

Spring & Winter Safflower as a Potential Crop South Plains Region, Texas



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Safflower

Carthamus tinctorius L.

- Origin: Middle East
- Typical Oil Content:
 - 35-40%, average ~38%
 - These numbers from regional commercial production
- Premium Oil: Linoleic and oleic acid
 - Some varieties are now 'High Oleic'
- Disadvantages: Foliar and head rot diseases
- Advantages: Very drought tolerant due to extensive root system (3 to 10 feet)
- "The best location to grow safflower may be where it doesn't rain after flowering."



Safflower

- Planting experience so far suggests that safflower establishes relatively easily
- Like many oilseed crops, can you justify making fuel (no) out of this oil which has valuable food and industrial uses?



Spring Safflower

- *Best time to plant?*
 - *Seed germination can handle cold temps down to 40°F*
 - *Initial TX South Plains seeding is best probably late Feb. to mid-March*
 - *May plantings may suffer from heat and/or Botrytis head rot*
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- *What about July plantings with maturity in the cool fall?*
 - *Most current commercial varieties are spring*

Safflower Characteristics

- Safflower is adapted to dryland conditions and medium to clay soils that hold moisture well.
- With adequate moisture, it responds well to high soil fertility levels.
- Use standard equipment designed for the small grain or row crops.
- Safflower is deep-rooted crop and can use moisture and nutrients to 6-8' in dryland.

Safflower Characteristics

- Maturity occurs four weeks after the last buds are in flower.
 - March 1 dryland planting in central and lower TX South Plains with adequate establishment, likely thresh in early June-July 1 or so.
- Safflower requires dry atmospheric conditions during the bloom period, a condition unfavorable for disease occurrences and favorable for good seed set

Safflower Characteristics

- Safflower in a rotation can be beneficial if planted when winter wheat fields become infested with grass-type weeds.
 - This interruption decreases weed pressure and possibly disrupts small grain insect and disease cycles.
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Safflower in Rotations

- Safflower and wheat
- Weed control options may be favorable, however, some states (Colorado) suggest that winter wheat should not follow safflower (disease issues, removal of residual nutrients)
- Safflower should not follow safflower or sunflower

Early-spring stand (Irrig.)



Late May (Excessive irrigation)



Mid-June



Harvesting



Markets

- Eastern Colorado Seeds is the west Texas contracting agent for California Oils—\$18.00/cwt (2014)
 - Main office, 719.342.5020
 - High oleic and hybrid planting options
 - Price up from \$11/cwt. in 2010
 - Standard 38% oil content with 2-for-1 premium/discount for each 1% oil relative to 38%

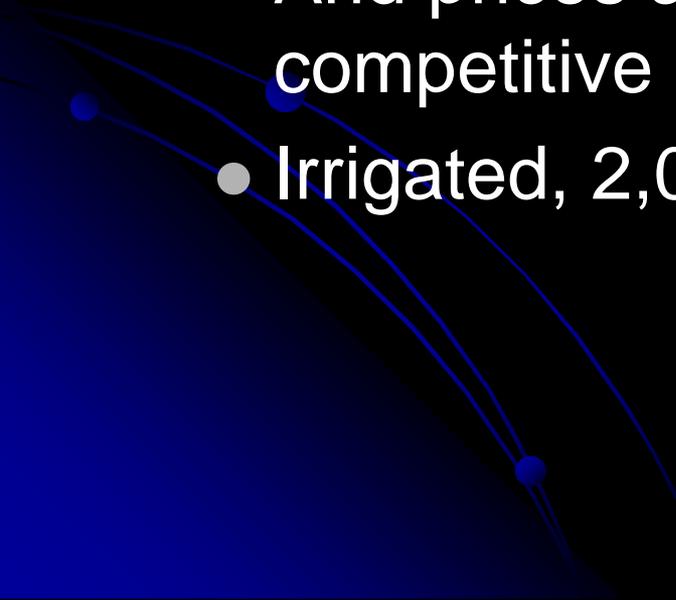
Production Issues (1)

- When to plant, especially for **spring** types
- Texas South Plains region, project late February to mid/late March—Problem: **No moisture!**
 - Safflower seedlings are frost hardy to ~20°F
- Mid-April & later may be a problem due to later summer heat
- Most safflower is drilled (your drill will have settings), but how might production compare if treated as a row crop?
 - Seeding in March means likely limited moisture, so planters rather than drills help place seed better to H₂O
 - Since weed control options are limited, then 30" rows might be feasible—you can still cultivate

Production Issues (2)

- N fertilizer will be needed—dryland, perhaps 30-50 lbs./A for optimum production
 - First time with deep root, maybe no N as safflower scavenges deep N
- This is something that is often overestimated, that safflower can ‘get by’ without significant applied fertility
 - Even with better safflower prices like in 2012 (\$23.50/cwt.), you may not be interested in spending money on N

Production Issues (3)

- Yield potential in Texas needs to be established
 - Dryland, 1,000 lbs./A needs to be competitive **agronomically**
 - And prices are needed to help safflower to be competitive **economically**
 - Irrigated, 2,000 lbs./A
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Production Issues (4)

- Labeled herbicides for safflower—what weed problems can you handle with:
 - **Trifluralin/ethalfluralin** (Treflan/Sonalan)
 - **s-metolachlor** (Dual)
 - **Sethoxydim** (Poast Plus)
 - **Clethodim** (Select Max)
- If you have significant broadleaf pressure then safflower may not be appropriate—safflower is not competitive in rosette stage (up to 4 weeks) But early planting may minimize weed competition
- Other herbicide labels:
 - Weed control: in northern states, not labeled in Texas—EPTC (Eptam), flumioxazin (Valor)
 - Pre-plant burndown and/or harvest aid (read labels): paraquat (Gramoxone, many others), glyphosate (Roundup, many others), saflufenacil (Sharpen)

Production Issues (5)

- Direct harvest with combine
 - Combine will have safflower settings (your drill will, too)
 - Dockage for moisture > 8%
- Crushing facilities not so important
- Availability of seed—Contractor will have it for you
- Volunteer potential as a weed?

Winter Types vs. Spring

Taller winter hardy safflower in center vs. non-hardy spring type in front (almost all dead), Hale Co., TX



- Total oil yield per acre for winter hardy and spring types may be similar
 - Initial tests: higher yield in winter types, but lower oil content
 - Planting opportunities for fall safflower, which needs to be planted we believe at least six weeks before average first freeze, may come by 2013

Winter Safflower on the Texas High Plains

- Compliment existing winter wheat production with higher potential return.
- Winter safflower may be better economically due to:
 - Lower disease potential
 - More efficient water use
 - Reduced weed competition

Winter Safflower Field Conditions

- Key is not whether safflower will establish at a given time rather will it survive—and it needs to be established!
 - Lubbock region, plant by ~mid-September
 - Earlier to north/northwest, a little later toward Big Spring
- For established safflower lows of 5°F have no further stand loss
- Acceptable varieties must have $\geq 80\%$ stand survival through the winter.
 - Commercial lines anticipated in 3-5 years (Texas Tech Univ. development and testing; also Cal Oils)

Winter Safflower Results

- % oil lower, yields higher
 - But this will cost processor more to get the same amount of oil
- No insect pests
- No disease problems
- Broadleaf weeds less of an issue except for mustards (tansy mustard, London rocket, etc.) for which there'd be no herbicide control method