

# MOON TREES



# How to Apply Guide

# Table of Contents

About Moon Trees – Past & Present.....	3
Moon Tree Checklist:.....	4
Moon Tree Applicant Information .....	5
Artifact Module Walkthrough.....	9
Moon Tree Supplement Form .....	14
Resources.....	15



## About Moon Trees – Past & Present

More than a half-century ago, NASA astronaut Stuart Roosa, the command module pilot for the Apollo 14 mission and a former USDA Forest Service smoke jumper, carried tree seeds into lunar orbit. The Apollo 14 Moon Trees were grown into seedlings by the USDA Forest Service and eventually disseminated to national monuments and dignitaries around the world, with a large number distributed as part of the nation’s bicentennial event. In a nod to the legacy of Apollo 14, and a celebration of the future of space exploration with NASA’s Artemis Program, a “New generation” of Moon Tree seeds traveled into lunar orbit aboard the Orion spacecraft. The seeds travelled thousands of miles beyond the Moon spending about 4 weeks in space before returning to Earth.

Through NASA’s Office of STEM Engagement (OSTEM) and NASA’s Artifact Module, museums, universities, federal agencies, including NASA Field Centers, and K-12 serving organizations are eligible to apply for ownership of a Moon Tree seedling. Recipients of a Moon Tree seedling will be encouraged to develop educational opportunities to connect students, schools, and communities to the ARTEMIS mission. As a requirement, potential recipients will register through NASA Gateway and NASA CONNECTS (*Connecting our NASA Network of Educators for Collaborating Together in STEM*).



## Moon Tree Checklist:

- ✓ Review “Moon Tree Applicant Information” for Planting & Care Document
- ✓ Create a NASA Artifact Module Guest User account (If not part of the NASA network)
- ✓ Apply through the NASA Artifact Module
- ✓ Complete the Moon Tree supplement form (Google Form) – **THIS IS REQUIRED FOR MOON TREE SEEDLING PROPOSALS**





# MOON TREE INFORMATION FOR APPLICANTS:



The Girl Scouts of America planted this Moon Tree, a sycamore, in 1976 in Lincoln State Park, IN. NASA photo by Dave Williams.

## CHOOSING A POTENTIAL PLANTING SITE

Inspect your proposed planting area. Make sure it provides plenty of room for the Moon Tree to grow without restrictions. Envision the tree's canopy growing up and the roots growing down and out. Trees can reach more than 100 feet (ft) in height. Tree roots can grow 2–30 ft down and extend as wide or wider than their canopy. Key structural roots often extend more than 6 ft in width from the trunk.

Trees that grow too close to powerlines, buildings, or sidewalks/driveways could create a safety hazard or result in costly maintenance issues. Please review your proposed area for these concerns:

- **Look up:** Ensure the tree will not grow upward into any powerlines or buildings.
- **Look down:** Ensure the immediate area is free of buried waterlines and other utilities that growing tree roots could damage. Check to make sure ongoing site maintenance will not damage the tree's roots. Avoid planting near sidewalks, driveways, or other impermeable structures that would interfere with tree growth or could be damaged as the tree roots develop. Confirm safe planting for your

Moon Tree by calling your local utilities or 811 (the national call-before-you-dig phone number).

- **Look underneath:** Once you confirm no underground utilities are present, dig a hole and confirm your soil is of good quality. For example, soil should not be contaminated with old construction waste, waterlogged during the winter and spring, or have limited depth to bedrock (i.e., a solid layer of rock). Your local County Extension Agent can help with this evaluation.
- **Look around:** How close to structure(s) will your Moon Tree be? Your Moon Tree should ideally be planted at least 30 ft or more away from buildings. Consider your location and how much sun the Moon Tree will receive. Sunny areas are better than shady locations.

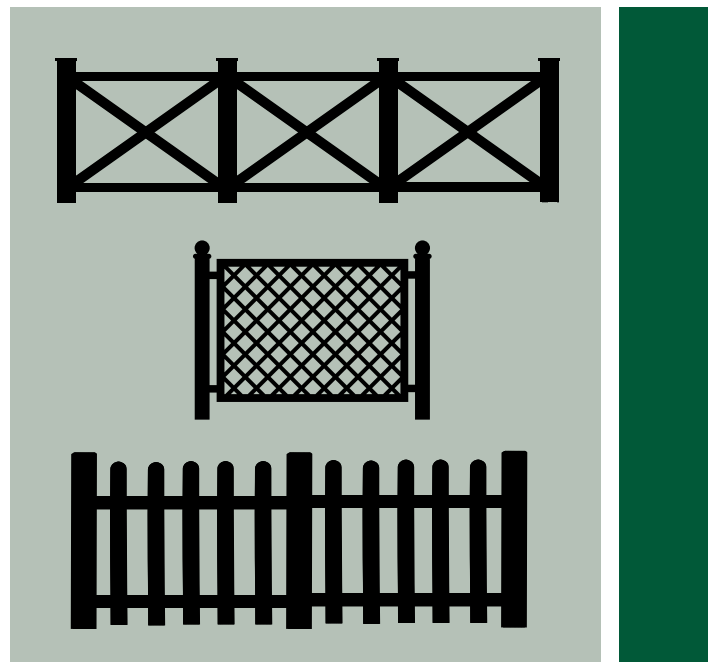


A tree's root system can be very wide. Make sure to plant your tree with enough space to allow root growth over time, without damaging other objects or structures.

## SHORT-TERM CARE CONSIDERATIONS (YEARS 0–5)

- **Seedling shipping size:** Moon Trees will be shipped as small seedlings (around 10 to 48 inches tall depending on species). Moon Tree species will include Douglas-fir, loblolly pine, sweetgum, sycamore, and giant sequoia. The table on the last page has information regarding potential tree species each region or State may receive, as well as seedling size. Note that these species can often be successfully grown as a landscape tree or arboretum specimen outside their native range.
- **Seedling arrival:** Selected Moon Tree stewards will receive updates regarding their seedling's arrival timeframe (which will vary depending on tree species), individual tree growth, and planting location. They will also receive an after-planting care guide.
- **Seedling planting timeframe:** Trees should be planted as soon as possible upon arrival. If planting is delayed more than a day or two after delivery, store the seedling in a cool location. Refrigerated storage is best, especially if planting is delayed more than a week. Depending on seedling size, you may need a walk-in refrigerator.
- **Pruning:** Hardwood species (sweetgum and sycamore) may require simple, but annual, maintenance pruning during the first 2 to 5 years to ensure a healthy form. A pruning guide will be sent to assist with these efforts.
- **Seedling protection:** Young Moon Trees will require protection from animals, people, weeds, and other potential hazards. Ideally, seedlings should have the following:
  - Perimeter Fence (exterior fencing for the entire Moon Tree planting area):
    - Purpose: Prevent accidental tree damage from things such as lawn maintenance equipment or playing children.

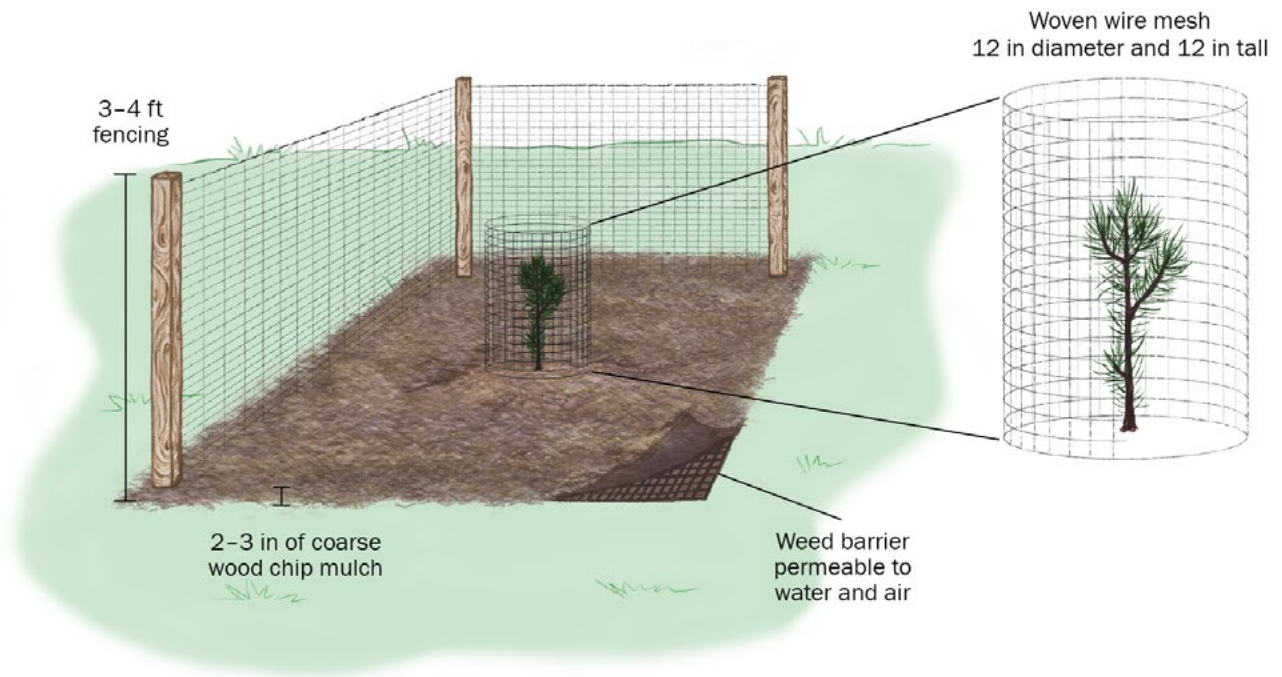
- Placement: At least 3 feet from the Moon Tree.
- Height: 4 feet tall (location with browsing deer, elk, or moose may require taller fencing)
- Materials: Could be constructed from a variety of materials such as wire, wood, or vinyl, but must be porous enough to allow sunlight to reach the tree. Fences made of wood, vinyl, metal, or a combination of all three will work. Below are some examples.



- Mesh Cage (interior open-topped cage directly around the Moon Tree seedling):
  - Purpose: Prevent damage from animals such as rabbits and mice.
  - Placement: Surround the seedling with a 12- to 18-inch diameter cylinder.
  - Height: 12 to 18 inches tall.
  - Materials: Should be constructed of 0.5-inch woven wire mesh or similar. A wooden or metal stake can be used to keep this cylindrical cage in place. Burying the bottom 2 or 3 inches of the cylinder can further protect the tree from burrowing pests.

Your completed protection could look something like the following example. It may vary based upon the type of perimeter fence chosen.

You may need to fundraise or work with local businesses to secure the materials needed for these protective items.



## LONG-TERM CARE CONSIDERATIONS (YEARS 5+)

Think about long-term care and how seasons will impact the tree.

Trees produce leaves, fruits, branches, and/or sap that fall. Consider where these items will land and resulting difficulties (for instance, sap falling onto cars).

Think about plans for the proposed planting location. Will a playset, shed, small building, or anything else be added that would disrupt your Moon Tree's growth?

Keep in mind that Moon Tree species can live for decades (and the giant sequoia can live for thousands of years). How will your tree be nurtured for the long term?

## FINDING EXPERT SUPPORT

Many organizations can help you care for trees and answer questions regarding tree health and care. It may be helpful to research organizations in your area so that you know who to contact if you are selected to receive a tree. Potential organizations include:

- **County Cooperative Extension Office**, which often run programs such as Master Gardeners (in the drop down boxes search for your State and select *Extension* in the "Type" field)

- State universities and local colleges that offer forestry degrees
- **Local arborist** (local arborists usually work for a company and may charge a fee for their services)
- **State forestry agency**
- **Local USDA Forest Service Office**



## SPECIES OF MOON TREE AND THEIR NATIVE RANGES

Species	Region/State(s)	Potential Seedling Height
Douglas-fir	Western United States, including AZ, northern CA, CO, ID, MT, NM, NV, OR, SD, UT, WA, and WY	10–18 inches
Loblolly pine	Southeastern United States, including AL, DE, FL, GA, MD, MS, NC, SC, TX, and VA	10–18 inches
Sweetgum	Southeastern United States, including AL, AR, DE, FL, GA, IL, IN, KY, LA, MD, MS, NC, NJ, OH, SC, TN, TX, VA, and WV	24–48 inches
Sycamore	Eastern United States, including New England and the eastern parts of NE, OK, and TX	24–48 inches
Giant sequoia	West slope of the Sierra Nevada in CA	10–18 inches

Remember that with proper care, these trees can be grown outside their native ranges. If selected to receive a Moon Tree, you will also receive tree-specific planting and care instructions.



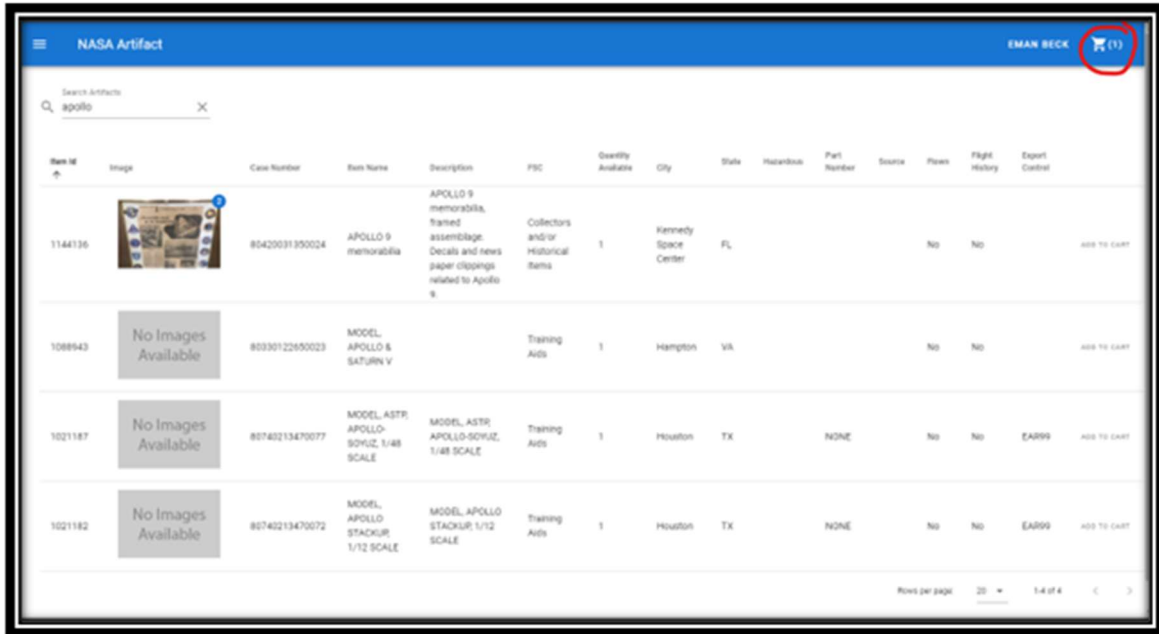
Left: A Douglas-fir Moon Tree planted at Oregon State University's College of Forestry, taken in 2010.  
Below: The same tree, planted as a seedling in 1976.  
Oregon State University photos courtesy of Edward Jensen.





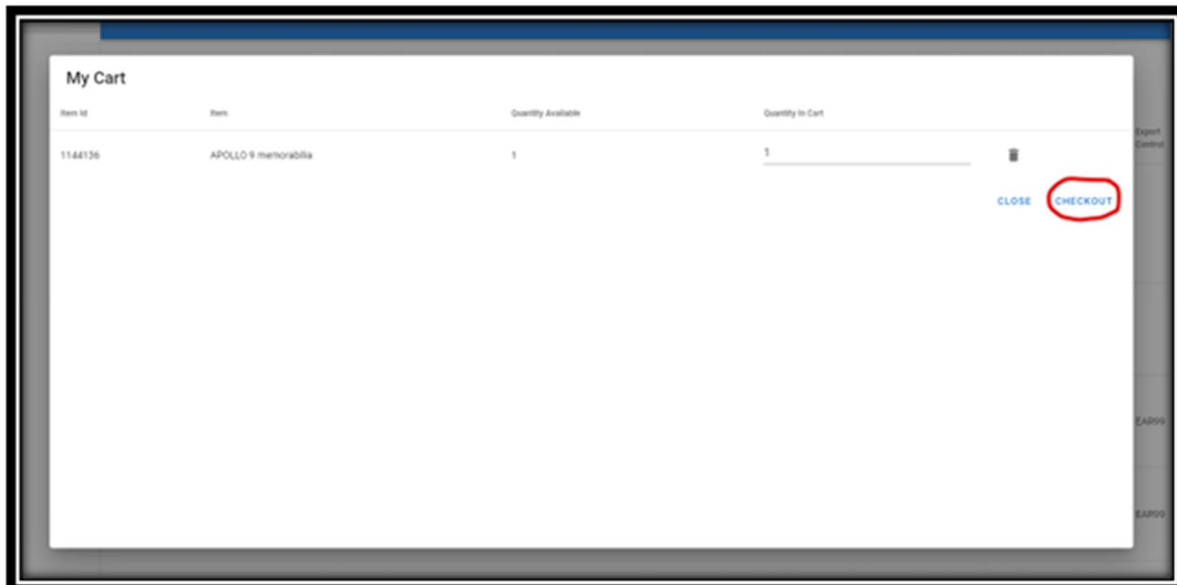
# Artifact Module Walkthrough

## Selecting an Artifact



- Choose **Artemis Moon Tree Seedling** from the list of artifacts.
- Click **“Add to Cart”**.
- To see all items in your cart, click on the **shopping cart icon** in the top right-hand corner.

## Checkout



- Once you click on the shopping cart icon, select the **“Artemis Moon Tree Seedling”** and click **“Checkout”**

## Checkout Questionnaire: Acknowledgement

**Checkout Questionnaire**

1 Acknowledgement 2 Usage 3 Presentation 4 Additional Comments 5 Summary

I understand with the following ...

- That some artifacts may require special consideration in preparation for display to preclude foreign nationals from excluded countries from gaining access to sensitive technical or manufacturing information. I also understand that all artifacts are subject to Export Control requirements and acknowledge my responsibility for these controls at time of transfer of the artifact.
- That artifact availability is subject to change dependent upon the needs of NASA and unforeseen circumstances encountered during use.
- That the property is offered As-is, Where-is and I agree to pay shipping and handling fees to transport the property to my location.

I Agree  You must agree to continue

CANCEL NEXT

- Read each statement carefully and mark the checkbox indicating that you “Agree”
- Click “Next” to move on to the next question/screen

## Checkout Questionnaire: Usage

**Checkout Questionnaire**

1 Acknowledgement 2 Usage 3 Presentation 4 Additional Comments 5 Summary

Intended onsite use of the requested property

The organization agrees to fund shipping and handling of the property

Availability of facility

Additional comments on availability of facility

0 / 2400

CANCEL PREVIOUS NEXT

- Answer the checkout questions using the guidance below:
  1. **Intended onsite use of the requested property:** Please choose “instructional” from the drop-down menu

2. **The organization agrees to fund shipping and handling of property:** Please choose “yes” from the drop-down menu
3. **Availability of Facility:** After confirming and reviewing the “**Moon Tree Applicant Information**” document, please choose “Has Facility” from the drop-down menu.
4. **Additional comments on availability of facility:** Please describe the location where you intend to plan the Artemis Moon Tree Seedling. Please include whether it is a publicly accessible location.
  - Click “**Next**” to move onto the next section.

### Checkout Questionnaire: Presentation

The screenshot displays a web form titled "Checkout Questionnaire". At the top, there is a progress bar with five steps: Acknowledgement, Usage, Presentation, Additional Comments, and Summary. The "Presentation" step is currently active and highlighted. Below the progress bar, the form is divided into two main sections. The first section is titled "Viewing Population" and contains a drop-down menu and a large text area for "Additional comments on viewing population". The second section is titled "Presentation" and contains a drop-down menu and a large text area for "Additional comments on presentation". Both text areas have a character count of 0 / 2400. The form is enclosed in a black border.

- Answer the checkout questions using the guidance below:
  1. **Viewing Population:** Please choose the appropriate option from the drop-down box that describes the approximate number of people/students who will have access to the Artemis Moon Tree Seedling
  2. **Additional comments on viewing population:** Please describe the viewing population (i.e., students, teachers, underserved, grades, etc.. )
  3. **Presentation:** Please select “Display> 1 year” from the drop-down box
  4. **Additional comments on presentation:** This section is required. Include details of your tree care plan here.
    - Click “**Next**” to go on to the next section
    -



## Checkout Questionnaire: Additional Comments

The screenshot shows a web form titled "Checkout Questionnaire" with five steps: Acknowledgement, Usage, Presentation, Additional Comments (current step), and Summary. The "Additional Comments" step contains two text input areas. The first area is labeled "Provide information on relevance and provenance to the item that your organization may have" and has a character count of 0 / 2400. The second area is labeled "Please provide any additional information that you would like to offer for consideration" and also has a character count of 0 / 2400. At the bottom right of the form, there are three buttons: "CANCEL", "PREVIOUS", and "NEXT".

- Answer the checkout questions using the guidance below:
  1. **Provide information on relevance and provenance to the item that your organization may have:** This section is required, Please describe the impact that receiving a Moon Tree will have on your viewing population.
  2. **Please provide any additional information that you would like to offer for consideration:** This section is not required. You may provide any additional information you wish to offer.
    - Click “**Next**” to move onto to the next section

## Checkout Questionnaire: Summary

Checkout Questionnaire

Acknowledgement Usage Presentation Additional Comments Summary

Intended onsite use of the requested property: Instructional  
The organization agrees to fund shipping and handling of the property: Yes  
Availability of facility: Has Facility  
Additional comments on availability of facility:  
Viewing Population: < 10,000  
Additional comments on viewing population: test  
Presentation: Display > 1 year  
Additional comments on presentation: test  
Provide information on relevance and provenance to the item that your organization may have:  
Please provide any additional information that you would like to offer for consideration:

CANCEL PREVIOUS SUBMIT

- Please review your answers to each question.
- Click “Submit” to submit your application for an Artemis Moon Tree Seedling

**Once you’ve completed your application on the NASA Artifact Module, you must complete the Moon Tree Supplement Form explained on the next page. Please ensure that contact and organization information given on the Moon Tree Supplement Form matches the information on the NASA Artifact Module application.**

**Once we’ve received your information, you will be notified by the email provided.**

# Moon Tree Supplement Form

(Click on Image)

The image shows a Google Form titled "Artemis Moon Trees Supplement Form". At the top, there is a dark green banner with the text "MOON TREES" in white, where the letter "O" is replaced by a grayscale image of the moon. Below the banner, the form title "Artemis Moon Trees Supplement Form" is displayed. A link "Sign in to Google to save your progress. Learn more" is present. A red asterisk note states "\* Indicates required question". A section with a red asterisk contains the instruction: "Please ensure you've completed the following steps before continuing with the supplemental form". This section includes two checkboxes: "I've read the 'Moon Tree Applicant Information' document" and "I've applied through NASA's Artifact Module". At the bottom left is a "Next" button, and at the bottom right is a "Clear form" link. A footer note reads "Never submit passwords through Google Forms."

<https://forms.gle/C9LkTtzwheHVV2FA9>



## Resources

- **Moon Trees Landing Page:** <https://beta.nasa.gov/stem-content/apply-for-an-artemis-moon-tree-seedling/>
- **Moon Tree STEM Toolkit for Educators & Students:** <https://www.nasa.gov/stem/moon-trees-toolkit>
- **Moon Trees Live w/ USDA Forest Service & Natural Inquirer:** <https://www.fs.usda.gov/learn/conservation-education/moon-trees>
- **GLOBE Moon Trees QUEST:** <https://observer.globe.gov/nasa-moon-trees-quest>  
(Ends Sept. 21)
- **Moon Trees Collection on NASA CONNECTS:**  
<https://stemgateway.nasa.gov/connects/s/all-collections/collection/a183d0000007Ew6AAE/collection000000415>

