You Bought Land, Now What?

An updated version of

Enjoy Your Land

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You Bought Land, Now What?

A Guide for Landowners

Compiled and Supplied by Floyd County Soil and Water Conservation District

Introduction

Thank you for caring enough about the environment to look at this guide. This guide contains practical information which will aid in the economical care and maintenance of your property. People who take advantage of this information will not only be adding value to their own property, but will be contributing to an improved environment. Fortunately, the same techniques that improve our soil, beautify our landscape, aid in disposal of wastes and prevent nonpoint source pollution, are also environmentally beneficial for ourselves, our neighbors and future generations.

The idea for this guide grew from the Floyd County Soil and Water Conservation District's need to more effectively educate the public about sound conservation practices and to emphasize their important role in protecting, preserving and in some cases restoring the quality of the environment.

Each year acres of forest and fields are converted to residential development to house a growing population. Every resident of those homes owns a piece of our natural resources. As a landowner you may have many questions: how to best care for your own property; what to do about a drainage problem; what trees and plants are native to your area, etc. Every topic discussed will not interest all readers, but many of the ideas presented throughout come together like pieces of a puzzle to reveal a comprehensive conservation picture. If you use the suggestions in this handbook you will not only improve your immediate surroundings but will also enhance the quality of life in your community.

CONTENTS

BECOMING A HOMEOWNER … CONSIDER THESE ITEMS

Following is a list of items that must be considered when investing in an existing home or building on a lot. Read them carefully! Ask your home inspector / realtor if you have questions.

Existing Home

- When you drive in, do the grass, trees, and shrubs look healthy?
- Is the ground elevation around the home higher than the street?
- Does the ground around the house slope away from the house?
- Do the downspouts have drains that take the water at least 10 feet away from the house?
- Are there swales in the rear and side yards to carry the surface runoff water to a proper outlet?
- Have adjacent drainways, creeks or rivers been analyzed for flooding?
- If on a slab, do the heat ducts have water in them or is mold growing on walls?
- If there is a crawl space, does it show signs of wetness, mold or rotten wood?
- Does the crawl space have a footing drain or sump pump?
- Is your crawl space entrance large enough for maintenance?
- If it's a shallow or full basement, does it show signs of dampness or water marks on walls or floors?
- Have the appliances, etc. been raised off the floor to prevent damage if flooded?
- If there is a sump pump, does it have a proper outlet, and has it been maintained?
- Is the sump pump outside or inside?
- If inside, is there a battery or water power back up system?
- Check concrete floors, porches, walls and paint for evidence of settling, heaving and excessive moisture.
- Are there underground features (aka karst)?
- Do you know what type of soils are found on the property?
- Are the soils suitable for your needs?
- Is water available from a public water system? What system? What is the cost of water?
- Is pressure adequate for all normal uses? Any restrictions on use of water for swimming pools, washing cars, sprinkling lawns, etc.?
- Will a water softener, filtration system or other equipment be needed to condition water prior to its use?
- Are sanitary sewers in place? If not, are they planned for future installation?
- Is a detailed sketch or map available showing the location of the septic tank and absorption field? Lateral lines?
- Are there existing utilities which may have right-of way- across the property, such as underground pipelines, transmission lines, or easements.

- Always be sure to determine the location of underground utility lines BEFORE doing any digging, Call 811 Before you dig!
- If property is recorded in a subdivision, are there restrictive covenants, if so, do you have a copy?
- Does the property have a clear title?
- Have you checked out surrounding areas for industries, including farm livestock operations that you may consider a nuisance to live near?
- Is property located in a floodway/ floodplain or wetland?
-

Lot

- Does the lot meet minimum Health Department requirements for on-site sewage disposal?
- Before construction of a home on a lot in which there are no sanitary sewers, fence off the area where the septic absorption field will be located. Permit no traffic on this area.
- For any trees that are to be saved, fence the tree (s) out to the drip line to protect the root system from compaction damage from any equipment.
- What home utilities are available? Electric-Water-Gas-Sewage-Telephone-Cable-Internet
- Can desirable natural features be preserved at a reasonable cost?
- Install a stone base for the driveway before starting construction and instruct all deliveries to be made only using the driveway.
- Lots of more than one acre require erosion control plans. **See MS4 Section.**

Soils are suitable for various uses.

First, find out if your soil is suitable for your project (home site, forests, pastures)
For detailed information about your soil, check the web soil survey (https://websoilsurvey.nrcs.usda.gov/app/)

SOIL SUITABILITY

Understanding Soils

Soil is often referred to as “dirt”. Dirt is the stuff that is swept off the kitchen floor and should not be confused with SOIL. It is a valuable resource that supports homes and roads, grows food, flowers, trees, grass and filters our septic waste. Soil properties can severely affect living conditions and thus should be thoroughly investigated before making a decision about how the

land is to be used. Many soils have physical or chemical characteristics that cause hazards or limitations to certain kinds of land use. Often it is very easy to overcome these limitations if provisions are made at the time of construction but very costly to correct later on. It is important for those making land use decisions to have a working knowledge of the soil and its properties. The soil is one of the major factors affecting urban development. Everyone remembers to check out what's above ground, but we often forget to check below it.

Any investigation should start by contacting your local **Soil and Water Conservation District** office. Information that can be provided include soil maps, kinds of soils in the area and their suitability for various land uses. If you have any difficulty understanding the soil survey, the district office will help you contact a Natural Resources Conservation Service (NRCS) person trained to interpret the information. It should be noted that although soil maps are an excellent guide, on-site investigations may be needed for some specific uses, particularly if the area is smaller than one acre.

When there are multiple soil types on the land, consideration should be given to the following:

Wetness - Is a problem when the soil is saturated with water or water is ponded on the surface. This may be due to seasonal high water tables, slow permeability, restrictive layers, poor surface runoff or a combination of these factors. Wetness may cause homeowners to experience wet basements and crawl spaces, septic failures, and mud problems. Usually some type of artificial drainage specifically designed for the site, such as footing tile or perimeter drains are needed to overcome this limitation.
Soils showing wetness limitations are: Avonburg, Bartle, Bonnie, Clermont, Newark, Wakeland

Flooding - Is a hazard along the rivers, streams and drainageways. It is very difficult to overcome. Usually some kind of levee is necessary to assure permanent protection. These are quite costly. It is usually best to avoid urban development in flood plains. Planning and zoning rules / ordinances usually will not permit building in flood prone areas. Local flooding may also become a problem in developments where natural drainageways have been blocked and no provisions have been made for the increased runoff.
Soils with flooding limitations are: Bonnie, Haymond, Huntington, Lindside, Newark, Pope, Wakeland, Wilbur

Depth - This limitation refers to the depth to bedrock. This often limits where basements can be built, how deep utilities can be buried and the amount of cut and fill that can take place in road construction. The soils listed as having a depth limitation are usually less than 40 inches to bedrock.
Depth limitation soils: Berks, Colyer, Corydon, Gilpin, Rarden, Rockcastle, Trappist, Weikert

Slow Permeability - Refers to the ability of the soil to allow water to soak into it or move through it. Soils with slow permeability may have a dense layer of high clay content that restricts the downward flow of water through the soil. These soils may have perched water tables and stay wet longer than normal. Drainage systems may be needed to remove excess water. Slow permeability is the major reason for failure of conventional on-site septic tank filter fields. Special kinds of septic systems can be installed to diminish the problem. Public sewer systems are the best way to avoid this problem.
Slow Permeability soils are: Avonburg, Bartle, Bedford, Clermont, Cincinnati, Jennings, Johnsburg, Markland, Pekin, Zanesville

Steeply Sloping - These soils are usually on hill sides along major drainageways. Special design is needed to adapt homes to the landscape. Stability may be a problem in some areas. Most of the soils on steep slopes are also not very deep to bedrock so that the amount of cut and fill or land grading is limited. Soil erosion during and after construction can be a problem unless practices are installed to prevent it.
Steeply sloping soils are: Berks, Corydon, Fairmont, Gilpin, Hickory, Rockcastle, Weikert

Clayey Subsoils - These soils are plastic and sticky when wet and hard and dense when dry. This makes them difficult to manipulate during construction. Another problem is that some of these soils shrink when dry and swell when wet. Special practices should be installed during construction to prevent cracked walls and buckled driveways.
Soils with clayey subsoils are: Crider, Hagerstown, Markland

Reliable soils information is essential for land developers and urban planners. By studying soil maps and supporting data they can determine which tracts are best suited for development and avoid cost overruns caused by unforeseen soil hazards. Informed decisions can be made as to what additional investigation, if any is needed. Soils information can help avoid unnecessary complications caused by cracked foundations, failed septic systems, flooded basements, and other breakdowns caused by adverse soil conditions.

Considerations
Before buying, building or starting a major home project involving soil, you will save time and money by:

- Visually inspecting your site's soil and slope
- Consulting your county's soil survey
- Testing the soil if detailed additional information is needed.

REMEMBER: There is more to soil than meets the eye.

SURFACE DRAINAGE

Flooded basements, wet yards, and malfunctioning septic systems are all problems homeowners want to avoid. Eliminating these problems created by surface runoff and poorly drained soils will not only improve your property and protect your investment, but will yield benefits to our rivers, streams and reservoirs. By encouraging rainwater to move slowly across the soil, most of it will filter into the ground. Several practical ways to improve the drainage patterns around your home are discussed in this section.

As rain runs off roofs, patios, and driveways, it often erodes slopes and creates bare spots in yards and vacant lots and carries a load of soil into culverts, roadside ditches, and waterways. This sediment adversely affects the appearance of streams, smothers fish and blankets bottom-dwelling animals. Oil, pesticides, and nutrients from fertilizers also can be carried away by runoff from your property and contribute to the pollution of our surface waters and groundwater.

Pollution can occur, too, when soils become so soggy that they cannot filter the outflow from home septic systems. Foul-smelling effluent can rise to the surface and be carried into drainageways and streams with the first heavy rain.

Keys to Good Surface Drainage

- The ground elevation around a house should be a minimum of 18 inches higher than the street.
- The soil around the house should be graded so it slopes away from the house at least 6 inches in the first 10 feet.
- The front half of the house and lot should be graded to drain to the street and the back half of the house and lot should be graded to drain to the side and rear yard swales.
- All lots should have some form of swales on the property to take surface water away from the house. Swales are generally “V” shape with mowable side slopes and a minimum slope of 12 inches per 100 feet. (Swales not having the minimum slope should have a subsurface drain the length of the swale to keep them dry.)

Remember, the above recommendations work for most typical or ideal lots. Some lots have special characteristics that need extra thought, planning and design.
For example, a lot that is very rolling with a front yard that slopes toward the house instead of away may need a swale in the front yard that would divert surface water away from the front of the house and take it to the rear or side yard swale.

Improving Drainage

Slow soil permeability commonly contributes to drainage problems. Restricting heavy foot traffic on your lawn during wet periods helps prevent soil compaction which adds to the problem. A dense layer of clay restricts the flow of water through the soil which may cause

water to collect or "pond" on your lawn. If the clay layer is near the surface, digging a small trench through the clay layer and filling it with sand, gravel, pine bark, or other porous material may improve a small low-lying wet spot.
Larger wet areas may require the installation of 4 to 6 inch subsurface drains at a depth of 2-5 feet. For maximum effectiveness, the trench should be backfilled to within one foot of the ground surface layer with 6-12 inches of pea gravel. Use topsoil to fill up to the surface layer. For soils that lack cohesive properties, a filter fabric around the tile is recommended to prevent movement of soil particles into the drain. (Also see RAIN GARDENS)
Another common cause of poor drainage is a seasonable high water table. The water table is the level below which the ground is saturated with water. It may fluctuate several feet annually depending on soil, topography and weather. The water table is a good reason to check the soils before buying a new homesite.
When a seasonable high water table is already causing difficulties in or near your home, possible remedies include installing drains around your outside walls or beneath the basement floor. Special care should be taken in lowering the water table under the basement floor because unequal settlement on some soils, especially slow-draining silts and clays, may crack the walls. A high water table may affect only a limited portion of your lawn. An interesting solution might be a small rain garden.

Rain Gardens
A soggy nuisance area in your yard can be transformed into an attractive landscape feature called a rain garden. Rain gardens are shaped as shallow bowls to capture stormwater from downspouts, driveways, sidewalks, and other hard surfaces - reducing runoff from homes and communities. When plants and soils in these gardens absorb rainwater where it lands, they keep pollution from reaching our streams, rivers, and lakes. Rain gardens should be planted with species that can tolerate having their root systems covered by standing water ie. "wet feet" for periods of time.

Plant Selection for Rain Gardens
When selecting plants for your rain garden, always consider native plants first. Native plants require less (or no) herbicides and pesticides. They form deep roots that increase stormwater absorption. And they are adaptable to our climate and require less maintenance. A good resource for native plants in rain gardens can be found here: (https://marionswcd.org/wp-content/uploads/HHRCD-Rain-Garden-Inf-090428.pdf)

Berms & Trenches
Other solutions to channel surface runoff is to design a system of berms (low ridges) and/or swales (shallow depressions). Installing gravel trenches (at least 12 inches wide and 3 feet deep along your driveway or patio is another good runoff management practice.

Severe drainage problems can occur when your home is located on a flood-prone site. A home in the floodplain of a nearby stream, may be flooded if the stream overflows during heavy rainfall or rapid snowmelt. Community-wide measures are often necessary to provide adequate property protection. When selecting a new homesite, check to make sure the area is not highly flood prone and build the foundation above any expected flood level. Federal floodplain maps are also available at the NRCS office. Flooding can occur if your home is located in the path of natural drainageways or in a site that is lower than the surrounding area. Cooperation of several homeowners may be required to remedy this potential hazard. Link to floodplain maps: (https://www.in.gov/dnr/water/surface-water/indiana-floodplain-mapping/indiana-floodplain-information-portal/)

Gutters

Gutters around the edge of your roof at the eaves are intended to collect the water running off your roof so that it does not flow or drip down the side of the house into the soil near the foundation. To function properly, the gutters should be firmly and tightly attached against the face board at the eaves ends so that the roof runoff cannot seep between the gutter and the face board. The water would lead to rotting of the face board and leakage through the walls. Gutters are sloped to downspouts generally at about 0.5%. For a 30-foot long house the low end of the gutter should be about 1.8 inches lower than the high end of the gutter.

Downspouts

Downspouts take the concentrated flow of water from the roof gutters and discharge it onto the ground. All downspouts should be extended on top or below the ground at least 10 feet from the house. Ideally all downspouts should be extended below ground to the nearest swale. It is best to use solid plastic tile for extending downspouts. (Slotted tile will put some water next to the foundation when installed above ground and roots will grow into it when installed below ground.) If the downspout is discharged on top of the ground it should go into a splash block to prevent the concentrated flow from gouging a gully or digging a hole. The splash block absorbs some of the energy of the falling water and spreads it out so it is less likely to erode the yard. It is important to make sure the water flows away from the house and does not soak into the soil near the wall.

Karst Features

Southern Indiana is rife with Karst. (Landscape underlain by limestone which has been eroded by dissolution, producing ridges, towers, fissures, sinkholes and other characteristic landforms) If you feel you have a sinkhole (karst feature) please contact your local Purdue Extension, Soil and Water Conservation District, or NRCS office.

EROSION

Erosion is another reason for understanding soils. Erosion is the process of soil particles moving from one place to another. The texture of the soil and its potential for absorbing water, the steepness of the slope and the adequacy of protective cover on the soil are all factors that influence the extent of erosion. The primary cause of erosion is the action of water on soil with insufficient vegetative cover. As the amount and force of rainfall and resulting runoff increase, so does erosion. Although erosion is a natural process, the land disturbing activities that accompany development cause an unnatural acceleration of this process.

Erosion affects us directly and indirectly. Valuable soil can be lost from your property when it is washed or blown away. Bare, eroded areas not only detract from a home's appearance, but can cause more serious consequences. Erosion along a home's foundation can eventually undermine it. Gullies may form. Mud from eroded areas can build on driveways, sidewalks and other places.

When this same soil is deposited where it isn't needed, it can cause serious problems by filling roadside ditches, plugging culverts and clogging our stream channels, impairing their use for flood control and wildlife habitat. As taxpayers, we ALL pay for the harmful effects of erosion.

Everyone recognizes a gully as evidence of soil erosion. Other signs are more subtle and may be visible only for a short time following a rain. Muddy water in your gutter or driveway indicates that erosion is occurring. These small problems require prompt attention so that they don't become larger problems.

Be alert to the following indications of erosion:

- Bare spots anywhere on your property
- Tree roots showing above ground (certain species tend to grow naturally that way, such as maples)
- Small stones or rocks on top of the ground.
- Small channels or gullies beginning to form
- Silt build-up in certain areas
- Soil splashed on outside windows or walls

Where is all the erosion coming from? All the places where water flows over bare soil is one answer. But erosion also occurs where grass is thin, where leaves have been raked away, where weeds with poor root systems grow, and where water flow prevents vegetation from getting started. Once you have identified your erosion problem, correct it with a sound conservation practice.

Due to their high potential for erosion, bare areas should receive your attention first. The answer to preventing soil erosion in these areas seems easy. Get something growing! Before you begin planting, determine if there is sufficient sunlight for plants to exist. If enough sunlight is present consider the drainage patterns of the area, future maintenance requirements and your preferences

to determine which plants are best. Your Cooperative Extension Service, local nursery, or a professional landscaper will be able to help suggest plants that will grow well in your setting. If the bare area of concern is large, it may be wise to have your soil tested before you even begin. Once you've prepared and planted bare spots, remember to mulch with straw, bark or other materials to protect the soil until the new plants are well established.

What about areas that are not totally bare? If suitable plants are already growing there, you can quickly increase their coverage by fertilizing. This will encourage them to quickly cover the entire area. If the plants are undesirable, (plants that provide little cover of the soil surface) you need to eradicate them and start over as if the area was bare.

If your area is deeply shaded, plantings may not be successful. A permanent mulch of wood shavings, stone or other material may be the best solution. High traffic may not allow vegetation to take place. Gravel or stepping stones may be the best solution in such places.

Most erosion occurs on sloping ground. The steeper the slope the greater your potential problem and more difficult its solution. Slope erosion can be reduced by terracing. Intervals between terraces should not exceed 10 feet vertically. Vegetation is useful on a slope height of 6 feet with slopes as steep as 45 degrees. However, it may require a structure to make it stable (masonry wall, railroad ties, or similar durable material).

Erosion control can be difficult and may require substantial time and patience. Your chances for success in reducing erosion will be increased if you've taken the steps necessary to improve drainage around your home.

It's important to reduce erosion in your own yard. Because of the harmful effects erosion has on public facilities and natural areas; Suggestions for getting started:

- Inventory your property for problem areas.
- Attack bare spots first. Carefully select and plant the species best suited. Don't forget to mulch.
- Increase plant coverage and soil retention in thin vegetation by fertilizing.
- Reduce erosion in stubborn spots with the use of non-plant materials.
- Be sure drainage patterns do not undermine your erosion control efforts.
- Put stepping stones or gravel where foot traffic is heavy.
- Contact a trained engineer for structural solutions on difficult slopes.

Mulch considerations

- Species
- Types
- Degrading material

WATER QUALITY

It's an unfortunate fact of life -- many of our streams, lakes, and rivers have been polluted. It may be a surprise, however, to learn that water pollution often starts with you.

Water pollution begins when development alters natural processes. Removing vegetation and replacing it with streets, rooftops and driveways greatly decrease the amount of water soaking into the soil. As a consequence, the amount of water running off to streams, rivers and lakes increases dramatically.

Storm sewer inlets, which open into a network of underground pipes, transports water from the street to a stream. Leaves, litter, pet wastes and other materials dumped or washed into storm sewer inlets do not go to a sewage treatment plant but flow directly to streams, lakes and rivers. Since most storm sewer systems are designed to remove water from developed areas quickly during a storm, the pollutants reach their destination at a rapid pace.

Water quality can be helped or harmed by your actions around home. For example, rain can wash improperly applied lawn fertilizer and pesticides into lakes, streams or rivers. Careful landscaping and sound lawn care practices can reduce the need for chemicals and protect water quality.

Did you realize that poor auto maintenance can seriously harm our waters too? Anything that drips from a motor vehicle (oil, gas, antifreeze) can wash into storm sewers. These materials are toxic to aquatic life. Dumping them into a storm sewer has detrimental consequences.

We all need to rethink what we are doing at home if our waters are to be clean and usable no matter where we live.

PERMITS

No matter where in the state of Indiana you build, you are required to obtain building permits. No construction can be started without a permit. Contact your local town, city, or county building department to obtain the information and permits each will require if you choose to build or make modifications to an existing home.

You must have a recorded deed or real estate contract before any permits can be issued.

If you choose to build, you will need to know who will perform various parts of the work when completing your applications:

- General contractor
- Plumber
- Electrical contractor
- Mechanical contractor

Special permits may be required if your home site disturbs more than an acre of ground and the town, city, or county is considered an MS4 (Municipal Separate Storm Sewer System) entity.

Construction Stormwater General Permits (CSGP) (IDEM: Storm Water Permitting: Home)
Indiana Department of Environmental Management Stormwater Program is responsible for issuing permit coverage and monitoring compliance for stormwater associated with industrial activity, construction activity, and municipal separate storm sewer systems (MS4s). IDEM's general permit program targets construction activities that are associated with land disturbance of one (1) acre or more. If your home construction site disturbs more than one acre you will be required to apply for their stormwater permit through an on-line portal (IDEM: Storm Water Permitting: Home)

Septic Permits
If your home site is going to require an on-site septic system, contact the local county health department for information on their permitting procedures and requirements.
A properly functioning septic system does not pollute the groundwater.

RESIDENTIAL HOMES OUTSIDE CITY LIMITS

Colorful roadsides, open fields, woods, wildlife and charming pastoral scenes seem to make the country an ideal setting for a home. Rural areas are very attractive to many families seeking a new homesite. Although few real country areas still exist in the county, aspects of country living should be considered before the important decision to move to the country is made.

Livestock Owners
Most rural folks are considerate, friendly people, but they have a farm business to operate. **There is no such thing as a 9 to 5 schedule in a farming operation.** They may run noisy, dusty machines - tractors, combines, and grain dryers whenever necessary - at any hour of the day or night. Their animals smell, attract flies, and occasionally get out of fenced-in areas.

Manure is spread out as fertilizer. Farmers spray chemicals to control weeds and insects. Large, slow moving farm equipment is common on rural roads throughout the crop year.

Respecting and understanding the **farmer's** right to continue his normal farming activities is essential to the new rural family. Unruly loose dogs can cause major problems for farmers with livestock. Farm drainage changes caused by nearby poorly planned buildings can mean extra tile drainage and/or waterway expense for the farmer. Gardens or large valuable ornamental plants should not be planted close to the common border between farm and homesite due to chemical drift and crop shading problems. The farm field is not an open garbage dump - even grass clippings dumped over the fence can be a problem. Huge combines can be badly gummed up by trash as simple as an empty plastic bleach bottle.

Farm fences should never be taken out or changed without the farmer's permission. In fact, you will be legally obligated to repair or replace a boundary fence. Indiana law makes it a duty for landowners outside corporate town or city limits to separate their land from that of their adjoining neighbor by a partition fence. The fence law states a landowner shall build the right one-half of the line fence determined by standing on his or her own property and facing the adjoining neighbor's property. Many questions and problems arise concerning the duties and rights associated with the partition (line) fences. Landowners should, however, consult a lawyer when they have problems concerning line fences, damages caused by animals or location of property lines.

Farm fields, ponds and creeks are attractive to nonfarm neighbors, especially children. Youngsters are attracted to the "open land", woodlands, and to farm buildings, machinery and animals. Parents need to be aware of the potential dangers to children around big machinery, cows with protective instincts and the proverbial dangerous bull.

Getting prior permission to be on any farmer's land is extremely important. A farm field should be considered much as a residential backyard where uninvited guests may be prosecuted. Invited guests should leave all gates as they found them and have respect for all property, crops and livestock on the farm.

ESTABLISHING AND MAINTAINING LAWNS

A dense, healthy lawn can be a valuable asset to your property and your neighborhood. In addition to its attractiveness, a good lawn has several important environmental benefits. When combined with sound landscaping practices, your lawn can reduce erosion, moderate summer heat, filter rainwater runoff, and actually improve soil structure and infiltration by additional

organic matter. Our streams, lakes and public roadways can benefit from the reduced runoff and filtering capacity provided by lawns and landscaping.

On the other hand, when homeowners indiscriminately apply fertilizers and herbicides, lawns can become a source of pollution. Broad spectrum pesticides have already been implicated in harming beneficial lawn organisms, pollination insects, songbirds and wildlife, as well as people and pets. The use of lawn chemicals can be limited because environmentally safe practices can produce a turf vigorous enough to control the growth of most weeds and withstand pest damage.

Soil Test

Whether you're establishing a new lawn or developing a denser lawn, a soil test is needed to determine your soil needs. Contact your local Cooperative Extension Service about getting your soil test done.

How to collect a soil sample:

- Select several locations throughout your yard.
- Collect the soil from the top 4-6 inches
- Do not collect the sample from just the soil on top of the ground.
- Allow the soil to dry before taking it to get tested.

Establishing a Lawn Fertilizer

A complete fertilizer for lawns should contain nitrogen, phosphorus, and potassium. Incorporate these nutrients into the seedbed as the soil is being tilled. The specific amounts of each nutrient should be based on soil test results. The fertilizer label must state the percentage by weight of nitrogen, phosphorus and potassium in that order. The turfgrass growth rate as well as lawn color is determined primarily by the kind of nitrogen and the rate of application. Phosphorus and potassium are involved in many important growth processes in the plant.

Lime

The ideal soil pH for turfgrasses is 6.0 - 7.0. Lime (agricultural limestone) should be applied only if the soil test indicates the pH is below 6.0. The amount of lime applied should be based on the soil test results.

Avoid excessive application rates as too much lime may be more detrimental than too little. If lime is added, incorporate it with the basic fertilizer material.

Soil Preparation

When grading begins around the home any subsoil that has been stock piled should be spread first. Next the topsoil should be graded over the subsoil. Topsoil provides good material to grow a lawn. Subsoil has poor structure, low fertility and high pH. It is quite expensive to make subsoil fertile enough for a good stand of grass or other plant material. Some homesites,

especially in newer subdivisions, may have so little topsoil that you will have to haul some in if you plan to establish a nice lawn.
Always remove building debris and/or other trash from the lawn area before grading. Such material is a mowing hazard, causes short root systems and rotting woody material is often the host for diseases. The subgrade should be sloped away from your house and the area should be allowed to settle for 2-3 weeks before seeding or sodding. Several wetting and drying cycles will aid settling and help you locate spots in the lawn that should be filled. The needed fertilizer and lime should be worked into the top 5-6 inches. After each separate operation, additional stones, wood, or other debris should be removed.

When to Establish
Seed will germinate only under optimum conditions. There are certain periods each year when temperature, moisture and the day's length are most favorable for establishing turfgrass. Late summer/early fall seedings are preferred because there is typically less competing vegetation and more gentle rains.
Sod can be installed during most of the year. Sod should not be cut or installed when either the turf or the ground is frozen. When extreme heat and drought conditions exist in summer, sodding operations should be delayed. If sodding must be done under these conditions, the turf should be kept moist and cool, the soil should be watered enough to cool it prior to sod installation and through watering should be done as the sod is laid.

Selecting the Right Seed
Careful selection of turfgrass species and varieties is important in developing a lawn that will fulfill the purpose for which it is intended. The cost of grass seed or vegetative planting material is not cheap so give careful consideration to how the lawn will be used when establishing it. Using the wrong grass for a particular environment, intensity of maintenance or use will likely result in failure or an inferior quality turf.

The seed bag tag provides specific information on the percent purity and germination as determined in laboratory tests. The percentage of weeds and other crop seeds is also listed. Best results from seeding are usually expected with seed containing no weeds or other crop seed. The higher price paid for quality seed is a good investment.

The most popular types of grass for lawns is Kentucky bluegrass and fine fescue. The many varieties that exist within these species display marked differences in color, texture and disease susceptibility. Environmental variation is the principal reason for combining different grasses for seeding. Combinations of several varieties within a species are referred to as "blend". A combination of 2 or more species is a "mixture". Blends of Kentucky bulegrasses offer the advantage of potentially greater adaptation to a broad range of conditions, while pure stands of

selected varieties generally provide the finest quality turfs. Mixtures of Kentucky bluegrass and fine fescue are used for shady locations or where there are wide variations in sunlight intensity. Tall fescue is suggested for low quality lawns that will receive minimal maintenance.

Rye grasses are often found in seed mixtures. They germinate several days after planting and provide quick growth which will not restrict development of the grass plants.

Seed vs. Sod

A quality lawn, containing the recommended mixtures and species can be established with either seed or sod. Both seed and sod of recommended varieties are available, and the soil preparation for the two methods of establishment does not differ.

Initially, seed is less expensive than sod. However, successful establishment is more risky with seed than with sod. Also, because of the time required for turf grass seed to germinate and establish good density, the area is exposed to weed invasion, excessive erosion and sedimentation. Sodding practically eliminates such problems. Sodding saves time and labor during the establishment phase and gives an immediate eye-pleasing turf that will successfully compete with weed seed already present in the soil. When using seed, an intensive weed control program must immediately be implemented to reduce the weed competition. Sod offers less time limitations in that it may be established during any season, even in the hot summer if water is available.

Establishment methods

SEEDING (Best done in the fall) - Prepare a smooth, firm seedbed; then divide the seed and sow in cross directions. Avoid a smooth surface. Mulch the area with straw or other suitable material so that approximately half the soil surface is covered. Water frequently to keep the soil moist until the seedlings have become established. Try to keep pets and people from walking on the area.

SODDING - Soil preparing should be similar to that described for seeding but one must take care not to disturb the prepared soil to the extent that deep footprints or wheel tracks exist. These depressions will give an uneven appearance to the installed sod and will hinder rooting. During hot summer days, the soil should be dampened just prior to laying the sod to keep the turf roots from contacting excessively dry or hot soil. Sod is perishable and should be used within 36 hours.

To reduce the need for short pieces when installing sod, it is generally best to establish a straight line lengthwise across the lawn area. The sod can then be laid on either side of the line with ends staggered as when laying bricks. A sharpened concrete trowel is very handy for cutting pieces, forcing the side tight and leveling small depressions. Immediately after the sod is laid, it should be rolled and kept moist until well-rooted into the soil which normally will take about 2-3 weeks.

MAINTAINING YOUR LAWN

Once your lawn is established, you can increase its density through proper fertilization and maintenance. Following are some guidelines to help you.

Fertilization
Fertilizers help lawns maintain their beauty as well as turf density. Turfgrass leaves have a very short life span of 30-45 days. As a leaf blade dies off naturally, a new one pushes out from the base of the turf plant to replace it. Fertilization enhances this process. The rate and time of the fertilizer applications are very important in maintaining a vigorous and healthy turf and reducing the incidence and severity of disease during the season. It is best to fertilize light in the spring and early summer, little to none in the summer and heavy in the fall and late fall, as a general rule. High rates of nitrogen in the spring sharply increases the potential for disease and insect activity and produces excessive top growth at the expense of root growth. Limited food systems result in decreased quality of the turf during dry summer conditions.

Liming
Apply lime according to soil test needs. Soil should be retreated every 3-5 years.

Mowing
So that a sufficient blade remains to absorb sunlight and manufacture food most grasses in our area should be mowed to a minimum height of 2-2.5 inches. No more than 35-40% of the blade should be removed at one time. Grass clippings <u>should not</u> be removed unless they are excessive. Allowing them to decompose recycles plant nutrients and reduces the solid waste disposal problem and the time and effort required for mowing.

Watering
Seldom is watering necessary to keep established turf alive, but it is necessary to keep it attractive. Grass survives by naturally "shutting down" above ground to conserve its food supply in the roots, during the dry, hot days of summer. Brown grass, therefore, is not necessarily dead grass. Approximately 1 inch of water per seven to ten days is needed to establish a deep, drought-and-disease-resistant root system. Shorter, more frequent waterings are much less beneficial and can produce a shallow, more vulnerable root system. Be careful to not water your lawn faster than the soil can absorb it.

Reseeding
Seed added to existing lawns is usually wasted unless it is preceded by cultivation. To increase your chances of success, reseed by raking, adding a thin layer of topsoil if necessary, sowing

seed, adding fertilizer and keeping the area moist. Use a seed mixture similar to that prevalent in the surrounding lawn.

Controlling lawn pests

The most efficient way to control lawn pests is by having a thick, healthy turf. Occasional use of a herbicide or insecticide may be useful. Contact your Cooperative Extension Service for information on targeting a specific lawn pest before applying any substance. Once the problems have been correctly identified, determine the most effective control method. Always use the least toxic alternative for controlling them.

Dethatching

Thatch in turf is the layer of living and dead organic matter that occurs between the vegetation and soil surface. It is composed primarily of turfgrass stems and roots. Thatch is medium to dark brown and resembles a woven tangled mat. A build up of thatch encourages an environment for fungus and insects, reduces turfgrass tolerance for cold, heat and drought. It also can result in poor root growth which leads to turf deterioration.

Grass clippings contribute little to thatch buildup. If you pull the grass blades apart and can see the soil you do not have a thatch problem. A thin layer of thatch can benefit the turf because it can insulate the turf from rapid changes in soil temperature and moisture. A layer of thatch less than ½" thick should cause little concern.

Thatch can be physically removed by a dethatching attachment for your lawnmower, a dethatching machine or a garden rake. Caution must be used so a great deal of live turf is not pulled out in the process. Early fall is the best time for this procedure.

Lawn Services

Complete lawn care is a big job. Lawns are not natural systems but are actually man made "monocultures". Nature tends to make a diverse environment, so the quest for a weed-free lawn can be a struggle. Chemical lawn treatment companies can offer a quick solution to busy homeowners. If you decide to use a professional, ask for a contract that (specifies how long) what service will run, cites which chemicals will be used and allows you to reject products you do not want. Be sure the company is willing to customize its services to your needs. Evaluate your need for service each year instead of automatically extending the service. Get quotes from multiple companies.

Things to remember when using a lawn care service or spraying yourself:

- Do not expose yourself, family or pets to the treatment chemicals.
- It may take 7-10 days for the chemicals to soak into the ground. Stay off the grass during that period.

- Let your neighbors know when treatment is scheduled. You may want to post a warning sign to stay off.
- Make sure to spray on a calm day and that chemicals are blended in proper proportions.
- Read the Label, it's the Law

Lawn Attitudes
If you're willing to change your attitude about a totally weed-free lawn and tolerate some non-grass vegetation, caring for your lawn will become less of a struggle and you'll be protecting your environment.

Keep these things in mind when planning and caring for your yard:
- Keep the mowing height high to shade out unwanted sun-loving plants.
- Remove built-up thatch.
- Consider planting low maintenance groundcovers in areas where it's difficult to grow grass or mow.
- Explore environmentally friendly insecticide and herbicide options when necessary.

LANDSCAPING YOUR HOME

The first step in landscaping is to decide what activities your outdoor space will be used for. Entertaining, playing, gardening, walking, viewing, ect. Next, use trees for canopies, shrubs for walls and ground cover for floors to define spaces for those activities. Information on how to plan your landscape is available at your County Cooperative Extension office or public library. By doing the first stages of planning before hiring a landscape designer or nurseryman, you not only save money in design fees but also have a design which reflects your family's values and concerns.

Planting trees, shrubs and groundcovers benefits the environment and also enhances the appearance and value of your property. Because it reduces runoff and minimizes erosion, good landscaping not only protects your land but reduces damage to roadside ditches and waterways. Trees and shrubs are invaluable in reducing air pollution by removing carbon dioxide from the air and manufacturing and releasing essential oxygen.

Well-placed trees can reduce air conditioning needs by 30% and save 20 - 50% in heating costs according to USDA Forest Service. With an eye on energy conservation, serious consideration should be given to proper placement of shade trees, foundation planting and windbreaks. Plants grouped together to form walls of dividers can also help conserve energy since it takes less time to mow around groupings rather than individual plants. New plantings also enhance the habitat for birds and other wildlife (see "Attracting Wildlife to your Yard"). Trees, shrubs and

groundcovers require less maintenance than grass. Because they require less fertilizer and fewer herbicides than grass, they also reduce pollution caused by lawn care chemicals.

Landscaping for best results includes selecting plants well adapted to our climate. You should also choose plants suited to your yard's unique growing conditions of light exposure, soil type, moisture and slope.

A common mistake is buying plants that need much more or far less moisture than the soil provides. Some appealing introduced plants (Invasives) grow quicker than native plants but spread rapidly and become a nuisance. In spite of their attractiveness, you'll save work by resisting the temptation to landscape using these plants. Choosing plants appropriate for your yard will save you time and money by reducing insect problems and the need for excessive fertilizing and watering.

Shade Trees
If you will be adding an active solar unit to your home or if you have large south windows for passive solar, then you may want to keep shade trees to the southwest and west areas of your house. Trees and large shrubs should be placed so that their main trunks do not interfere with the natural summer breezes. By the proper placement of plants on both the south and north side, cool summer breezes can actually be enhanced.

Foundation Plantings
Low shrubs, particularly evergreen, along the north and west sides of your home can serve as extra insulation. Low deciduous or evergreen shrubs planted on the south side and closer to the home than the shade trees can channel the breezes downward into the living space through the window on the southside. Choose the right plant for the right place. Plants too close to the house may cause walls to be inaccessible and root systems could cause damage to the foundation.

Windbreaks windbreak2 (purdue.edu)
Windbreaks are the third type of landscaping to help you save on energy. If you live on the north and west edge of town or if you decide to "live out in the country", your need for a windbreak may be crucial. Even a well-insulated home can be robbed of heat when winds of 20 mph or more hit a home.

There are four things to consider when planning a windbreak: 1) the height, 2) the density, 3) the location, and 4) the length of the windbreak. The calm area (the distance from the downward edge of the windbreak to the edge of your home) occurs at a distance of between 3-15 times the height of the windbreak depending on the density of the material used in the windbreak. A windbreak that is made of all evergreen material, (a dense windbreak) will create the calmest

area. If you have a 90-foot high evergreen windbreak, the calm area will occur up to 30 feet away from the downwind edge of your windbreak.

A windbreak of mostly deciduous material (less dense windbreak) provides the calmest area farther away from the downward edge. It will be five times the heights of windbreak as well as provide a larger area of protection- 10-15 times the height of the windbreak. For example, if you have a 30-foot high mostly deciduous windbreak, your calmest area will occur 150 feet away (30 x 5), and the wind will not return to its normal speed for a distance of 300-450 feet.

Therefore, if your home is located very close to the north and west edge of your property, you should have a windbreak made up of mostly evergreen material. If your home is located far away from your north and west edge of your property, then you should plant mostly deciduous material.

Remember to include deciduous or evergreen shrubs on either or both sides of your windbreak, since evergreens and deciduous trees lose their lower branches eventually. If you do not plan for this, years down the road you will find that the wind is being channeled under the trees and blowing past your home at a **faster** rate than before the windbreak was planted.

The windbreak should extend at least 100 feet beyond your house, if you have the space.

To increase aesthetics, trees with bright flowers or beautiful fall colors can be planted on the downwind edge (side of windbreak closest to the house). Use rows of less expensive trees (evergreen and deciduous) on the upwind edge as a backdrop. Windbreaks do not have to be straight monotonous rows. They can be planted so that "pockets" occur inside the windbreak to serve as space for private gardens, pathways, or play areas for children.

Groundcovers

Hardy, low-maintenance ground covers have become increasingly popular in recent years for planting in shady areas, on slopes and other difficult spots. Although most groundcovers can survive under a variety of growing conditions, it is best to break up the soil and allow pore spaces for air, water and nutrients. Mulching after planting will help conserve both moisture and soil. Many groundcovers can be trimmed in spring either by hand or at the highest lawnmower setting.

Some groundcovers well-suited to our growing zone:
Blue Phlox, Creeping Juniper, Lamb's Ear, Seersucker Sedge, Virginia Creeper, Wild Ginger

Always remember to consult your local Cooperative Extension Service or local nursery for advice on which plants will thrive in your yard and the proper care.

PLANTING AND MAINTAINING TREES AND SHRUBS

Planting

Transplant deciduous trees and shrubs in the dormant season while there are no leaves on the plant. Fall is the most favorable time. Evergreens can be planted any time the ground is not frozen, but the optimum time is in the spring. Summer planting is not recommended. Younger plants survive transplanting more often than mature plants.

Indiana has two state tree nurseries that sell bundles of seedlings for conservation plantings. DNR: Forestry: Tree Seedling Nurseries

Trees and shrubs can be obtained in three forms:

- Bare root - No soil is (moved) with bare-root plants, and so roots must be kept moist at all times. Many of the large roots are undamaged, but most of the fine roots are lost. If you are unable to plant them immediately, protect bare root plants by temporarily planting them in the soil (heeling).
- Balled and Burlapped - A ball of soil, containing the roots, is wrapped in burlap and moved with the tree. This is the most common method of transplanting field-grown trees. These types of plants should be checked for plastic or rot-proof burlap and all material removed including tags. These non-biodegradable material must be removed, along with any twine which may girdle the tree underground. The root ball should not be disturbed when planted. Care must be taken to close air gaps around the root ball with soil and water.
- Container plants - Sometimes trees are grown above ground in specifically designed plastic pots. Because no digging is involved, container plants do not suffer root loss during transplanting. Round containers may cause circling roots which should be straightened or cut back at the time of planting. Container soils are very light and well drained, and require frequent irrigation in the landscape to avoid drought stress.

Each of the forms has its advantages, and no single type is appropriate for all situations. Balled and burlapped and container plants have a higher survival rate, but require a much larger planting hole. Any form should have the roots watered and stored in a cool place out of direct sunlight before planting.

Digging the Hole

When planting, dig a hole 3 times wider than the diameter of the roots or root ball. The sides should slope gradually, making the hole saucer-shaped or bowl-shaped. Do not dig any deeper than necessary to cover the roots, because the tree needs firm support below to stabilize it. **Never** plant it deeper than it was. Bare root trees have a soil line stain at the base of the trunk which indicates previous planting level. Planting a tree too deep can kill it. Roots of bare-root plants should be spread out in the wide shallow hole. Never allow the roots to circle or kink in the hole.

Plantings in poorly-drained heavy clay soils, (which are common in our area), may cause problems. The hole must drain for the tree or shrub to survive. More trees die from root drowning than from drying out. To test the hole for proper drainage, pour a few gallons of water in the bottom; observe and measure the rate of drainage over several hours. Ideal soil drainage is 2" per hour. Planting the tree on a slight mound may be necessary to get the root system out of the saturated soil.

Filing the Hole

If the soil has a high clay content it should be mixed with 25% organic matter before the hole is backfilled. New roots will grow more rapidly in this lighter, better-drained soil mixture. Once the tree or shrub is in place, fill the hole ¾ full of soil. Then tamp the soil around the tee and water it thoroughly. After the water has drained away, finish filling the hole. A small earthen ridge constructed around the tree will help retain water in the summer.

Fertilization

No fertilizer should be used when planting the tree. Fertilization is ineffective until the tree has partially reestablished its root system.

Mulching

A circle of mulch should be placed around newly planted trees to conserve soil moisture and moderate soil temperature. It has been proven that wood-chip mulch can nearly double tree growth in the first few years after planting. The mulch should cover an area at least 4 times the diameter of the root ball or bare root at the time of planting, and should be 3-4 inches deep.

Trunk Protection

Trees can be damaged by the warm winter (sunscald) and borer infestation and should be protected by some type of wrap. Rabbits and mice can also damage the trunks of small trees during the winter. If standard paper tree wrap is applied it should be removed in the spring.

Staking
Stake trees for 1-3 years if stability is a problem. Drive 2 or 3 stakes in the ground outside disturbed soil area and attach twine encased in a garden hose to protect the trunk. Avoid staking it too rigidly or allowing guide wires to damage the bark.

Maintenance
Trees and shrubs are an investment that must be maintained properly to reap the benefits. Plants need proper watering, pruning and pest control after they are planted, especially the first few years.

Mulching
The main purposes of mulching are to maintain soil moisture, reduce weeds, prevent erosion and prevent heaving of the soil by keeping the soil temperature more constant during rapid freezing and thawing in the spring and fall. Soil covering the plant's root ball should remain free of sod for at least one year after planting. Many materials are suitable for mulch. Maintain 3 inches of mulch around your trees and shrubs. Excessive mulching holds excess water and can rot your tree roots.

Pruning
One of the most necessary garden practices is pruning. First, it is important to remove dead, diseased, and broken branches. But pruning should also be done for the following purposes:

- To reduce size of overgrown plants
- To train young trees
- To thin out trees and shrubs
- To remove dead flowers and see pods
- To rejuvenate a declining shrub
- To make young shrubs more bushy
- To develop a special form
- To offset root loss after transplanting

Although minor corrective pruning can be done during any season, the best time for most trees and shrubs is late winter before the leaves emerge. There are many exceptions. For example, spring flowering shrubs should be pruned after flowering, but those that bloom in the summer or fall should be pruned in late winter. Trees such as elm, maple, birch, dogwood and walnut "bleed" sap freely if pruned in late winter. The sap may draw insects that otherwise would not congregate in such an area. Therefore it may be more desirable to postpone pruning these trees until the leaves mature. The cut should be ⅛ to ⅜ in. above the bud and slightly slanted.

Hedges should be sheared narrower at the top. The low branches will not receive adequate light for dense growth if shaped wider at the top.

Some shrubs, such as roses, are headed back by pruning individual branches. Position the blunt end of the pruners on the side of the branch opposite the bud. The cut should be sloping just above the strong bud. Cutting too close may cause the bud to dry out. If the branch is cut too far above the bud, the stub will die back to the bud and increase the chances of bacteria and fungus entering. This can cause a cavity to form in large branches.

Tools should be sharp, not only to make the job easier, but also to make smooth even cuts. Guard against over pruning. Do not remove more than ⅓ of the crown during the pruning process. Pruning too heavily can seriously affect the tree's health and growth rate. For more information on pruning contact a local nurseryman or your local Extension Service.

Fertilizing shrubs **Fertilizing Woody Plants (purdue.edu)**
Observe plant symptoms. Shrubs which have small, light green leaves and short thin twigs should receive a moderate application of fertilizer to simulate more attractive growth. Apply about 1 cup of 5-10-5 fertilizer to medium-sized shrubs which are 4-8 feet tall. Use about half this amount on small shrubs which are 3 feet tall and twice as much on large specimens which are more than 8 feet tall. Apply the fertilizer uniformly over the root zone starting about 6 inches from the base of the shrub and extending out about a foot beyond the branches. Apply the fertilizer in the fall after the first hard frost. Do not fertilize shrubs which are making satisfactory growth.

If you are not sure whether your plants need fertilizer, wait until they are in a stage of active growth about a month or 6 weeks after the last spring frost. You may then apply a little or moderate amount of fertilizer as seems to be needed by your plants.

Use caution when applying fertilizer from July through October. This can cause vigorous tender growth late in the season, which may be killed by cold weather in early winter.

Fertilizing Trees **Start Preparing Trees for Winter and Next year | Purdue Extension Forestry & Natural Resources**
Trees which are making weak growth on poor soils may respond to moderate applications of fertilizer. Use 2 pounds of a 5-10-5 formula for each inch of trunk diameter measured 4 feet above the ground for trunks less than 3 inches. Apply the fertilizer, as suggested for shrubs, after the first full hard frost.

The easiest and most practical method of application is to broadcast the fertilizer over the area of greatest concentration of feeder roots. These are located in a band around the trees starting about 2 feet from the trunk and extending several feet beyond the ends of the branches. Scatter the

fertilizer evenly over the area, and apply water liberally to suck it into the ground. Most of the feeder roots occur in the top foot of the soil with few extending below 2 feet.

Mature trees which are making very weak growth on poor soils may benefit from having fertilizer placed in holes around the tree. An easy way to mark off the area to ensure complete coverage is to make concentric circles. Make the first circle about 3 feet from the trunk and successive circles at 18 to 24 inch intervals along these circles. The holes may be made with a punch bar when the soil is moist after a period of rain or sprinkler irrigation.

Apply the fertilizer at the rate of 3 (5-10-5) formula for each inch of trunk diameter 4 feet above the ground for trees with trunk greater than 3 inches. Mix the fertilizer with equal parts of dry soil or sand and distribute in each hole. Water may be used to cause the fertilizer to move out into the soil around each hole. Fill the top portion of each hole with rich garden soil.

The fertilizer in the holes will become available quite slowly. Thick concentrations of feeder roots usually develop near each point of application. The trees should show renewed vigor the year after application. The treatment should not have to be repeated for several years.

TREES FOR LANDSCAPING

Selection of the proper tree species is a very important first step to consider when planting a tree. Selecting the wrong plant can be a waste of money when the plant fails to survive, or it can be the beginning of years of problems.

There are many tree species that can be successfully planted. Conditions vary widely, and the species chosen must be carefully matched to your site. Factors to consider are explained below:

- **Cold Hardiness** - Landscape plants are assigned numbers that correspond with the coldest zones in which they are reliably hardy. The zones are based on the average annual minimum temperatures. Floyd County is in zone 6a. Be sure the species you select is for our zone.
- **Tree Height and spread** - The numbers given for tree height and spread should be used as a guide for the plant's expected appearance at maturity. Height, spread and shape may vary due to the genetic potential of the plant and the growing conditions provided. Small trees should be planted under utility wires. Medium trees can be used to match the scale of homes. Large trees are often best in large, park-like spaces.
- **Growth rate** - Should not be the most important consideration when selecting a tree. The growth rate of a tree will vary greatly with the conditions under which it grows. Adequate water, fertilizer, proper planting and freedom from pests will encourage growth. Many fast-growing trees have certain other undesirable characteristics.

- **Spacing** - Plant spacing varies with the intended use of the plant. Trees for hedges or screens will be planted closer together than those used for shade. Consider the function and mature spread of a tree when planting.
- **Longevity** - Thirty to forty years is considered average for an urban tree. Many fast-growing trees are very short-lived.
- **Deciduous versus evergreen** - Deciduous plants lose their leaves each fall and are dormant through the winter months. However, evergreen trees retain their foliage and color throughout the seasons. These characteristics are important when considering the winter landscape function and appearance of a plant.

Trees Well Suited to Indiana [fnr-idnr-36.pdf (purdue.edu)]

Tree Conservation in Development Areas

Mature trees can add 10-30% to the property value of a home. They provide shade and privacy, reduce soil erosion and noise pollution, and help clean the air. Trees have a high economic value in a developing area and the effort to protect them is worth the cost. How can we preserve trees?

Before Construction: Planning to Save Trees

- Gather information: Use soil and topo maps, aerial photos and natural resource professionals to understand the site's attributes.
- Walk the Site: Walk over the area and map out potential specimens (good aesthetics) trees, special features, sensitive areas, etc.
- Use Creative Design: Use the information you've gathered to make adjustments in the layout of the roads, driveways, sidewalks, utilities, etc. to save specimen trees and greenspace areas.
- Utilities: Plan underground utilities so they can all be combined in the same trench away from trees and potential planting sites. When near trees tunnel under roots to avoid cutting.
- Mark Trees to Remove: Mark trees in construction areas and hazardous trees for removal. Trees larger than 16" in diameter may be sold to the timber buyers, depending on species and condition. Thinning out the stand well ahead of time will allow trees to acclimatize to a new open environment.
- Mark Specimen Trees: Flag trees of high aesthetic value for protection. In selecting specimen trees consider the condition of the tree, the spacing and the species.
- Tree Planting: In some cases small open grown trees of desirable species can be transplanted from areas to be cleared. Property buffers, windbreaks and green space areas can be cheaply established with these trees or by planting small trees from private nurseries. Consult with a local nursery or landscaper.

During Construction: Protecting Trees

Understanding how a tree grows can help save it. The roots are the most sensitive part of the tree. They grow out horizontally and can go farther than the tree height. 90% of the roots are in the top 18 inches of the soil. Protect the critical rooting zone around the tree. Protect a circle whose radius in feet is equal to the tree diameter in inches (for a 15 inch tree protect a circle with a 15 foot radius). Disturbing more than 40% of this zone will kill the tree.

Avoid Compaction - Compaction reduces the amount of air and water that is available to the roots.

- Erect Barriers: Fencing will keep equipment off the rooting area of the tree. The barrier should be out as far as the critical root zone
- Cushion Soil: Where areas cannot be fenced, cushion the rooting area with wood chips, wood planking or brick paths.
- Direct Traffic: Create traffic patterns to keep soil compaction to a minimum. Establish safe parking areas for subcontractors.
- Storage, Washout and Barn Areas: Store supplies and equipment away from tree stress. Designate specific sites well away from trees, for burning and washing out of cement trucks.

Reduce Damage from Grading: Removing soil tears up the root system, and adding soil reduces air and water availability.

- Clearing: When clearing, cut by hand or use equipment such as a hydro ax. Where root areas must be graded, cut or prune large roots instead of tearing them with equipment.
- Retaining Walls: Use retaining walls to minimize the grading damage to roots.
- Drainage: minimize changes in the drainage pattern. Existing trees are accustomed to the current drainage. Creating wet or dry areas can kill the tree.
- Filling: Adding soil over the root system reduces moisture and air availability. A well and tile system can help to minimize the impact of putting fill around specimen trees.

Avoid Wounds - Wounds are entry points for disease and insect problems and reduce the transport of food and water.

- Trunk Wounds: Protect unfenced trees by wrapping the trunk with a snow fence.
- Limbs: Prune low hanging limbs that can be broken off by equipment.
- Exposure: Where possible, leave trees in groups. Trees grown in the woods are accustomed to shade. When they are suddenly in open, exposed areas they can be damaged by sun scald, frost cracks, excessive branching and become windthrown.

After Construction: Repairing the Damage

Consult a qualified arborist for technical tree care help.

- Prune: Properly prune all damaged limbs. Don't leave stubs. This allows the tree to heal over more quickly, reducing disease problems.
- Aerate: Aerate soil where compaction has been severe.

- Wounds: Repair wounds by removing damaged bark and wood tissue. Do not apply tree paint.
- Fertilize: When properly done, fertilization can improve the growth, vigor and appearance of trees.
- Water: Watering during dry periods helps offset soil compaction and root damage.
- Cable and Brace: Cabling and bracing can strengthen splits, weak forks and large limbs.

Resources for tree care can be found on the DNR website: DNR: Forestry: Forestry Home (in.gov)

ATTRACTING WILDLIFE TO YOUR YARD

The presence of wildlife can make a backyard a special place. By creating a mini-sanctuary on your property, you can attract and hold many species of wildlife. Space is usually at a premium, but space not used for recreation, gardening or other activities may be landscaped for wildlife.

The first step in planning is to assess your property as it is right now. Identify the habitat elements that already exist for wildlife. Plants that provide food (seeds, fruit, nuts, and insects), dense shrubbery, a stand of evergreens or a brush pile may already be in place. Make a drawing of your property and start putting your ideas on paper. Plan to landscape so that you can see the wildlife-attracting features from a convenient window, patio or deck. It's important to include 3 basic elements that all wildlife requires: food, water, and shelter. Try looking at your yard from an animal's viewpoint. Consider the needs of wildlife you wish to attract.

The ideal wildlife management plan tries to supply year-round food through a variety of vegetation. Plants native to the soils and climate of your specific area provide the best overall food sources for wildlife.

On a typical residential lot, it's difficult to produce enough natural food for wildlife to last all winter. Supplemental feeding will help bridge the gap for your backyard residents and provide your household with many hours of enjoyment. Select a feeder, tray or holder designed for the food you plan to provide and place it in a secure location that can be viewed easily from your home. Remember to keep your feeders well stocked until spring when natural sources of food

become more abundant. Remember during the summer you may want to provide sugar water in a feeder for the hummingbirds.

Water is needed for both drinking and bathing. It can be provided by a birdbath, a small pool, a recirculating waterfall , a shallow dish, or through a dripping hose. The amount of water you need to supply depends on the type of wildlife you want to attract. Elevated bird baths will protect birds from cats and other predators. A shallow, wide-rimmed dish will provide water for small animals if placed by cover.

The best water source is dependable year round. Be sure to replace water regularly and keep bird baths clean. When the temperature drops below freezing, use a bird bath heater or remove ice in the morning and refill with water daily.

The third element of a wildlife plan is shelter. Shelter must provide escape cover and serve as a home base for wildlife. Nesting cover is essential for producing and raising young. Concealed places for hiding from predators and nesting can be created by planting trees and shrubs with overhanging branches, using prickly or thorny plants in a few areas, and establishing ground covers or prairie grasses in several areas.

Rows of trees and shrubs can provide cover and act as a wildlife corridor while providing privacy and screening out noises. "Living fences" of dogwoods, redbuds, osage orange, or mapleleaf viburnum creates an ideal habitat. Such hedgerows can be established by planting in staggered rows at a spacing of 6 feet. Replant annually until a dense hedgerow is established. Be sure to mark it carefully to prevent accidental mowing.

Clump planting of a few to several trees are attractive to birds and mammals. White pine, Oaks, and wild crabapples are recommended species that can be planted in spacings of 8 feet minimum. Mowing between the seedlings during their first 2 years will help them become established. If you establish more than one clump, a hedgerow planting to connect them will act as a travel lane.

Wildlife plantings that provide both food and cover can make the difference between survival and death during severe winter weather. Evergreens, hollies, and serviceberries are among the plants that provide good winter protection.

In addition to food, water and shelter, good wildlife habitat features variety in plant species, in slope and terrain, and in the transition between plant communities.

Just for Birds

Tips for Feeding

- Place only the amount of food in a feeder that can be eaten within a few days.

- Keep feeding areas clean by raking up spilled seeds and grains periodically and wiping off messy feeders
- Use only fresh, clean, dry seeds and grains in your feeders.
- Put the feeders in places that are protected from the wind and that have lots of cover nearby.
- Provide water at your feeding station. Clean and refill every few days.

Meals

Sunflower seed - bluejay, bobwhite, cardinal, chickadee, finches, nuthatch, woodpecker
Millet, Wheat - bobwhite, dove, goldfinch, sparrow
Oats - bobwhite, chickadee, mourning dove
Cracked corn - bobwhite, cardinal, mourning dove, sparrow
Thistle (Niger) seed - goldfinch
Suet - bluejay, brown creeper, chickadee, mockingbird, nuthatch, tufted titmouse, woodpecker, wren
Chopped Apples & Raisins - mockingbird, robin, wren

Trees, Shrubs, & Vines that attract Birds

Beautyberry	Hawthorn
Birch	Persimmon
Blackberry	Raspberry
Blueberry	Red Cedar
Buttonbush	Sassafras
Crab Apple	Serviceberry
Dogwood	Sumac
Elderberry	Trumpet Vine
Greenbrier	Virginia Creeper

Just for Butterflies

Brightly colored butterflies can be a welcome addition to your backyard. Approximately 750 species of butterflies are found in North America, and very few are agricultural pests. To attract the greatest number of butterflies and have them as residents in your yard you will need to have

plants that serve the needs of all life stages of the butterfly. They need a place to lay eggs, food plants for the larva (caterpillar), a place to form a chrysalis, and nectar sources for the adult.

Most adult butterflies may live 20-40 days. Some, however, are believed to live no longer than 3-4 days, while others, such as over-wintering monarchs, may live 6 months. Monarchs do not over-winter in Indiana.

Adults searching for nectar are attracted to red, yellow, orange, pink or purple blossoms that are flat-topped or clustered and have short flower tubes which allow the butterflies to reach the nectar with their proboscis. Nectar producing plants should be grown in open, sunny areas , as adults rarely feed on plants in the shade.

Some caterpillars are picky eaters, and rely on only one or 2 species of plants, while others will feed on a variety.

Plants and herbs that can attract butterflies

Asters	Goldenrod
Bee Balm	Milkweed
Butterfly Weed	Lilac
Calendula	Phlox
Joe-Pye Weed	Red Clover
Coneflowers	Black-Eyed Susan
Cosmos	Thyme
Hyssop	Yarrow
Golden Alyssum	Zinna

Another excellent resource for attracting butterflies can be found on Purdue University's website: (Recommended Indiana-native Plants for Attracting Pollinators)

MANAGING WOODED AREAS

Often taken for granted, mature trees give homesites a natural beauty that otherwise might take decades to achieve. A house with trees on the property typically sells for a higher price than one without and tends to move faster on the marketplace.

If you are selecting a site for a new home, consider the size of the lot. One-third of an acre is about the minimum size on which you can build and still have a few trees.

Many builders are seeing the wisdom in keeping mature trees as part of the landscaping around new homes and buildings.

Before building, be sure that the trees you expect to save are clearly marked so the contractor knows you want to keep them. Build temporary fences so construction equipment will not damage trees or pack soil around their roots. It is also possible to move especially desirable trees from construction sites to other locations on the property. It's best to seek professional advice when considering this.

Cutting into the tree's roots and changing the ground level around a tree are the two most common causes of tree death or damage during construction. If a change in grade is necessary, build a retaining wall at a distance sufficient to save as many of the tree's roots as possible. Roots can extend far beyond the limits of the tree's leaf canopy. A stone wall can help keep soil away from the trunk.

Rising land values, expanding highway and utility systems, greater personal income and more widespread enactment of zoning regulations have contributed to single-family home development on small, rural tracts of land within our country. Some homeowners find themselves with the opportunity and challenge of managing 3-15 or more acres. Instead of converting it all to grass and spending hours each week mowing, many owners prefer to establish woodlands through planting or natural succession. Reestablishing trees and shrubs in non-wooded areas can serve several purposes including screening or buffering adjoining properties or land uses.

Effective woodlot management begins by determining your objectives in view of what is most feasible for your land. If much of your homesite is already wooded, you may wonder if you

should preserve it in its natural state, enhance its use for recreation or harvest some of the wood. Fortunately, woodlands are adaptable enough to be managed for more than one purpose.

Most small stands can sustain a limited annual cut of firewood, but few can generate enough wood for a timber sale. It's important to remember that as the size of a woodland tract diminishes, so does its ability to yield frequent crops of high-valued, marketable timber. The value of trees varies according to the demand for them and the quality of their wood. When cutting firewood, harvest the most undesirable trees including those that are poorly formed or damaged by insects, fire or weather.

Woodlands and wildlife can be managed compatibly. Some homeowners prefer to manage their woodland tracts for game and develop a private hunting area while others enjoy preserving wildlife to observe. Different management techniques are required for different animals, but you can create desirable habitats for each species if your tract is large enough.

Woodlots are a poor place for livestock because the forage is sparse and of poor quality. Livestock not only trample and browse young trees and injure the larger ones, but compact the soil. This compaction reduces tree growth, increases water runoff during heavy rains, and promotes soil erosion.

Developing hiking trails, picnic areas, and other recreational facilities on your wooded homesite should be done very carefully to prevent tree damage and erosion. Locate trails on the contour whenever possible. Install culverts or bridges when necessary and use gravel, wood chips, or other suitable material on the paths.

Proper management practices are essential to protect your woodland from insect damage, undesirable vegetation, and fire.

Trees are subject to attack from many insects. A poorly managed forest of weak trees is usually more susceptible to insect damage than a well managed one. Insects attack by defoliating, boring into the twigs and roots, and by girdling the stems. Some insects also attack the fruit and seed, reducing the tree's reproductive capacity. Close observation and early control measures can prevent excessive insect damage.

Carefully select and control vegetation as needed. Prolific, obnoxious, non-native competitors such as bush honeysuckle, autumn olive, japanese barberry, etc. should be eliminated to improve the visibility in the woods and encourage the growth of the more desirable vegetation. It would be impractical to eliminate all of the poison ivy, but you can spot control with a suitable herbicide or mow where a person may come in frequent contact with it.

Prevention is critical to protect your woodland from fire damage. Many trees are lost because of careless trash burning, campfires and smoking. Small woodlots can receive protection by clearing firebreaks at least 8 feet wide.

Successfully managing a wooded homesite involves a wise investment of labor, time and money. As with other investments, careful planning and research are needed before you invest your resources. Additional technical assistance can be obtained by contacting your Cooperative Extension Service or a forester with the DNR state forestry division.

To gain maximum benefit from your wooded homesite you must determine your land's assets and set realistic management goals. Here's how to begin:

- Make an inventory of your trees to determine their species, size, condition and density.
- Mark your property boundaries to avoid the possibility of accidental timber trespass and other management problems. When boundaries are in doubt, a professional survey may be necessary. Indiana's Purple Paint Law allows for marking perimeter boundary trees or posts with purple paint to serve the same legal purpose as a "No Trespassing" sign.
- Determine what benefits you want from your woodlands - natural beauty, recreational opportunities, wildlife enhancement, firewood, timber….
- Develop and implement a plan including necessary thinning, pruning, elimination of unwanted species and fire protection.
- Resist the urge to mow your woods. A mowed woods may appear more pleasing to some, but the whole elimination of understory plants can cause injury to larger, established trees.
- Allow the woodland's natural materials such as leaves and twigs to decompose and return nutrients to its system.
- Allow dead trees to stand whenever practical. Many species of wildlife depend upon dead and dying trees.

INVASIVE MANAGEMENT

Managing the invasive plants on your land can be costly and time consuming but it's imperative to the health and biodiversity of your land.
Taking an inventory of the unwanted, obnoxious, and invasive plants on your property will be an important first step in eradicating or managing them. Educate yourself on the most effective treatment method (foliar spray, cut-stump, hack and squirt, etc.) and best time of year for treatment or application. Keep a list of what species you are battling as well as what you used for treatment and when. Another suggestion is to make a sketch of your property with notations of where invasives are growing or have been treated.
Patience and persistence will be required with some species as they require multi-year treatment cycles.

The State of Indiana Cooperative Invasives Management (SICIM) organization is an excellent resource for managing invasives. (https://sicim.info)

GLOSSARY

Bedrock - The more or less solid rock found on the surface of land or below the soil.
Channel - A natural stream or excavated ditch that conveys water.
Clay - (1) Soil consisting of particles less than 0.002 mm in diameter. (2) A clay dominate soil texture class.
Contour - An imaginary line connecting points of the same elevation on the earth's surface.
DNR - Indiana Department of Natural Resources
Drain -A buried pipe (subsurface drain) or a ditch (open drain) for carrying off surplus groundwater or surface water.
Drainage - The use of ditches or subsurface drains for the removal of excess surface water or groundwater from land.
Drainage area - The area draining into a stream at a given point. The surface runoff area is considered as the drainage area or watershed.
Drainageway - A depression (natural or artificial) that carries surface water to a larger watercourse or outlet.
Environment - External conditions that may act upon a living organism or community to influence its development or existence.
Erodibility - Susceptibility to erosion.
Erosion - The process which moves soil from one location to another by wind, water or other natural action.
Floodplain - Land that borders a stream and is subject to flooding when the stream overflows its banks.
Floodway - A channel used to carry flood flows.
Grade - (1) The slope of any surface. (2) Any surface prepared to a design elevation for the support of construction. (3) to finish the surface of a land area to a smooth, even condition.
Grading - Giving the land surface a desired slope or elevation by cutting/or filling.
Ground cover - Low-growing, spreading plants used for low maintenance landscape areas.
Habitat - An area where an animal or plant lives which supplies food, water, shelter, and space.
Impervious - Not allowing fluids (water) to pass through.
Invasive - Non-native, aggressive
Karst - Landscape underlain by limestone which has been eroded by dissolution, producing ridges, towers, fissures, sinkholes and other characteristic landforms.
Mulch - A layer residue covering the land surface which conserves moisture, holds soil in place, aids in establishing plant cover, and minimizes temperature fluctuations.
Natural drainage - The flow of stormwater run-off over the land in its pre-development state.

NRCS - Natural Resources Conservation Service.
Outlet - The point of water disposal from a water source.
Outlet channel - A waterway constructed or altered to carry water from man-made structures.
Permeability - The quality of a soil that allows water or air to move through it.
Permeability rate - The rate which water will move through a saturated soil expressed in inches per hour. Classified permeability rates are classified as: **Very slow* - less than 0.06 in./hr. **Slow* - 0.06 - 0.20 in./hr. **Moderately slow* - 0.20 - 0.63 in./hr. **Moderate* - 0.63 - 2.0 in./hr. **Moderately rapid* - 2.0 - 6.3 in./hr. **Rapid* - 6.3 - 20.0 in./hr. **Very rapid* - More than 20.0 in./hr.
Pervious - Allowing water to pass though.
Pesticides - Chemicals used to control undesirable animals, plants or insects, etc.
pH - A measure of how acidic / basic water is. 7.0 is neutral, values below are acidic, values greater are basic (alkaline).
Retention - Temporary or permanent storage of stormwater to prevent it from leaving the site.
Runoff - The portion of precipitation that flows off the land surface.
Saturation - The point when soil or aquifer will no longer absorb any water without losing an equal amount.
Sediment - Solid material that has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth.
Seedbed - Soil prepared to promote the germination of seed and the growth of seedlings.
Seedling - A young plant grown from seed.
Silt - (1) Particles of soil between 0.002 and 0.05 mm in diameter. (2) Soil textural indicating more than 80% silt.
Slope - A numerical ratio or percent of deviation of a surface from the horizontal.
Soil - The mineral and organic material on the earth's surface that serves as a growing medium for the plants.
Soil and Water Conservation District (SWCD) - Created under state law to develop and carry out a program of soil, water and related resource conservation, use, and development within its boundaries. A subdivision of state government with a local governing body having limited authorities.
Soil Survey - An inventory of the county's soil resources.
Soil texture - The relative proportions of sand, silt and clay in a given soil.
Subsoil - Soil below which roots do not normally grow. It is the B horizons of soils with distinct profiles.
Swale - Usually, a heavily vegetated elongated depression in the land surface that is at least seasonally wet, normally without flowing water.
Tile Drain - Pipe laid to a designed grade and depth, to collect and carry excess water from the soil.
Topography - General term to include characteristics of the ground surface and other physiographic features.

Topsoil - The dark-colored surface layer rich in organic matter and having textural and structure characteristics favorable for plant growth.
Vegetative stabilization - Protection of erodible areas with some type of vegetation.
Water table - The level below which the ground is saturated with water.
Watershed - An area from which water drains and contributes flow to a given place or point on a stream or river.
Zoning ordinance - An ordinance to protect the public health, safety and general welfare based on the police power of government.

Notes: