

# Safflower Production in the Southern High Plains, 2010



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# Safflower



**“Best location to grow safflower is where it doesn't rain after flowering and humidity is low”**

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

# Safflower (cont)



**“Rain or irrigation  
after flowering can  
lead to head rot”**

- **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**



# Safflower Crop at Flowering



# Major Producers



# Spring Safflower



**“Most current varieties are spring types”**

- **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**



**“Safflower likes deep, clayey soil with higher water holding capacity. Light and shallow soils need more frequent watering or rainfall”**



# Safflower Planting



(Clovis 2009)

- **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**

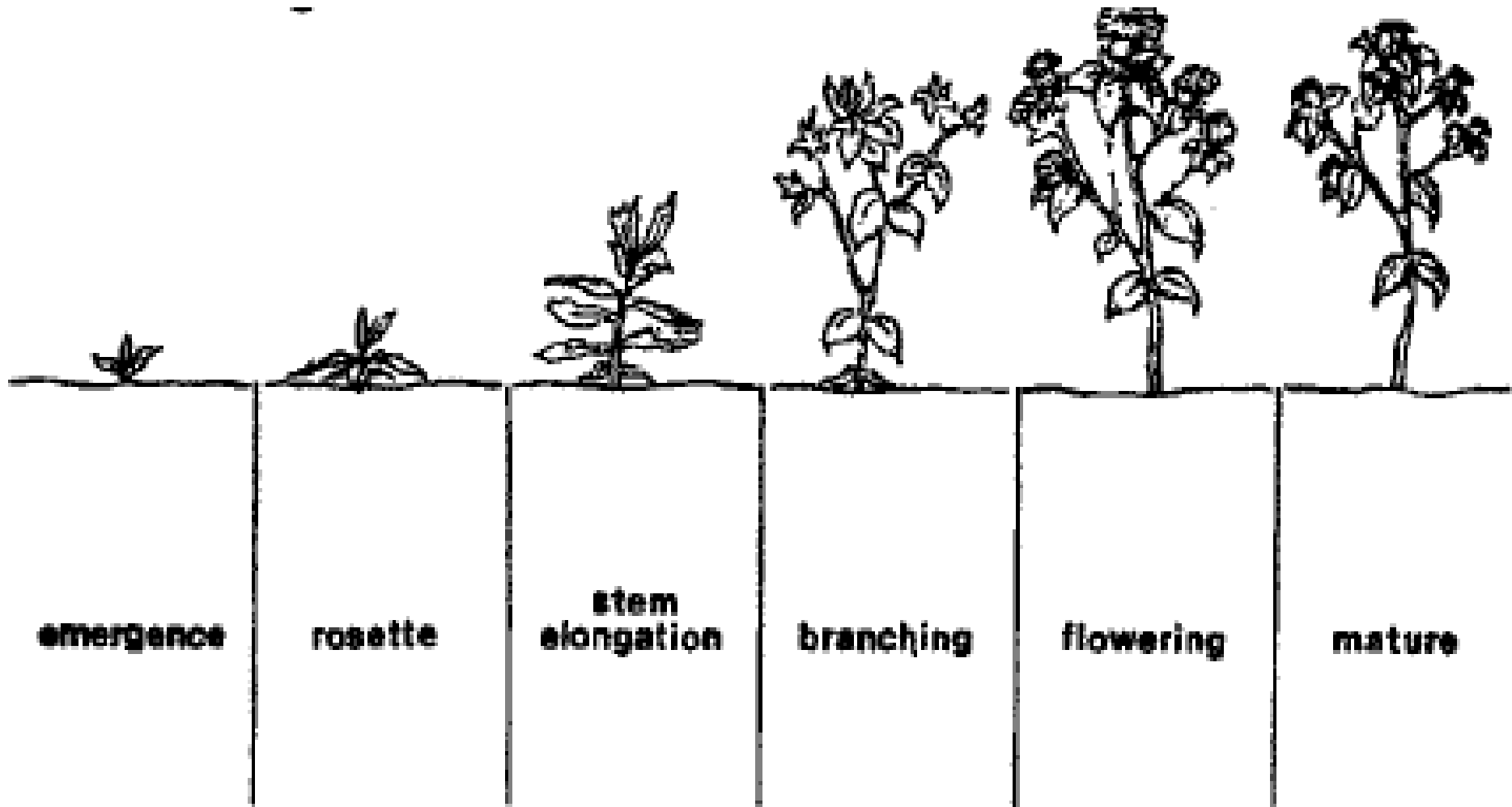


# **Fertility requirement** **(NDSU)**

- **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



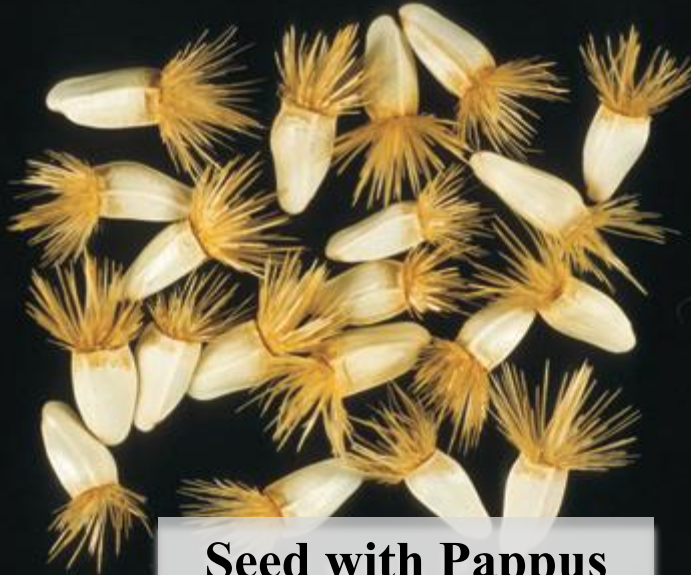
Mundel et al., 2004



**Head Cross Section**



**Safflower Ready  
for Harvest**



**Seed with Pappus**



**Non-striped seeds**

**Mundel et al., 2004**



**Striped seeds**



# Safflower Seedling



(Clovis 2009)



# Safflower (Stem Elongation)



(Clovis May 21, 2009)



# Safflower (Bud stage)



(Clovis June 7, 2009)



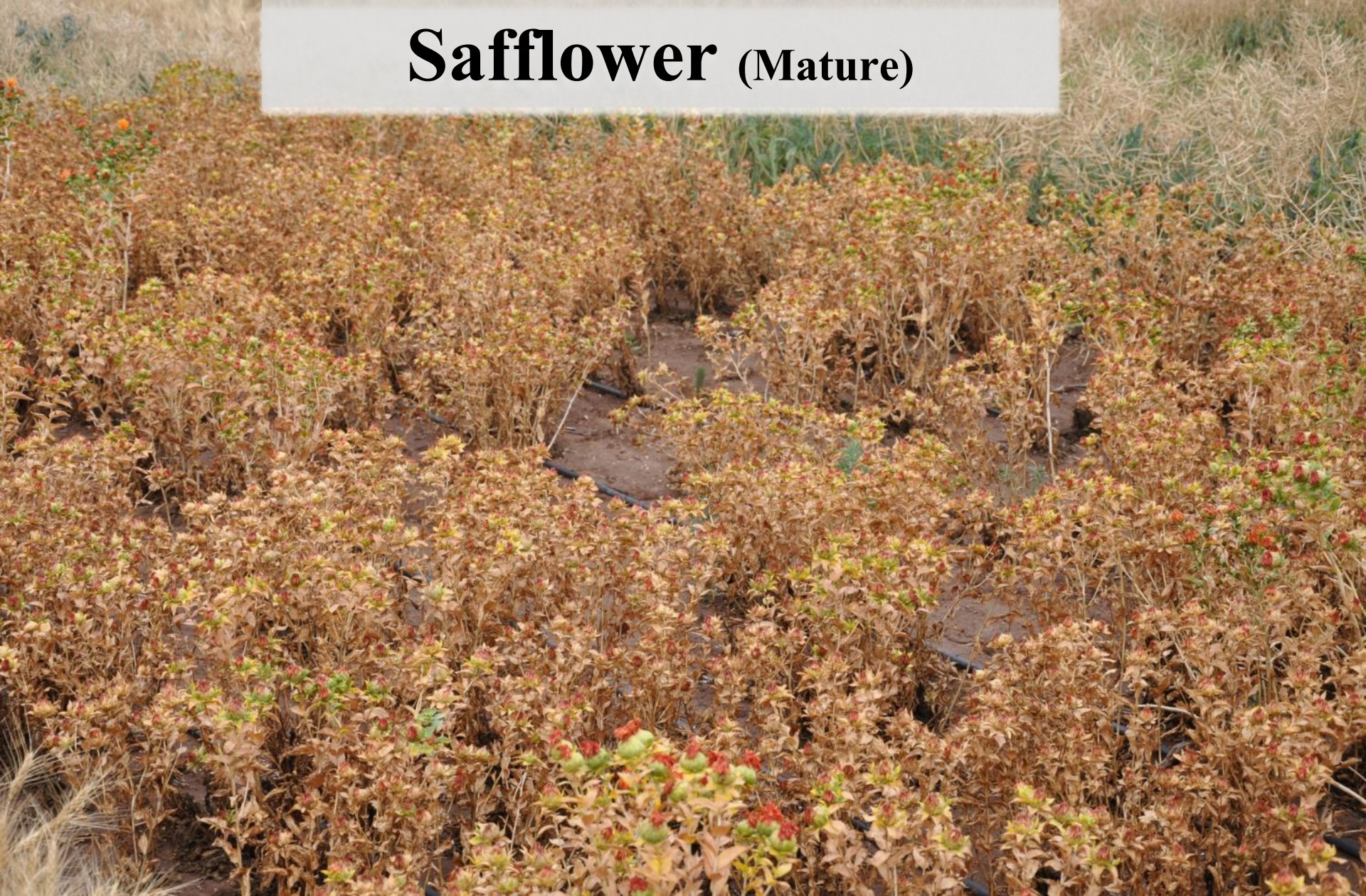
# Safflower (Flowering stage)



(Clovis 2009)



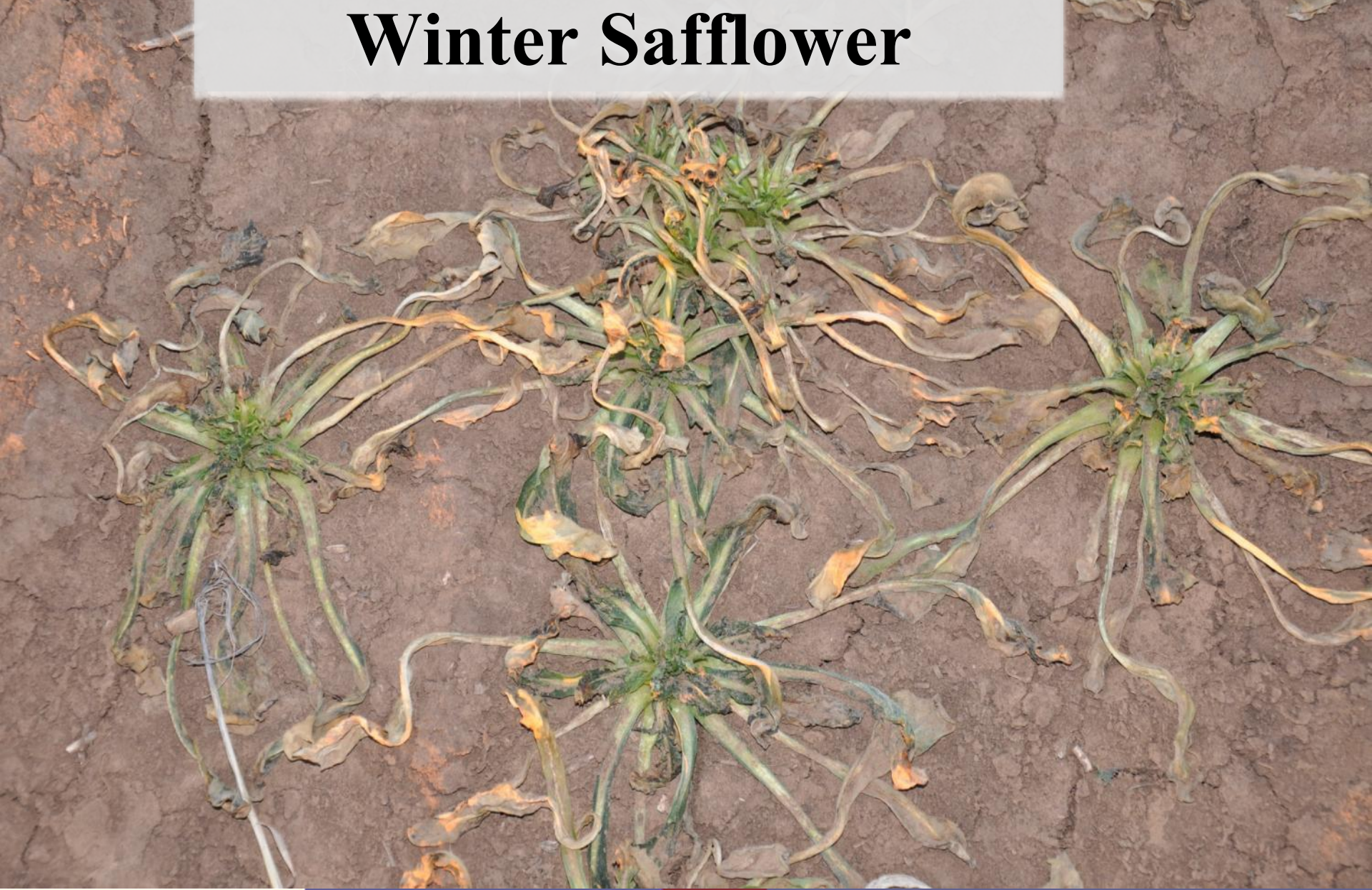
# Safflower (Mature)



(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**



# Safflower Diseases

*Alternaria* leaf blight



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



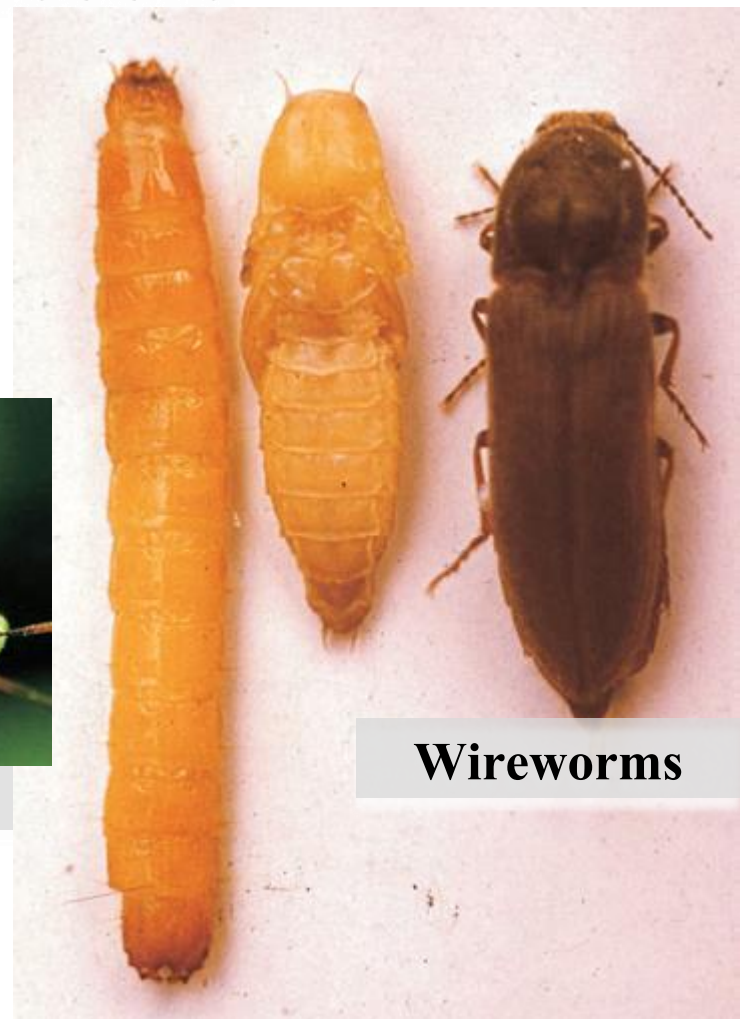
# Safflower Insects



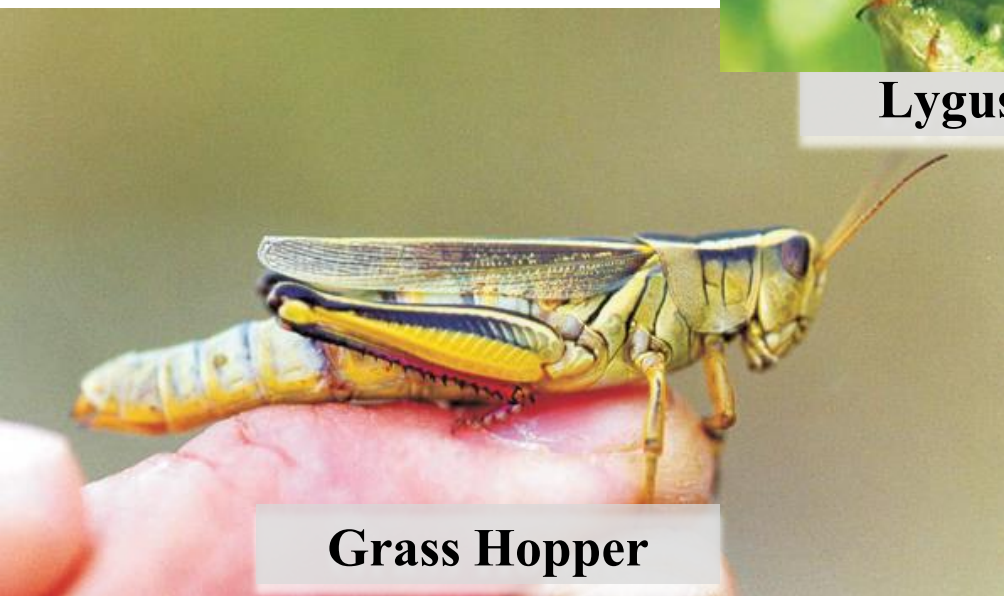
**Cutworms**



**Lygus bugs**



**Wireworms**



**Grass Hopper**

Mundel et al., 2004



# Harvesting

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

# Harvesting





# 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  $\approx$ 1,000 to 1,200 lbs./ac**
  - **Limited irrigation  $\sim$ 2,000 lbs./ac**
- **Winter types are expected to be higher yielding (but lower oil content)**

# Winter Safflower Water Management

Treatments	Yield
% of Wheat ET	(lb/ac)
0 <sup>†</sup>	1,325
25	1,578
50	1,621
75	1,456
100	1,789
125	1,702

<sup>†</sup> 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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