



Energy Landscaping

A guide for planting near overhead power lines and other electrical facilities



Nebraska Public Power District

Always there when you need us

To Our Customers,

Trees are an important natural resource here in Nebraska. They add beauty to our surroundings. They provide habitat and food for birds and animals. They protect us from blustery winter winds and provide shade during a hot summer's day. They can even lower electric bills when planted in the right location. But when planted in the wrong spot, trees can threaten the reliability of your electric service and pose a safety hazard to you or your property.

Keeping trees healthy and beautiful and providing safe, reliable electric service are important to NPPD and our customers. That's why we have developed a comprehensive vegetation management program. By combining tree trimming and removal with public education on the importance of planting the right tree in the right place, we can reduce outages caused by trees.

NPPD has assembled the information to help you make good decisions when planting trees near overhead power lines and other electric facilities. We hope you find it a useful tool.

Sincerely,



Scott Walz

Vice President Energy Delivery
Nebraska Public Power District

2 Energy Landscaping

Contents

A word about safety	3
The right tree in the right place	4
Plan before you plant	5
Planting near overhead power lines	6
Planting near padmount transformers	7
Proper tree selection	8
Tree species characteristics	9
Pruning methods	11
Conserving energy with trees	12
Planning graphs	14

A word about safety

Planting or trimming a tree may seem easy enough, but working in your own backyard can lead to accident or injury if you're not careful. Here are some important safety tips you can't afford to leave behind when you work outdoors:

- Property owners should never attempt to trim or remove tree limbs near power lines. If you are concerned about a tree that may be too close to a power line, contact NPPD at 1-877-275-6773, or your local electric utility.
- When using a ladder or pruning tool, look up and look out for overhead power lines.
- Stay away from trees with overhead power lines running through them.
- Never touch a tree that's in contact with a power line.
- Make sure children don't climb, build tree houses or play in a tree near overhead power lines.



Call before you dig — it's the law

Before you break ground, dial 811, the toll-free number of Nebraska 811. Tell the operator where you plan to dig and what type of work you will do, and the affected local utility companies will be notified about your intent to dig. In a few days, they'll send a locator to mark the approximate location of your underground lines, pipes and cables, so you'll know what's below — and be able to dig safely.

Remember, always call 811 before you start any digging project. It's free. It's easy. It's the law.

The right tree in the right place

Before starting your landscaping project, you may want to answer the following questions. Now is the time to evaluate your needs and clarify what you want so you can plant the right tree in the right place.

Reasons for planting

For shade? For shelter? To minimize erosion? For fruit, flowers or fall colors? For energy efficiency?

Planting for tomorrow

Will it still answer your needs and fit your landscape when it's full grown? How tall will the tree be at maturity?

Characteristics

Will the tree survive Nebraska's climate? Is it suitable for a sunny, shady, wet or dry location?

Value

Will the tree add to or detract from the value of your property, today and at maturity?

Maintenance

Will the tree require frequent pruning or spraying? Will you need to clean up messy fruits and seeds? In the fall, will it drop a lot of leaves you won't want to rake?

Durability

Will the tree be strong enough to bear snow and ice without breaking? Will it weather periods of drought? Will it have a shallow or deep root system?

Utilities

Are there overhead or underground restrictions? Will the tree come into contact with vital utility infrastructure when it's fully grown? Have you called Nebraska 811?

Local ordinances

Are there ordinances controlling where you plant as well as what you plant?



Plan before you plant

You can help minimize power outages by simply taking care to select and plant the right sized trees at maturity near electric power lines and electric padmount transformers. Your wise decision now will support growth of easily maintained, healthy trees, and prevent future removal of mature trees.

Before planting trees and shrubs, consider what you want your yard to look like in 10 or 20 years. Then take an inventory of the features that impact your site. Map out your yard, house, driveway, street, power lines, padmount transformers, natural gas lines and other immovable elements.



Planting near overhead power lines

Overhead power lines are usually easy to see and probably most often taken for granted. NPPD maintains two different overhead electrical systems.

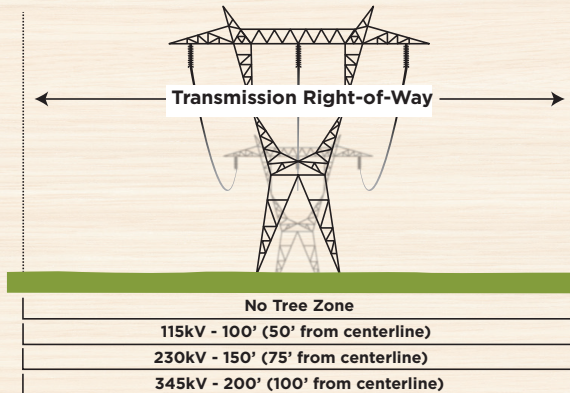
Transmission lines transport high voltage energy over long distances from generation facilities to substations in local communities.

Transmission normally takes place at voltages of 115 kilovolts (kV) or higher.

Distribution lines link substations and transformers to homes and businesses. Unlike transmission lines, distribution lines carry less than 34.5 kV. Distribution lines are installed both above and below ground.

Planting tall-growing trees under and near power lines eventually requires your utility to prune or remove them to maintain safe clearance from the wires. Your wise planting decision now will support growth of easily maintained trees, lessen the likelihood of future removal, and eliminate potential safety hazards.

High-Voltage Transmission Lines



Distribution Lines

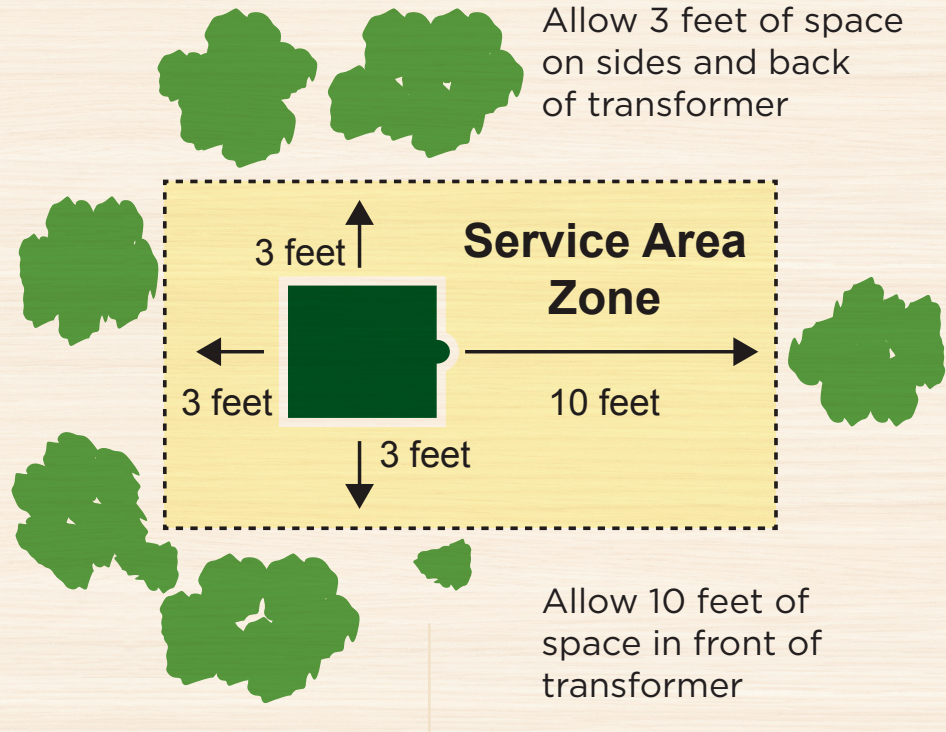


Planting near padmount transformers

A padmount is a ground-mounted transformer that moves electricity from one circuit to another. It steps down the power (changes the voltage) so it may be used in homes and businesses. Because electricity flows through transformers, it is important to keep transformers clear of vegetation.

Tips for safe planting

- Keep in mind that the transformer must be accessible for service at all times.
- Select plants that are easily maintained and suitable for the site.
- Allow plants sufficient growing room.
- Do not plant in front of the transformer (the side with the padlock).
- Do not allow plants to grow over the transformer.
- Do not change grade levels around padmount transformers.



Proper tree selection

Seeds for tomorrow

There are hundreds of tree species that flourish in Nebraska: short trees, tall trees, fruit trees, ornamental and shade trees. By carefully selecting the right tree for the right place, your investment will pay off each year.

Avoid buying the fastest growing or cheapest trees you can find. It may be a costly mistake you'll pay for later. Fast-growers usually are weak-wooded trees that are damaged easily by wind or ice. These trees are hazardous if located adjacent to power lines, and they will require repeated pruning. In addition, they are often prone to surface roots and insect and disease problems.

Types of trees

There are basically two types of trees. Deciduous trees are those that lose their leaves each fall, go dormant for the winter and leaf out again in spring. Coniferous or evergreen trees keep their leaves or needles year around, and then shed only the oldest leaves.

A well-formed deciduous tree, planted in the right location, can shade our homes and yards in summer, reducing air conditioning costs.

Evergreen trees make perfect windbreaks. Planted in the right place, they can protect your home from blustery winter winds and help reduce home heating costs.



Tree species characteristics

The following chart lists many species of shrubs and trees that grow well in Nebraska. Take this guide with you when you visit your local nursery or greenhouse.

Remember, this is only a guide to help you get started, not an all-inclusive list. **Contact your local electric utility for planting limitations at your site.**

Shrubs

Mature height of 10 feet or less.

	Average Height
Caragana (<i>Caragana arborescens</i>)	8' - 10'
Sandcherry (<i>Prunus besseyi</i>)	2' - 4'
Peking Cotoneaster (<i>Cotoneaster acutifolia</i>)	5' - 8'
Golden Currant (<i>Ribes aureum</i>)	4' - 6'
Elderberry (<i>Sambucus canadensis</i>)	4' - 6'
American Hazel (<i>Corylus americana</i>)	6' - 8'
Amur Honeysuckle (<i>Lonicera maackii</i>)	5' - 8'
Common Lilac (<i>Syringa vulgaris</i>)	5' - 8'
American Plum (<i>Prunus americana</i>)	5' - 8'
Dwarf Russian Almond (<i>Prunus tenella</i>)	2' - 5'
Glossy Abelia (<i>Abelia x grandiflora</i>)	3' - 6'
Golden Globe Arborvitae (<i>Thuja occidentalis 'Golden Globe'</i>)	2' - 3'
White Azaleas Mollis Hybrid (<i>Rhododendron x kosteranum</i>)	4' - 6'

Sources: Arbor Day Foundation, Nebraska Natural Resources District, Nebraska Forestry Service

NOTE: Situational and topographical conditions may not allow for selected species to be planted in some locations.

Remember, before you dig, dial 811, the toll-free number of Nebraska 811. The service will contact member utilities who will mark the location of underground facilities for you at no charge.

Call two to 10 working days in advance.

Small Trees

Mature height of 25 feet or less.

	Average Height
Russian Olive (<i>Elaeagnus angustifolia</i>)	14' - 18'
Crabapple (<i>Malus halliana</i>)	15' - 20'
Montmorency Cherry (<i>Prunus cerasus</i>)	8' - 15'
Prairiefire Flowering Crab (<i>Malus 'Prairiefire'</i>)	15' - 20'
Tatarian Maple (<i>Acer tataricum</i>)	15' - 20'
Cloud 9 Dogwood (<i>Cornus florida 'Cloud 9'</i>)	10' - 15'
Amur Maple (<i>Acer ginnala</i>)	16' - 20'
Smoketree (<i>Cotinus coggygia</i>)	10' - 15'
Old Fashioned Weigela (<i>Weigela florida</i>)	6' - 9'
Arbor Day Hazelnut (<i>Corylus sp.</i>)	10' - 15'

Large Trees

Mature height of 40 feet or more

	Average Height
Austrian Pine (<i>Pinus nigra</i>)	35' - 55'
Jack Pine (<i>Pinus banksiana</i>)	35' - 45'
Ponderosa Pine (<i>Pinus ponderosa</i>)	35' - 45'
Scotch Pine (<i>Pinus sylvestris</i>)	35' - 20'
Colorado Blue Spruce (<i>Picea pungens</i>)	35' - 45'
Green Ash (<i>Fraxinus pennsylvanica</i>)	35' - 45'
Cottonwood (<i>Populus deltoides</i>)	65' - 85'
Hackberry (<i>Celtis occidentalis</i>)	45' - 55'

Medium Trees

Mature height of 40 feet or less.

	Average Height
Rocky Mountain Juniper (<i>Juniperus scopulorum</i>)	15' - 25'
Eastern Redcedar (<i>Juniperus virginiana</i>)	25' - 35'
Siberian Elm (<i>Ulmus pumila</i>)	25' - 42'
Goldenraintree (<i>Koelreuteria paniculata</i>)	30' - 40'
Eastern Redbud (<i>Cercis canadensis</i>)	20' - 30'
Corneliancherry Dogwood (<i>Cornus mas</i>)	20' - 25'
Purpleleaf Plum (<i>Prunus cerasifera</i>)	20' - 25'
Hawthorn (<i>Crataegus</i>)	25' - 30'
Downy Serviceberry (<i>Amelanchier arborea</i>)	15' - 25'
American Mountainash (<i>Sorbus americana</i>)	10' - 30'

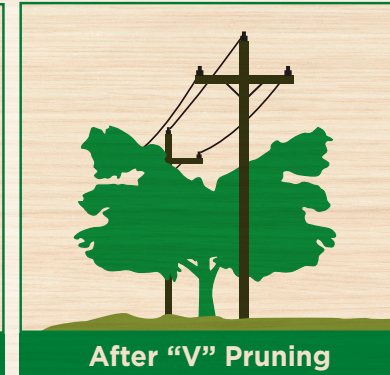
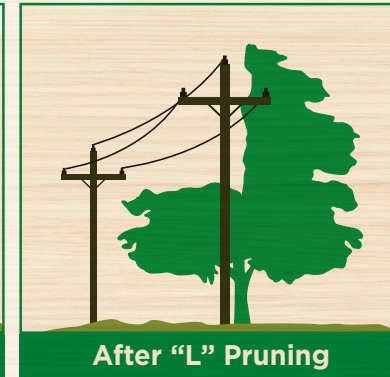
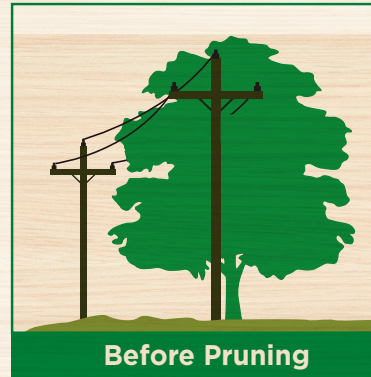
Sources: Arbor Day Foundation, Nebraska Natural Resources District, Nebraska Forestry Service

Pruning Methods

For our electric distribution system (lower voltage) lines, NPPD adheres to tree pruning practices set forth in the American National Standards Institute (ANSI) A300, Standard Practices for Trees, Shrubs and Other Woody Plant Maintenance, which is endorsed by the National Arbor Day Foundation, the International Society of Arboriculture, and the Tree Care Industry Association. This standard allows natural trimming, where branches are pruned back to the natural point of growth in the crown, making the least damaging cut, reducing the chance of insect and disease damage and promoting a healthier regrowth of branches away from power lines.

Professional contractors for tree pruning and removal work may be hired by NPPD. All contractors representing NPPD are required to follow NPPD guidelines.

Property owners should never attempt to trim or remove tree limbs near power lines. If you are concerned about a tree that may be too close to a power line, contact NPPD at 1-877-275-6773, or your local electric utility.



NOTE: The illustrations above show how trees growing too close to power lines can be trimmed to protect tree health while providing necessary line clearance for reliability and safety.

Conserving energy with trees

We often think of planting trees simply as a way to add beauty to our new or existing home. The fact is, a properly planned landscape that includes carefully selected trees and shrubs can modify the climate around your home, resulting in greater comfort and significant savings in heating and cooling costs over time.

Reducing lawn areas can also save energy. By planting ground covers or under-story shrubs, less mowing is required.

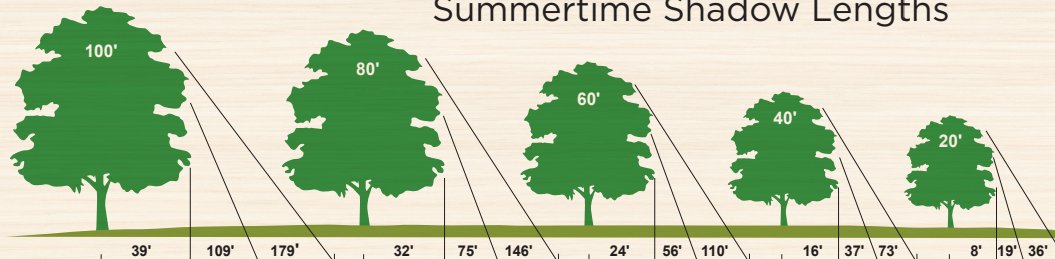
Tips when planting shade trees

- Consider the seasonal sun angles when planting for shade. Homes with large south and west exposures need shade in mid to late afternoon sun.
- Plant medium to large deciduous trees on the east, south and west sides for shade and to block hot summer winds. In the winter, when they lose their leaves, it allows the sun to warm your home.
- Plant shrubs and small trees to shade your air conditioning unit. Don't plant too close to the unit blocking its air flow.

Tips for planting windbreaks

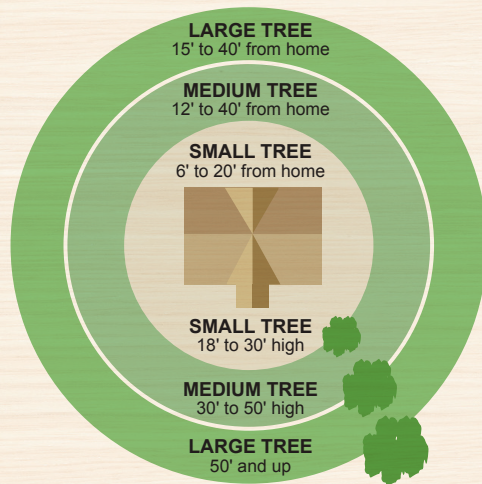
- Plant evergreen varieties on the north and west sides as a winter windbreak.
- Where space is limited, a single row of evergreens is adequate. However, up to five rows of several evergreen species is more effective.
- Consider the mature shape of the tree when developing a landscape plan for a windbreak.
- Evergreen shrubs planted close to the home can further reduce effects of wind and provide additional insulation.
- Remember — plant the right tree in the right place.

Summertime Shadow Lengths

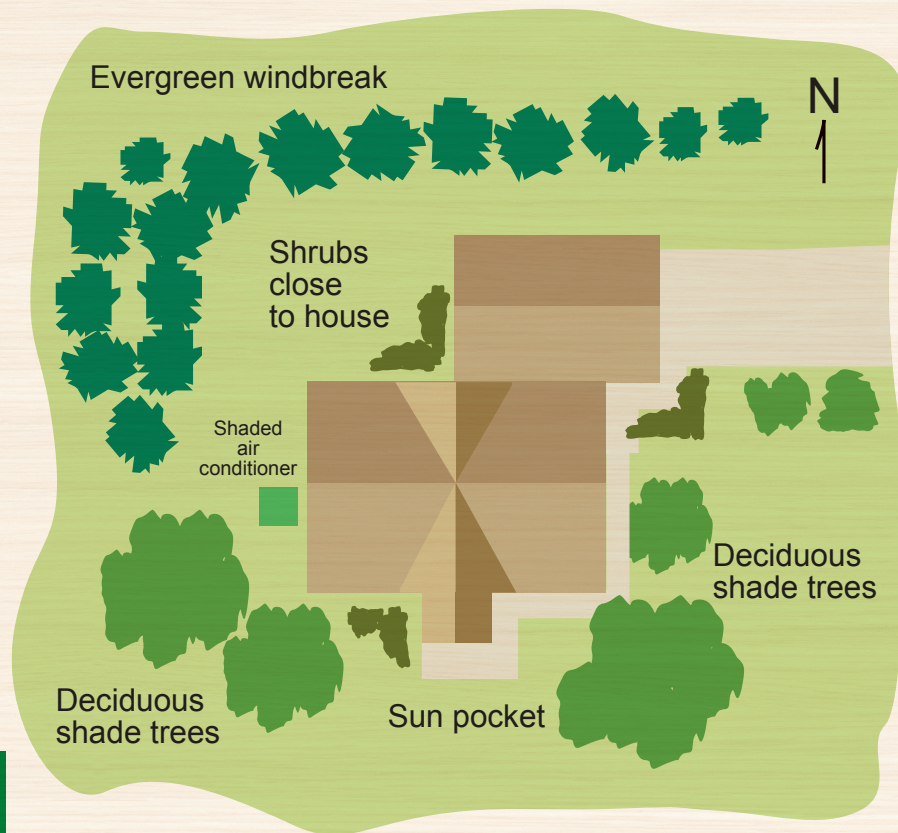


Typical Nebraska summer tree shadow lengths shown for different times of day; the shortest distance is the shadow at noon, the middle distance is the shadow at 4 p.m., and the longest distance is the shadow at 8 a.m.

General recommendations for tree placement

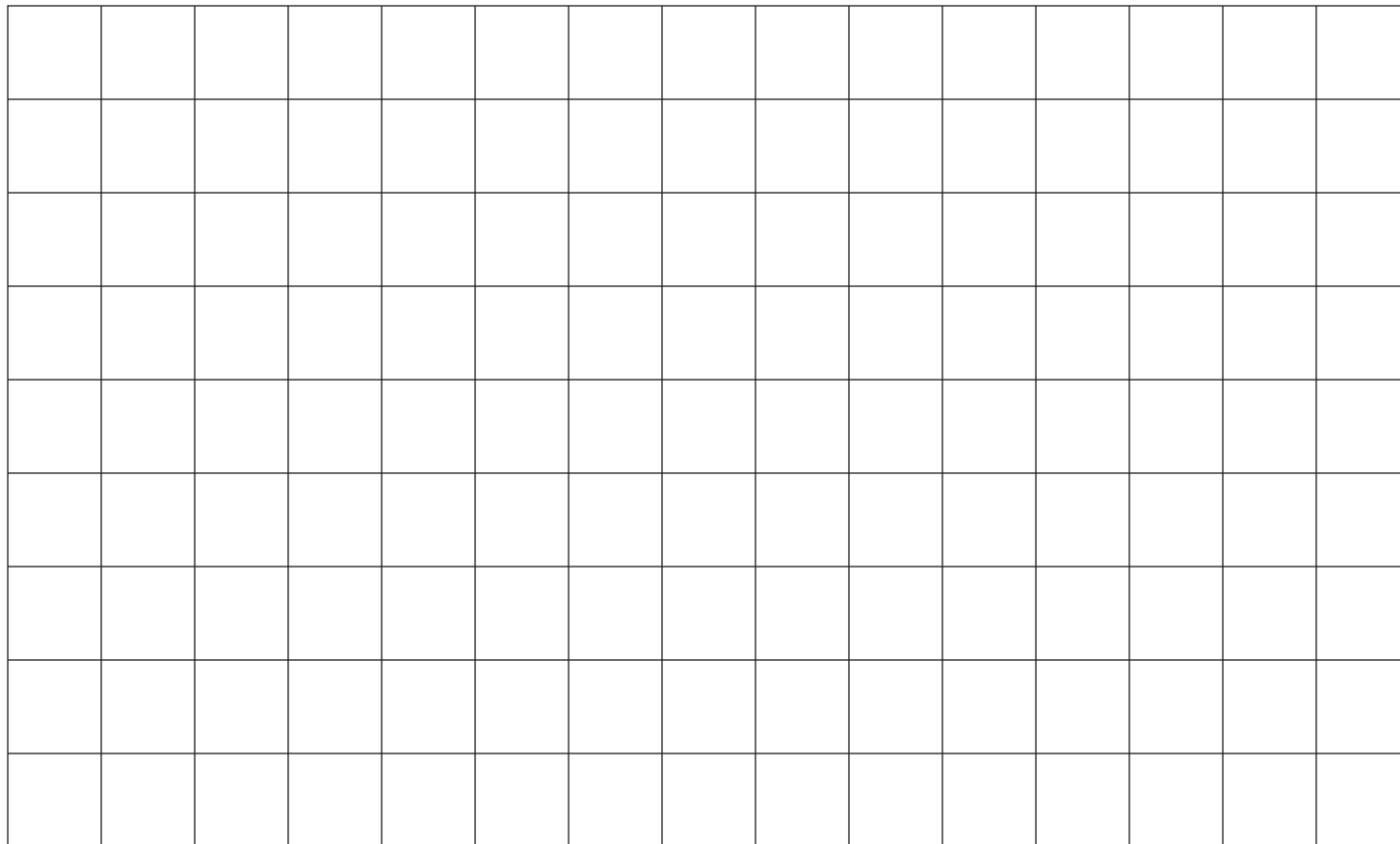


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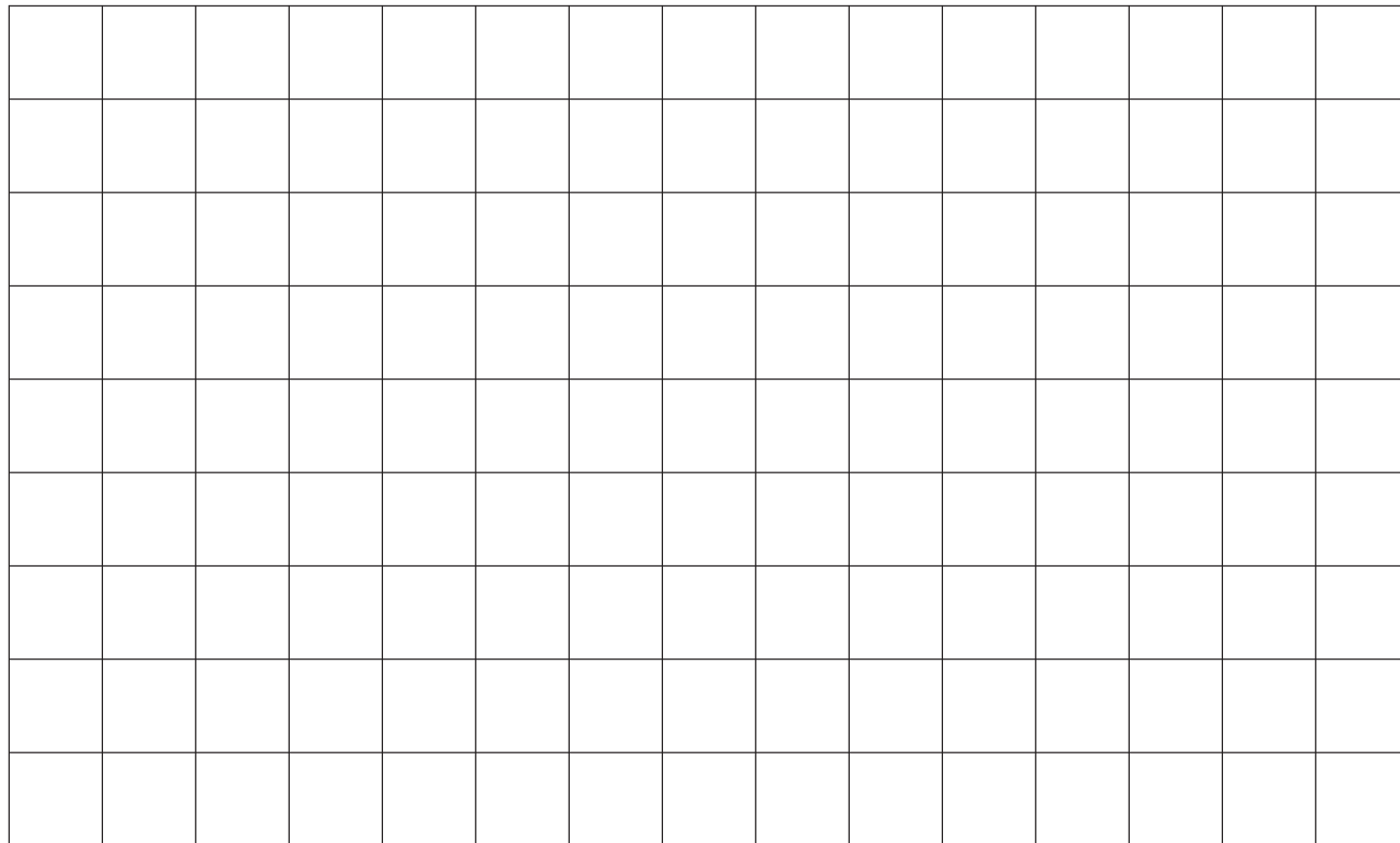


NOTE: Select and plant the right trees near power lines and padmount transformers.

Use this grid to draw a planning sketch of your yard. (Refer to “Plan before you plant” on page 5.)



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Nebraska Public Power District is a member
in good standing of the Tree Line USA® program.



Nebraska Public Power District

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For more information, visit nppd.com/treeprogram.