

IS THE ROLLER A RELIABLE CHOICE FOR COVER CROP MANAGEMENT?

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EQUIPMENT

KNIFE ROLLERS, CRIMPERS OR JUST ROLLERS ARE USED BY ORGANIC AND NO-TILL FARMERS TO MANAGE LARGE AMOUNTS OF COVER CROPS AND CROP RESIDUES. THEY FLATTEN AND CRIMP THE PLANTS FOR KILLING THEM AND LEAVE AN UNINCORPORATED MULCH WHICH CONTRIBUTES TO REDUCE EROSION, RUNOFF, WEEDS AND CONSERVES SOIL MOISTURE.

DESIGN

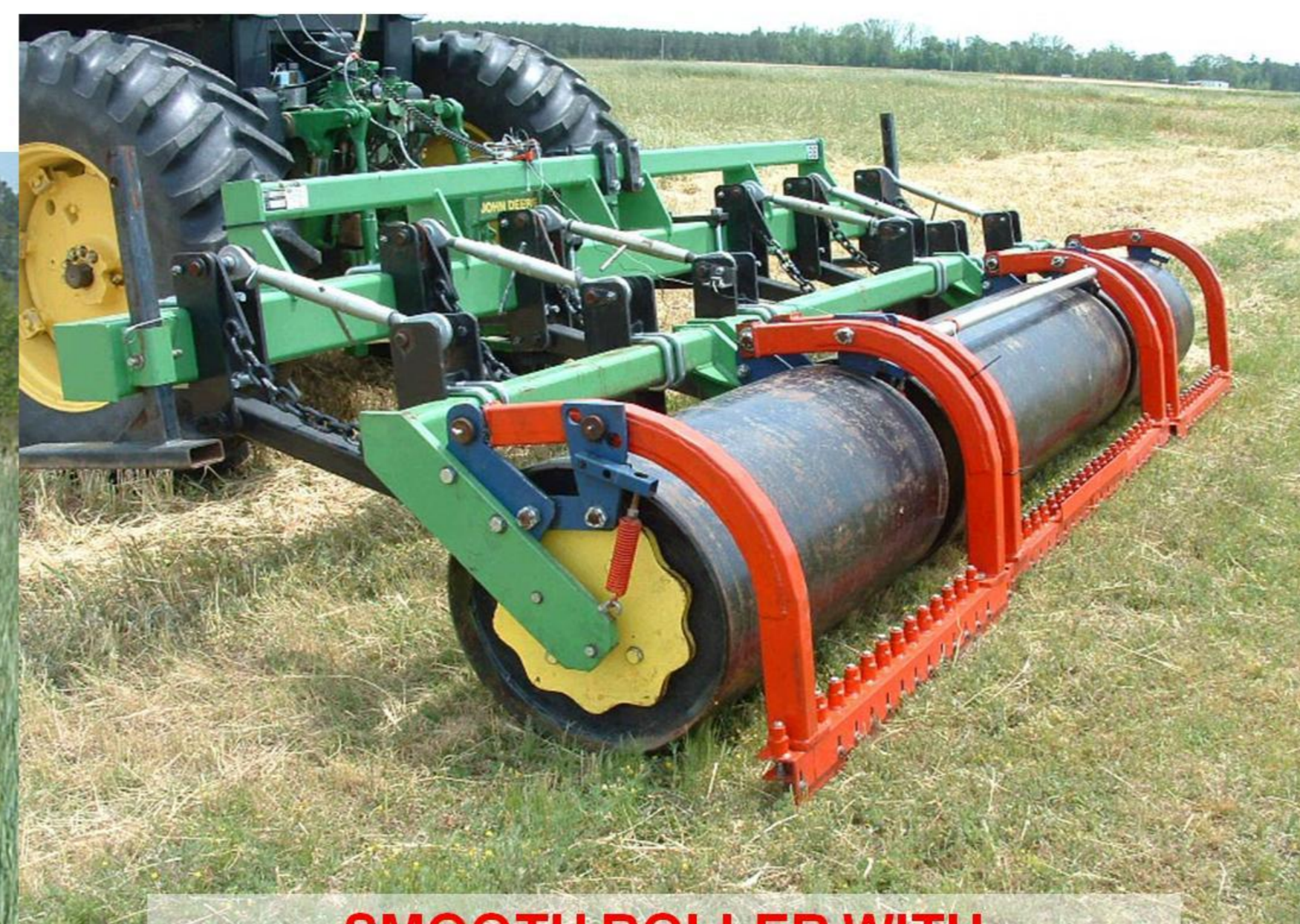
HOLLOW DRUM MADE OF STEEL OR WOOD WITH PARALLEL BLUNT KNIVES OR BARS ALONG THE LENGTH OF THE DRUM WHICH TURNS AROUND THE END OF THE BARS WHEN PULLED. THERE ARE MANY DESIGNS WITH DIFFERENT DRUM WIDTHS, NUMBER OF DRUMS AND BARS, BARS DESIGN AND ALSO FOR TRACTOR OR ANIMAL TRACTION.

ROLLER DESIGN IMPROVEMENTS

STRAIGHT BAR ROLLER



CURVED BAR ROLLER⁵



SMOOTH ROLLER WITH OSCILLATING/CRIMPING BAR⁵

FRONT MOUNTED CHEVRON TYPE BARS³



POWERED ROLLER FOR WALK-BEHIND TRACTOR⁴



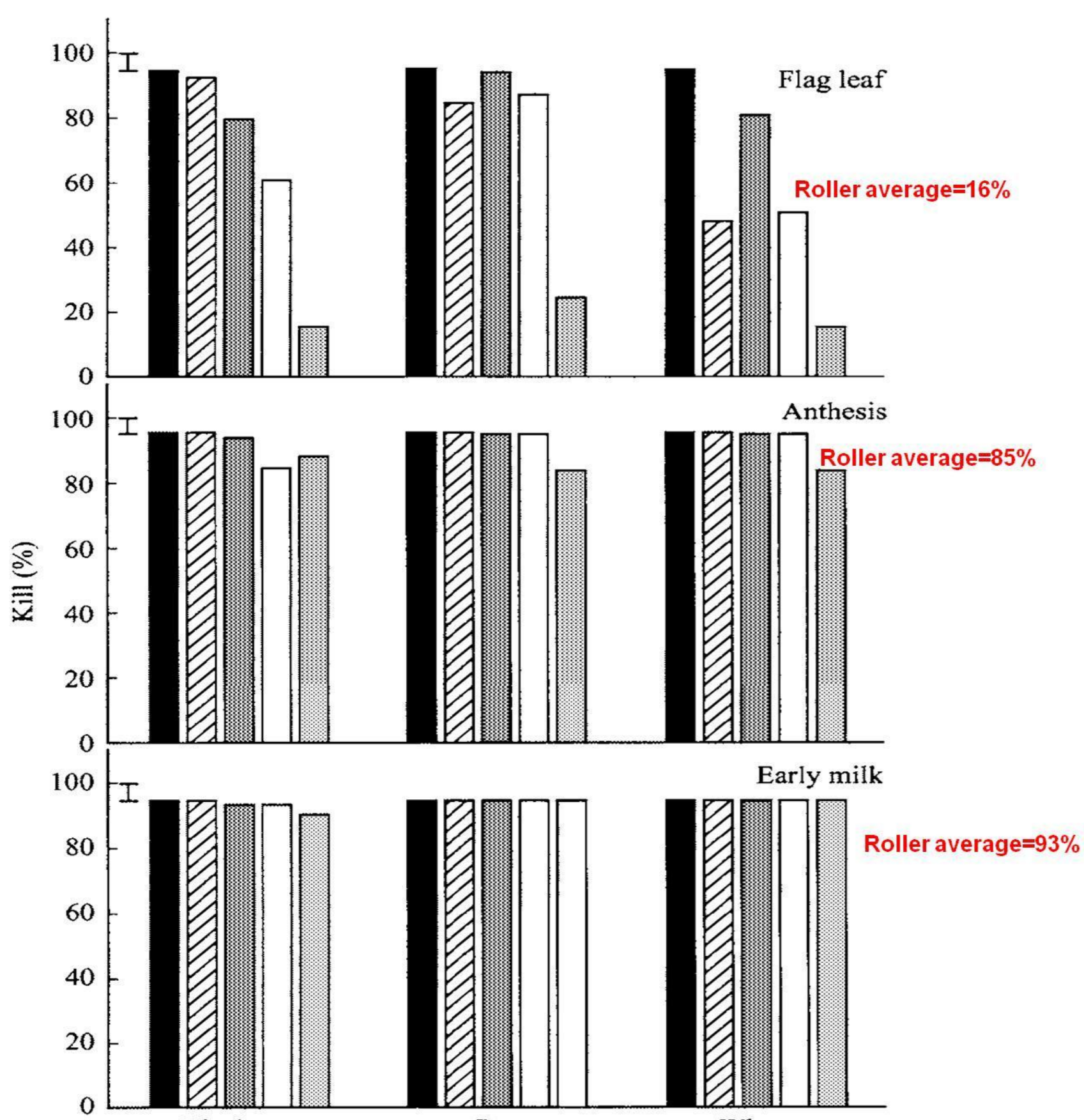
FOR ANIMAL TRACTION



WITH STAGGERED STRAIGHT BARS

IS THE ROLLER EFFECTIVE FOR COVER CROP CONTROL COMPARED TO HERBICIDE?

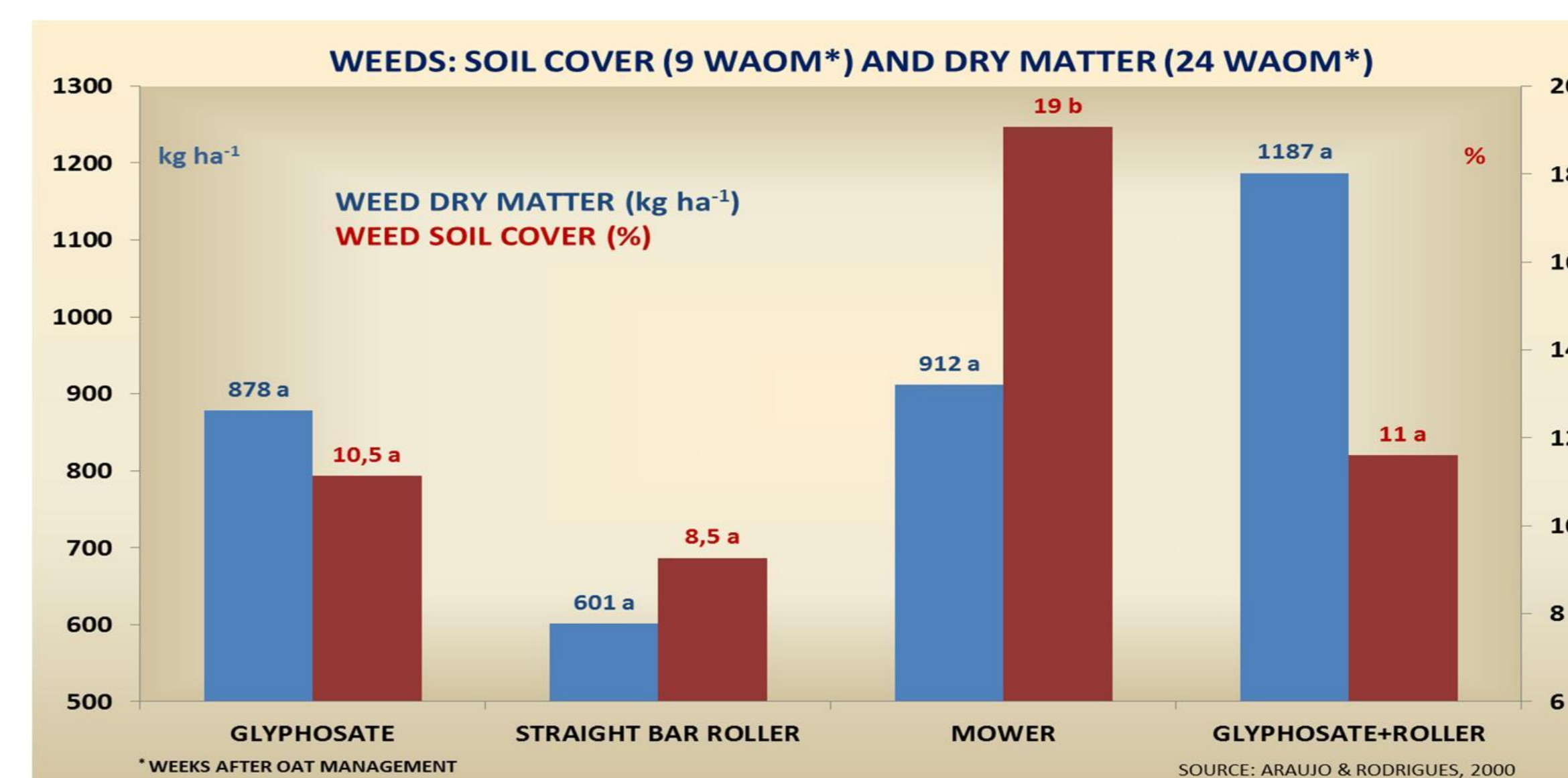
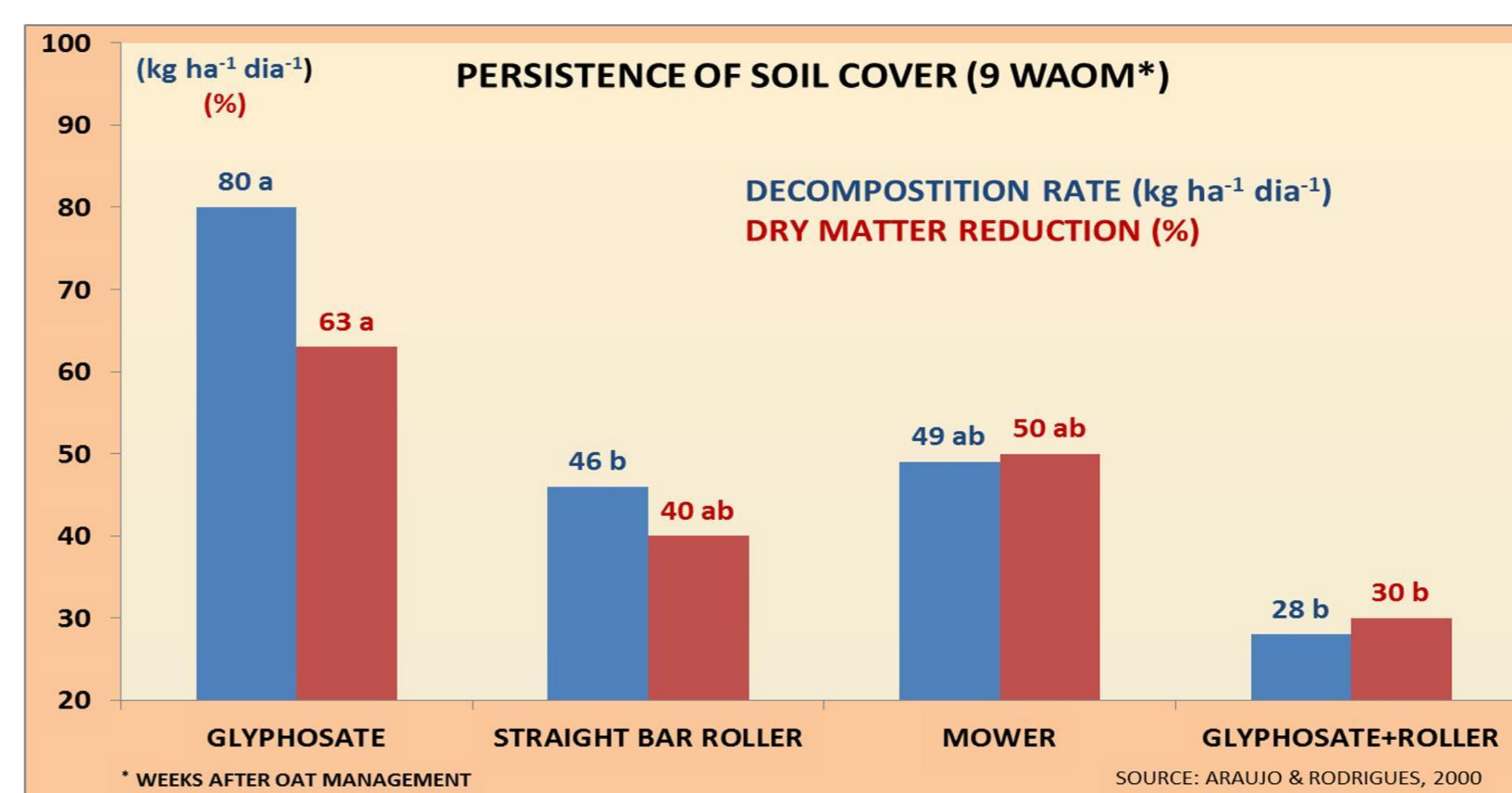
TREATMENT	BIOMASS		CONTROL (%)	SPEED (km h ⁻¹)	GROWTH STAGE	OBS.	SOURCE
	type	Mg ha ⁻¹					
STRAIGHT BAR ROLLER	RYE	6.4	96.5	6.4	Soft dough	Four wheel tractor; Evaluation: 3 weeks after rolling	Kornecki et al, 2010
SMOOTH ROLLER			94.0				
STRAIGHT BAR + GLYPHOSATE			100.0				
CHEVRON ROLLER	RYE	8.3	98.0	3.2	Soft dough	Walk behind tractor; Evaluation: 3 weeks after rolling	Kornecki, 2014
POWERED ROLLER			99.0				
STANDING (control)			80.0				
CHEVRON ROLLER	RYE	9.6	73.0	3.2	Early milk	Walk behind tractor; Evaluation: 3 weeks after rolling	Kornecki, 2014
POWERED ROLLER			87.0				
STANDING (control)			45.0				
GLYPHOSATE	BLACK		78.3	--		Four wheel tractor; Evaluation: 7 weeks after rolling	Araújo and Rodrigues, 2000
STRAIGHT BAR ROLLER	OAT	7.7	77.3	7.5	Early milk		
ROTARY MOWER			74.5	5.0			



Legend:
 ■ glyphosate (label rate) ▨ glyphosate (1/2 rate) + roller-crimper
 ■ paraquat (label rate) □ paraquat (1/2 rate) + roller-crimper
 ■ roller-crimper only

STRAIGHT BAR ROLLER; Evaluation: 4 weeks after rolling; Biomass: OAT = 10.8; RYE = 10.7; Wheat = 7.7 Mg.ha⁻¹. Source: ASHFORD & REEVES, 2003.

IS THE ROLLER EFFECTIVE FOR WEED CONTROL AND PERSISTENCE OF SOIL COVER ?



CONCLUSION: YES, IT IS A CHOICE AS EFFICIENT AS HERBICIDE CONSIDERING COVER CROP AND WEED CONTROL WHEN MANAGEMENT OF RYE AND OAT IS DONE AT THE CORRECT GROWTH STAGE. ROLLER IS MORE EFFICIENT WITH RESPECT TO PERSISTENCE OF SOIL COVER (HIGHER) AND DECOMPOSITION RATE FOR OAT (LOWER).

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