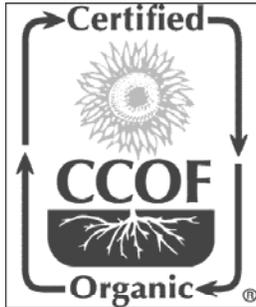


Weed Control in Organic Production



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"It's not easy being green"



General Weed Management Factors

- Exclusion
- Elimination
- Prevent Establishment
- Removal
- Management

Exclusion

- Field Selection
 - A good choice
 - Knowledge needed of sites
 - Usefulness depends on available certified land
- Prevent weed additions
 - Critical for organics
 - “Bring-ins” may contain weed seed
 - Organic mulches
 - Raw manures

Elimination

- Prevent weed build-up
 - Timely cultivation, tillage
 - Purposeful plantings- don't let weeds take over
- Weed population reduction
 - Perennial management through grazing
 - Fallow/tillage cycles
 - Solarization

Prevent Establishment

- Preemergence "herbicides"
 - Corn gluten meal, mustard meal
- Timely cultivation
- Cover crop management
 - Species important
 - Crop sequence
- Mulches
 - Organic and synthetic

Weed Removal

- Mechanical – cultivation
 - Keep it shallow
 - Minimize injury to the crop
 - Improve the rootzone
- Manual
 - Removes remaining weeds
 - Supervision, monitoring, and incentives for optimum results

Weed Removal

- Physical: energy consumers!
 - Flame
 - Special equipment, directed flame
 - Best for small, annual weeds
 - Steam
- Herbicides



USDA National Organic Product Standards

- Crop pests, weeds, and disease will be controlled primarily through management practices including physical, mechanical, and biological controls
 - When these practices are not sufficient, a biological, botanical, or synthetic substance approved for use on the National list may be used.

Corn Gluten Meal

- Herbicide
 - Dipeptides inhibit root formation by inhibiting cell division
 - Established plants are not affected



Organic Herbicides

- Most active ingredients:
 - Vinegar (acetic acid), clove oil (eugenol) or soap (fatty acids)
- Contact herbicides
 - Will cause crop injury
 - Control small annual weeds



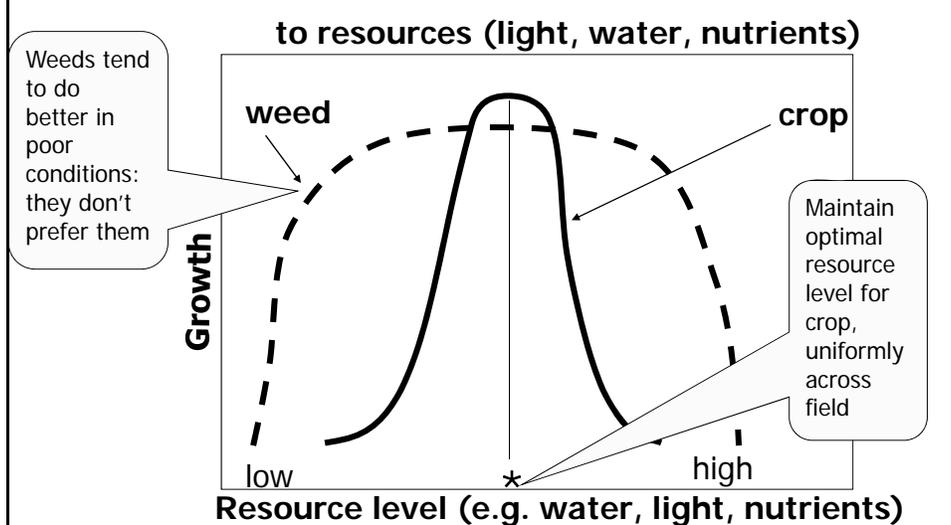
Management

- Crop Selection
 - Use crops that tolerate weeds
 - Rapid growth, dense canopy
 - Crops that allow for weed control
 - Sweet corn – easy cultivated
- Give crops an edge
 - Getting "THERE" first

Weed Competition

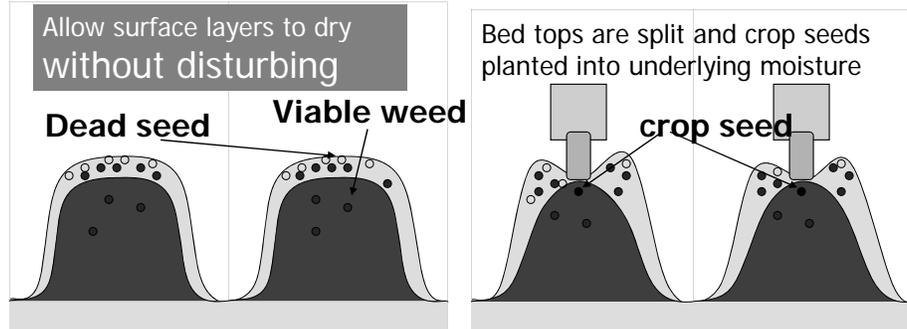
- Our goal as weed managers: minimize acquisition of resources by weeds, maximize acquisition by crop
- This is a TIME and SPACE problem: getting "there" first

Crop vs. Weed Response



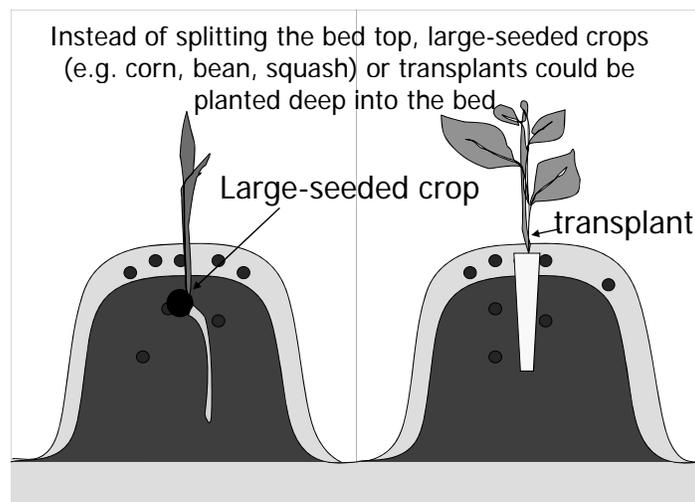
Planting into moisture: establishing a "dry mulch layer"

After removing plastic, rotivating, or herbicide/flaming on last irrigation:



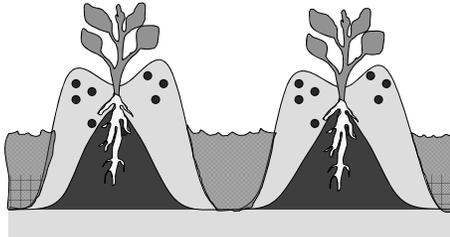
Dry "dirt mulch" on surface 1-2". Weeds seeds will usually not germinate from below 1-2" and will not germinate in dry soil

Giving the crop a head start by taking advantage of its initial size

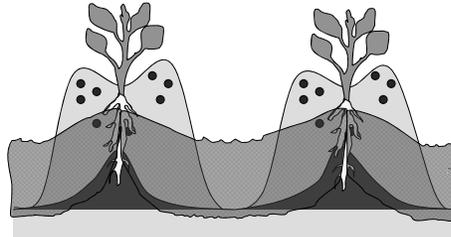


Planting into moisture

Hold off on irrigation until crop plants need it. Crop roots follow moisture downward.



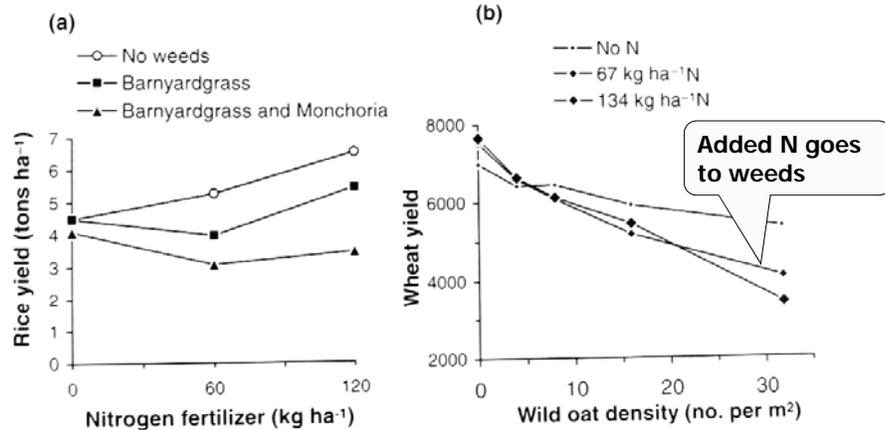
Furrow irrigation will soak across bed from below---leaving weed seeds in dry "mulch"



Nutrient Management

- It might seem logical to add supplemental fertilizer to make up for weed presence
- Usually the added nutrients will go to the weeds
- Weeds tend to be better luxury consumers of nutrients

Fertilizing weeds



Carlson and Hill 1986

Nutrient Management

- Put the fertilizer *when* and *where* crops will use it first
- Weeds are better competitors for nutrients → plasticity
- Remove weeds → Do not add fertilizer to make up for weed competition

Conclusions

- You have to be smarter and harder working
- Work to get crops “there” first
- Don’t fertilizer weeds, remove them
- Organic herbicides are generally non-selective

Thank You

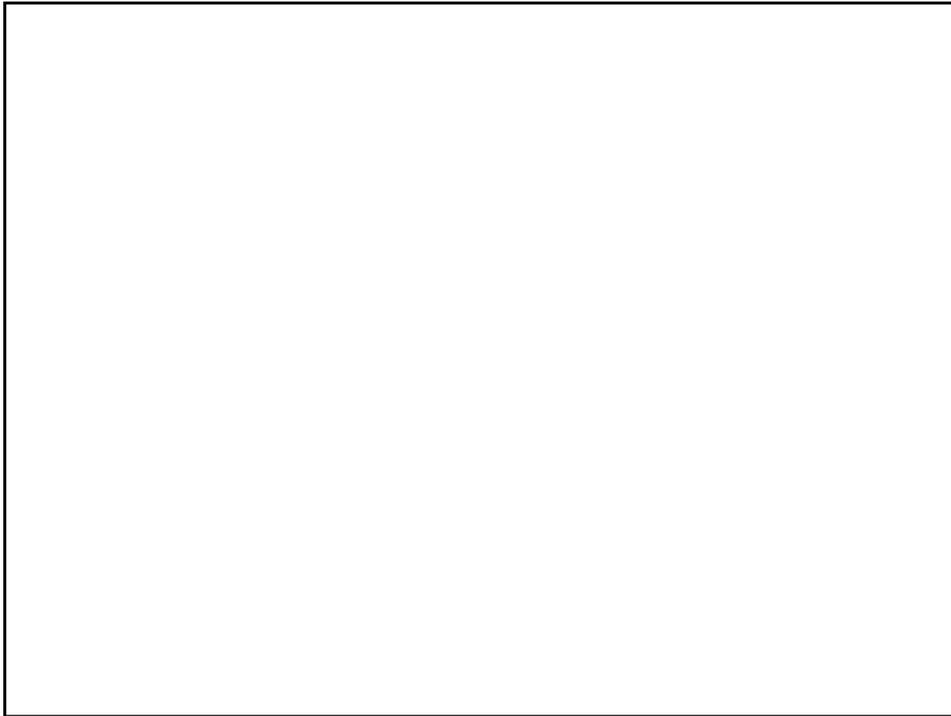


Questions?

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USDA National Organic Program Standards

- Consistent national standards
- Anyone that wants to sell an agricultural product as organically produced must adhere to the NOP standards
- Requirements apply to the way the product is created, not to measurable properties of the product itself

Management effects on seed banks

**Crop rotation effects seedbank
species composition and
abundance**

**→ different cropping systems favor
different weed species**

rotational effect > tillage effect

