



Forest Pest Fact Sheet

Herbicide Injury From Silvicultural Treatments

Introduction

Natural and newly planted seedlings must be free from excessive vegetative competition for light, water, and nutrients if they are to survive, grow rapidly, and develop into established and vigorous stands. Herbicide sprays constitute an effective method of vegetation control when the proper chemical is applied at the correct time. Herbicide treatments can be divided into two types. Site preparation refers to treatments applied **PRIOR** to planting seedlings (**Figure 1**). Release treatments are applied **OVER OR AROUND** crop seedlings and must control target vegetation and also minimize injury to established conifers (**Figure 2**).



Figure 1. Site prep herbicide treatment applied prior to planting seedlings

Damage

The chemical, application rate, season of application, adjuvants (substances added to improve herbicide performance), and plant species treated act together to influence the amount of vegetation control achieved. These factors also affect the chance of injuring seedlings. Injury can result in little or no new root growth, needle discoloration, deformed needles, dieback, topkill, and tree mortality (**Figured 2, 3, & 4**). Herbicide injury is temporary in most conifers when it does not exceed partial defoliation, and growth losses are often small. Trees that are not seriously injured often outgrow the symptoms within a few years.



Figure 2. Pine seedling with topkill and needle discoloration from herbicide release treatment

Location

If herbicide injury is suspected, look for skips (areas missed by herbicide treatment) within the application and around the edges of the treatment area. Healthy seedlings in skips and outside the treated area indicate that damaged seedlings in the treatment area were affected by a problem with the spray prescription or application.

Symptoms

Tree injuries vary with tree species and herbicide treatments. Symptoms include:

- Discolored needles or needle tip burn
- Abnormal curling, twisting or bending of shoots or needles
- Stunting of growing points
- Death of current year's growth including candles and second flushes of late summer growth
- Dead seedlings



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Prevention & Precaution

To minimize the chance of injuring conifers, READ and FOLLOW herbicide LABEL instructions. The label is the law. Check labels for:

- Approved use on timberland
- Is the product labeled for site preparation, release treatment, or both?
- Lists of conifer species compatible (tolerant) with use)
- Lists of species that could be injured
- Application rate - may change with treatment type or conifers treated.
- Recommended waiting periods between application and planting conifers
- Season of application. Conifers should be dormant or protected (covered) when over sprayed. To be safe, spray only after the current year's needles are the same color as those of previous years. This is an indication that the waxy layer on the needle surfaces has fully developed. The waxes slow herbicide entry into the needles, reducing or preventing seedling injury. Spraying seedlings that have flushed again in late summer can result in significant top kill.
- Note: Ponderosa pine treated with hexazinone when planted will often develop a second (summer) flush of growth for several years after planting.
- Adjuvants approved for use with the product. Adjuvants are products added to the spray mix to modify the behavior of the spray. These additives can act as wetting agents to increase leaf penetration, spreaders and stickers to help spray droplets adhere to leaves and drift control agents. Adjuvants must be used cautiously. They can increase the effectiveness of herbicides but may also increase the chance of conifer injury. Labels often specify reduced amounts of adjuvants for conifer release treatments.



Figure 3. Deformed new growth on young, herbicide-damaged pine



Figure 4. Herbicide damage on established ponderosa pine

For more information: [Link to US Forest Service Regions 1&4 Field Guide \(Pages 146-147\)](#)