**Supplemental Figure 1**. Images of well plates for the colorimetric assay for detecting mechanical damage on weed seeds. Mechanically damaged and non-damaged seeds were individually steeped in deionized water for 12 h. Then, 50  $\mu$ L of steepate was transferred to a well-plate (1 seed steepate well<sup>-1</sup>) and mixed with 2  $\mu$ L of 0.1% aqueous solution of resazurin (7-Hydroxy-3H-phenoxazin-3-one-10-oxide) sodium salt. Plates were imaged at 2 h, 5 h, 20 h, and 40 h after the initial mixing of steepate and resazurin solutions.

Explanation of Bayer codes: AMAPA = Palmer amaranth, *Amaranthus palmeri* S. Watson; ANVCR = spurred anoda, *Anoda cristata* (L.) Schltdl.; DATFE = oakleaf datura, *Datura quercifolia* Kunth; ECHCG = barnyardgrass, *Echinochloa crus-galli* (L.) P. Beauv.; ECHCO = junglerice, *Echinochloa colona* (L.) Link; ERAME = stinkgrass, *Eragrostis cilianensis* (All.) Vignolo ex Janch; KCHSC = kochia, *Bassia scoparia* (L.) A. J. Scott; PHBPU = tall morningglory, *Ipomoea purpurea* (L.) Roth; RUMCR = curly dock, *Rumex crispus* L.; SETPU = yellow foxtail, *Setaria pumila* (Poir.) Roem. & Schult.

Explanation of seed damage treatments: Abraded = scarified with coarse sandpaper; Pierced = punctured with sharp-pointed, stainless steel, dissecting needle; Ground = struck once with metallic mortar and pestle (tall morningglory, oakleaf datura, spurred anoda) or blunt metallic rod (kochia, yellow foxtail, barnyardgrass, junglerice, curly dock, Palmer amaranth, stinkgrass); Sliced = cut with singled-edged razor blade under a dissecting microscope

<b>4 4 4 4 D</b>		Mechanical damage treatment					
AMAP	Non-damaged	Abraded	Pierced	Ground	Sliced		
0				COCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCO	66666666666666666666666666666666666666		
n period (hr) ^				00000000000000000000000000000000000000	60000000000000000000000000000000000000		
Resazurin incubation period (hr)				00000000000000000000000000000000000000			
Resazu 0					66666666666666666666666666666666666666		
40					60600000000000000000000000000000000000		

ANVCR		Mechanical damage treatment					
		Non-damaged	Abraded	Pierced	Ground	Sliced	
	0					00000000000000000000000000000000000000	
n period (hr)	2	000000000000 0000000000000000000000000					
Resazurin incubation period (hr)	5						
Resazu	20						
	40						

DATEE	Mechanical damage treatment				
DATFE	Non-damaged	Abraded	Pierced	Ground	Sliced
0		@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@			60000000000000000000000000000000000000
n period (hr)			00000000000000000000000000000000000000		
Resazurin incubation					
Resazu 0					00000000000000000000000000000000000000
40			000000000000000000000000000000000000000	Coccoccoccoccoccoccoccoccoccoccoccoccocc	Coope

ECHCG		Mechanical damage treatment					
		Non-damaged	Abraded	Pierced	Ground	Sliced	
Resazurin incubation period (hr)	0				6000000000000 0000000000000 0000000000	60000000000000000000000000000000000000	
	2						
	5						
Resazu	20						
	40				00000000000000000000000000000000000000		

ECHCO		Mechanical damage treatment					
		Non-damaged	Abraded	Pierced	Ground	Sliced	
	0		0000000000000 00000000000000 000000000		\$0000000000000000000000000000000000000	\$6666666666666666666666666666666666666	
Resazurin incubation period (hr)	2		000000000000 0000000000000 00000000000		00000000000000000000000000000000000000	00000000000000000000000000000000000000	
	5		00000000000000000000000000000000000000	00000000000000000000000000000000000000	00000000000000000000000000000000000000	00000000000000000000000000000000000000	
Resazu	20		0000000000000 000000000000000000000000	**************************************	<b>*************** ********************</b>	60000000000000000000000000000000000000	
	40		<ul><li>6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6</li></ul>		<b>6666666666666666666666666666666666666</b>		

	_	Mechanical damage treatment					
ERAN	Non-damaged	Abraded	Pierced	Ground	Sliced		
0							
n period (hr) 8				50000000000000000000000000000000000000			
Resazurin incubation period (hr)				000000000000000000000000000000000000000			
Resazu							
40	00000000000000000000000000000000000000						

KCHCC	Mechanical damage treatment				
KCHSC	Non-damaged	Abraded	Pierced	Ground	Sliced
0	00000000000000000000000000000000000000	00000000000000000000000000000000000000	00000000000000000000000000000000000000		
n period (hr) ^	000000000000000000000000000000000000000		00000000000000000000000000000000000000		
rin incubation G		000000000000000000000000000000000000000			
Resazurin 0					
40					

		Mechanical damage treatment					
PHBPU	Non-damaged	Abraded	Pierced	Ground	Sliced		
0		000000000000000000000000000000000000000	00000000000000000000000000000000000000				
n period (hr) ^		000000000000000000000000000000000000000	00000000000000000000000000000000000000				
Resazurin incubation			000000000000000000000000000000000000000				
Resazu 0			000000000000000000000000000000000000000				
40							

SETPU		Mechanical damage treatment					
		Non-damaged	Abraded	Pierced	Ground	Sliced	
Resazurin incubation period (hr)	0				00000000000000000000000000000000000000		
	2					66666666666666666666666666666666666666	
	5			**************************************			
	20						
	40						