Safflower Production in the Southern High Plains, 2010

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Safflower

- Thistle like plant with spines
- Middle East Origin (desert species)
- Sunflower family
- One of the oldest crops
- Historically for dye & oil

“Best location to grow safflower is where it doesn’t rain after flowering and humidity is low”
Safflower (cont)

- 20 – 45% oil
- Linoleic and oleic acid
- Drought tolerant
- Strong root system
- Down to 10’
- High demand for food, industry and fuel uses
- Foliar and head rot diseases

“Rain or irrigation after flowering can lead to head rot”
Safflower Crop at Flowering
Major Producers
Spring Safflower

- Best time to plant?
- Seeds can germinate in cold temp down to 40°F
- Initial High Plains seeding is best in March??
- Strong root system down to 10’ deep
- Heat tolerance ??
- Late planting (summer) and maturity in cool fall is a concern

“Most current varieties are spring types”
“Safflower likes deep, clayey soil with higher water holding capacity. Light and shallow soils need more frequent watering or rainfall”
Safflower Planting

- Plant 1.0-1.5” deep
- Seeding rate 15 to 20 lbs./ac
- Generally 6 to 10 inch row spacing
- Can use a planter, but yield potential is not met

(Clovis 2009)
Fertility requirement (NDSU)

- 5 lbs. N per 100 lbs. yield
- Depending on soil type may need P & K
- Weed Management
- Poor competitor
- A few herbicides are labeled
Safflower Growth Stages

emergence | rosette | stem elongation | branching | flowering | mature

Mundel et al., 2004
Head Cross Section

Safflower Ready for Harvest

Seed with Pappus

Mundel et al., 2004

Non-striped seeds

Striped seeds
Safflower Seedling (Clovis 2009)
Safflower (Stem Elongation)

(Clovis May 21, 2009)
Safflower (Bud stage)

(Clovis June 7, 2009)
Safflower (Flowering stage)
Safflower (Mature)

(Clovis 2007)
Winter Safflower
Weed competition

Mundel et al., 2004
Spring Safflower Pests

- Relatively few insect pests
- Heavy rain or humidity causes a number of diseases
- Botrytis head rot is predominant one
Alternaria leaf blight

Safflower Diseases

Mundel et al., 2004
Safflower Diseases

Leaf rust

Mundel et al., 2004
Safflower Diseases

Damping off

Mundel et al., 2004
Safflower Diseases

Seedling blight

Mundel et al., 2004
Safflower Insects

- Cutworms
- Lygus bugs
- Grass Hopper
- Wireworms

Mundel et al., 2004
Harvesting

- Direct combining
- No problem of shattering
- Bird damage is also not severe
- Store at 8% moisture

(Clovis 09)
Harvesting

May planted spring safflower in 2007 yielded 1,245 lbs./ac at Tucumcari and 1,500 lbs./ac at Clovis with very limited irrigation

Early guesses of yield potential

- Rainfed ≈1,000 to 1,200 lbs./ac
- Limited irrigation ~2,000 lbs./ac

Winter types are expected to be higher yielding (but lower oil content)
## Winter Safflower Water Management

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Yield (lb/ac)</th>
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<tbody>
<tr>
<td>% of Wheat ET</td>
<td></td>
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<tr>
<td>0†</td>
<td>1,325</td>
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<tr>
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<td>1,702</td>
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</tbody>
</table>

† Used High Plains Winter Wheat ET (Clovis 2008-2009)
Future Research

- Winter safflower variety development
- Planting dates for spring and winter safflower
- Deficit water management of winter safflower
- Fertility requirement of winter safflower
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