

Controlling Invasive Callery Pear in Arkansas

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Introduction

Exhibiting rapid, compact growth, vibrant white blossoms in spring, and striking scarlet foliage in autumn, the ornamental cultivar of the Bradford Pear (*Pyrus calleryana*), known as the Bradford pear, has insidiously spread throughout Arkansas. This species has been unwittingly introduced by gardeners and landscapers attracted to its numerous appealing characteristics, ultimately acting as a trojan horse for ecological disruption.

Distribution and Ecological Issues

Even under controlled conditions and with careful management, Bradford pear continues to spread, primarily through birds and other animals that consume their abundant fruits (inedible for human consumption) in late summer and fall. Its rapid and aggressive proliferation across Arkansas has become a significant concern among landowners, many of whom have seen their pastures and landscapes overtaken by hundreds of these trees within a few years. The species is equipped with sharp thorns capable of puncturing bicycle

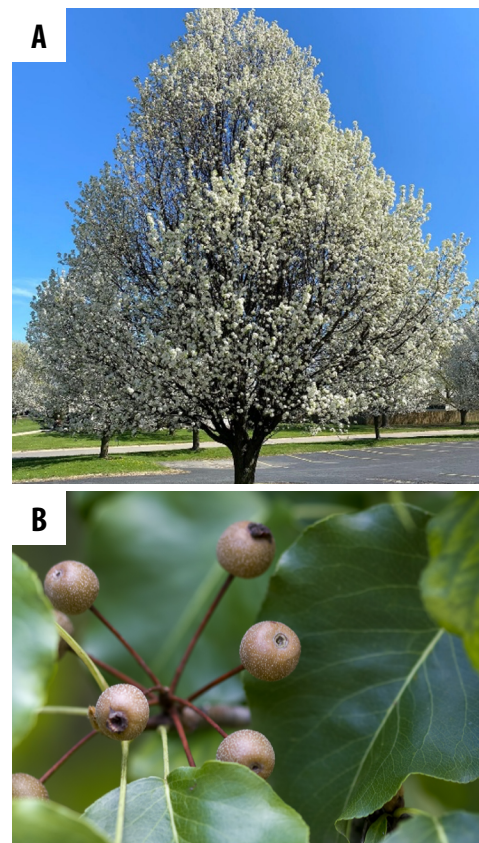


Figure 1. Bradford pear tree in bloom and fruit.

tires, penetrating shoe soles, and injuring grazing livestock. Additionally, Bradford pear trees out-compete numerous native plant species for sunlight, water, and nutrients, resulting in substantial ecological disruption.

Control Methods

The control and eradication of Bradford pear should be imple-

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mented without delay to prevent the species from establishing a strong foothold in the landscape. The most effective management strategies depend on both the size of the trees and the extent of their presence in each area. Methods such as prescribed burning and manual cutting alone have proven largely ineffective, as Bradford pear is known for vigorous resprouting following such treatments. The most successful control technique involves complete removal of the plant, including all roots, through excavation or manual pulling. However, these approaches can be extremely time-consuming, labor-intensive, and, in some cases, impractical, particularly in areas where the infestation is widespread or the trees have reached significant size. Herbicidal treatments have shown varying degrees of success, largely influenced by the size of the trees and the specific application methods used.

Demonstration and Experimental Design

A herbicide demonstration site was established in Stuttgart, Arkansas, where a pasture was becoming overrun with Bradford pear. The goal of this demonstration was to establish a series of treatments which can be recommended to sprayers, landowners, and extension agents to control Bradford pear on their lands. All treatments were applied on 1/10 acre plots consisting of 10-20 Bradford pear trees of varying size and age classes. Treatments were applied in early spring on April 18, 2025, and reassessed for control approximately 40 days post treatment.

Seven treatments were used:

1. Foliar treatment with glyphosate (Maddog 5.4) applied at a 10 GPA rate over the top of young Bradford pear trees less than 3 feet tall without MSO surfactant. Application: a low-volume directed spray, contacting at least 50% of the foliage on all sides. Foliar treatments were applied with an 80° fan tip.
2. Cut stump treatment with undiluted Garlon 3A (Triclopyr) applied to Bradford pear stumps that were removed via a handsaw and chainsaw cut at the base of each stem. Treatments were applied immediately after cutting and sprayed using a 3-gallon pump sprayer.
3. Cut stump with no follow-up herbicide treatment.
4. Basal bark application with Garlon 4 in diesel or seed oil in a 25-to-75 percent ratio applied using a 3-gallon pump sprayer. The base of each stem was thoroughly coated with herbicide.
5. Soil application of Hexazinone (Velpar DF) using 5.3 ounce per acre rate, 1 ml of hexazinone was applied to the base of each stem per 2.54 cm of basal diameter for each stem.
6. Control plot with no control measures taken.
7. Manual removal of Bradford pear using large tractor and chains.

Results

Initial results were documented 40 days post application for each treatment. Below highlights before and after images of each treatment.

Treatment 1: Foliar application with Glyphosate (Maddog 5.4) without surfactant with glyphosate applied at a 10 GPA rate over the top of young Bradford pear trees covering at least 50% of foliage on all sides using an 80° backpack sprayer. Results indicated that of the 18 plants with an average height of 36 inches, five of the 18 stems had minimal green foliage remaining, with much of the foliage allocated to the bottom of the plants or on internal stems near the base of each stem. Two of the stems had a substantial amount of green foliage remaining on the interior of the stems. These leaves and stems likely were shielded from the foliar application by external leaves.

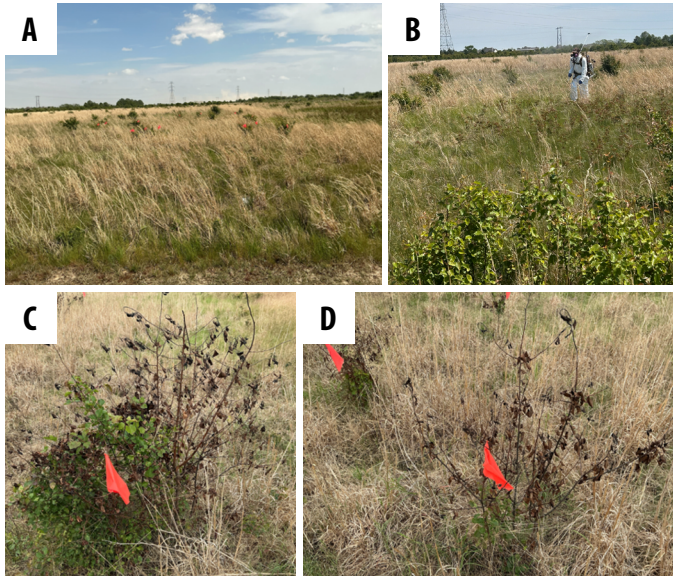


Figure 2. Foliar treatment. **A:** Before foliar application: 18 healthy stems growing averaging 3 feet tall. **B:** Foliar application applied via backpack sprayer with 80° fan tip at 10 gpa rate. **C:** Post treatment 40 days: Green foliage remaining on interior of plant. **D:** Post foliar treatment 40 days: Some foliage remaining at base and interior of clusters.

Management considerations for foliar treatment: ensure adequate coverage of as much leaf area as possible, including leaves and stems on the interior of the stems that could be shielded by outer vegetation when applying foliar treatments using a directed spray method.

Treatment 2: Cut stump with Garlon 3A (Triclopyr)

Cut stump treatment with undiluted Garlon 3A (Triclopyr) applied to Bradford pear stumps that were removed via a handsaw and

chainsaw cut at the base of each stem. Treatments were applied immediately after cutting and sprayed on the freshly cut stems using a directed spray bottle.

Results: Of the nine stem clusters that were manually cut and removed with a chainsaw and handsaw and sprayed with undiluted Garlon 3a (Triclopyr), none exhibited resprouting

40 days post treatment. Manual removal of the stems resulted in a non-insubstantial risk of cuts and wounds from the many thorns that cover the Bradford pear stems. Some surrounding vegetation was damaged due to this treatment constrained to roughly 3 to 4 feet around stem clusters.

Treatment 3: Cut stump with no herbicide treatment

The seven stem clusters removed all had aggressive resprouting after 40 days, indicating this is not an effective treatment of Bradford pear.

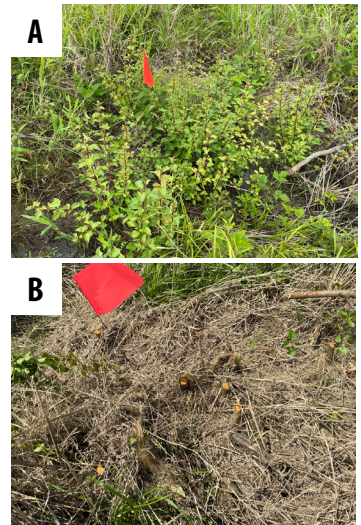


Figure 4. Cut stump treatment control no herbicide. **A:** Stem clusters were removed at the base of each stem as close to the ground as possible. **B:** Post cut stump treatment with no herbicide 40 days: significant resprouting has occurred on all stems and clusters.



Figure 3. Cut stump treatment. **A:** Before Cut Stump Treatment with 9/9 stems standing on average 7 ft tall. **B:** Cut Stump application applied via spray bottle filled with undiluted garlon 3a (Triclopyr) on each individual stem. **C:** Removal of stems via chainsaw and handsaw resulted in many minor to moderate lacerations from thorns on bradford pear. **D:** Post cut stump treatment 40 days: no resprouting has occurred on original stems for any of the nine clusters. Some surrounding vegetation was also damaged.



Figure 5. Basal bark application. **A:** Before basal application all 11 stem clusters were healthy averaging 8 ft tall. **B:** Spray method using a 3-gallon pump sprayer to apply basal bark herbicide treatment. **C:** Ensure proper coverage of all stems in each cluster. **D:** Post basal application treatment 40 days: minimal foliage remaining if any on any of the 11 stems treated.

Treatment 4: Basal bark application treatment

Basal bark application with Garlon 4 in diesel or seed oil in a 25-to-75 ratio applied using a 3-gallon pump sprayer. The base of each stem was thoroughly coated with herbicide.

Results: Of 11 Bradford pear trees averaging 8 feet tall, only a single stem had any green foliage remaining possibly due to inadequate coating of stem at the base. Basal application using a 3-gallon pump sprayer was applied with relative ease to each stem from each cluster. Multiple angles of spray around the base of the tree were used to ensure proper coverage of each individual stem in the cluster. Multiple clusters and stems could be treated in a day with relative ease if dealing with high infestation rates.

Treatment 5: Soil application using Hexazinone (Velpar DF)

Soil application of Hexazinone (Velpar DF) using 5.3 ounce per acre rate, 1 ml of hexazinone was applied to the base of each stem per 2.54 cm of basal diameter for each stem.

Results: Of 14 Bradford pear clusters, only a single stem had foliage remaining for the soil treatment with Velpar DF. Substantial damage occurred to surrounding foliage showcasing its high soil activity. Stems applied using this method were 3 feet tall on average. A single 3- gallon pump sprayer was used to apply herbicide. Dry-flowable Velpar DF should be added slowly and agitated consistently while mixing to ensure proper homogenization. Application of this type

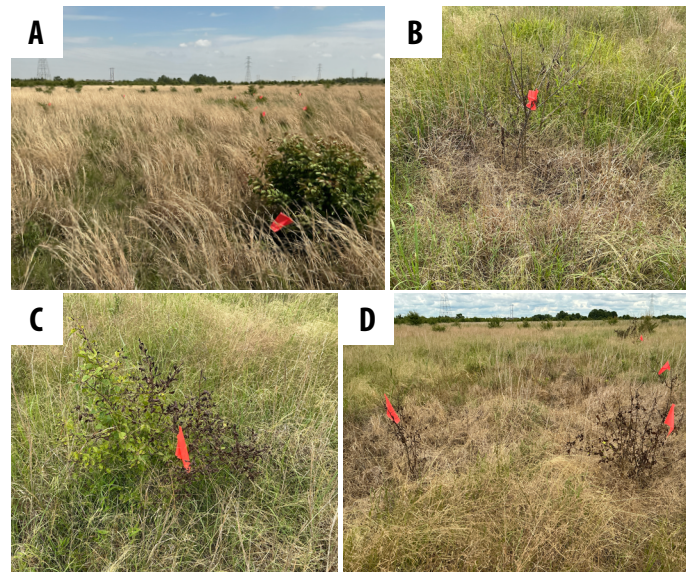


Figure 6. Soil treatment. **A:** Before treatment all fourteen stems were alive and well with an average size of 3 ft. **B:** 40 days post treatment: Almost full defoliation of all 14 stem clusters with significant damage to surrounding vegetation. **C:** 40 days post treatment: A single stem had some green foliage remaining, indicating poor soil coverage due to surrounding vegetation or misapplication. **D:** 40 days post treatment: full defoliation occurred on almost all stems.

was relatively easy and could be performed on many stems in a single day without much manual labor or expense.

Treatment 6: Manual removal of stems

Results: Of the 6 Bradford pear clusters removed with a front-loader tractor, no resprouting has occurred. Attempts were initially made wrapping a chain around the base of the clusters, but due to the clusters being small diameter, chains and straps would slip

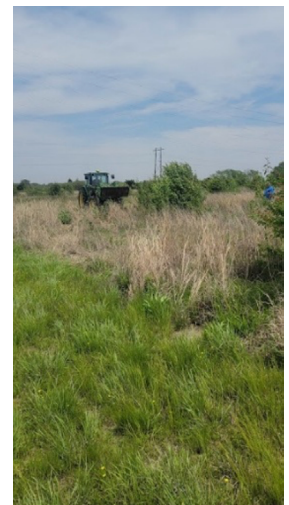


Figure 7. Manual removal of whole stem. Manual removal with tractor.

off the base of the stems. Full excavation using the buckethead was required for larger Bradford pear clusters. Once Bradford pear reached a certain size, it was nearly impossible to remove them without mechanical assistance.

Overall Recommendations for Management

Treatments were assessed based on level of control and ease of application and execution.

Foliar treatment with 10 GPA Mad Dog 5.4 (Glyphosate)

Foliar application of glyphosate had the least amount of control but was the easiest to apply. All stems treated with glyphosate were less than 2 m (6 feet) in height. We attribute the low control due to a lack of herbicide coverage on the leaf area for each individual stem. Likely a second treatment at 40 days would have eradicated the remaining stems leaf area that was shielded.

Cut stump treatment with undiluted Garlon 3a (Triclopyr)

Cut stump application with triclopyr required additional labor cutting down each individual stem. However, application of triclopyr on each individual stem exhibited great control over resprouting.

Cut stump treatment with no herbicide

As expected, cutting down the stem initiated aggressive resprouting of Bradford pear. We do not recommend this treatment without additional mechanical removal or herbicide treatment.

Basal application with Garlon 4 (Triclopyr) in diesel or seed oil in a 25-to-75 percent ratio

Basal application worked quite well on large stem clusters averaging 3 to 4 meters tall (12 feet), with almost all stems resulting in tree mortality. This treatment was minimally labor intensive but did require thoroughly coating each individual stem with chemical.

Soil application of Hexazinone (Velpar DF) using 5.3 ounce per acre rate

Soil treatments of hexazinone were very effective at controlling Bradford pear less than 2 meters (6 feet) tall. However, because hexazinone is highly soil active, much of the surrounding vegetation also suffered from increased mortality. If hexazinone is used for spot treatments, ensure there are no high value plants or stems within 4-5 feet from the point of contact with herbicide.

Mechanical Removal

Because Bradford pear typically grows in clusters with multiple stems, removing them individually can be time consuming and labor intensive. Those greater than 3-4 meters required heavy machinery to remove from the ground.

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