Ohio Department of Transportation Research Project Fact Sheet

Efficient and Safe Removal & Debris Disposal of Dead Ash Trees Killed by Emerald Ash Borer

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The Problem

ODOT is challenged with managing fallen, infected, or standing dead ash trees throughout the state. The invasive insect emerald ash borer (EAB), causes ash trees to become brittle hazards along the roadway for the traveling public and the maintenance crews that must manage them. Due to the large number of hazardous ash trees throughout the state, ODOT has had difficulty keeping up with mitigating the hazards. The purpose of the project was to identify and evaluate safe and efficient ash tree removal and disposal practices that can be implemented by ODOT to increase cost-effectiveness of roadside maintenance activities, improve worker safety, and foster safe highway use by the traveling public.

Research Context

Evaluate improved ash tree removal and disposal management processes and equipment to increase safety and efficiency.

- Present national and international industry standard practices for dead ash tree removal and debris handling by public and private workforces
- Evaluate ODOT current practices and provide a gap analysis
- Develop a process for selecting the best solution for ash tree removal and debris handling
- Field test current equipment and processes versus alternative processes and equipment

Research Approach

After interviewing regional DOTs confronted with EAB, compiling industry practices, observing ODOT practices, and researching alternative equipment available in the United States, the research team produced a matrix of recommended processes to implement and equipment to test. The processes included recommendations to help with productivity including morning mobilization and efficient use of time and safety improvements with current equipment. Equipment recommended for purchase keeps workers farther away from hazardous trees, saws, and chippers by using specialized, mechanized equipment and reduces the labor needed to complete the tree work.

Equipment tested included:

- Sennebogen 718E tree handler
- Rotobec 4042HD log grapple mounted to a midsized excavator
- Bandit 2090 whole tree chipper with Kesla loader

As part of Phase II of the study, the recommended equipment was purchased, a third-party safety training was held, and the research team provided an efficiency workshop. A baseline test was performed to measure standard crew productivity levels to the productivity levels of a crew experienced with the new equipment.

Findings

The new equipment has improved the safety and efficiency of the crew using it. After ten months of use, the dedicated operators are more productive than they were when they first started with the equipment and are more productive and safer than ODOT's bucket crews. The new equipment setup can become more efficient by minimizing the additional staff onsite that are not required for the operation throughout the shift. Additionally, ODOT has many bucket truck crews throughout the state that can improve their safety and efficiency by implementing the processes recommended as part of the research.

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This research was sponsored by the Ohio Department of Transportation and the Federal Highway Administration.

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Recommendations

ODOT should implement a comprehensive ash removal and disposal program to improve safety and efficiency through new processes and equipment. This includes the following recommendations:

- Enhance worker training
- Hire contractors for larger or more dangerous jobs to keep up with workload
- Purchase and integrate the following equipment for tree removal work:
  - Sennebogen 718E for tree handler
    - Ability for personnel to maintain distance from trees that are being felled and moved
    - Eliminate personnel on the roadside with chainsaws
  - Rotobec 4042HD log grapple mounted to a midsized excavator
    - Reduces manpower to load chipper
    - Reduce personnel with chainsaws and lifting debris
  - Bandit 2090 whole tree chipper with Kesla loader for debris handling
    - Can handle larger diameter logs than brush chippers with an increased chipping rate
    - Reduce personnel working near the road and chipper

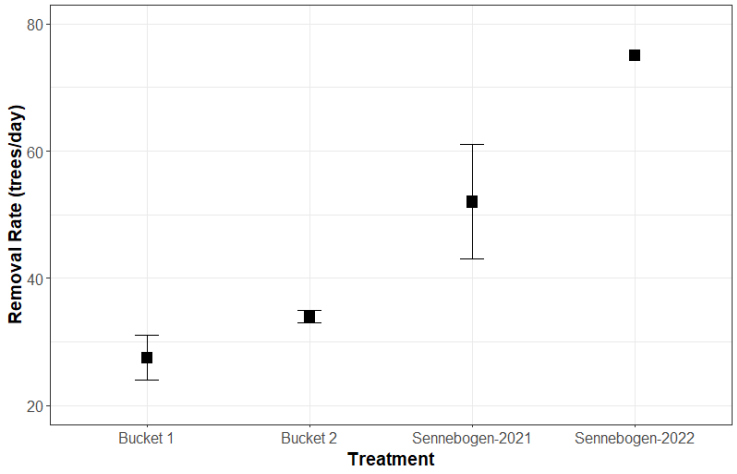
Tested Equipment

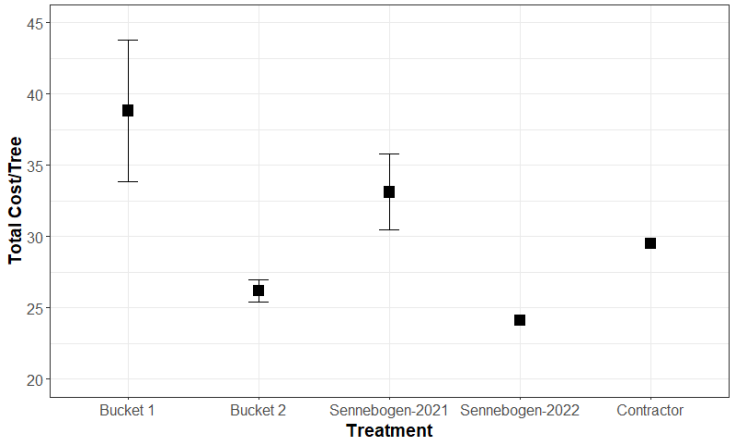
Sennebogen 718E

Rotobec 4042HD log grapple mounted to a midsized excavator

Bandit 2090 whole tree chipper with Kesla Loader

Increased Productivity and Reduced Costs with Tested Equipment





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