DIY Lawn to Forest Guide

A DIY tree planting program with assistance and materials supplied by the Alliance for the Chesapeake Bay

ALLIANCE
for the Chesapeake Bay

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Introduction

The Alliance for the Chesapeake Bay is committed to improving water quality throughout the Chesapeake Bay Watershed. To accomplish this goal, we utilize tree plantings, lawn conversion, improved agricultural practices, green infrastructure projects, and outreach events. The Alliance has been operating since 1971 and now has offices located in Washington D.C., Pennsylvania, Maryland, and Virginia.

The Chesapeake Bay has become degraded as a result of human activity throughout the Bay watershed. Nutrient inputs that exceed natural levels have negatively impacted the plants and animals that call the Bay home. As a result, we now recognize that action must be taken to restore the Bay by working with landowners to reduce the amount of nutrients and pollutants entering our waterways. Whether you live along the Bay itself or hundreds of miles upstream, your actions and stewardship of the land directly affects your local community and everyone downstream. By working to restore native habitats, improving stormwater management, implementing sustainable agricultural practices, and increasing the amount of urban tree canopy, we are improving the condition of the Bay and its watershed.

Landowners like you are an important component of the Chesapeake Bay restoration efforts. A vast number of acreage within the Bay watershed is privately owned, so we rely on the participation of private landowners to implement conservation practices that will benefit the Bay. One of the practices that can easily be implemented on private land is a practice we call ‘lawn conversion.’ This involves the establishment of trees and the eventual reduction in mowing. Mowed lawns are all too common throughout the Bay watershed, and do little to filter runoff or provide wildlife habitat. By choosing to convert your lawn to native habitat, you can use your own property to limit erosion, reduce runoff, provide habitat for native animals, and sequester carbon. Through our DIY Lawn to Forest Program, the Alliance for the Chesapeake Bay can help you establish a forest that provides these benefits!

This DIY Lawn to Forest Guide provides detailed instructions on how you can convert your lawn to a beautiful sanctuary for wildlife while also protecting the Chesapeake Bay. Please follow the process below to get your reforestation project started!

The Process

1. Determine if you meet the qualifications for this program using the Program Qualifications section below.

2. If you believe you qualify, fill out the intake form. If you are using a printed copy of this guide, contact rlauver@allianceforthebay.org to receive a link to this form.

3. The Alliance will set up a time to talk on the phone about your goals and the potential planting area.
    a. During this phone call, an Alliance staff member will help you select the species package that is right for your site.

4. After the call, follow the "Designing My Planting" steps and then send the Alliance your planting plan.
    a. Take a look at the FAQ section to see if there is information that can answer any questions you may have.

5. Once your plan is approved, an Alliance staff member will send you a landowner agreement to sign. The Alliance will then be in touch before the next spring or fall planting season to provide information about when to pick up your tree planting materials.

6. When you have the trees, shelters, and stakes, you can plant your trees!
    a. Follow the "How to Plant" process to help boost your tree survival rates.

7. Once the planting is completed, send photos of your new planting to the Alliance staff member you were working with.

8. Conduct the proper maintenance as specified in the "Maintenance" section.

9. Send a photo update of your planting each year on *June 1st*. An Alliance staff member will be reaching out each year to check in around this time as well.

If you feel that this DIY program is not a good fit for you and you'd like to just do a lawn to meadow project yourself without additional resource assistance, we'd still love to know about the work you do! *Continuing to document the growing interest in lawn to meadow conversions is very important to show that there is still a need for funding for these projects and that the general public is interested in them. If you do a lawn to meadow conversion project using this guide but without the technical and resource support from the Alliance, please still fill out this Google form so we can have a record of this work! Thank you! https://forms.gle/A4jT3TFFii5Ntuic6*

Program Qualifications

In order to qualify for this DIY lawn conversion program, you must meet the following parameters:

- Must be in Pennsylvania within the Chesapeake Bay Watershed
    - Not sure? Enter your address into the map on the Chesapeake Riparian Forest Buffer Network website.

- Area to be planted must be equal to or smaller than 0.5 acres
    - If larger than 0.5 acres, please let us know! You may qualify for a different program that would provide more assistance with planting and maintenance.

    - Not sure how large your planting area is? In Google Maps, right-click, then click “Measure distance.” Click to mark the perimeter of the area, and click the first point to close the perimeter. A small box at the bottom center of the screen will tell you the size in square feet. 0.5 acres is 21,780 square feet.

- The area should not be along a waterway. If the potential planting area is along a waterway, this would qualify as a streamside planting, not a lawn conversion planting. However, please contact us as you may qualify for a different program that would provide further assistance!

- The area should currently be an existing lawn that is less than 30% forested.

Program Logistics

How to get supplies

- Each planting season, the Alliance will provide dates during which you can stop by the office and pick up your trees and supplies. The office address is *841 Flory Mill Road, Lancaster, PA 17601*. For the spring season, this will be sometime in late March or early April. For the fall season, it will be in late September or early October.

When to plant

- Ideally you will be able to plant your trees soon after you pick them up, either during the fall or spring planting season. Planting during these times helps to avoid the heat of the summer and frozen ground during the winter. The ideal times to plant during the spring season are from mid-March through April. Fall plantings can start around mid-October and go until late November (although you can plant later into the season as long as the ground isn’t frozen).

- To help ensure the survival of your trees, it is best to plant within a few days after a rain event or just before you know it is going to rain. If you plant your trees and there is a period of dryness, it may be best to water them to boost survival rates. However, watering is not necessary as all of the trees and shrubs will be native ones that are adapted to the climate of this region.

Supplies that we will provide

- Trees/shrubs
- Tree shelters
- Stakes
- Bird nets

Species Packages

Each site we plant is unique, and the location you have in mind is no exception. For our larger tree plantings over 0.5 acres, a staff member from the Alliance goes to a site and determines which types of trees best fit the location. However, with this program, you are in charge of that! In order for the trees to survive, it is very important that they be planted in an area with the correct soil moisture and sunlight while also fitting your desired outcomes for the site.

Use the flowchart below to determine which "package" of trees/shrubs is right for you. An Alliance staff member will also work through this flowchart with you on the initial phone call. Please note that package species selection will depend on availability and similar species may be swapped as needed.

1. Is your soil regularly wet (holds standing water after precipitation events, can sometimes be difficult to mow due to the wetness of the ground)?
    - **a. Yes**
        - i. "Wet-loving"..... page 7
    - **b. No**
        - i. Is your area partly shaded?
            1. **Yes**
                a. "Shade-tolerant"..... page 8
            2. **No**
                a. Do you have additional preferences?
                    i. **Yes**
                        1. "Floral/ Pollinator"..... page 9
                        2. "Edible"..... page 10
                    ii. **No**
                        1. "General"..... page 11

“Wet-loving”

This package is excellent for areas that periodically hold standing water. Many of these species are fast growing and will absorb excess water. A mixture of trees and shrubs, from the tall American Sycamore to the bushy Silky Dogwood, will fill in different levels of the future forest canopy.

Trees

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture*
River Birch	*Betula nigra*	Attractive bark, fast growth	W,M
Silver Maple	*Acer saccharinum*	Fast growth, early pollinators	W,M,D
American Sycamore	*Platanus occidentalis*	Fast growth, wildlife habitat	W,M,D
Swamp White Oak	*Quercus bicolor*	Wildlife food (insects, small mammals)	W,M
Black Willow	*Salix nigra*	Fast growth, early pollinators	W,M

Shrubs

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture
Smooth Alder	*Alnus serrulata*	Fast growth, wildlife food (songbirds)	W,M
Buttonbush	*Cephalanthus occidentalis*	Floral appeal, pollinators	W,M
Silky Dogwood	*Cornus amomum*	Pollinators, live stakes, fast growth	W,M
Winterberry	*Ilex verticillata*	Pollinators, wildlife, décor (red berries)	W,M
Elderberry	*Sambucus canadensis*	Fruit production, pollinators	W,M

*W= wet, M= mesic, D= dry

“Shade-tolerant”

If you are intending to plant in an area with some already existing mature trees or in a location that doesn’t receive much sun, the shade-tolerant package is right for you. These trees and shrubs are suited for the understory and will grow just fine without full sun. Please note that the area should currently be less than 30% forested.

Trees

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture*
Flowering Dogwood	*Cornus florida*	Flowers, pollinators, wildlife food	M,D
Serviceberry	*Amelanchier canadensis*	Fruit production, pollinators	M,D
Pawpaw	*Asimina triloba*	Fruit production, need at least 2 to pollinate	M,D
Redbud	*Cercis canadensis*	Floral appeal, pollinators	M,D
Blackgum	*Nyssa sylvatica*	Pollinator/wildlife food, fall color	M,D

Shrubs

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture
Arrowwood Viburnum	*Viburnum dentatum*	Pollinators, wildlife food	W,M
Silky Dogwood	*Cornus amomum*	Pollinators, live stakes, fast growth	W,M
Spicebush	*Lindera benzoin*	Pollinators, wildlife food	M,D
Elderberry	*Sambucus canadensis*	Fruit production, pollinators	W,M
Witch-Hazel	*Hamamelis virginiana*	Late pollinators, wildlife food	W,M

*W= wet, M= mesic, D= dry

“Floral/Pollinator”

These trees and shrubs are all favorites of various pollinators and planting them will help to support these populations. An added bonus is that the blooms provide a beautiful display of color all season long. It should be noted that there is a range of moisture requirements in this package- watering may be needed during early establishment for some of the more drought-sensitive plants.

Trees

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture*
Red Maple	*Acer rubrum*	Fall color, pollinators, fast growth	W,M,D
Serviceberry	*Amelanchier canadensis*	Fruit production, pollinators	M,D
Redbud	*Cercis canadensis*	Floral appeal, pollinators	M,D
Honey Locust	*Gleditsia triacanthos*	Pollinators, wildlife food	M,D
Tulip-poplar	*Liriodendron tulipifera*	Fast growth, pollinators	M,D
Black Locust	*Robinia pseudoacacia*	Fast growth, pollinators	M,D
Basswood	*Tilia americana*	Fast growth, pollinators	W,M

Shrubs

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture
Elderberry	*Sambucus canadensis*	Fruit production, pollinators	W,M
Spicebush	*Lindera benzoin*	Pollinators, wildlife food	M,D
Red Osier Dogwood	*Cornus sericea*	Pollinators, décor, live stakes, fast growth	W,M

*W= wet, M= mesic, D= dry

“Edible”

This package is tasty for both wildlife and humans! A multifunctional forest can provide fruits and nuts for human consumption along with the regular benefits of a forest. Make sure to research which parts of the plants are edible, what time of the year they are edible, and how to properly prepare them.

Trees

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture*
Serviceberry	*Amelanchier canadensis*	Fruit production, pollinators	M,D
Pawpaw	*Asimina triloba*	Fruit production (need at least 2 for pollination)	M,D
Shagbark Hickory	*Carya ovata*	Wildlife food, bat roosts	M,D
Persimmon	*Diospyros virginiana*	Fruit production, pollinators	M,D
American Plum	*Prunus americana*	Fruit production, pollinators	M,D
Black Cherry	*Prunus serotina*	Pollinator/wildlife food	M,D
Sugar Maple	*Acer saccharum*	Fall color, pollinators, syrup production	M,D

Shrubs

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture
Elderberry	*Sambucus canadensis*	Fruit production, pollinators	W,M
Black Chokeberry	*Photinia melanocarpa*	Fruit production, pollinators	M,D
Hazelnut	*Corylus americana*	Nut production	M,D

*W= wet, M= mesic, D= dry

“General”

This collection of trees and shrubs is great for any open area with mesic to dry soil. If there are wet spots throughout the area, plant the trees/shrubs that are also wet tolerant, as noted in their moisture ranges. This package will give you a mixture of heights, shapes, and floral resources while helping to increase the biodiversity of your area. Diverse forests are resilient ones!

Trees

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture*
Red Maple	*Acer rubrum*	Fall color, pollinators, fast growth	W,M,D
Hackberry	*Celtis occidentalis*	Fast growth, wildlife food	W,M,D
Redbud	*Cercis canadensis*	Floral appeal, pollinators	M,D
Tulip-poplar	*Liriodendron tulipifera*	Fast growth, pollinators	M,D
Blackgum	*Nyssa sylvatica*	Pollinator/wildlife food, fall color	M,D
American Sycamore	*Platanus occidentalis*	Fast growth	W,M,D
White Oak	*Quercus alba*	Wildlife food, bat roosts	M,D
Black Locust	*Robinia pseudoacacia*	Fast growth, pollinators	M,D

Shrubs

Common Name	Scientific Name	Additional benefits/characteristics	Soil Moisture
Elderberry	*Sambucus canadensis*	Pollinators, fruit production, wildlife food	W, M
Red Osier Dogwood	*Cornus sericea*	Pollinators, live stakes, fast growth	W,M

*W= wet, M= mesic, D= dry

Designing the Planting

Developing a planting plan is an important first step in the tree planting process. It will help you to better estimate the size of your desired planting area and familiarize you with the soil and levels of sunlight this area has. *Please attempt to complete this process prior to your initial phone call with an Alliance staff member* as it will be helpful to us to better understand your planting area. You will probably have to do another walkthrough of the planting area following the call as well!

1. Identify the area you are interested in reforesting.

2. Take a walk through the area and note the moisture of the soil, the presence of any existing structures or trees, and any overhead obstructions.
    a. Are certain sections wetter than others? If a large portion of the area has saturated soil, the “Wet” package is the right one for you. However, keep in mind that if it has been drier than usual, or is mid-summer, the area may appear less moist than it normally would be.

    b. Are there already existing trees in the area that create a lot of shade? The “shade-tolerant” package might be a good choice for you.

    c. Note any power lines or underground utilities.

3. Take general measurements to determine the length, width, and total square footage of the area.
    a. You could do this by hand or by using Google Maps/ Google Earth.

4. Decide on your tree spacing preference.
    a. For easier maintenance and proper forest density, we recommend a 10’ by 15’ grid. This allows you to still mow between the tree shelters and also allows the trees to grow freely without shading each other out.

    b. Account for any preexisting trees and plan your planting around them.

    c. Keep in mind that we would like to see 3 rows of trees planted to ensure the wildlife habitat benefits of an actual forest.

5. Create a drawing or map of the area. This could be done on paper or through an online mapping resource like Google My Maps, Google Earth, or ArcGIS.
    a. Draw the outline of the area you will be planting in

    b. Note any areas that are wet or may have special requirements..

6. Calculate approximately how many trees you will need.
    a. Take the acreage and multiply it by 275 trees. A 10 by 15 foot spacing comes out to 275 trees per acre.

7. Bring all of this information to the initial call with an Alliance staff member.
8. Wait for feedback and approval from the Alliance. Once your plan is approved, you will sign the landowner agreement and then you can arrange a time to pick up your trees and supplies during the next upcoming planting season.

Tree Planting Standards

- Must plant at least 25 trees
- Planted areas should be 3 rows of trees wide to ensure proper wildlife habitat and to create a future forest
- Area cannot be under any power lines, right-of-ways, etc
- Area should be mostly unforested currently with roughly less than 30% canopy cover
- Must use tree shelters
- Must keep this area reforested for at least 10 years

How to Plant and Shelter Your Trees

The Alliance has a lot of great resources on tree planting and tree maintenance. Check out the Alliance's Riparian Restoration 101: How to Plant a Tree video to see a full walkthrough of the steps below.

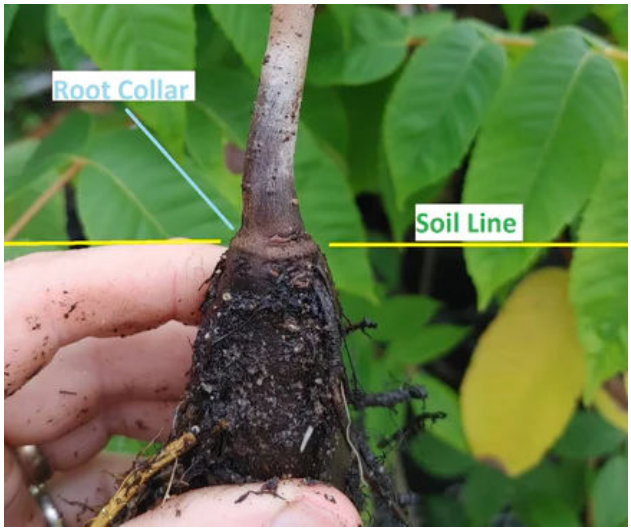
1. The best time of the year to plant is during the spring or fall, preferably just before or after a rain event. Periods of drought will reduce the rates of survival of newly planted trees so watering may be necessary if you find yourself in that situation.
2. Scuff the ground with your foot where you intend to plant to remove the grass and expose the dirt in that location.
3. Dig a hole that is roughly the same depth and width as the pot the tree is growing in. Keep this dirt close by as you will need it to refill the hole.
4. Gently loosen the tree from inside the pot- you may have to squeeze the sides of the pot or push the roots from the bottom.
5. Once you pull the tree out of the pot, determine if the roots are bound or not. If they are tightly compacted or girdling each other, try to loosen them by massaging the soil and gently separating some of the roots.
6. Put the tree in the hole that you dug so that the root collar is level with the ground. The root collar is the part of the tree where the roots end and the

trunk begins. The biggest risk for long-term survival is planting too deep or too shallow. Plant so that the soil in the pot is level with the ground, assuming that no soil has fallen out of the pot.

7. Make sure that the hole is deep enough that none of the roots are curved against the bottom of the hole. This “J-hook” shape can lead to tree health problems down the road.

8. It is best to plant the tree towards one side of the hole so that when you pound the stake in, you can pound it into undisturbed soil.

9. Once you have the tree at the proper depth and positioned correctly, hold it there as you backfill the soil into the hole. As you fill the hole in, gently press the soil down to remove any air pockets in the soil.



Knowing where the root collar is located is extremely important when planting a tree. Photo Credit: Liberty Tree Nursery

10. Once you fill the hole up to the tree’s root collar, make sure the tree is securely planted by giving a little tug on the stem. The soil around the base of the tree should not pucker up. It if does, pack down the soil around the base of the tree until it does not move when you tug the tree.

11. Using a hammer or stake pounder, pound in a stake next to the newly planted tree. It is best if the stake is pounded into undisturbed soil. The stake should be positioned so that when the tree tube is added, the tree is in the middle of the tube. The tubes are most secure when they are flush against the stake, so make sure the stake has a flat side facing the tree.


A properly sheltered tree. Photo Credit: Rebecca Lauver

12. Take a tree tube and identify which end is flared and which is straight. The flared end should face the sky and the straight end should face the ground. This helps to prevent the tree from getting damaged when the tree blows around in the wind.
13. Slide the tree tube over the newly planted tree and next to the stake , making sure the zip ties are around the stake and the tree tube is outside of the stake.
14. Make sure that the tree is not caught in any of the zip ties, that the branches are pointing up, and that the top of the tree is not bent.
15. Press the tube into the ground a few centimeters.
16. Tighten the zip ties around the stake so that they are as tight as possible..
17. Add a bird net to the top of the tube, pulling it down the tube so that a silver dollar sized opening is at the top.

Maintenance

Maintaining your new planting, especially during the first three years, is crucial for the trees to survive. Deer and rodents will eat your seedlings if given the chance, intense weather can knock over tree tubes, and unwanted plants may grow in the tree tubes. Conducting regular maintenance will help to limit these problems before they get out of hand.

The Alliance has a lot of great resources on tree planting and tree maintenance. Check out the Alliance's Riparian Restoration 101: A Typically Maintained Buffer video to see a full walkthrough of the steps below. Please note that this video is targeted towards non-lawn sites, so you will probably have a lot less existing vegetation to work around!

Leaving a tree shelter on until it splits itself allows for full protection of the trunk until the tree is the proper size. Photo Credit: Rebecca Lauver

Tree Shelters

Due to high winds, flooding, or other sorts of weather events, it is likely that your tree shelters will get loosened or damaged. It is important to keep the zip ties as tight as

possible around the stakes to prevent the tree tubes from moving around a lot in windy conditions. As much as possible, you want to keep the tree shelters straight and open for the trees to grow. If any tree branches grow through openings in the tree shelter (like where the zip ties are) you will want to redirect the branches back inside the tube or just cut the branch off. Allow the trees to split the shelters off themselves. *Please do not remove them before this point as buck rub can very quickly kill the trees*! For some trees, this may only take 3 years while for others, this can take 5-7 years. The shelters photo-degrade and aren't endlessly reusable, but can still often shelter other seedlings on your property or elsewhere for many years.

Bird Nets

Once the tree comes within about 2 inches of the top of the tube, you can remove the bird net. Leaving the bird net on too long could lead to the tree getting entangled in the net and becoming deformed. However, it is important to keep the bird nets on until this point as they prevent birds from falling into the tubes, at which point they can not get out and will most likely die in the tube. Make sure that there is a silver dollar sized opening at the top so that the tree could hopefully grow through the net if you forget to remove it in time.

Leave about half of the top of the shelter open when putting on the bird net. Make sure that the flared, vented end of the tube is upbright. Photo credit: Rebecca Lauver

Surrounding Vegetation

Voles will take advantage of vegetation that is next to the tree shelter and use this as cover as they dig to eat the seedling's roots. Therefore, it is important to make the surrounding 3 feet of ground around the tree shelter unappealing to them. Simply mowing up against the tree shelter is one way to ensure this. However, be careful not to bump the shelters too much as this will damage the tree's trunk overtime.

If you planted into an area with taller vegetation, you could spray herbicide around the tree shelter. However, if you do not want to use herbicides, you could also use a string trimmer to scour the ground in a 3 foot radius around the shelter or install 2a modified stone mulch in a 6" radius around the base of the shelter. It is most important to make sure no vegetation is up against the shelter.

Invasive Plants

There are numerous non-native invasive plants that would love to grow within a new tree planting area. In order to prevent these invasive species from taking over, it is important to remove them as soon as you spot them. If possible, you can remove them by hand. However, you will need to remove the roots system in order to prevent them from regrowing. The best way to kill herbaceous invasives is with a spot treatment of herbicide. For invasive trees, the hack-and-squirt technique is advised. Whenever using herbicide, always make sure you are following the proper guidance on the labels. Plant Invaders of the Mid-Atlantic Natural Areas is a very robust invasive species guide that can help you determine what unwanted vegetation may try to move into your planting area. However, regular mowing should address most of the potential invasive species concerns until your new forest is established!

Frequently Asked Questions

- I have leftover trees after my planting- what should I do with them?
    - It is okay if you have some leftover trees, if you planted according to the original planting plan and density. If you have other open spots on your property, feel free to plant these trees there or if you have a friend that would like a few, that would be another option! If there aren't any other open places to add these trees in, you can drop them back off at our office again: 841 Flory Mill Road, Lancaster, PA 17601

- Can I plant anything around/under these trees?
    - We recommend keeping the area around your new tree planting as just mowed lawn for the first 3 or so years until the trees get better established. This will make it easier to maintain them as well as keep voles away from the tree roots. Once trees get more established and especially after the shelters are removed, adding in native herbaceous vegetation is a great idea! The goal is to reduce the amount of lawn cover you have, so adding in more native plant diversity is wonderful.

- The area I want to plant in has a mixture of wet and dry areas. What package would be right for me?
    - We would recommend going with the "General" species package and then using the soil moisture column to determine which species you should plant in the wetter areas from within that package.

- I'm not sure I can commit to keep this area forested for 10 years as I may move locations within that time frame. Can I still participate in this program?
    - If you think you will move in the near future (1 year or so), it may be best to hold off on moving forward with this program. However, if you are

hesitant to join because of a potential move at some point in the future, we'd recommend moving forward with the program. You can inform the next landowner about the purpose of this reforestation project and we can connect with them to ensure they have the proper knowledge and materials to take care of the tree planting area.

- I'm having some trouble creating my planting plan. Is there a way I can get some help?
    - Reach out to the Alliance contact who you have been working with! We can set up another phone call to talk through the planting plan if you feel you are having trouble making it.

- It hasn't rained recently- do I need to water my trees?
    - Since these trees and shrubs are all native species, they do not need to be watered. Watering during a drier period will certainly help them, but it isn't necessary.

- I haven't seen any deer within the area I want to plant in. Do I really need tree shelters?
    - Within the target region for this program, we always use tree shelters when planting the smaller containerized or bareroot seedlings. Part of your participation in this program is agreeing to use these shelters. Even if you feel that you haven't really seen any deer in the area, it only takes 1 deer to eat numerous seedlings!

- It looks like a lot of my trees died. What should I do?
    - It is normal for about 10-15% of the young planted trees to die. However, if you feel that your site has a significantly high die off rate, reach out to your Alliance contact and we can try to get you some replacement trees during the next tree planting season! It may also be helpful to try to determine why the trees are dying at higher rates before replanting so that any potential problems can be addressed first.

- What if I don't want to select a specific species package and instead want to select individual trees?
    - In order to keep our program efficient and standardized, we ask that you stick with one of the packages. If you are looking to select all of your own species and feel confident doing so, we recommend that you just purchase them directly from a native tree nursery.