SMALL GRAINS SEEDBED PREPARATION AND RESIDUE MANAGEMENT

Kent L. Brittan

Agronomic Crops Farm Advisor, Emeritus

UC Cooperative Extension
STAND ESTABLISHMENT

- Sight Selection
- Seedbed preparation – conventional
- Seedbed preparation – minimum and no-till
- Mulching
- Sowing flat vs. on beds
- Drill vs. broadcast seeding
- Irrigating or seeding to rainfall
- Planting- equipment, date, depth
- Residue Management
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Sight Selection

• Good Drainage
  – 2-4 day submersion max
  – Provide for rain runoff and avoid soil loss
  – Avoid working when too wet

• Too much slope requires specialized equipment – hillside production

• Beds for heavy soils
Main Objective - produce a firm, debris and weed-free, seedbed for rapid germination and emergence

Provide for irrigation and drainage
Seedbed Preparation – conventional

• Amount and type of tillage dependent upon:
  – Soil structure
  – Previous crop – how much residue
Seedbed Preparation – conventional

- Amount and type of tillage dependent upon:
  - Soil structure
  - Previous crop – how much residue
- Heavy disking vs. deep plowing
  - breaking up the plow-pan important for grains?
  - Herbicide carryover – oat sensitivity to trifluralin
  - Deep tillage following summer fallow – south valley
- Typical - 2 heavy disk passes followed by 1 light
Seedbed Preparation – conventional

• Heavy disking vs. deep plowing
  – Is breaking up the plow-pan important for grains?
  – Herbicide carryover – oat sensitivity to trifluralin
  – Deep tillage following summer fallow – south valley
• Typical - 2 heavy disk passes followed by 1 light
Seedbed Preparation – conventional (cont.)

- Harrowing – following rain to get early weeds
- Seedbed – what you want
  - Several inches deep
  - Clod size small enough to pass through the drill
  - Residue dry and chopped small enough not to impede drill
• Poorly prepared seedbeds lead to uneven germination and weak stands
Seedbed preparation – minimum and no-till

• Importance of surface crop residue
  – Control movement of soil from rain and wind
  – Slows movement of water off site
  – Increases and retains soil moisture

• Reduces input costs – less tractor work
Seedbed preparation – minimum and no-till

- Seedbed preparation
  - Chemical weed control
  - Direct drilling through residue
  - Limited disking, harrowing
  - Condition of residue critical – size and moisture content, avoid “hairpinning”
  - It’s all about timing
For these crops just plant!

Minimum and no-till

Sunflowers

Processing Tomatoes

Safflower
Minimum and no-till

Corn Residue Needs a Bit More Work
Mulching

- Used in irrigated production in southern California
- 2-4+ weeks before planting
- Fields prep’ed, leveled, fertilized and irrigated
- Mulch layer 2-3 inches of dry soil over top
- Compacted with ringroller to hold moisture
- Plant through this layer into moist soil beneath
- Good weed control
Planting Flat vs. On Beds

• Soil structure and surface drainage determines

Flat Planting

• Sandy to loamy and peat soils with good drainage
• Irrigation – usually border checks up before planting
  – Sow across levees
  – Provide drainage for heavy winter rain
• Delta spud ditch irrigation and drainage

Planting On Beds

• Heavy clay-loam soils – often lose plants in furrow bottoms
• Typically 60 inch beds
• Many planting methods possible – drill with row, across, air
Drill vs. Broadcast

• Drill or harrow-air-seed if you can
  – More uniform depth
  – Lower seeding rate
  – Better soil contact
  – Better starter fertilizer placement
  – Means more uniform emergence

• Broadcast usually by air
  – Quicker to beat the weather and cover more acreage
  – Higher seeding rates +20%
  – Harrowing or raking required
Irrigating or Seeding to Rainfall

- San Joaquin Valley and desert valleys pre-irrigate
- Leave enough time for fine textured soils to dry
- Pre-irrigation germinates weed seeds for cheaper control strategies

Planting dry and waiting for Rain??

- Seed to rainfall if you can – timing uncertain
- Common in Sacramento Valley
- Soil moisture uncertain
- Can not guarantee frequency or amount
- Where irrigation possible its used as a backup
Too Much or Not Enough Rain

Waiting in December

Still Waiting in late February

No where for the water to go

Heavy rain in May
Adjust Planter, Sowing Depth, Calibrate

• Give that planter a good over-haul
  – Replace badly worn parts and realign
  – Make sure disk openers and press wheels move

• Set Sowing Depth
  – Semi-dwarf wheat **not** more than 1 ½ inches deep
  – Triticale, barley, oats 2 inches max

• Calibrate EVERY seed lot change!!
# Seeding Rates for Small Grain Crops in California

<table>
<thead>
<tr>
<th>Crop</th>
<th>Rate (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigated wheat</td>
<td>100-150</td>
</tr>
<tr>
<td>Irrigated wheat, Delta</td>
<td>180-250</td>
</tr>
<tr>
<td>Dryland wheat</td>
<td>60-100</td>
</tr>
<tr>
<td>Irrigated barley</td>
<td>80-120</td>
</tr>
<tr>
<td>Dryland barley</td>
<td>60-100</td>
</tr>
<tr>
<td>Oat¹</td>
<td>80-120</td>
</tr>
<tr>
<td>Irrigated triticale</td>
<td>100-150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cover Crops</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>90</td>
</tr>
<tr>
<td>Cereal rye</td>
<td>60</td>
</tr>
</tbody>
</table>

¹Use higher rates for forage production, lower rates for grain production.
### Recommended Sowing Dates for California

<table>
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<tr>
<th>Growing Area</th>
<th>Wheat, Triticale and Oats</th>
<th>Barley</th>
</tr>
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<tbody>
<tr>
<td>Intermountain (winter grain)</td>
<td>Mid-Oct. to early Nov.</td>
<td>Mid-Oct. to early Nov.</td>
</tr>
<tr>
<td>Intermountain (spring grain)</td>
<td>Early April to early May</td>
<td>Early April to early May</td>
</tr>
<tr>
<td>Northern Sacramento Valley</td>
<td>Mid-Oct. to mid-Nov.</td>
<td>Mid-Nov. to Feb. 1</td>
</tr>
<tr>
<td>Sacramento Valley, Delta, Northern San Joaquin Valley</td>
<td>Late Oct. to Jan. 1</td>
<td>Mid-Nov. to Feb. 1</td>
</tr>
<tr>
<td>Coastal, irrigated</td>
<td>Mid-Nov. to mid-Dec.</td>
<td>Mid-Nov. to mid-Dec.</td>
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<tr>
<td>Coastal, dryland</td>
<td>Early Nov. to mid-Dec.</td>
<td>Early Nov. to mid-Jan.</td>
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Residue Management

• Preplanting residue high enough to interfere with planting – usually San Joaquin Valley

• Practices include:
  – Baling and straw removal - $$
  – Grazing – helps with some weed emergence
  – Plowing
  – Burning – permitting issues

• Try no or minimum till if possible
  – Good for late corn following small grains
California
Small Grains - The Best In the World

Thank You For Attending