

Row Configuration and Plant Population Dynamics

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Plant Population

- Recommended final plant population is 25,000 to 30,000 plants/acre
- Ideal plant population depends on several factors.
 - The lower end of the recommended range should be planted when low yields are expected due to soil type, a late planting date, a drought-prone area or lower fertilizer use.
 - Higher plant populations should be seeded on good, deep alluvial soils where moisture is not usually limiting or where corn will be irrigated. These populations usually need high nitrogen rates (200 lbs or more of N) and should be planted early.
 - The best plant populations for some hybrids may be less than what is routinely recommended.
- Optimum plant population depends on factors such as yield potential, soil type, row spacing, and hybrid.
- After hybrid selection, it is advisable to consult with the seed company and request the optimal populations for respective hybrids.

Cost of Planting Seed Estimator

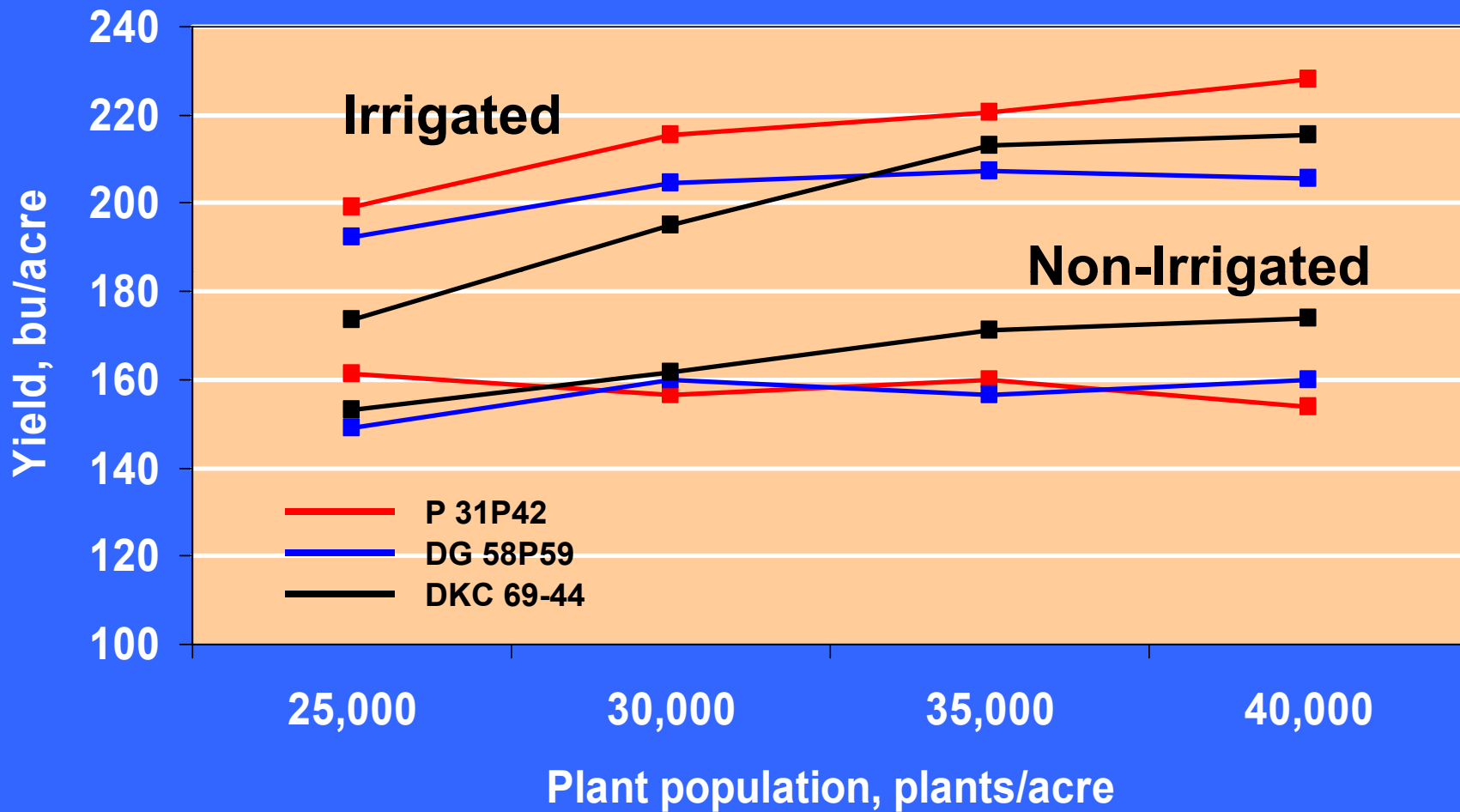
| Seed Rate | -----Cost of Planting Seed Per Bag----- | | | | | |
|-----------|---|-------|-------|-------|--------|--------|
| | 100 | 120 | 140 | 160 | 180 | 200 |
| 20 K | 25.00 | 30.00 | 35.00 | 40.00 | 45.00 | 50.00 |
| 25 K | 31.25 | 37.50 | 43.75 | 50.00 | 56.25 | 62.50 |
| 30 K | 37.50 | 45.00 | 52.50 | 60.00 | 67.50 | 75.00 |
| 35 K | 43.75 | 52.50 | 61.25 | 70.00 | 78.75 | 87.50 |
| 40 K | 50.00 | 60.00 | 70.00 | 80.00 | 90.00 | 100.00 |
| 45 K | 56.25 | 67.50 | 78.75 | 90.00 | 101.25 | 112.50 |

Notes: 80,000 (80 K) Planting Seed Per Bag

Projected Costs for 2007: \$140 to \$200

Influence of Yield Potential and Hybrid on Plant Population

Sharkey clay - 2008



Influence of Row Spacing and Seeding Rate on Optimal Plant Population

Influence of row spacing and seeding rate on yield of PB 3223 on Commerce sl in 2000.

| Row spacing | Seed rate | Plants | Yield |
|--------------------|------------------|----------------|----------------|
| inches | no/acre | no/acre | bu/acre |
| 20 | 25,000 | 30,080 | 160.8 |
| | 50,000 | 49,700 | 162.3 |
| 40 | 25,000 | 28,340 | 135.2 |
| | 50,000 | 45,344 | 127.0 |
| LSD (0.10) | | 3,220 | 10 |

Influence of row spacing and seeding rate on yield of PB 3223 on Commerce sl in 2001.

| Row spacing | Seed rate | Plants | Yield |
|--------------------|------------------|----------------|----------------|
| inches | no/acre | no/acre | bu/acre |
| 20 | 30,000 | 32,870 | 207.4 |
| 20 | 40,000 | 42,010 | 211.9 |
| 20 | 50,000 | 46,590 | 208.1 |
| 40 (flat) | 30,000 | 28,080 | 194.6 |
| 40 (bed) | 30,000 | 32,650 | 212.9 |

Influence of row spacing and seeding rate, averaged over two hybrids, on Commerce sl in 2003 and 2004.

| Row spacing inches | Seed rate no/acre | 2003 | | 2004 | |
|-----------------------|----------------------|--------------------|------------------|---------------------|------------------|
| | | Pl popn no/acre | Yield bu/acre | Pl popn. no/acre | Yield bu/acre |
| 20 | 33,000 | 33,090 | 175.1 | 25,520 | 150.0 |
| | 44,000 | 49,850 | 155.7 | 33,150 | 138.0 |
| 30 | 33,000 | 27,540 | 188.9 | 29,430 | 146.4 |
| | 44,000 | 32,480 | 183.9 | 36,030 | 152.4 |
| 40 | 33,000 | 29,520 | 171.2 | 28,360 | 160.4 |
| | 44,000 | 38,540 | 173.9 | 33,760 | 169.0 |
| LSD-0.10 | | | 4.9 | 10.3 | |

Influence of Row Spacing on Corn Yield at St. Joseph

| Row spacing | 2003 | 2004 |
|-------------|----------------|-------|
| inches | -----bu/a----- | |
| 20 | 169.0 | 144.3 |
| 30 | 184.7 | 145.3 |
| 40 | 174.8 | 164.1 |
| LSD (0.10) | 4.9 | 10.3 |

Summary

- For dryland with relatively low yield potentials, 25,000 plants/acre is probably adequate, especially when planting a 'flex-ear' type hybrid.
- For deep soils and/or irrigated, at least 30,000 plants/acre
 - For higher seeding rates, be sure hybrid has good stalk and root strength ratings.
- Rows narrower than 40-inch wide may be advantageous; however, in wet years yield may be reduced when planting flat

Twin-Row Corn Research

- Plant narrow rows on raised bed
 - 9.5-inch spacing on 40-inch centers
 - Single row – JD 1700
 - Twin row – Monosem
- Potential for furrow-irrigation



Twin-Row Corn Production

- **Northeast Research Station**
 - Commerce silt loam
 - Sharkey clay
- **Seeding rates, seed/acre**
 - 25,000
 - 30,000
 - 35,000
 - 40,000



Influence of row configuration on Sharkey clay at St. Joseph

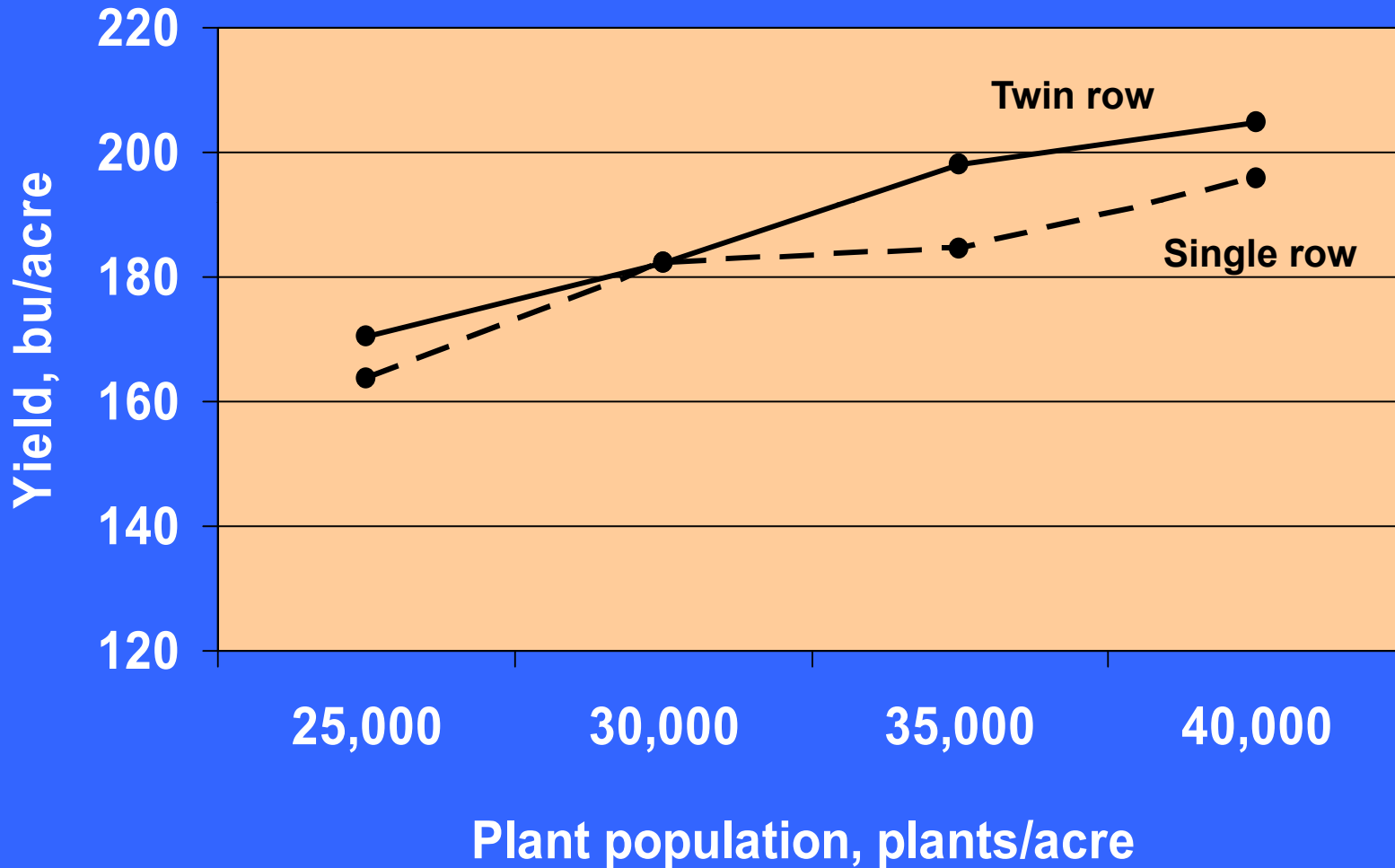
| Year | Hybrid | Single row | Twin row |
|---------|----------|-------------------|----------|
| | | -----bu/acre----- | |
| 2004 | DK697 | 114.5 | 119.4 |
| | PB3223 | 117.3 | 116.9 |
| 2008 | DKC68-44 | 181.5 | 188.8 |
| | PB 31P42 | 186.5 | 203.6 |
| Average | | 150.0 | 157.2 |

Influence of row configuration on Commerce silt loam at St. Joseph

| Year | Hybrid | Single row | Twin row |
|----------------|----------|-------------------|--------------|
| | | -----bu/acre----- | |
| 2005 | DKC69-71 | 193.7 | 194.8 |
| 2006 | DKC69-71 | 127.5 | 132.0 |
| 2007 | DKC69-71 | 119.3 | 106.5 |
| 2008 | DKC69-44 | 184.0 | 185.0 |
| | PB 31P42 | 186.9 | 189.4 |
| Average | | 162.3 | 161.5 |

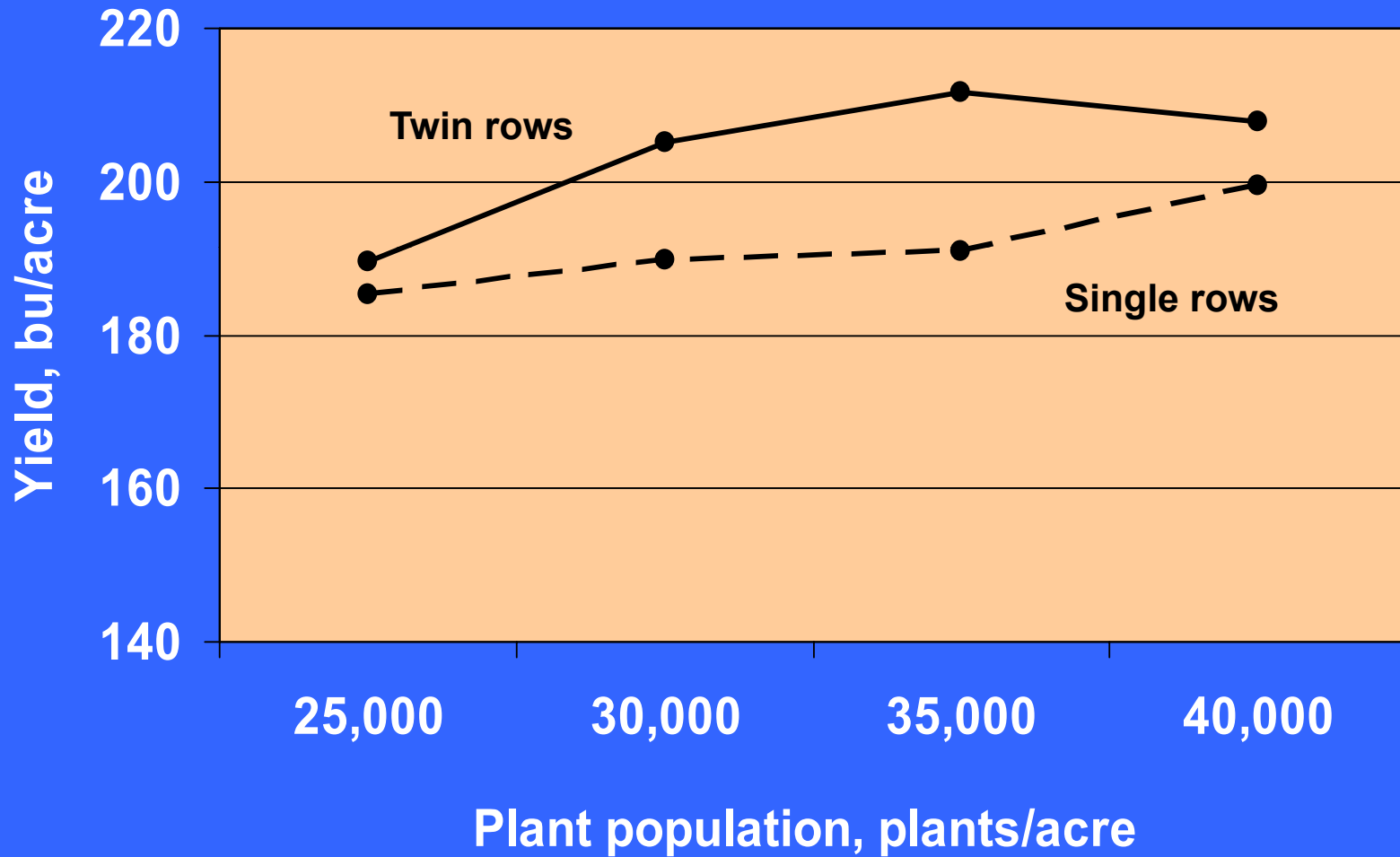
Sharkey clay – 2008

Dekalb DKC69-44



Sharkey clay – 2008

Pioneer 31P42

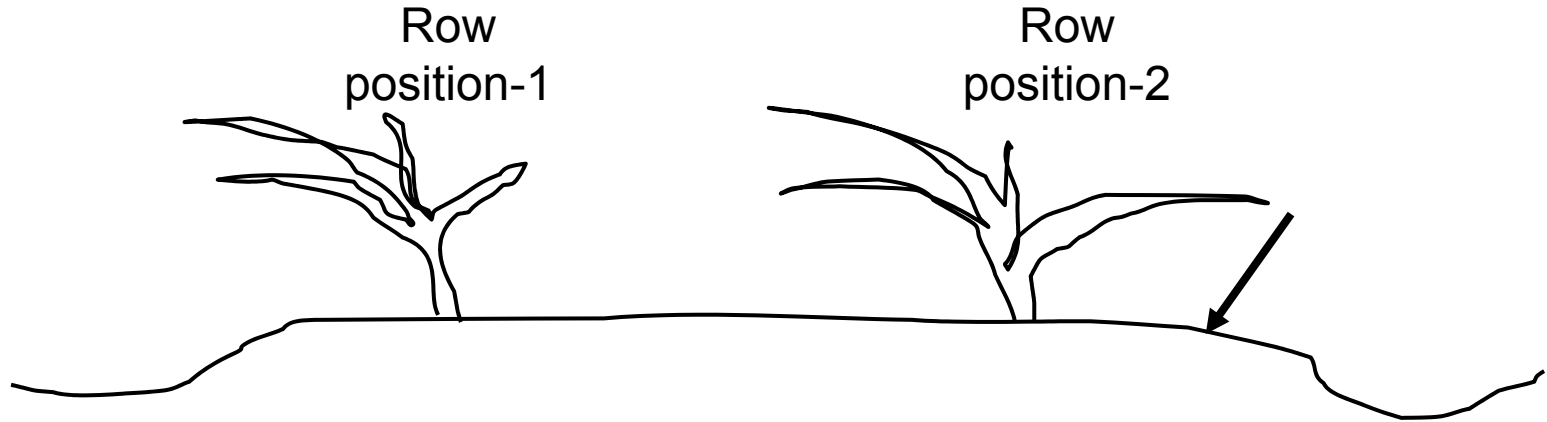


Fertilizer N Placement

- **NERS (2007)**
 - Sharkey clay
- **Hybrid**
 - Croplan Genetics 818
- **N Placement**
 - Single knife
 - Dual knife



Single Knife Placement



Dual Knife Placement

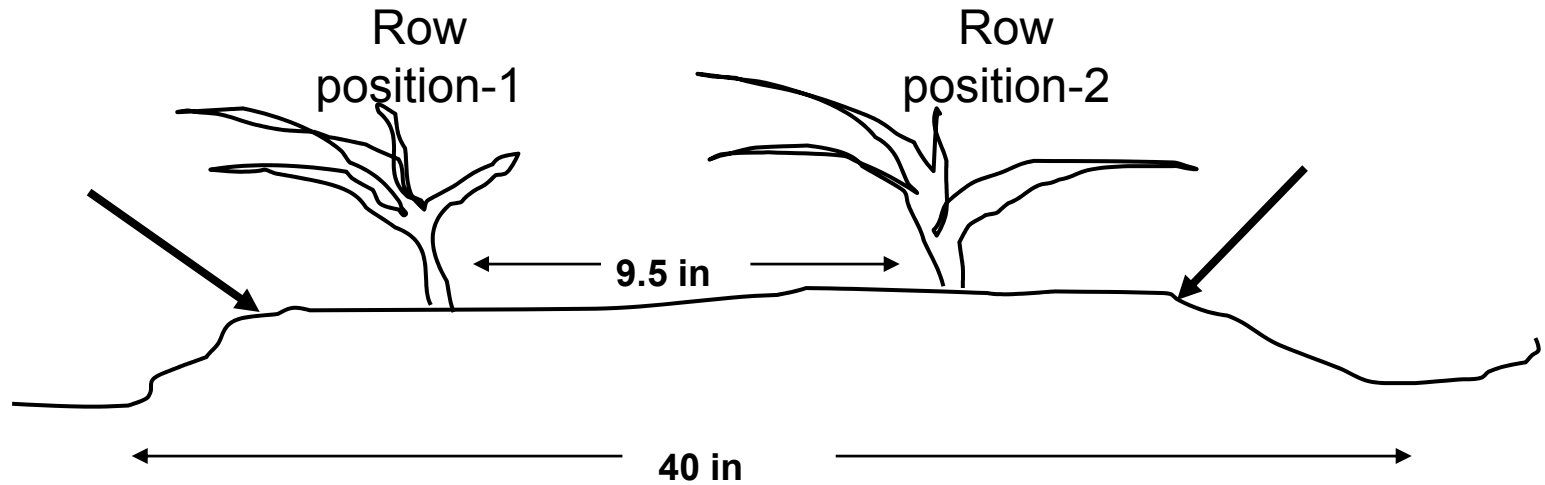
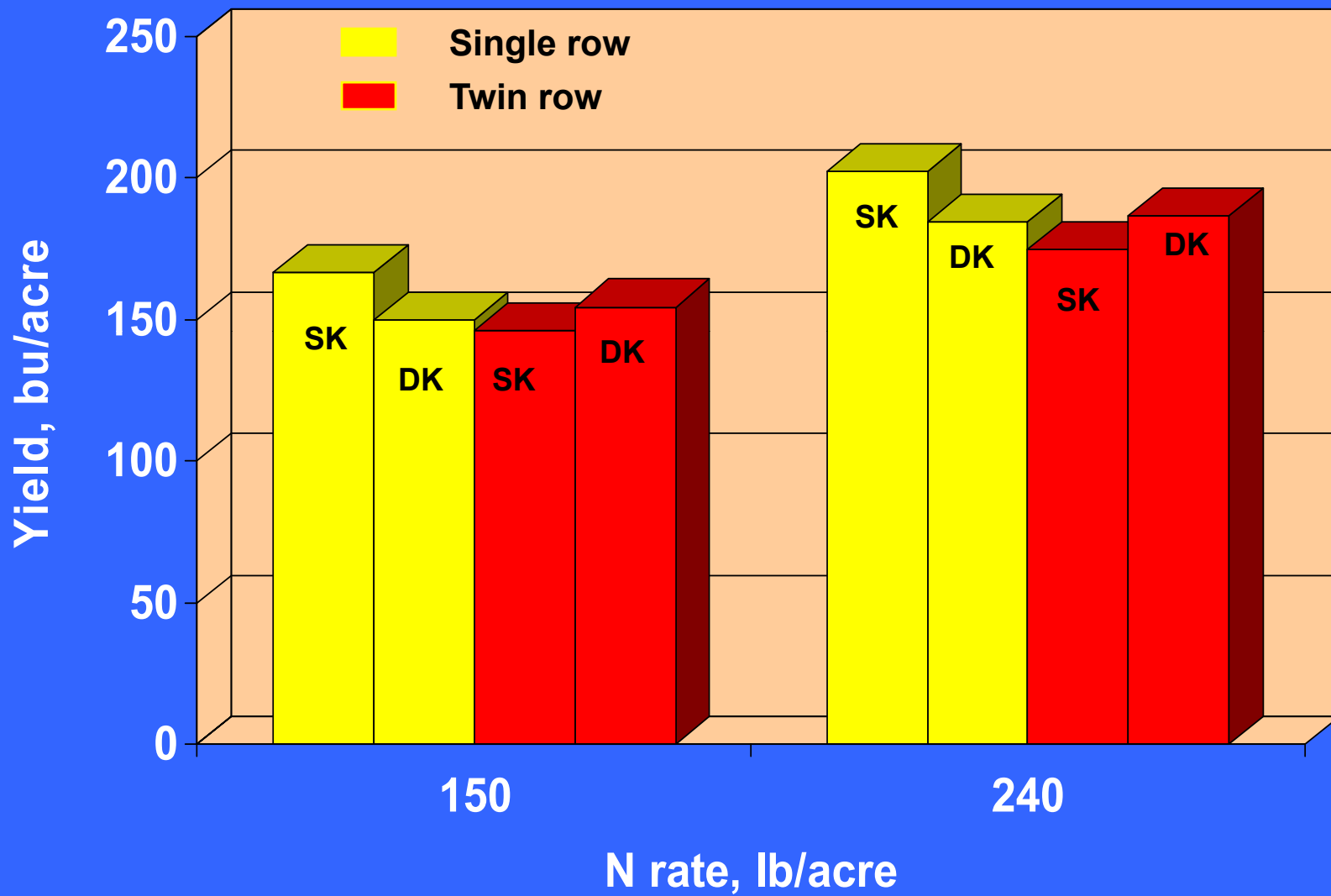
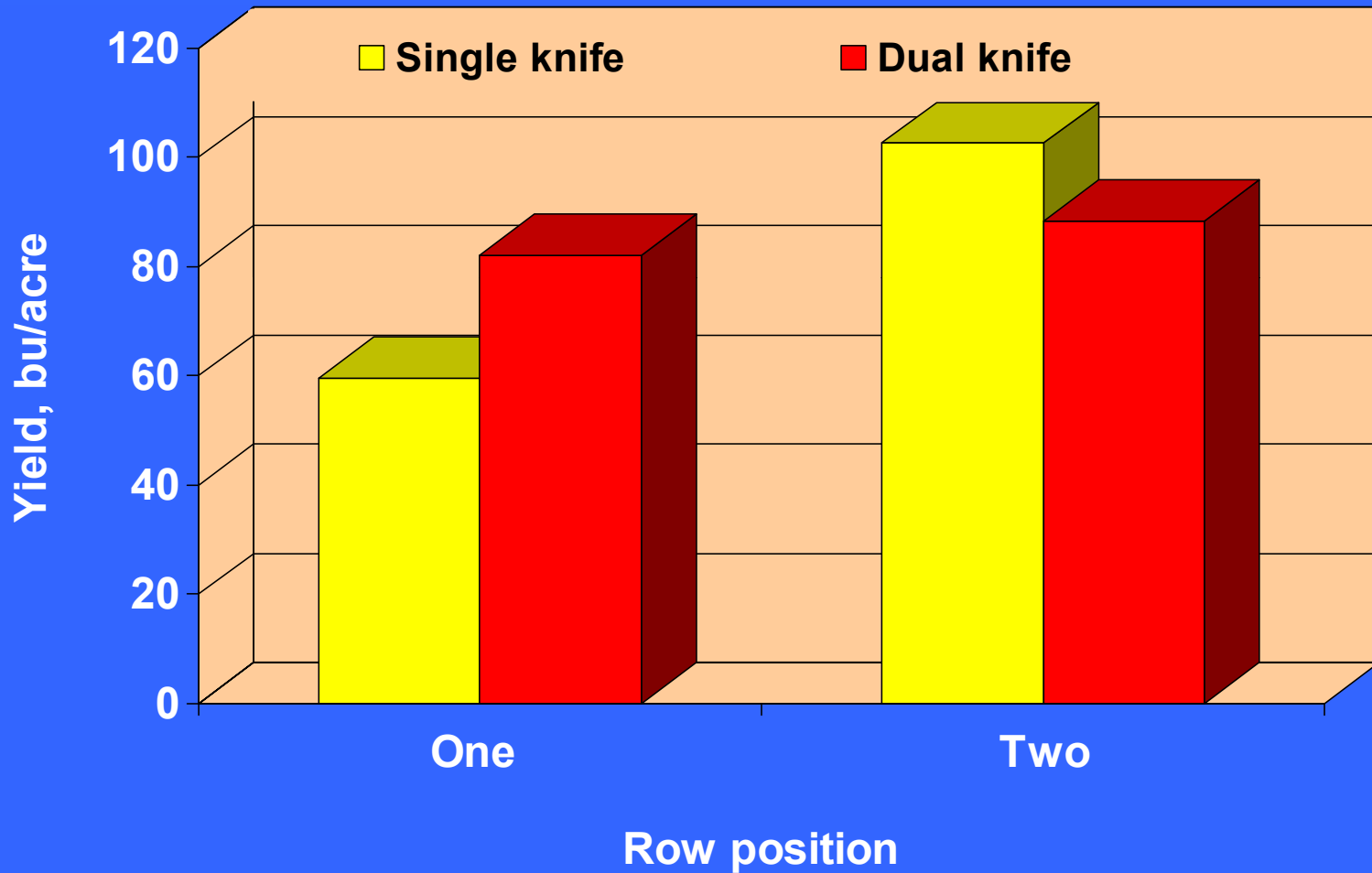


Fig. 1. Single knife placement for bed two is depicted in the upper illustration and dual knife placement in lower illustration.

Sharkey clay - 2007



Sharkey clay - 2007

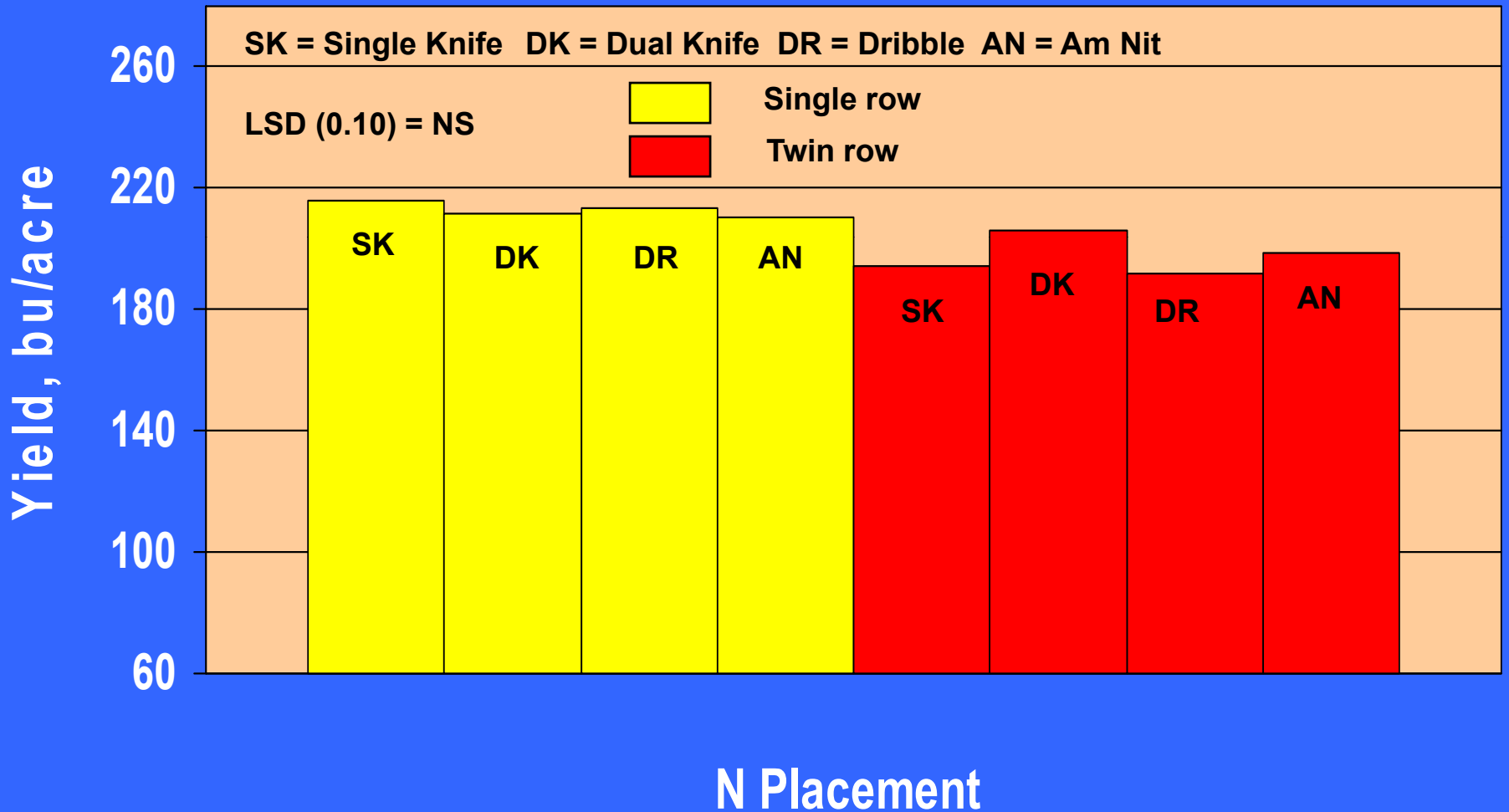


Fertilizer N Placement

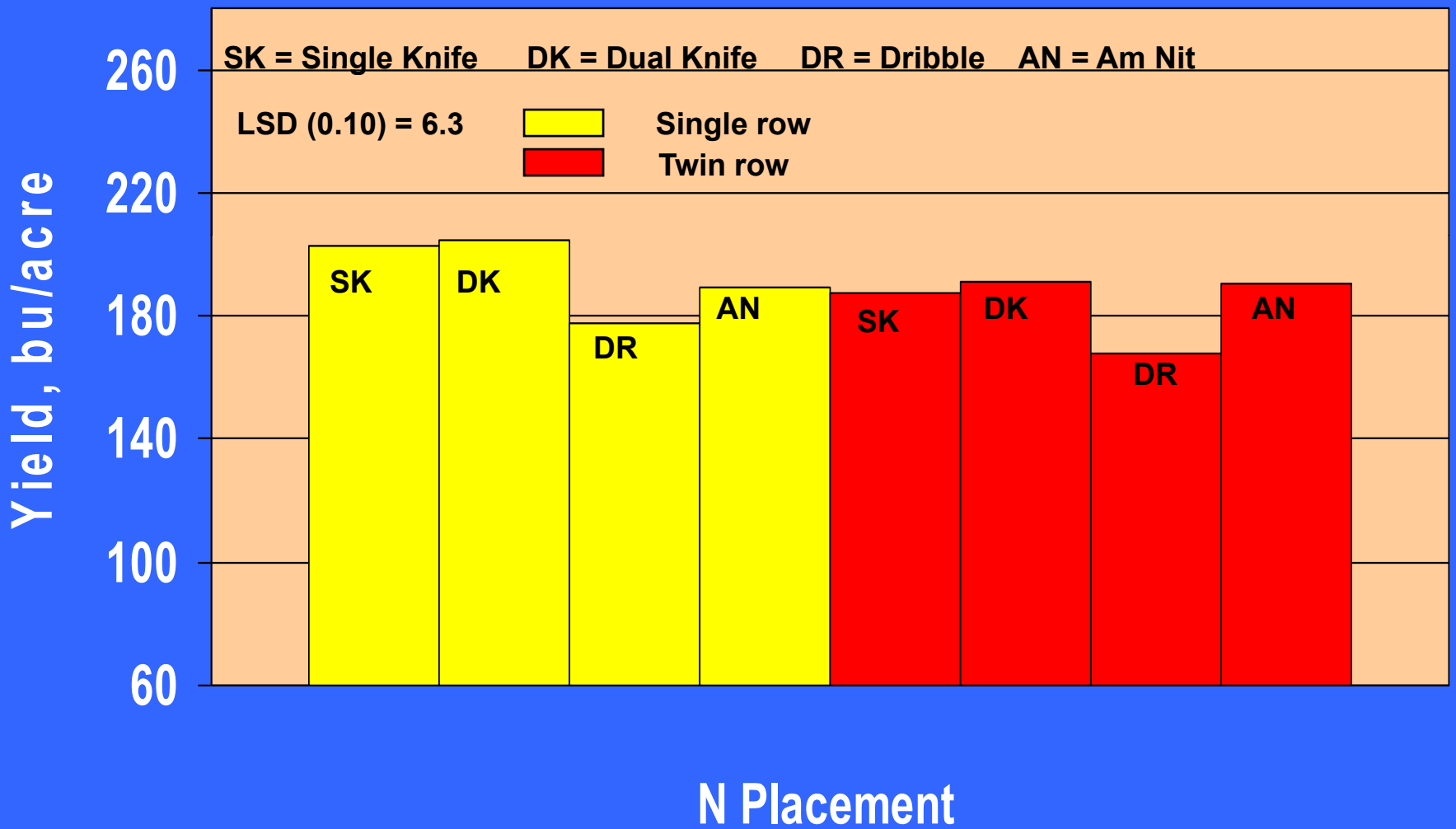
- **NERS (2008)**
 - Commerce silt loam
 - Sharkey clay
- **N placement**
 - Single knife
 - Dual knife
 - Dribble
 - Amm nitrate (bc)



Sharkey clay - 2008



Commerce silt loam - 2008



Influence of row configuration on grain sorghum yield on Gigger sl at Winnsboro.

| RC | 2004 | 2006 | 2007 | Avg. |
|----------|-------------------|-------|-------|-------|
| | -----bu/acre----- | | | |
| Single | 5,286 | 4,294 | 4,748 | 4,776 |
| Twin | 5,523 | 4,442 | 4,879 | 4,948 |
| LSD-0.10 | NS | NS | NS | |

Influence of row configuration on grain sorghum yield on Sharkey c at St. Joseph.

| RC | 2005 | 2006 | 2007 | Avg. |
|----------|-------------------|-------|-------|-------|
| | -----bu/acre----- | | | |
| Single | 4,643 | 6,115 | 6,268 | 5,675 |
| Twin | 4,949 | 6,474 | 6,755 | 6,059 |
| LSD-0.10 | 195 | 63 | 180 | |

Influence of row configuration on soybean and cotton yield.

| Row conf. | Soybeans | | | Cotton | |
|---------------|-------------------|-------|-------|----------------------|-------|
| | NE-04 | DL-07 | DL-07 | MR-05 | MR-05 |
| | -----bu/acre----- | | | -----lb lint/acre--- | |
| Single | 46 | 56 | 58 | 1,634 | 1,489 |
| Twin | 47 | 63 | 66 | 1,491 | 1,462 |
| LSD - 0.10 | NS | 2 | 4 | NS | NS |

Summary

- **Based on LA research, grain sorghum and soybeans had the most consistent yield response to twin rows.**
- **Some corn hybrids may yield higher on twin rows than other hybrids, particularly at higher plant populations.**

**Questions or Comments,
Thanks**

