Hazard Reduction Strategies: CROPS Integration in High School Ag Mechanics Curriculum 2013-2018

The CROPS Project is led by Dr. Stacy Vincent (University of Kentucky/CAFE, Dr. Joan Mazur (University of Kentucky/COE, Dr. Alex Preston Byrd (Clemson University/College of Agriculture), and Dr. Kang Namkoong (University of Maryland/Coll of Ag). Southeast Center for Agricultural Health & Injury Prevention

SouthON Conference, Savannah, GA
April 2-6 2018
Our Starting Point: NIOSH Cost Effective Rollover Protective Structure Plans

http://www.cdc.gov/niosh/topics/aginjury/CROPS/default.html
High School Agricultural Education
CROPS Integration Rationale

There are approximately 8,000 Agricultural Education programs nationwide:

• in these Amechanics classes, students must engage in projects that require
  – project planning, skills (measurements), teamwork reading plans and completing projects in work groups.

• The NIOSH CROPS assembly and installation plans encompass all these required tasks and ties well into agricultural mechanics class work.
Feasibility Study: 2013-14

• Conducted the feasibility study with 3 Appalachian schools in 2013-14 (Mazur, Vincent, Watson, Westneat (2015).
• Purpose: test the feasibility of integration of CROPS construction and installations procedures into the required agricultural mechanics classes (82 students); and
• Explore barriers to implementing such a program in high school agricultural education (mechanics) programs. Observations and interviews confirmed NIOSH and UK-CROPS statistics and beliefs that ROPS education needs to be a part of the Ag Education curriculum.
Extended Feasibility (Curriculum Improvements): 2014-15

• In Spring 2014 a pilot grant enabled 5 more KY districts to use the plans, and further gather feedback on teachers’ curriculum needs and implementation issues in the classroom setting.

Multi-State Expansion and Summer Teacher Training Workshop

- Summer 2014 – Development of CROPS Curriculum Guide
- Beginning in Fall 2015 – With funding from a pilot grant from SCAHIP, the UK-CROPS project is scaling up to a multi-state program 3 states -- 11 Teachers
- These 11 teachers each built and installed 3 CROPS per agricultural mechanics program. The Curriculum Guide was also implemented after formative testing, feedback and refinement.
19 Teachers implemented CROPS project in 19 schools in 3 states. 437 students participated and most significantly completed 52 CROPS installations. The number of installations and models of tractors are shown below in Table 1 that follows
# Hazard Reduction: Costs & Implementation for 3 State Scale-up

<table>
<thead>
<tr>
<th>Tractor Models</th>
<th>Ford 4000</th>
<th>Ford 3000</th>
<th>MF 135</th>
<th>Ford 8N</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM Cost</td>
<td>$985</td>
<td>$985</td>
<td>$950</td>
<td>$750</td>
</tr>
<tr>
<td>AM Cost</td>
<td>$671</td>
<td>$671</td>
<td>$671</td>
<td>$671</td>
</tr>
<tr>
<td>No. Installed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>5</td>
<td>17</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>North Carolina</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Tennessee</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Total (52)</td>
<td>6</td>
<td>23</td>
<td>16</td>
<td>7</td>
</tr>
</tbody>
</table>

OEM = Original Equipment Manufacturer Costs  
AM = Agricultural Mechanics Classes Costs
Continuation & Expansion 2016-2017

• Continue multi-state implementation
• Continue Summer CROPS Teacher Institutes
• Social Media and Crowd-Funding Sustainability Strategies
  – One school Go-Fund-Me – raised $1200 for 2 CROPS builds in upcoming 2016 School Year
• Development of a CROPS app: supports portability in Ag Mech classroom installations – and on-site inspections that students can conduct on their local farms.
Continuation & Expansion
2016-2017

From 3 States: Kentucky, Tennessee & North Carolina
To
9 States in 2017: KY, TN, WV, SC, NC, GA, AL, AK, MS

Cost-effective Roll-Over Protective Structures
Current Project Status: Innovation & Sustainability

10 States: KY, TN, WV, NC, SC, GA, AL, AK, MS, IA (F 2018)
800 Students Participated
30 Teachers in Ag. Mechanics Classes
110 CROPS installed/each tractor reduces hazard for 4 others who also use that tractor

10 Go-Fund Me Campaigns

CROPS Products: CROPS Curriculum (Mazur), CROPS Teacher Training (Vincent) CROP Inspection Checklist & EPOCH Ultrasound Check (Byrd), UK-CROPs App (Namkoong)
Tractor Safety & Hazard Reduction: A complex problem requires multi-faceted intervention: CROPS

• We need BOTH active & passive strategies
• Active - PPE, Cleaning Operator Platform, tied back hair, glove, installing SMV ...
• Passive – CROPS, seat and seatbelt
• Education must be ongoing and sustainable
  – Agricultural Mechanics Teachers are powerful role models and safety advocates
  – Long-term sustainability in community – schools
  – Community engagement – CROPS installation
  – Educating the Next Generation of Young Farmers


UK-CROPS Project Research
Publications & Presentations

PRESENTATIONS


UK-CROPS Project Research Publications & Presentations

PRESENTATIONS


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• The following graduate students have been invaluable to the success of the UK-CROPS project: Jennifer Watson, Morgan Shafbuch, Ashley Leer, Tori Summey, Kyle Wood, Sarah Warren

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• Human subjects approval was granted by the University of Kentucky Institutional Review Board under IRB protocol 13-0557-P4S
R2P in Action: Preparing the Next Generation of Farmers

The following slideshow depicts agricultural mechanics students from high schools in rural communities in KY, TN, NC and SC working in Agricultural Mechanics on CROPS construction and installation projects.
ACHS Agriculture Science classes make older tractors safe with grant

By MICAH HENRY

Students at Alexander Central High School in the Agriculture classes have recently received a grant to outfit older tractors with modern safety equipment, and the project is going well, said Scott Creek, Agriculture Science teacher.

The grant, administered by the Southeast Center for Agricultural Health & Injury Prevention at the University of Kentucky, enabled ACHS to receive materials, including welding rods, steel, new seats, seat belts, and hinge-plane fasteners to retrofit three older tractors with roll-over prevention bars.

Known as CHOPS, the project takes its name from the phrase Cost-effective Roll-Over Protection Systems. The aim of the project is to show that the many older, still functioning tractors which remain in use can be made safer with little extra equipment or time.

Above, student Savannah Cosharin is shown painting roll bar pieces at ACHS.

All Assembled — Alexander Central High School students Briar Coltrane (left) and Adria Jowers are shown above with the finished roll-over prevention bar on a Massey-Ferguson 135 tractor.
ROLL-OVER PROTECTION FOR 42 YEAR OLD TRACTOR — Owners of older tractors need not fear roll-over accidents. That's the focus of a project which Alexander Central Agriculture Sciences students have completed this semester that retrofitted older units, such as this 1968 Ford 85 tractor, with a Cost-effective Roll-Over Protection System (CROPS). Above, sophomore Isaac Jolly is shown seated on the Ford.

PUTTING IT ALL TOGETHER — Alexander Central students built together the retrofit Cost-effective Roll-Over Protection System (CROFS). Pictured above, from left to right: Jay York (grey shirt), Ryan Hudler (pink shirt), and Stephanie Brown at the seated position.