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Randall E. James
Ohio State University Extension, james.7@osu.edu

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PREVIOUS ARTICLE | ISSUE CONTENTS | NEXT ARTICLE

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Abstract
Highway accidents between automobiles and horse-drawn buggies are a major, life-threatening concern in and near Amish settlements in the United States and Canada. In 1996, Extension worked cooperatively with the fourth largest Amish settlement in the world, on a multi-faceted educational program urging Amish families to add reflective tape to their buggies to improve highway visibility. A 1999 study documented a 78% rate of practice adoption for this specific recommended buggy safety innovation in this community. This study demonstrates that Extension can have meaningful educational impact even in strict religious communities like the Amish.

Randall E. James
Extension Agent
Ohio State University Extension
Burton, Ohio
Internet Address: james.7@osu.edu

Introduction

There are over 135 accidents per year involving horse-drawn vehicles in Ohio (Ohio Department of Public Safety, 1994-1998). Approximately one third of all Amish in the United States reside in Ohio. The Geauga County settlement, which includes portions of two adjacent counties, is the second largest settlement in Ohio and the fourth largest in the United States (Hofstetler, 1993). There are now approximately 1,850 Amish households in the Geauga settlement (Miller, 1998), along with an estimated 3,700 Amish buggies (Eicher, Bean, & Buccalo, 1997).

In 1993, an Extension Agent in Ohio received a request from the local Amish community to explore improvements in buggy marking and lighting. A group of Extension agents from six Ohio counties, an Extension Specialist in farm safety, and members of his staff began to look at buggy modifications that would increase safety and yet be consistent with the religious and cultural beliefs of the Amish (Eicher, Bean, & Buccalo, 1997).

Gaining acceptance of changes in the outward appearance of the buggy would be problematic because the changes would be highly visible, which conflicts with Amish beliefs in simplicity and in not being prideful. The markings and lighting would also tamper with the buggy itself, which is a symbol of ethnic identity for the Amish community (Kraybill, 1989).

A research project was funded by the Ohio Department of Public Safety and the Ohio State University Extension in July 1994 to determine methods of improving buggy safety, compatible with the religious beliefs of the community. Two of the many safety recommendations that came from this study included the use of the slow moving vehicle sign and the use of reflective tape to outline the rear of the buggy. (Eicher, Bean, & Buccalo,1997). The use of the slow moving vehicle sign on buggies in the Geauga County settlement was widespread; however, the practice of outlining the back of the buggy with reflective tape was almost unknown in 1994. The challenge for Extension was to find ways to gain acceptance and adoption of this safety practice within the community.

Extending the Research

An Extension fact sheet outlining the new safety recommendations for Amish buggies was written

and distributed to counties throughout Ohio (Ohio State University Agricultural Engineering, 1996). In the Geauga settlement, an Amish buggy maker was hired on a part-time basis for 3 months in 1996. He was given copies of the fact sheet as well as a prepared kit of materials on retrofitting buggies for safety. The buggy maker then made individual visits to teach other buggy makers in the community about the safety improvements.

In addition, a full-sized buggy was fitted with the recommended lighting and safety markings by the OSU Department of Food, Agriculture & Biological Engineering and made available as a teaching tool for Amish communities in Ohio. The buggy was in Geauga County for approximately 2 months in 1996. During this time it was moved to various buggy shops in the county. Local buggy makers printed a schedule of when the buggy would be in each neighborhood in the local newspaper and in the *Germinderbiev* (church newsletter). This procedure allowed local buggy drivers to study the innovations and discuss possible buggy modifications with the buggy makers.

Through these methods, it was believed that a high level of awareness of these suggested buggy safety recommendations had been accomplished. However, there was no documentation of the level of practice adoption within the Amish community.

Evaluation Methodology

In October of 1999, a study was undertaken in which 404 buggies in the Geauga Amish settlement were directly observed to determine the extent to which the practice of outlining the back of the buggy with reflective tape had been adopted by the community. This number of observations exceeded the minimum number necessary to statistically extrapolate the findings to the entire population of 3,700 buggies in the community (Zemke & Kramlinger,1986). On parts of 3 consecutive days, the researchers slowly traveled roads in different areas of the community to observe buggies that were parked in lawns, barns, or other out-buildings at Amish residences.

While over 800 buggies were actually seen, only buggies that were parked so that the rear of the buggy could be clearly observed by the researchers to accurately assess the presence of the recommended reflective tape were included in the 404 observations. A buggy was considered to display the recommended reflective tape pattern only if the top and two sides were clearly outlined in tape. Buggies with no reflective tape or other tape patterns were considered non-adopters of the practice.

There was a slight possibility that a particular buggy might be double counted. However, in order to be counted twice, an individual buggy would need to have been moved to a separate area of the community and parked so that the rear of the buggy was visible by the researchers each time.

There was almost no possibility of a buggy from another Amish settlement being included in this study. The nearest Amish settlement with similar buggies to the Geauga settlement is approximately 90 miles away, a distance that would take several days to accomplish by buggy. (When Amish people visit another settlement they hire a taxi or use some form of public transportation.)

There is a small group of Amish families that have migrated from Pennsylvania to within buggy distance of the Geauga settlement, but the buggies used by these families have a very different design and are readily distinguishable from the buggies in the Geauga Amish settlement. None of these non-Geauga buggies were observed during the study.

Results and Discussion

Three hundred and fifteen of the total 404 observed buggies had the rear of the buggy outlined with reflective tape as recommended. This represents a 78% rate of practice adoption, which translates to almost 3,000 buggies in the Geauga Amish settlement.

The educational materials and methods used, along with the safety recommendations themselves, are generic in nature and could readily be used by Extension professionals anywhere in the United States and Canada who are interested in working with local Amish settlements to improve buggy safety. Because the Amish church has no national or international structure, each church district decides whether or not a particular innovation is acceptable. Ultimately, all of the districts and individual households throughout the United States and Canada will need to review and decide how these safety innovations fit with their religious beliefs. Extension workers can have an important role in introducing these buggy safety innovations to each Amish settlement.

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