

Expanding Youth Knowledge and Skills in Lawnmower Safety

Forrest Lang
The Ohio State University
126 Halterman Hall
1328 Dover Rd. Wooster OH 44691
330-464-6746
Lang.485@osu.edu

Dr. Dee Jepsen
The Ohio State University
262 Agricultural Engineering
590 Woody Hayes Dr. Columbus, OH 43210
614-292-6008
Jepsen.4@osu.edu

Dr. Amanda Bowling
The Ohio State University
200F Agricultural Administration
2120 Fyffe Rd. Columbus, OH 43210
614-688-1121
Bowling.175@osu.edu

Introduction and Literature Review

Lawnmowers can cause serious injuries to young operators and despite manufacturers' improvements, injuries to youth continue to occur. A longitudinal study from 1990 – 2014 found a reported 212,258 children under the age of 18 received emergency treatment for lawn mower-related injuries, with an annual average rate of 11.9 injuries per 100,000 U.S. children (Ren, 2017). In 2021 alone, a reported 4,462 children received treatment for lawnmower related injuries (National Electronic Injury Surveillance System, 2022). A search for age-appropriate educational materials for youth yielded very limited results as the only source of information was found within small engine 4-H project books, which focus more on engines rather than lawnmower safety and operation.

Youth education and development takes on many forms and is present in many programs across the United States. The 4-H Organization reaches nearly 6 million youth each year with various styles of programs (National 4-H Council, 2021). The traditional 4-H club offers a variety of topics for youth to learn about in a project book format that engages them with the experiential learning model of experience, reflection, generalization, and application activities (Horton et al., 1999). An evaluation of a tractor and machinery 4-H project book found 86.3% of respondents agreed or strongly agreed that they were safer tractor operators because of their participation in the program and 97.1% agreed or strongly agreed that the program was effective at teaching youth to be safe tractor and machinery operators (Carrabba Jr. et al., 2001). The 4-H project book provides a format that engages youth in learning a new topic, as well as acquiring safety knowledge.

Methodology

Based on the findings of the literature review, five objectives were identified for the scope of this project

1. Describe the characteristics of lawnmower safety, operation, and maintenance that will educate 4-H youth;
2. Develop activities based on the experiential learning model that has been adapted to the national 4-H curriculum;
3. Develop a training and practice guide based on the national 4-H lawn mower competition;
4. Provide a draft project book for evaluation in the 2022 4-H year; and
5. Publish the project book for use in the 2023 4-H year.

To meet these objectives a panel of experts consisting of Purdue University extension agents, the Ohio 4-H Curriculum Manager, and the State Agricultural Safety and Health Leader of Ohio convened to develop the content of the book. The panel decided to have the content focus on three areas including (1) lawnmower safety, (2) operation of lawnmowers, and (3) lawnmower maintenance. Activities for each area were developed by referencing the 4-H experiential learning model and through the panel's knowledge on the included topics. The developed project book contains 13 content-based activities and 4 operational courses that engage youth in the 4-H experiential learning model. These activities can be completed with any style of lawnmower (i.e. push mower, riding mower, zero-turn mower, electric, and gas mowers) and provide the option

to be repeated, if youth want to take the project multiple years, using a different mower as their project focus. Each activity encourages youth to learn about a different component of their specific mower by providing guiding information. The activities also include a further challenge which promotes youth to engage with adults in their community who are involved in the lawncare industry. One consistent section of each activity was titled Manual Moment, which emphasizes reference to the operator's manual when working on or operating a lawnmower.

Results

Once activities and content were developed, a draft version of the book was sent out for evaluation to 31 Ohio and Indiana 4-H Extension professionals and volunteers. Info about your instrument: A 10-item rubric was used to collect information from these volunteers. Quantitative responses ($n = 2$) and qualitative responses ($n = 15$) were collected and incorporated into the final version of the book. The draft version was then made available to attendees of the Indiana State 4-H Lawnmower Competition held at the Indiana State Fair. The responses to the book yielded very positive feedback from 4-H volunteers, parents, and members; many of which stated that the book was a much-needed resource in the 4-H curriculum.

Following the pilot test phase, the evaluation results were discussed with the panel, changes were made to the book, and the content was formatted by a 4-H designer to ensure the book conformed to 4-H publishing standards. The result was a 52-page project book that is available in Ohio and Indiana for the 2023 4-H program year. A final version will also be submitted to the national 4-H review board for their jury review.

Future Plans

While this book focuses specifically on lawnmowers, it provides a starting point for expanding the 4-H curriculum to include further topics for youth interested in the landscape industry. Such topics may include landscape machinery, lawn and plant health, and starting a lawncare business. A previous Ohio 4-H lawncare project book was taken out of publication in 2008 due to low enrollment and outdated content. A new book focused on lawnmowers may spark future interest in lawncare management.

The processes outlined in this project provide an outline for the development of future 4-H books that address the needs of youth regarding their education about machinery safety. The activities in this book could be used as a template for other types of machinery that youth may operate even though their age may fall outside of the recommendations of manufacturer.

Costs/Resources

A USDA-NIFA grant sponsored the development and pilot testing of the project. The cost for youth is \$10, which covers production costs of the book. Currently the project is available to 4-H youth within Ohio and Indiana. Once the book goes through the national 4-H review board, it will be made available through 4-H programs nationally.

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