

#### @agronomybadger

# Combine Cleaning Fall Weed Seed Management

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#### Why Fall Weed Seed Management Matters











## Really Seed Production? Why?











#### Fall Weed Seed Management- Seed Retention

#### WEED SEED PRODUCTION & RETENTION IN SOYBEAN

TABLE 1		Seed Production per plant		Seed Retention % at harvest	
		2013	2014	2013	2014
Palmer amaranth	Arkansas	$50,022 \pm 8,209$	$33,195 \pm 5,775$	$99.98 \pm 0.00$	99.85 ± 0.05
	Illinois	$26,038 \pm 3,753$	-	$99.95 \pm 0.03$	-
	Nebraska	$36,978 \pm 5,399$	$58,004 \pm 9,434$	$98.89 \pm 0.23$	99.93 ± 0.02
	Missouri	13,384 ± 27,363	60,221 ± 21,991	$99.98 \pm 0.00$	99.67 ± 0.20
	Tennessee	22,833 ± 4,914	-	$99.96 \pm 0.01$	-
Waterhemp	Illinois	25,649 ± 5,800	$11,833 \pm 2,277$	99.98 ± 0.01	94.98 ± 0.94
	Nebraska	$60,228 \pm 8,348$	82,811 ± 15,051	$99.99 \pm 0.00$	99.63 ± 0.10
	Missouri	19,727 ± 2,493	23,787 ± 4,200	$100.00 \pm 0.00$	99.84 ± 0.04
	Wisconsin	$17,459 \pm 2,625$	$38,221 \pm 7,956$	$99.96 \pm 0.00$	$98.80 \pm 0.30$



#### Fall Weed Seed Management- Seed Retention

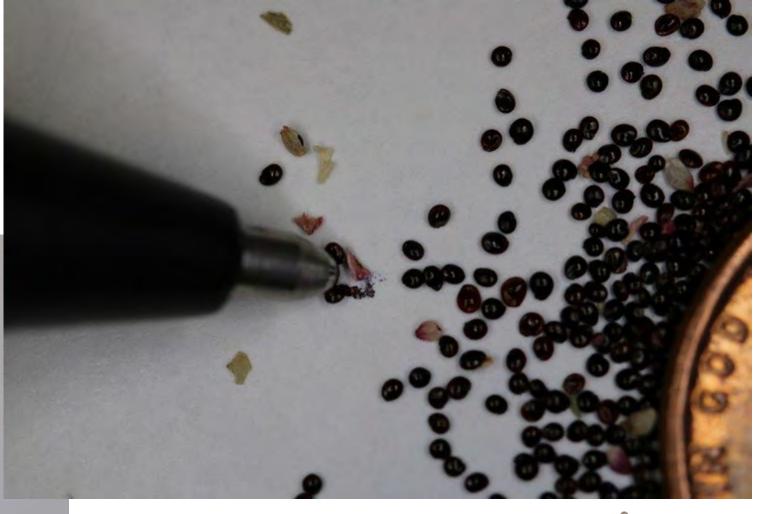
TABLE 2	Total Seed Captured per plant	% Seed Shattered before crop harvest	% Seed Shattered during harvest delay	% <b>Retained</b> on plant after simulated harvest
Redroot pigweed	149,427 ± 27,267	7.2 ± 1.1	$7.7 \pm 0.9$	85.1 ± 17.5
Common ragweed	2,204 ± 382	$7.2 \pm 1.2$	14.1 ± 2.4	$78.7 \pm 15.3$
Common lambsquarters	62,091 ± 11,332	$4.3 \pm 0.7$	$40.6 \pm 8.1$	55.2 ± 12.0
Common cocklebur	1,325 ± 155	$14.4 \pm 3.5$	$48.2 \pm 8.2$	$38.9 \pm 5.5$
Giant foxtail	26,334 ± 2,124	$26.3 \pm 3.6$	$24.0 \pm 2.8$	$49.8 \pm 5.2$
Large crabgrass	84,721 ± 11,637	$46.3 \pm 6.9$	13.7 ± 1.9	$40.0 \pm 7.7$

Adapted from: Haring S. (2017) Harvest Weed Seed Control: An Integrated Weed Management Strategy for Organic and Conventional Production System. M.S. Thesis. Blacksburg, VA: Virginia Tech. 64 p



## Waterhemp Seed







#### Waterhemp Seed Dispersal: Combines







#### Waterhemp Seed Dispersal: Combines

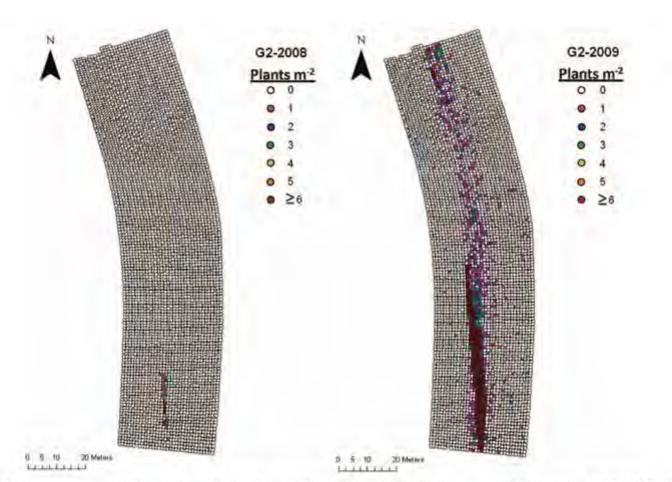


Figure 1. Glyphosate-resistant Palmer amaranth density maps from 2008 (first growing season after introduction) and 2009 (second growing season) for field G2 (0.53 ha) at the University of Arkansas-Agriculture Research and Extension Center, Fayetteville, AR.

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#### In-Field Movement of Glyphosate-Resistant Palmer Amaranth (Amaranthus palmern and its impact on Cotton Lint Yield: Evidence Supporting a Zero-Threshold Strategy

Jason K. Norwerthy, Griff Griffith, Tarry Griffin, Mathekamar Bagavathianuan, and Edward L. Ghur\*

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In 2012, the United States ranked first globally his commercial production of geometally modified maps, such eight crops platned across 69.5 milities ha during that your (lames 2012). In 2010, a usual of 91.78, and 70% of the U.S. suybean (Glyme mar-(L.) Morel, commission and com (See major L.) because. emperiorly, new placed to generically restified emps (USDA 2011). The majority of these hertary ven pland with GR vereies, which were attractional in the mid-1990s. As a most, the par-

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#### **Combine Weed Seed Dispersal**







**2018-2024 Combine Cleaning Clinics** 19 Combines- 17 contained weed seed







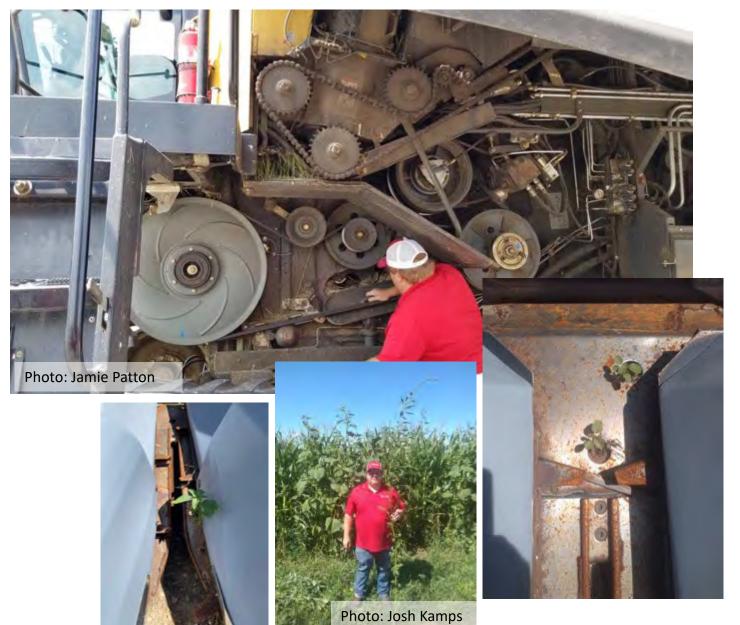








#### Where Weed Seeds Hide







#### Where Undesired Seeds May Hide

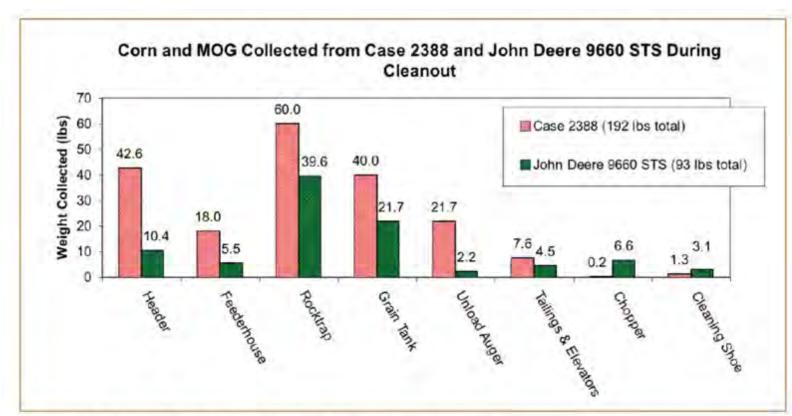
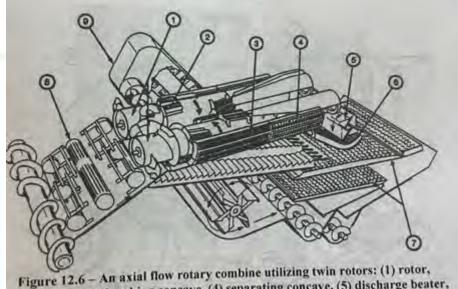
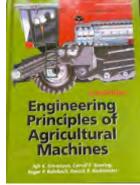


Figure 1. Material collected inside combines during cleaning.

John Deere data courtesy of: Hanna, H.M., Quick, G.R., and Jarboe, D.H. 2004. Combine Cleanout for Identity Preserved Grains. Proceedings of the 2004 International Quality Grains Conference, Indianapolis, Indiana. July 19-22, 2004







Grain Harvesting Chapter 12 Engineering Principles of Agricultural Machines, 2nd ed., pp. 403-436 St. Joseph, Michigan: ASABE. (doi: 10.13031/2013.41474)



#### So Your Going To Clean Your Combine

**Between Fields?** 



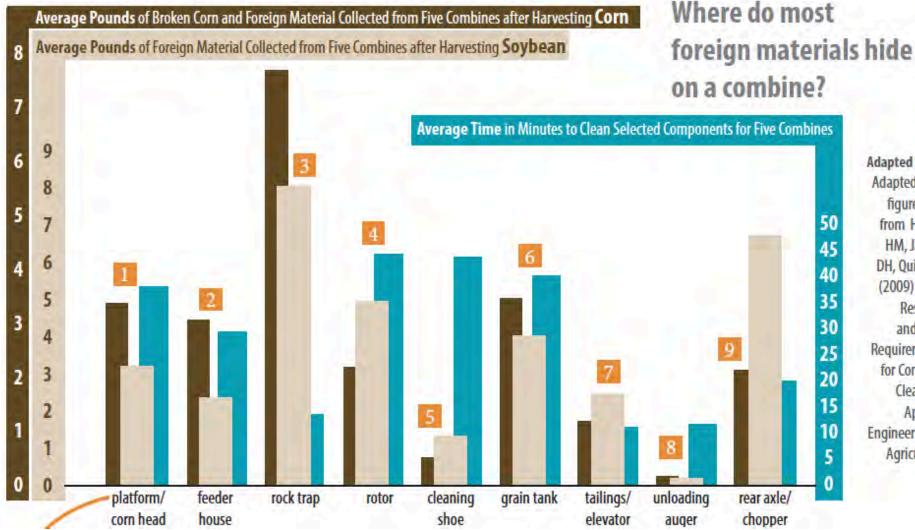


Read, Follow, and Understand all safety instructions for the combine and cleaning equipment!

**Use proper Personal Protective Equipment!** 



#### Where to Focus Cleaning Time







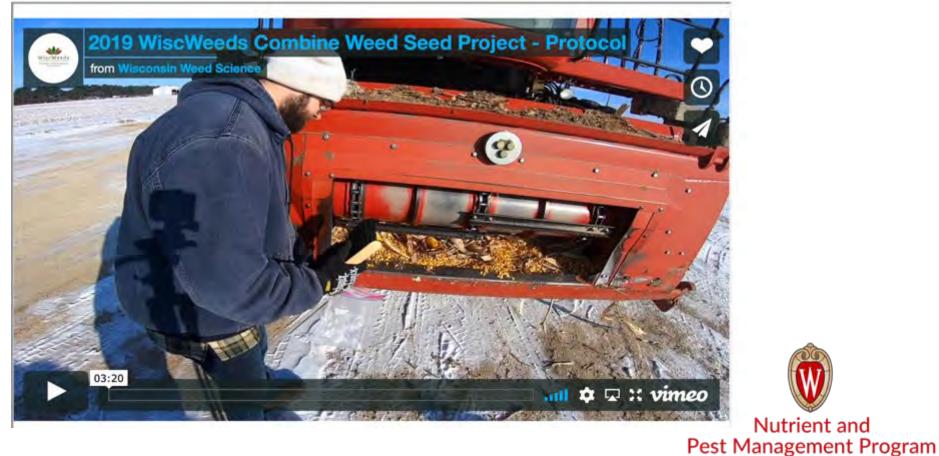




#### Weed Seed Movement Through Combines: **2020 Study**

**Nick Arneson:** Outreach Specialist UW-Madison Cropping Systems Weed Science Program **Dr. Rodrigo Werle:** UW-Madison Extension Cropping Systems Weed Scientist

Thank you to everyone who helped collect samples for this project!



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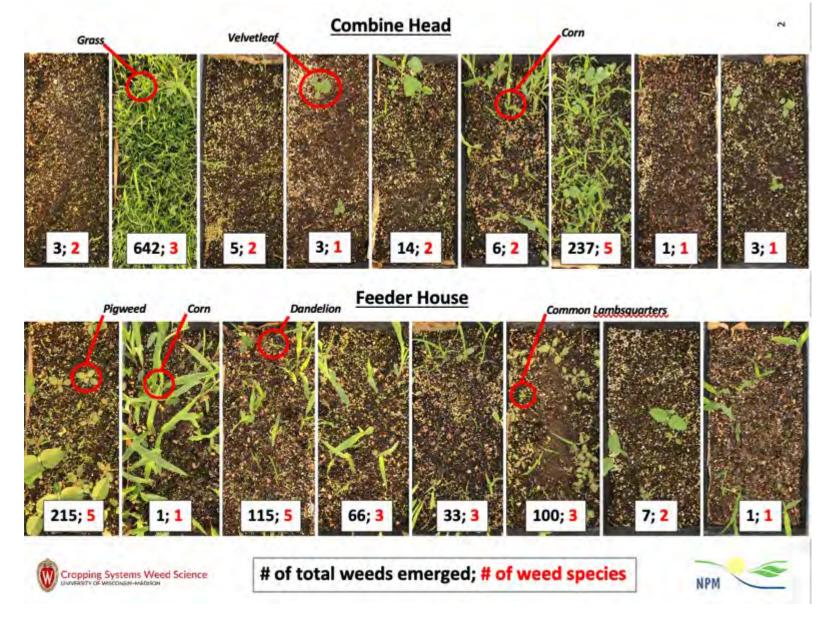


## Weed Seed Movement Through Combines: 2020 Study

- 97% of combine samples received (n=31) contained viable weed seed
- Most frequently observed weeds (% of samples present) were: grass (~68%), pigweed (~55%), and common lambsquarters (~55%).
- Combine head samples contained the most weed species with ~49% of the total weeds emerged (Feeder house, ~30%; Rock trap, ~19%; Rotor, ~2%)

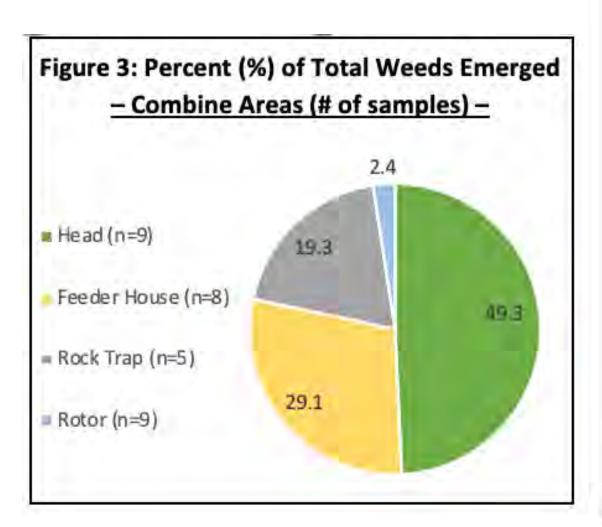
Weed Seed Movement Through Combines: 2020

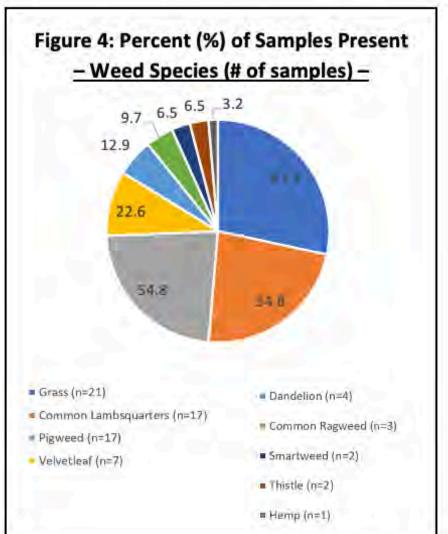
Study





Weed Seed Movement Through Combines: 2020 Study







#### Waterhemp Seed Dispersal: Feed, Seed, and Bedding

### CERTIFIED OATS

PURE SEED 99.38%
OTHER CROP SEED .01%
INERT MATTER .60%
WEED SEED .01%

ORIGIN: MINNESOTA

Noxious Weed Seed: NONE FOUND

TOTAL GERM & HS: 90% GERMINATION: 90%

HARD SEED:

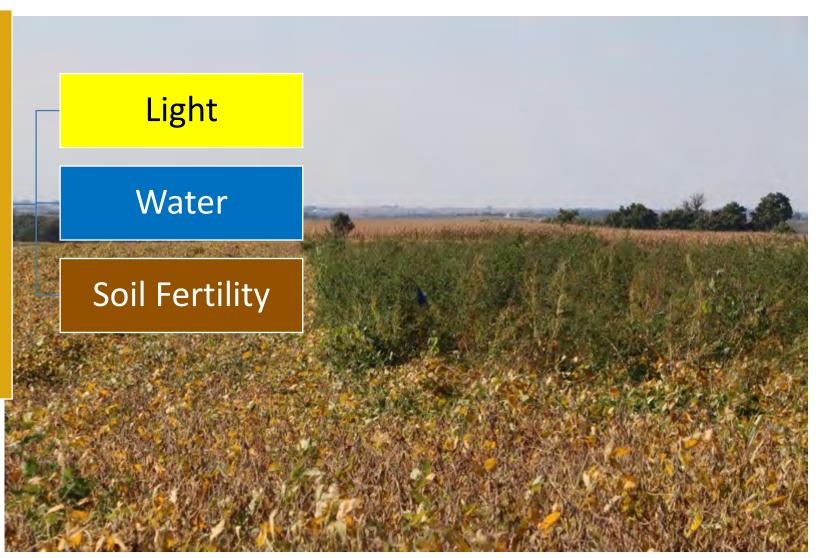
TESTED: JAN 2017 NET WT: 50-LRS (22.6

AMS 2352





**Cost of Spreading Waterhemp Seed** 



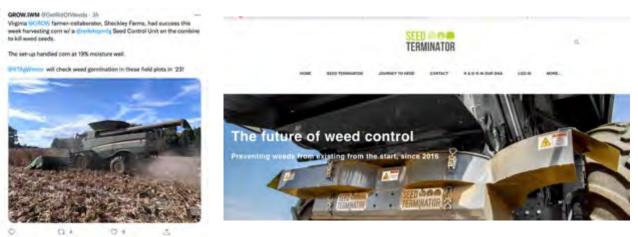


#### **Future Harvest Weed Seed Control Tactics**



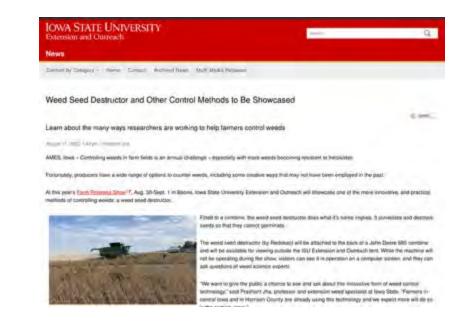


GNI put blue light science to work in a system that bolts onto combines, destroying weed seeds on their way out the back of the machine.
(Farm Journal)



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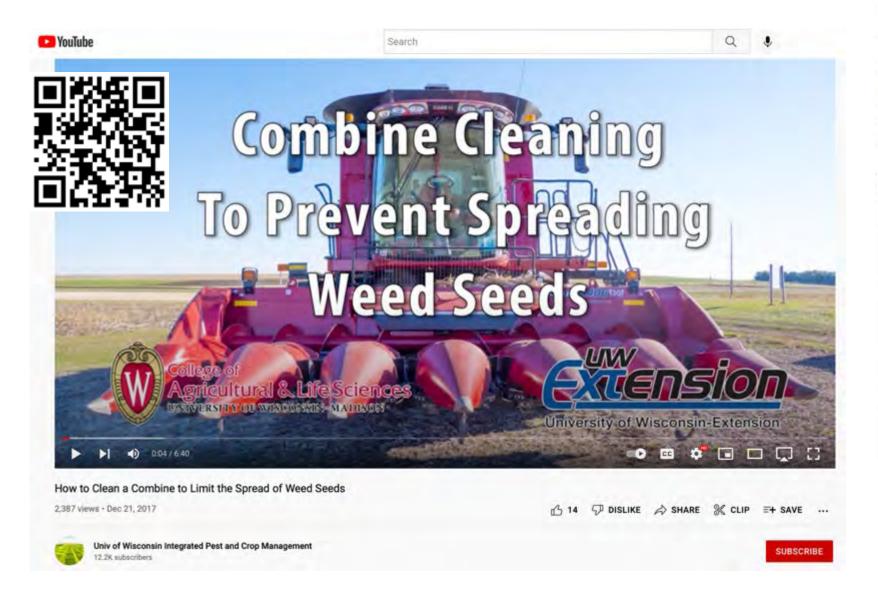


#### **Dedicate Time to Fall Weed Seed Management**



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#### **Additional Resources**





Worth Central Agriculture and Natural Resource Academy

Baranhar 5047

#### Recommended Procedures for a Between-field Combine Clean-out



By Meaghan Anderson, Iowa State University Extension: Kevin Janek, University of Wisconsh-Madison Extension: Angle Johnson, North Decote State University Extension: Wayne Offreedorg, University of Nebraska-Lincoln Extension: Mark Hanna, Jova State University

Combine Clean-out Series-

Benveny-half

ntion is Greater than 150 Pounds of

#### An Dunce of Prevention is Greater than 150 Pounds of Unwanted Biomaterial

Combines are one of the targest and most impressive machines on a farm. These large machines effectively nerrows crops from fields and separate grain from other missions be spread back in the field. Following harvest of an includicul field, combines retain significant material. An much as 150 pounds of biomaterial is retained, including shaff, grain, and weed seed. This material may remain in light spaces within the machine or is devived places, such as the gathering had and grain tark.

While it is impossible to remove all malerial from a combine, effort following the harvest of fields can be valuable in reducing movement of weed sees and other malerial from one field to another. Most ferment can point to fields with specific problems that other fields do not have, such as bareacomber. Palmor amanant, or other difficult-to-manage issues tike harbicide-resistant weeds. Sanitation and appropriate combine clean-out



Figure 1. Material removed from clean grain elevator and tailings elevator when initially opened.





of the cutting platform.



