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# Weed Biology

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# Weed Biology

- I. Weed Effects on Crops
- II. Weed Life Cycles
- III. Weed  
Reproduction
- IV. Weed  
Emergence



# Weeds Reduce Yields

- Compete with crops
  - Nutrients
  - Light
  - Moisture



# Other Negative Effects

- Interfere with harvest
- Reduce crop quality



Bindweed (shade berries) wheat)

# Weed Effects on Yield

<b>Crop</b>	<b>Weed species</b>	<b>% yield loss – 1 weed per ft<sup>2</sup></b>
Corn	Wild buckwheat	10
Corn	Wild mustard	18
Corn	Common ragweed	21
Soybean	Green foxtail	8
Soybean	Lambsquarters	25
Soybean	Eastern black nightshade	40

Source: Moncada & Huerd, 2010

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# Weed Life Cycles

Annual:  
1 Year



All in one year

Biennial:  
2 Years



Year 1

Year 2

Perennial:  
> 2 years



Does not die after  
setting seed





# Annual Weeds



**Foxtail**

- Completes its life cycle in one year
- Most crops are annuals
- Produce many seeds
- Examples are velvetleaf, pigweeds, waterhemp, lambsquarters, and foxtails

# Winter Annuals



Horsetail (or ~~ma~~ ~~restair~~ or horseweed)

- Germinates in fall and sets seeds in the spring
- Common in no-till and in winter wheat and winter barley
- Examples are horsetails and wild mustard

# Biennial Weeds

- Completes life cycle over two growing seasons
- 1<sup>st</sup> year as rosette, 2<sup>nd</sup> year flowering
- Examples are musk thistle and common mullein



# Perennial Weeds



**Canada thistle in**

**Dandelion**

- Can live for years
- Spread not just by seed, but vegetatively through rhizomes and other specialized structures
- Examples: Canada thistle, quackgrass, dandelion



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# Weed Seed Production

Weed species	Seeds/plant
Redroot pigweed	117,400
Lambsquarters	72,500
Giant ragweed	10,300
Velvetleaf	7,800
Yellow foxtail	6,500

Source: Renner, 2000



The **weed seed bank** is the viable weed seeds present in the soil

Number of viable weed seeds in soils in four agricultural fields in Minnesota.

Adapted from Robinson, 1949.

Location	County	Seed/acre
Sacred Heart	Renville	5,100,000
Danube	Renville	8,000,000
Morris	Stevens	25,500,000
Waseca	Waseca	333,700,000

Corn planting rate = 34,000 seeds/acre



# Weed Seed Viability

Weed species	# of years
Quackgrass	1-6
Wild oat	4-7
Cocklebur	16
Foxtail	20
Canada thistle	21
Lambsquarters	40
Redroot pigweed	40
Velvetleaf	40

- Seed remains until conditions are right for germination
- One strategy to reduce the weed seed bank is by not allowing weeds to set seed

Source: Ross and Lembi, 1999

# Rhizomes

- Vegetative reproduction
- Underground stem that produces roots and shoots
- Can generate new plants
- Prevent spread of rhizomes



Canada thistle rhizome

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# Weed Emergence – General



- Depends on soil conditions
  - Temperature
  - Moisture
  - Field operations
- Varies by weed species

# Time of Emergence – Species

April

May

June

Early to  
Mid

Mid to  
Late

Early to  
Mid

Mid to  
Late

Early to  
Mid

Mid to  
Late

Wild  
Mustard

Lambs-  
quarters

Common  
Ragweed

Foxtails

Black  
nightshade

Crabgrass

Kochia

Giant  
Ragweed

Woolly  
cupgrass

Redroot  
pigweed

Water-  
hemp

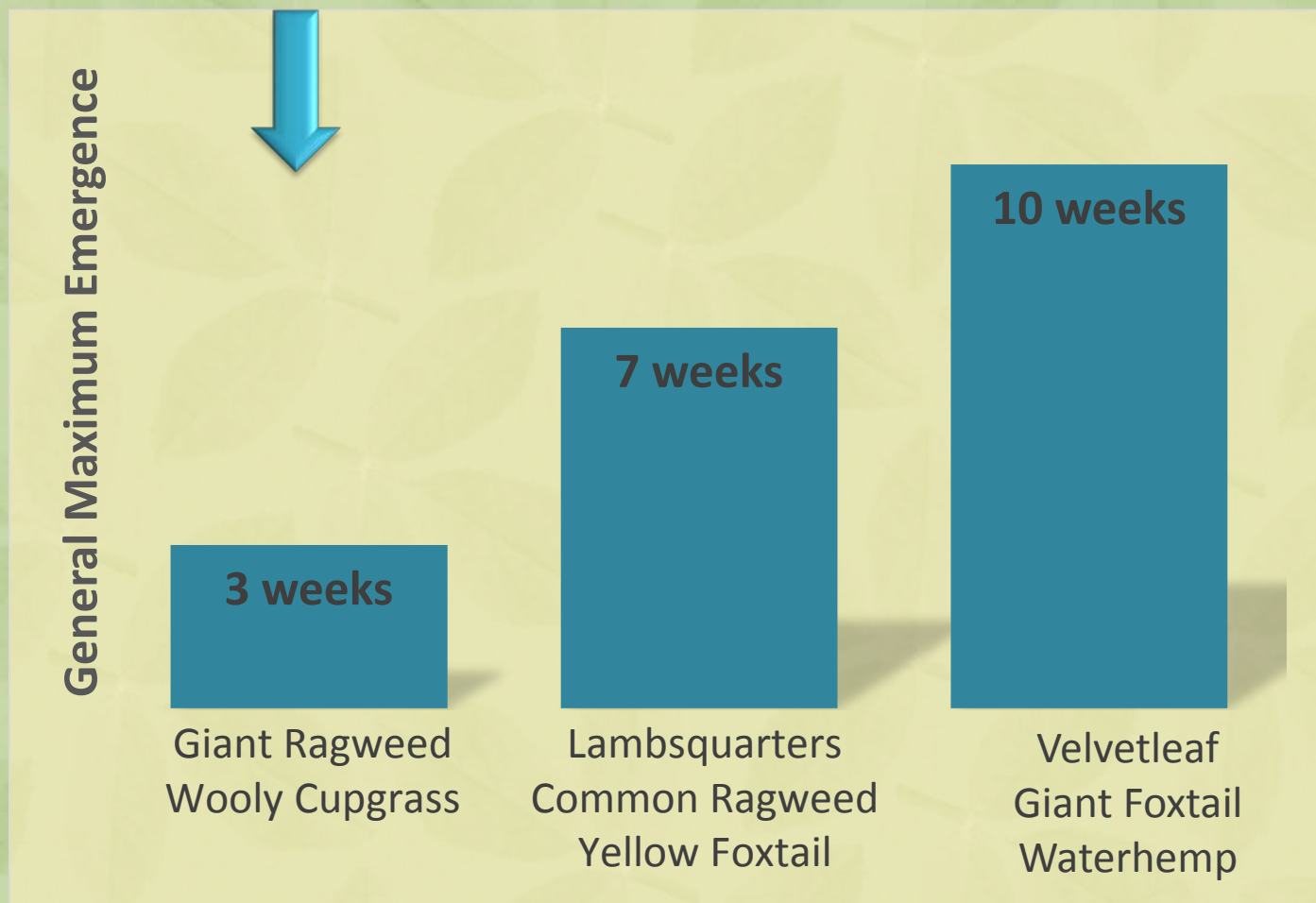
Jimson-  
weed

Velvetleaf

Cocklebur

# Duration of Emergence

Some weeds have a short window of emergence, others emerge over a longer time span





# Resources

- [Risk Management for Organic Producers – Weed Biology](#)
- [Risk Management for Organic Producers – Weed Profiles](#)
- [University of Minnesota Extension – Weed Identification](#)
- [Common Weed Seedlings of the North Central States](#)



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