* - the driving force that moves nutrients to plants from soil from long distances (miles) away
- *Protozoa/Nematodes/Micro-arthropods* - Are part of a predator/prey relationship going on underground. Their excrement provides plant soluble food sources.

Any tilling breaks up the food web in the soil. This can take a long time to repair, but there are methods to speed this up. Mulching, companion plants, and soil food such as fish hydrolysate, kelp meal and chitin based supplements. Surface application of healthy compost will reintroduce biology that may have been damaged or destroyed during the tilling process.

How to use your finished Water Kefit

Water it in- 15 to 30 mL per gal –*Helps break down organic matter and fertilizers into plant available forms. Helps with nutrient uptake and availability. It's pretty much just beneficial bacteria and some residual sugar, so its compatible to mix in with whatever else you are watering.*

Foliar- 15 mL per gal –*Natural antifungal, Helps prevent powdery mildew. Populates plant surfaces with beneficial lactobacillus which outcompete other harmful microorganisms. Use it alone or as part of your regular IPM spray.*

Make fertilizer with it- *Lactobacillus will attempt to break down any organic composting material it comes into contact with. You can make “fermented plant extract” by mixing nutrient rich plant matter with lactobacillus and allowing it to break down and ferment for a few weeks. After the mix is fermented, the chunks are strained out and the remaining liquid is a very effective fertilizer containing lots of nutrients and beneficial lacto bacteria. If you are interested in learning more, search the internet for “fermented plant extracts” and “dynamic accumulators” for tons more info.*

Use to aid in composting – Water it into your compost pile. Helps break down organic matter and accelerate the composting process. Also helps reduce compost related odors. Also seems to speed up the “cooking” process when preparing freshly mixed soil for use.

Companion Plants and Why We Use Them

Companion plants benefit the health of your whole orchard. Each plant has a job to do and do well. The more work they do, the less you have to do. By utilizing the correct types of plants you are able to spray less, fertilize less, and not worry about pollination.

The best companion plants do multiple jobs such as:

Fixing Nitrogen: taking nitrogen from the air to the soil to feed the roots of your trees.

Living Mulches: plants that produce organic matter that, when cut down and left to decompose under the tree (chop and drop), feeds the soil life, therefore feeding the tree.

Dynamic Accumulators: have taproots that help accumulate minerals from below the surface soils and make it available to plants and trees around them.

Beneficial Insect Attractors: attracts indigenous insect life, including predacious insects and tree pollinators throughout the whole orchard season.

Pest Confusers: have smells that confuse harmful insects to keep them away

Companion plants, once established, are very low maintenance. Mimicking nature by planting in groups of similar plants will make the plants more effective.

Keep in mind that plants underneath the tree where you need to go to harvest will be trampled on, and it's good to reserve these spots for plants that survive this and/or work well in a chop & drop situation.

Our favorite plants include:

Comfrey: an excellent nutrient accumulator. Pollinators love the flowers. Put a few leaves in your compost pile and it WILL break down faster. To utilize the excellent abilities of comfrey, chop and drop it. Never rototill it into the soil unless you'd like lots more comfrey.

The plant can easily get out of hand; however, we have not had this problem, we're always trying to get more from it. On the other hand, we have an acquaintance who rototills his land every spring and cannot understand why he cannot get rid of his comfrey, he has more every year. So grow with caution.

Yarrow: fabulous perennial with great cut flowers throughout the season. It naturally mulches the area it grows in leaving behind copper, nitrogen, and phosphorus. Out competes weeds. Comes in many colors. Said to keep the raspberry borer away and we have had mixed success with it.

Echinacea: perennial plant that increases gently for years. Butterflies flock to this plant for the pollen and colorful flowers. Bees love it too. Excellent herbal remedy for tinctures and teas.

Beans & Peas: one of the most productive nitrogen fixers! Instead of putting them in your garden, consider growing them under your fruit trees.

Black/Honey Locust Trees: leguminous nitrogen fixer that feeds other trees around it. Pods are good winter animal forage. Can be harvested to keep small and used for firewood or rot resistant posts.

Borage: An annual herb that prodigiously self seeds, coming back year after year. The leaves and flowers are edibles with a cucumber like taste. Its highest use is that it accumulates trace minerals to the surface and provides one of the most sought after flowers for beneficial bees and wasps. Walking through a borage patch provides great opportunity to observe all sorts of happy bees.

Lemon Balm: beautiful herbal plant with citronella compounds that keep all sorts of insects away, great pest confuser. The bees really like this one, too. Makes incredible herbal tea that keeps summer on your mind all winter long. Can self seed, so cut flower heads off if you'd like it to stay contained.

Red Clover: dependable and low cost cover crop/her. Helps break up heavy soil and adds a moderate amount of Nitrogen. Suppresses weeds very well. We use the red flower heads for a taste honey and general tonic herbal tea. Great for grazing animals as well.

Daffodils: are excellent at out-competing grass within the tree ring. Plant a ring around the drip line and the trunk provides protection against voles and gophers as well. Once planted, they are virtually a no-care plant that blooms and multiplies year after year. Excellent beneficial insect attractor that stops blooms about the time the orchard's in full bloom. These plants also do not mind the harvest time as they are well past their prime in summer and beyond.

Chives: perennial herb that helps prevent scab. Use in a tea to spray on leaves. Pest confusion and gently spreading ground cover. Excellent in the kitchen too!

Bee Balm: aromatic herb that is a very hard perennial native to our area. In the mint family with flowers that pollinators love. Emits lovely spicy odor which can function as a pest confuser in the orchard. Comes in dwarf and tall versions and reblooms all season if you cut it back. One of the first signs of spring is the greening of new bee balm (monarda) leaves in our orchard. Top notch ornamental that outcompetes weeds wherever it's planted.

Dill: Annual in our climate that readily self-seeds. Feeds all sorts of pollinators. Excellent in the kitchen.

Lupin: herbaceous perennial that fixes nitrogen from the air and is central to our Maine views! Lepidoptera feed happily upon these and are very valuable in your orchard.

Viola: hardy, self-seeding annual that feeds all sorts of pollinators, it is totally edible and stabilizes soil while looking absolutely fabulous!

St. John's Wort: an attractive ground cover and soil stabilizer. Once established, the plants need no care, and this makes them ideal for out-of-the-way locations. You can also use it as an edging or to mark boundaries and pathways where you don't want to obstruct the view. Excellent pollinator attractor

Dandelion: One of our favorite native herbs, this tap rooted perennial is an excellent dynamic accumulator. As one of the first flowers of the season, they are a very important nectar source for pollinators. The herb is good for all animals, especially us. Excellent food, excellent for the soil and fabulous for your trees. Don't kill them!

Map Out Your Orchard

Spacing

Depending on the trees you put in, a safe bet is between 10 and 20 feet between pears, 8 to 10 feet between apples, and 6 to 8 feet between plums. This spacing allows enough space for them to grow without their roots interfering with each other.

Pollination

Some fruit trees are self-pollinating while others require a mix of bees, butterflies, wind, and spores to start producing fruits. Check out our store selection to learn about what plants work best in cold weather areas so you can get the most fruit possible from your garden! Most people I talk to don't even know we can grow plums like mad here in New England. Picking the right variety is one of the most important parts.

Plant the trees by mixing fruit tree types within your orchard, attempting to keep harvest dates similar. For example, it's good to have an early apple (mid-August) with other plants (like plums and peaches) that have similar ripening times. This makes it easier to ensure good fruit collection within the orchard, making your life simpler.

Layout can be whatever works best for your location, really! Look to the forest, there is no set layout or spacing, but there are definitive patterns. We've found that fruit trees planted in good soil and cared for naturally are tolerant of variable spacing. In fact, in small yard you can plant more than one tree in a hole, but you must train them to grow correctly to prevent problems when they are older.

Natural Orchards:

Look to nature for inspiration on planting and maintaining your orchard. When looking to a natural design, you will see that there are no monocultures, instead there are multiple species in any given area and the edges are where the most life and variety is found.

Mimic what you find in a forest setting and plant many varieties of many different heights and fruiting. We enjoy mixing our annuals into our perennial food forest which gives us a reason to interact all season long with the plantings that mature more slowly.

You do not need to put specific plants under specific trees to gain the benefits they bring to an ecosystem. Within Permaculture, the “guild system” has been promoted and, although the premise is correct, the execution makes the average gardener confused. Instead of trying to put the perfect plant under the specific tree, we’ve found that ensuring certain supporting plants are in the orchard is enough.

With hundreds of fruiting trees, trying to use a guild under each tree became an overwhelming task. We researched the best of the plants we needed for each type of tree and came up with a list of the Companion Plants found previously in this booklet. Disburse these plants throughout your orchard and, by mimicking how nature plants, you'll receive all their benefits without a lot of extra work.

Install Your Trees.

Choose your location well. Fruit trees love sun, ensuring that your fruit ripens and has good sugar content. Your location should have at least six hours of sunlight, eight is even better. You want to have soil that is rich in nutrients and can retain moisture. Also, ensure that there is room for your choice tree to grow to its full size.

Trees are best purchased as bare-root trees. Planting them in the spring is the preferred choice for northern growers, ensuring that trees have enough time to become established before winter. Trees should never be planted during summer as the weather is too extreme and the soil holds less moisture.

The first thing you must do is remove the grass or sod from the location in a three foot circle. Then dig a hole big enough for the roots to sit in comfortably as well as grow easily. If your soil is heavy clay or compacted, dig up to twice as wide and deep as your tree's roots. When removing the soil from the hole, keep the topsoil and subsoil in separate piles and avoid mixing the soils together.

Place the tree in the hole you just dug. Make sure that the graft line - the location on the tree where the scion wood is grafted to the rootstock - is above the soil line. Feel free to ask for help identifying this location if you are not sure.

Hold the tree plumb and backfill the hole. Begin backfill using the subsoil first. Pull out any rocks that land on the root system. Do not place any sod back in the hole. Push your hand into the soil to help eliminate any air pockets that could

collapse under heavy rain. Press the soil in carefully with your heel and smooth out the top layer.

You can add a thin layer of compost to the surface before mulching. Add a minimum of two inches of a natural wood mulch to the entire surface. Water the tree slowly with half of a 5 gallon bucket of water. Lightly heel in the moist soil to firm up the tree, re-rake the surface of the mulch and make sure the tree is labeled.

We recommend NOT using any fertilizers in the trees' hole to ensure that the tree sends its' roots deep in search of nutrients. You can add in ¼ cup of kelp meal to help provide key micronutrients that are slow releasing.

If you are planting trees on dwarfing root stock, now is the time to stake it. Install one 4"x4"x8' rot resistant post or 1"-2" metal pole with at least 2' to 2 ½' in the ground. This post is for structural support and will tower over the newly planted tree, this is ok. Use a wide, flexible tie material (narrow or sharp edges are more likely to cause wounds to the tree due to friction). The tree should have the ability to move some, you're just looking to prevent toppling.

Now, after planting and staking, if needed, add a layer of mulch around the area you have dug to help your tree hold its moisture level and create a fungally dominant soil which helps your tree thrive.

Water as you go

As you install your trees, give your tree a good, deep drink of water. Half of a 5 gallon bucket of water will work here. We use pond water with all of its nutrients, but regular water works great too.

Avoid overwatering! I'll say that again! **Avoid overwatering!** Unless you are in a drought area, avoid watering your trees. If you plant in the spring, there should be enough natural water in the soils within cold climate growing zones to feed your tree.

The only time we water our trees is the day we plant them. We want to thoroughly soak the mulch and dirt to get the tree started. When you water, trees keep their roots shallow and tend to be more susceptible to drought and uprooting.

Just to note that if you are in a long term drought, water no more than once a week for the first year only. Water with a 5 gallon bucket and drench soils well. This is only necessary if the soils are very dry, very deep.

If the future few weeks are dry, do this once a week until it is established. Mulch helps hold in the moisture and prevents us from having to do this in our orchard. Only water for the first year unless you're in an area that is experiencing drought.

When to plant your understory shrubs, flowers, and grazing lanes.

Plant shrubs, flowers, herbs, roots, and grazing lane

The time to plant the understory shrubs would be after the tree rows are in place. At this point, one can more clearly see where the understory plantings will fit.

Planting the grazing lanes will only depend on the weather conditions in the spring. Tree/Shrub layer should be in place prior. Do not plant the grazing lanes until nighttime temperatures reach 50 degrees Fahrenheit on the average.

Mulching

Why do we mulch? Mulch is a fabulous covering for your soil. Not only does it cover and protect your soil from erosion, it feeds soil. Soil is composed of bacteria, fungi, protozoa, nematodes, and microarthropods. Dirt is dead brown stuff. Soil is alive, a full ecosystem thrives under your feet and **MULCH** feeds it!

As the soil grows from mulching, the earthworms bring it down deep, creating a deeper level of topsoil and making it easier to dig and easier for your plants to receive nutrients.

We have brought in literal tons of wood chips and hay over the last five years. By the time the end of August rolls around, it starts to look like we haven't put any down at all. All of the mulch turns to soil.

Six years ago you would have been hard pressed to find one worm in each shovel full of dirt. Now when digging under mulch I feel guilty as I'm sure I'm killing the worms every time I dig as they are so plentiful. In mulched areas, I can pull back the mulch and push my hand into the ground. Unmulched areas are hard clay and digging with a heavy shovel is hard work.

Protecting your orchard

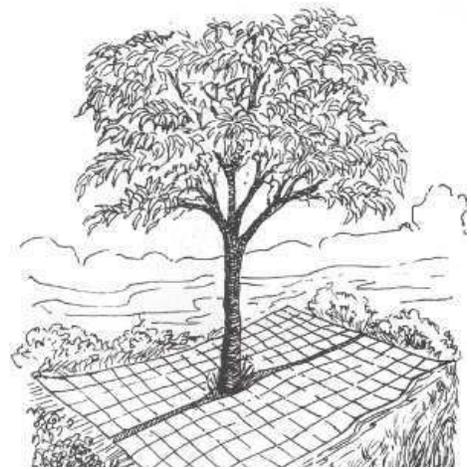
The first six to eight years of your trees growth may include protecting your trees from deer, mice, voles and rabbits, among other pests. There are many differing opinions on what to do, and you may need to try multiple options before you find one that works well for you. Each location will need to be monitored for deer pressure as well as bear pressure.

You can create individual cages out of cattle fencing or hardware cloth, and wrap that around the tree. There are wire mesh trunk guards that do well at protecting from rabbits and rodents as well, but not from deer. These two combined do provide very good protection from all species.

We've had good success with off set electric wire on a small charge with peanut butter on tin foil strips attached to the fencing. The peanut butter draws them in and the foil provides a strong charge to the deer's mouth.

To help keep them out of the orchard, try not to plant your trees within a deer path of traditional bedding area. Try planting some of their favorite foods outside of your orchard area, like wild apple trees, feed corn, hosta, etc... Just don't plant one anywhere near where your trees are and make sure you still have good fencing if they are a problem.

One innovative method we've seen, but have no feedback as to how it works is to lay down wire on the ground as seen in this picture. The wire is a deterrent to the deer walking to the tree. This might



work if you have less than 10 trees, more than that and it would be cost prohibitive.

Some people have had success with utilizing soap as a scent deterrent. Hang soaps from string on each tree in the orchard. Dogs are the best scent deterrent for deer, but not everyone has one to work with.

A word on spiral tree guards and wraps. If you decide to use spiral tree guards and wraps, you will be adding extra work both spring and fall. Each does provide good winter protection against sunscald and voles/mice. If you do not remove in the spring, you provide the perfect environment for tree borers to hide. We recommend removing them at the first sign of spring if utilized on your trees.

Training your trees

Training your trees in the first three to six years is vital to their long term health. Unpruned trees become bushy, lose vigor and grow smaller fruit. Don't worry about mistakes, they can be corrected as the tree grows.

A few simple rules are needed and you will be ready to perform yearly pruning that your new trees need. In general, you should do pruning for apples, plums and pears during the dormant (winter) season, but light pruning can be done during the summer if needed, to keep excessive growth in check.

Pruning Young Trees

The first pruning is an opportunity to set the stage for the shape of the tree. Once the tree reaches a height of 32-34", it is time to cut the top of the tree to start the branching. You will cut back this central leader to buds that are facing the direction you want the branch to grow.

A branch coming off the trunk at a near right angle is much stronger than a branch that grows more upright. If a tree does not form good angled branches, like a pear tree that grows very upright, you can tie weights or splint young branches to force them while young, into better angles.

Make sure you trim lower branches to the height you want them. Tree branches never get higher on a tree, they just get bigger. Make sure you keep a good distance from the ground to reduce rain splash onto the tree and fruit.

Modified central leader pruning is our recommended method for backyard orchards of apples, plums, cherries, and pears. This shapes a tree to one tall trunk with several major limbs branching off at different levels. The result is a strong form that will both support heavy crops and survive winter weather.

DEVELOPING A MODIFIED CENTRAL LEADER:

- **The first pruning choose 2-3 well spaces scaffold limbs. During the summer, the selected scaffolds are headed back to $\frac{1}{4}$ - $\frac{1}{2}$ of their summer growth.**
- **In the second year dormant pruning, the central leader and the first scaffolds are headed back similar to the first dormant pruning.**
- **The next level of scaffold branches are retained at a height of 1 $\frac{1}{2}$ to 2 feet above the previous scaffolds. Maintain the crotch angle of 45 degrees.**
- **A total of 4 to 8 levels of secondary branches per tree, usually two on each level, are retained.**
- **Top the central leader when desired height of tree is attained.**

Open vase pruning

This is the method we recommend for peaches, apricots, and nectarines. This increases light to the center of the tree, making for better fruiting. This method does offer less resistance to the winter storms; however, these are shorter lived trees and this method increases the fruit you will get during their lifespan.

The scaffold branches are selected the first winter when the tree is 1 year old, and developed over the next 2 years.

DEVELOPING VASE SHAPE:

- **At planting, cut off the central stem 2 to 3 feet above the ground. Prune any side branches back to two buds.**
- **During the first dormant season (a year after you plant the tree) remove the leader and direct growth to three or four strong scaffolds. Choose branches that radiate evenly around the trunk. Maintain about 6 vertical inches between the branches, and keep the lowest scaffold at least 18 inches off the ground. Leave some small branches on the lower trunk to encourage trunk strength. Prune back scaffolds to one-third of their length.**
- **During the second dormant season, prune off aggressive new shoots but leave twiggy growth, which will be the fruit-bearing wood in most trees. Choose and encourage additional scaffolds if needed.**

- **During the third dormant season, prune to remove any broken limbs or crossing branches, but don't do any more major pruning until the tree has produced a good-sized crop.**

Thinning fruit for larger, healthier fruits

Fruit trees often set more fruit than they can support. This happens more often when trees are not properly pruned. Excessive fruit set causes small fruits, and can weaken the tree making it more prone to disease and insect pressure. In addition, an overgrowth of fruit can cause limb damage and prevent fruit set the following year. When we thin out fruit, we encourage a healthy tree that produces healthy fruit.

After petal drop, flowers and fruits will naturally thin themselves. Fruits that are diseased or insect riddled may also drop prematurely.

All stone fruits (peaches, apricots, nectarines, cherries, plums) require thinning. All apples, Asian pears and most European pears require thinning as well.

Fruit should be thinned, by hand, when fairly small. Leave the fruits that will get the most sun exposure.

- Stone fruits at $\frac{3}{4}$ to 1 inch in diameter, remove doubles, small & damaged fruit, leave fruit on opposite sides of branches
- Pome fruits (pears and apples) are thinned at $\frac{1}{2}$ to 1 inch diameter, thin more heavily on the terminal end of the branch, remove doubles, small & damaged fruits. Leave only 1 fruit per cluster.

Remove fruits by pulling backwards so the stem snaps cleanly off at its base. Put fruits into compost.

Know Your Pruning Cheat Sheet

Here's a cheat-sheet on when to prune your trees and shrubs to keep them healthy for decades to come.

Fall Pruning

With exposed branches and a crisp October sun shining, reaching for those pruners is often tempting. It's better to take a deep breath and focus on other chores.

Pruning fruit trees in Fall may, with some warm subsequent days, induces new growth to sprout forth. After all the resources the tree invests into this growth, losing it to winter's chill could deal damage to its overall health.

Late Winter

It's good practice to prune many deciduous trees, including fruit trees, in late March or early April. Cutting them in late spring or summer, while their sap is running, creates an open wound that takes a long time to heal and rolls out the red carpet for diseases like fireblight.

Although spring blooming trees like apples and cherries flower on previous year's wood, fruit tree pruning is important to open the tree up for more fruit production in the long run. The few dormant flowers cut off are well worth the increase in fruit production you'll enjoy in the years ahead.

Brief History of Grafting

Grafting has no written history of the first successful graft, giving us little of the early history. We know that by the 5th Century, the Greeks and Romans were grafting quite productively, and the Chinese could have been practicing it over a thousand years prior.

Today, grafting is the most practiced art of cloning trees for specific reproduction of known varieties.

Here are some important terms related to grafting:

***Scion:** a piece of last year's new growth with three or four buds on it*

***Understock:** the part of the tree below the graft*

***Rootstock:** the part that becomes the root of a tree*

***Cambium:** the part beneath the bark that carries nutrients & water throughout the tree*

***Topworking:** grafting onto the top of an established tree*

***Dormant:** live trees at rest during the winter*

Many fruit trees cannot be reproduced true to type with seeds. Any apple, pear, or plum planted will be a cross from the two parent trees. Your favorite varieties of fruit can only be reproduced successfully by grafting. Grafting itself describes any of a number of techniques in which a section of a stem that has leaf buds is attached to a rootstock of a tree that favors your growing conditions. This process

of grafting ensures that you reproduce the exact tree you're looking for.

The Purpose of Grafting

What we graft

Generally speaking, we graft apple to apple, pear to pear, plum to plum, etc... We take a known cultivar and graft it onto rootstock that has qualities that are desired. The main reason we do this is to increase our chances of having our desired type of tree

Why we graft

We take a known variety, take scionwood from it, and join it to a desirable rootstock.

When picking varieties, there are thousands of known fruit types to choose from.

With rootstocks we have choices to make depending on our growing zone, our soil types, and our desired sizes.

When we graft

Grafting is generally done to bare root rootstock (bench grafting), during dormancy, and under cold conditions. There is a small window of weather as it should be above freezing, but below 60 degrees F.

For some trees, the best type of grafting is bud grafting which is done during the early growing season.

Where we can graft

Grafting scion wood is best done in unheated outbuildings where you are in out of the wind, the temperature is above freezing and below 60 degrees F. Other than that, it's up to you!

This brings us to....

How we graft

Taking the rootstock and scions you've chosen and find ones of similar thickness to graft together. Grasp rootstock firmly and with a very sharp, knife angle cut the stock to an elongated oval shape. Do the same for scion wood ensuring that the buds are UP FACING (right side up)

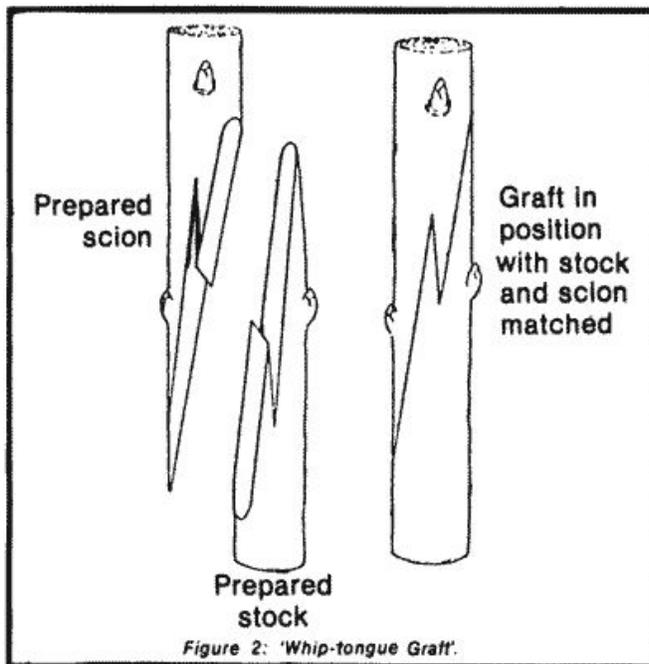
Place cut surfaces close to each other to ensure the two closely match. Trim as necessary.

Cut the tongue, which is used to help "lock in" the two pieces of wood. It is a small flap cut about one third the way down from the tip of the cut ends. Place sharp knife across oval and with even and careful pressure, gently rocking the knife, working it a short distance into the wood to create the tongue flat.

Attach the two pieces of wood by sliding together. Trim off scion wood one quarter inch above a scion wood bud, ensuring that there are at least 2 to 3 buds above the graft.

There are many types of grafts, the one I've found that is best for novices as well as success rates is the whip and tongue graft.

The whip and tongue graft



Some other types of grafts include:

Saddle Graft

Side Graft

Rhind Graft

Bud Graft

We will be using the Whip & Tongue for its reliability.

The Where, When, Why, and What of Spraying

Our main source and focus for spraying is to build the health of the tree. Trees that are healthy fight off disease and insects. If a tree needs more spraying than we do, we drop the tree from our orchard. We want to encourage and grow the best of the best available.

The basics:

Concentrated Garlic Oil (anti fungal, anti viral, changes scent of fruit)

Water Kefir (creates a probiotic colony on the branches & fruit with beneficial microbes to promote fruit growth & disease resistance.)

Liquid Fish Emulsion (feeds soil and arboreal food web)

Liquid Kelp (promotes growth and helps trees adapt to stresses)

Molasses (feeds tree)

Murphy's Oil Soap or Peppermint Liquid Castille Soap (helps emulsification)

Optional:

Apple Cider Vinegar (changes pH of leaves, fights off fungal challengers)

Compost Tea (must be FINISHED compost, feeds the tree & soil)

Mix:

1 Cup Water Kefir 1 ¼ C Liquid Fish

1 Tablespoon Concentrated Garlic Oil

½ C Molasses

1 teaspoon Soap

1/3 C Liquid Kelp
1 Tablespoon Natural Apple Cider Vinegar
1 Cup Compost Tea

Mix into 4 Gallons of Water.

Spray as follows:

When 1/4" green tips are on the trees
When buds turn pink
When petals fall
10 days after petal fall
Every 2 weeks after until harvest
Two weeks after harvest and spray the ground too.

At blossom opening:

(Optional) Spray 4 Gallons of water mixed with 1 Cup Water Kefir & 1/3 C Liquid Kelp.

Tree Health Made Easy

- Buy healthy trees
- Buy disease resistant varieties
- Buy trees that grow well in your USDA Growing Zone
- Remove ANY and ALL grass/sod/weeds within at least a three (3) foot diameter (and up to 6') of where the tree will be planted
- Mulch with natural woody mulch only, at least two to four inches
- Water at planting and never again unless in a severe drought. In the case of severe drought, water once weekly with one ½ of a 5 gallon bucket for first year only
- Correctly train tree for the first six years
- Ensure new mulch is added on a yearly basis
- Train trees for first 3-6 years, prune lightly after
- Thin fruits after petal fall
- In spring, bi-weekly throughout the season and at any sign of disease spray with homemade sprays

Follow through with these basic steps and you should be well on your way to healthy trees that produce beautiful fruit. Feel free to contact me at brian@wintercovefarm.com with any questions you might have and Best Wishes to you on your fruit growing journey!

NOTES: