

Using Crop Rotation and Other Cultural Practices to Manage Herbicide Resistant Weeds in Specialty and Minor Crops

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Crop Production Clinics



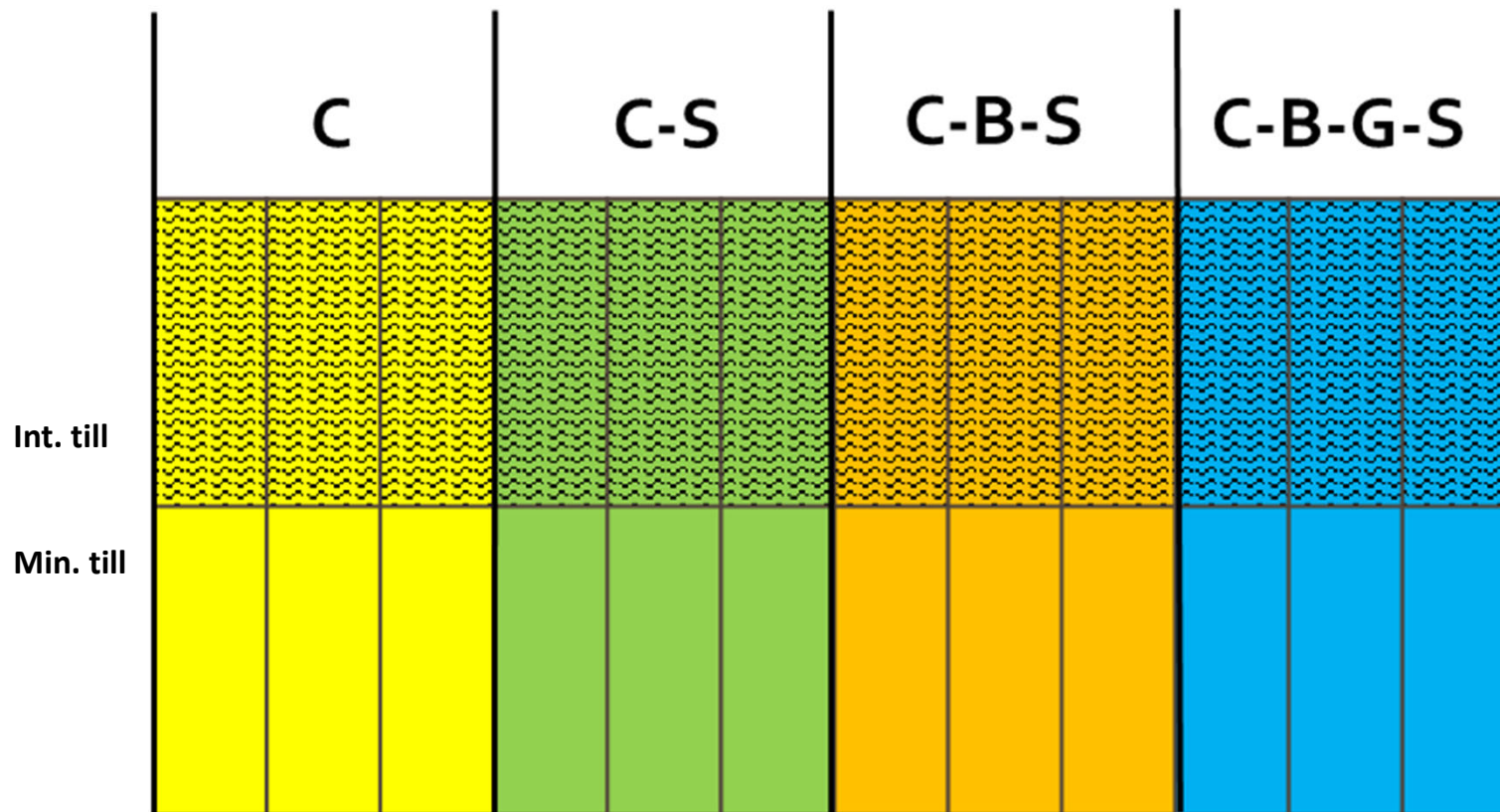
1. Integrating tillage, crop diversity, and herbicides to manage herbicide resistant kochia.
2. Comparison of spring wheat, corn, and dry beans as rotational crops before sugarbeet.
3. Cover crops in dry bean.



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Int. till												
Min. till												

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	C			C-S			C-B-S			C-B-G-S		
Int. till	M	R	O	M	R	O	M	R	O	M	R	O
Min. till	M	R	O	M	R	O	M	R	O	M	R	O

Intensive

Minimum

Minimum

Intensive

Minimum

Intensive



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2017

Tillage

Intensive	2,400 a
Minimum	4,300 b

- Tillage reduced seed production by 56%

Crop rotation

Continuous corn	3,300 b
Corn-Sugarbeet	7,700 c
Corn-Dry bean-Sugarbeet	3,700 b
Corn-Dry bean-Small grain-Sugarbeet	1,100 a

- Adding beets to the rotation made thing worse.
- Adding beans didn't make a difference.
- One year of wheat reduced production by 33%

Herbicide regime

ALS rotation	4,800 b
ALS only	7,900 b
ALS mixture	869 a

- Rotation was similar to using only ALS herbicides.
- Using a mixture reduced production by 82%



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Tillage	Crop rotation	Herbicide regime		
		ALS rotation	ALS only	ALS mixture
Intensive	Continuous corn	3,000	6,500	539
	Corn-Sugarbeet	8,300	22,600	2,000
	Corn-Dry bean-Sugarbeet	4,000	6,000	648
	Corn-Dry bean-Small grain-Sugarbeet	1,500	1,300	352
Minimum	Continuous corn	8,800	12,300	1,300
	Corn-Sugarbeet	17,400	21,700	1,500
	Corn-Dry bean-Sugarbeet	8,000	15,500	1,500
	Corn-Dry bean-Small grain-Sugarbeet	1,600	3,300	454

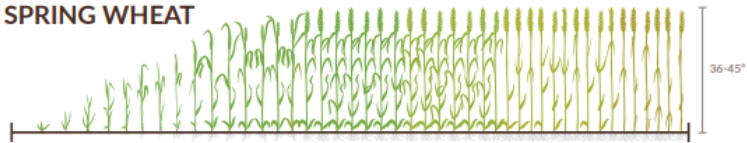
- **Most treatments didn't do enough to reduce kochia seed production.**
- **Three treatments increased kochia density.**
- **Three treatments reduced kochia seed production by 95%, over four years.**

Minimum Tillage, Beet / Corn / Bean / Wheat Mixture



MAR APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC

SPRING WHEAT



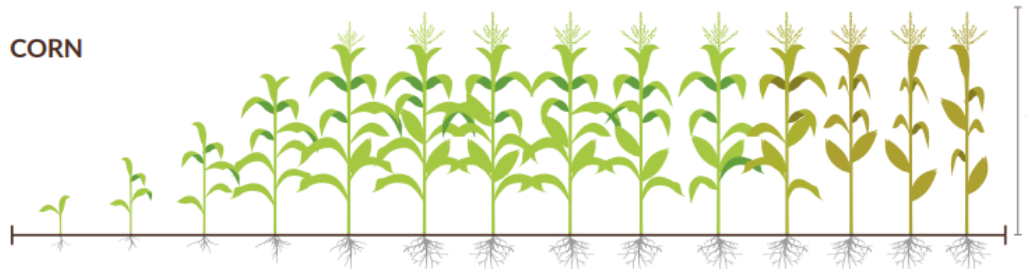
SUGAR BEET



DRY BEAN



CORN



KOCHIA

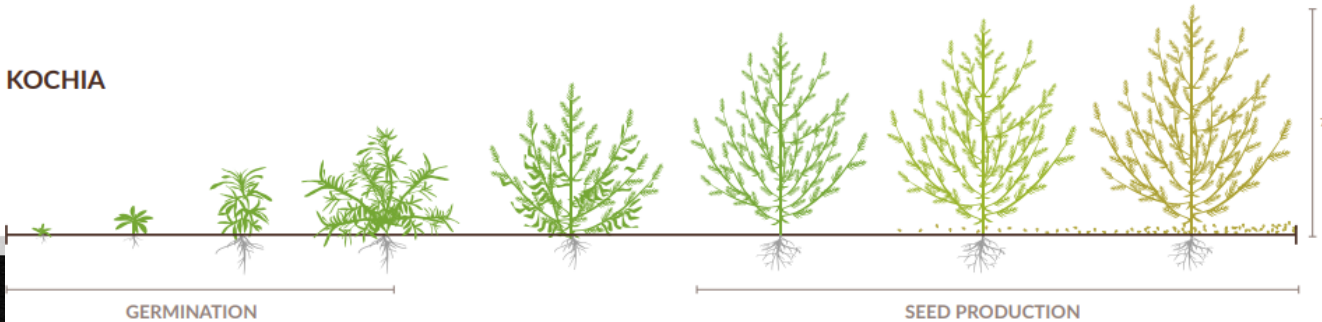


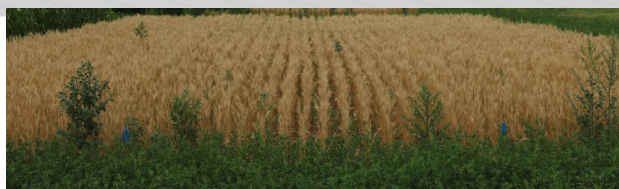
Image by:
Jessica
Perry

N EXTENSION

N

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Wheat: Good competitor with both kochia and Palmer amaranth



Dry Bean: Good competitor with kochia, poor competitor with Palmer amaranth



Corn: Better control of Palmer amaranth than kochia



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N EXTENSION

Wheat: Good competitor
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Palmer amaranth

Dry Bean: Good
competitor with kochia
poor competitor with
Palmer amaranth

Corn: Better control
of Palmer amaranth
than kochia



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EXTENSION

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1. Integrating tillage, crop diversity, and herbicides to manage herbicide resistant kochia.
 - **Small grains reduce kochia abundance when grown one out of four years.**
2. Comparison of spring wheat, corn, and dry beans as rotational crops before sugarbeet.
 - **Small grains reduce kochia and Palmer amaranth abundance after one year.**
3. Cover crops in dry bean.
 - **Small grains reduce kochia and Palmer amaranth abundance when used as a cover crop.**

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Thank you!

Questions?