



## Forest Stand Improvement - NRCS Practice Code 666 –

Refer to: [http://efotg.sc.egov.usda.gov/references/public/IL/IL666\\_2014.pdf](http://efotg.sc.egov.usda.gov/references/public/IL/IL666_2014.pdf)

Forest Stand Improvement (FSI), also known as Timber Stand Improvement (TSI), is used to remove undesirable trees and provide resources for the desirable trees that are left. With these resources (space, light, water, and nutrients) freed up, the desirable or crop trees are allowed increase their growth rate. FSI can also cause trees like oaks to produce more fruit (acorns) that are an important food for wildlife. FSI should not be done until after invasive species are removed, due to the fact that extra resources can allow the invasive population to explode. Please see Woody Invasive Brush Management for more info on removing invasive species.

### Target Trees

Usually, the desirable or crops trees to be left are Oaks, Hickories, and Black Walnuts. These trees have a high timber products value, while at the same time providing many benefits to wild life. Crop tree species can vary depending on the goals of the landowner. For example, maples may want to be left for maple syrup production. The down sides to leaving maples are that they provide little wildlife value, and shade out new trees that may be more beneficial to wildlife.

Trees targeted to be removed depends on the landowners goals for the property. Generally hollow trees or trees with poor form are targeted. However, many of these trees can have great wildlife value. For example a large oak tree with many low branches may not be very valuable for timber products, but it can produce a large number of acorns, which are one of the most important food source in the Illinois forest. Also, a hollow tree can provide shelter for many wildlife species.

In upland situations, it is a good rule of thumb to start by removing trees that can become invasive like osage orange (hedge), black locust, and honey locust. Next, your mesic tree species should be targeted. These include trees such as maple, elm, hackberry and ash. Some of these trees may have some timber value and could be logged if large enough. **(IT IS RECOMMENDED TO GET A CONSULTING FORESTER TO MANAGE YOUR TIMBER SALE)**

Bottomland areas are a little different than uplands because some mesic species may be your crop trees. A walnut or oak should still be given priority over a hackberry or ash as a crop tree if they are present.

No more than one third of the trees should be removed from an area in a given year. If too many are removed at once, there is a risk of wind throw (trees being blown over) and epicormic sprouting (branches sprouting on the trunk), which can lower the trees value.

### **DO NOT START FSI BEFORE INVASIVE SPECIES ARE REMOVED**

### Treatment Methods

There are several ways to remove invasive species from your property. These methods may be used in conjunction with each other over time in order to achieve desired results. The treatment types are:

1. Cut Stump Method
2. Basal Bark Spraying
3. Girdling
4. Prescribed Burning

Each method has its advantages and disadvantages. Cut stump method will ensure a higher kill percentage but is hard labor in order to do it this way. Basal bark spraying is a cost effective way to kill trees under 6", but with some species it is hard to get near the stem to spray directly on the bark. Girdling is cost effective ways to kill trees, but areas must also be chemically treated and checked for re-sprouting. Prescribed burning will help reduce non fire tolerant species (i.e. many undesirable trees) as well. All of these practices used in conjunction with each other can aid a landowner in returning their property to native species.

## Cut stump method



**Above: Week 1 after treatment; Below: Week 5**



## Foliar Spraying



**Above: Week 2 after treatment; Below: Week 5**

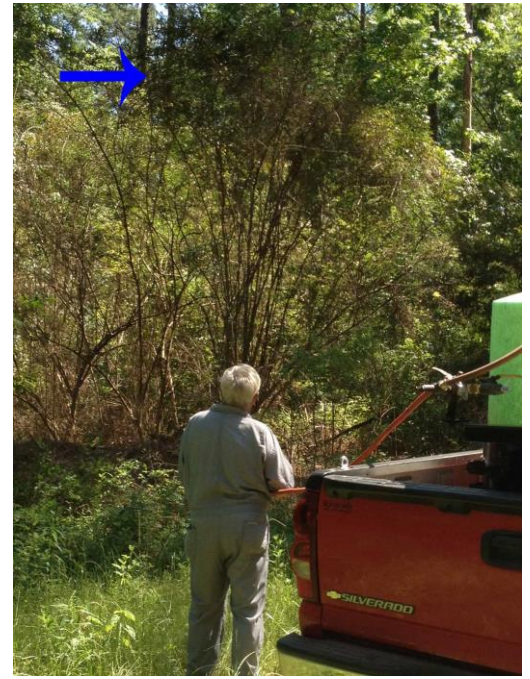




Can create wildlife structures with woody debris



Ensure complete coverage of target species



## Basal Bark Spraying



## Girdling



Girdle entire tree and treat chemically





# Prescribed Burning



Herbicide should be selected based upon the species you are trying to control. We recommend that you contact a local chemical dealer to talk about the alternatives. It is a person's responsibility to read and follow all label directions for a pesticide. Follow all procedures set forth for obtaining and using a chemical applicator's license (if applicable).

It is also important to select a herbicide based on the treatment being conducted on the property. The differing methods may need to have different chemicals in order to manage the plant. Some chemicals can be used for several types of methods. Common chemicals used for each treatment will be shared in the section below. Please consult with a chemical dealer about your management objectives and treatment method before selecting a herbicide.

## Conducting Each Treatment

### Cut Stump Application:

Cut stump application can be used on shrubs taller than 5ft and small trees any time of the year. It is done by cutting the shrub or tree off near the ground and applying herbicide to the stump. The herbicide should be applied within 30 minutes of the plant being cut. On smaller diameter stems the whole stump should be covered with the herbicide solution. On larger diameter stems only the cambium layer (outer inch) needs to have herbicide applied to it. A dye can be added to the herbicide solution to avoid overlapping spraying and misses. Recommended herbicides include; 50-100% (although 20% has been proven effective) solution of glyphosate (e.g. Roundup), a 4% mixture of 2,4-D & triclopyr (e.g. Crossbow) with basal oil, or 20-30% mixture of triclopyr ester (e.g. Garlon 4) with basal oil. **READ AND FOLLOW ALL HERBICIDE LABELS AND INSTRUCTIONS.**

### Basal Bark Application:

Basal Bark Application can be used on shrubs and trees less than 6 inches in diameter any time of the year. It is done by spraying the lower 12-15 inches, including the root collar, until thoroughly wet. A dye can be added to the herbicide solution to avoid overlapping spraying and misses. The recommended

herbicide is a mixture of triclopyr ester (e.g. Garlon 4) with basal oil. **READ AND FOLLOW ALL HERBICIDE LABELS AND INSTRUCTIONS.**

**Girdling:**

Girdling can be used to kill larger trees. It is done by cutting two complete, connecting rings around the tree, three inches apart, and at least ½ inch deep. Although, you can use one complete connecting ring at least ½ inch deep, and spraying the cut with herbicide. Recommended herbicides include 50-100% solution of glyphosate (e.g. Roundup), a 4% mixture of 2,4-D & triclopyr (e.g. Crossbow) with basal oil, or 20-30% mixture of triclopyr ester (e.g. Garlon 4) with basal oil. **READ AND FOLLOW ALL HERBICIDE LABELS AND INSTRUCTIONS.**

**Prescribed Burning:**

Prescribed burning is a useful tool in aiding in the reduction of undesirable species. Most are not fire tolerant like many desirable species are. Prescribed fires are conducted by establishing firebreaks around a pre-determined burn unit and then conducting a burn on the area. It is the landowner's sole responsibility to prepare their property for a prescribed burn. Please see more information on prescribed burning on the prescribed burning and firebreak establishment section.

**Other Useful information is available at:**

<http://extension.missouri.edu/p/g9414>

<http://web.extension.illinois.edu/forestry/home.html>

[http://mdc.mo.gov/sites/default/files/resources/2010/10/timber\\_stand\\_improvement\\_10-20-10.pdf](http://mdc.mo.gov/sites/default/files/resources/2010/10/timber_stand_improvement_10-20-10.pdf)