
The Potential for Sesame Production In Kansas



Vic Martin
**Alternative Crops &
Annual Forages**

What is Sesame?

Sesame (*Sesamum indicum* L., Pedaliaceae)

- **Summer annual broadleaf crop**
- **Cultivated for over 5000 years in Asia**
- **An oilseed crop (50% oil) and used as confectionary (buns, condiment)**
- **Two basic types – arid & high moisture**
- **Arid types lower fertility requirements**
- **Tap root – moisture and fertilizer efficiency**

What is Sesame? (cont.)

- **99% of world sesame production is hand harvested due to shattering**
- **U.S. sesame varieties now available are shatter resistant (Non-Dehiscent, ND)**
- **Newest varieties are IND**
- **Allows sesame to stand in field to dry down and retain almost all seed, self-defoliates**
- **ND and IND varieties are non GMO**

Why Sesame?

- **Markets – U.S. fast food industry (hamburger buns) & Asia (Japan, Korea, China, India), Near East (tahini)**
- **Extremely heat and drought tolerant**
- **Consistent under limited resources (moisture, fertility)**
- **Equipment**
- **Return vs. costs**
- **Insect and disease resistance**
- **Excellent rotational crop**
- **Bird and deer damage**
- **Root-knot nematode**
- **Tilth**
- **Full season and double-crop potential**

Why Sesame?

Rotational benefits:

- **Uses less fall water than crops like sorghum or soybean and allows for soil moisture recharge and the opportunity for fall double-crop under proper conditions along Oklahoma border.**
- **Cotton root rot and nematode suppression.**
- **Soil improvements – improves soil tilth, residue reduces erosion potential more effectively than soybean or sunflower.**

Where Sesame?

- **Currently grown in Texas, Oklahoma, Arizona, with interest in Southern Kansas.**
- **Initial area bordered by I-70 on the north, Dodge City on the West, and Emporia on the East.**
- **Medium to light textured, well-drained soils**
- **pH – 5-8**
- **Doesn't tolerate salinity or standing water**
- **Primarily dryland or very limited irrigation**

Growth and Development

Environmental factor affects:

- **Temperature requirements – below optimal temperatures far more detrimental than above.**
- **Temperatures below 60.6°F delay crop growth and maturity.**
- **Do not plant until minimum soil temperatures at 2” is at least 70°F.**
- **While early planting maximizes yield cool temperatures after planting will decrease yield.**
- **110 days of night temperatures above 40°F to reach maturity.**

Cultural Practices

- **Planting date – typically July 4 is the end of the planting window.**

Soils:

- **Medium to light well-drained soils, pH 5-8, moderate fertility. Intolerant to salts and standing water.**

Herbicide carryover/residues:

- **No problems – alachlor, diuron, linuron, metolachlor, glyphosate, glufosinate. 2,4D and other phenoxy herbicides okay as early burn-down.**
- **Few problems – trifluralin, pendimethalin (Prowl), pyriithiobac (Staple)**

Cultural Practices

Herbicide carryover/residues: (cont.)

- **Potential problems – prometryn (Caprol), imazethapyr (Pursuit). Poor rainfall increases chances of stand reduction and plant damage.**
- **Typically major problems – sulfuron family (Ally, Amber, Assert, Finesse, Glean) often complete stand loss. Triazines. At least one year is necessary before attempting to plant sesame. Longer under high pH soils.**
- **Rainfall is also an important determining factor.**
- **If you can't plant cotton, you definitely can't plant sesame.**

Cultural Practices

Rotations

- **May be planted after cotton, corn, sorghum, alfalfa, soybean, wheat, oats, rye.**
- **Double-crop after winter cereal grain – when able to plant before July 4 and if adequate soil moisture.**
- **After failed cotton, primarily near OK border.**
- **In all cases, herbicide programs must be closely examined**

Cultural Practices

Tillage and row-spacing:

- **Row spacing – 15” to 40” rows in traditional growing areas. In Kansas to facilitate weed control and compensate for shorter growing season, narrow rows are being experimented with and have worked well over three years. Wider rows allow cultivation for weed control. Newer varieties respond more favorably to narrow rows.**
- **Tillage: no-till, strip-till, and conventional tillage. Fine, firm seedbed. With reduced tillage the key is a weed free seedbed and keeping residue out of the row. In wheat stubble, lower stubble height is preferable.**

Cultural Practices

Tillage and row-spacing: (cont.)

- **Tillage: Advantages include bare soil and therefore warmer soil temperatures, weed free environment, eliminate crop residue problems. Disadvantages include dry soil surface require deeper planting to moisture, soil structure too loose for seed-soil contact, crusting after precipitation.**

Cultural Practices

Planting:

- **Most important phase in production and most challenging.**
- **Very small seed with less vigor than sunflower, soybean or cotton.**
- **Seed should be placed $\frac{1}{2}$ to $\frac{3}{4}$ inches below moisture.**
- **Total seeding depth of $\frac{3}{4}$ to 1.5 inches.**
- **Need good moisture at planting.**
- **Check planting rate and depth carefully.**
- **Slow down**
- **Light press wheel pressure**
- **Dusting in not recommended**

Cultural Practices

Planting: (cont.)

Planting rate:

- **Over-seeding is preferable to under-seeding as sesame is self thinning.**
- **2.5 – 4.5 lb/a on wider rows with 3 lb/a on average**
- **5 lb/a in narrow rows**
- **Increased seeding rate – deeper planting, compaction, clods and surface residues, cool temp., less than desired moisture**
- **Decreased seeding rate – good seed bed with good moisture, high soil temperatures, no herbicide concerns.**
- **Ideal population at harvest 5-10 plts/row-foot.**

Cultural Practices

Weed control:

- **Best weed control is rapid emergence and canopy cover**
- **Weed free seedbed**
- **Only two labeled herbicides in U.S. – glyphosate as a burn down through planting. Wipers or hooded sprayers after emergence. Clethodim (Select Max) at any stage except flowering.**
- **Work is under way examining herbicide programs.**
- **Glyphosate, 2,4D, and glufosinate drift.**
- **Cultivation – can throw dirt on stems, best to cultivate prior to bloom.**

Cultural Practices

Fertility management:

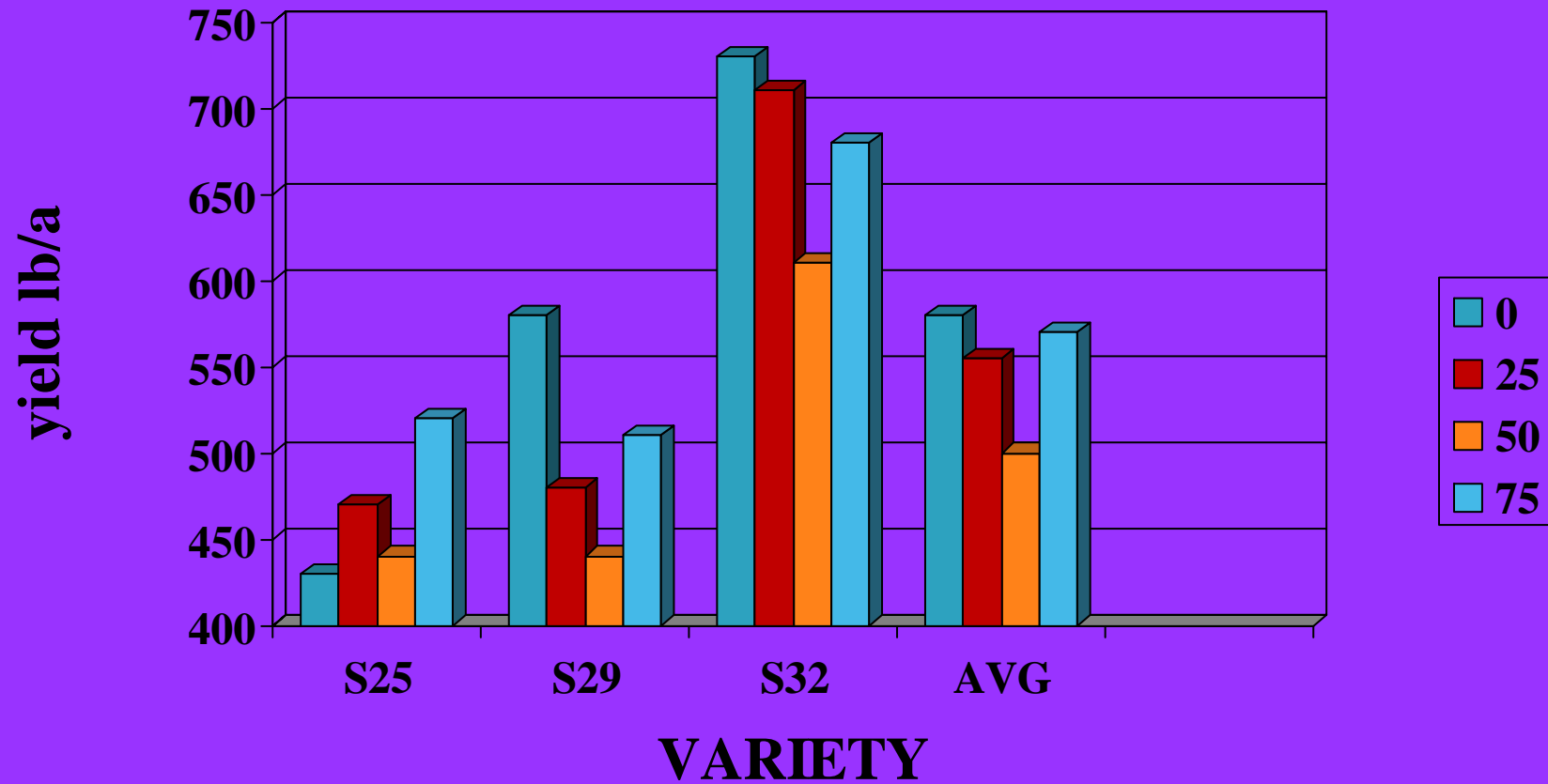
- **Soil test including N-Test.**
- **With deep taproot sesame can scavenge nutrients below grass crop root zone.**
- **Rates dependent upon conditions – especially moisture and soil type.**
- **Little work on P and K rates, most producers use cotton recommendations for their area.**
- **N work is on-going at K-State. Current recommendation is 50 lb/a total N. Slight less under lower precipitation and 10 – 30 lb/acre higher under good precipitation/irrigation.**

Cultural Practices

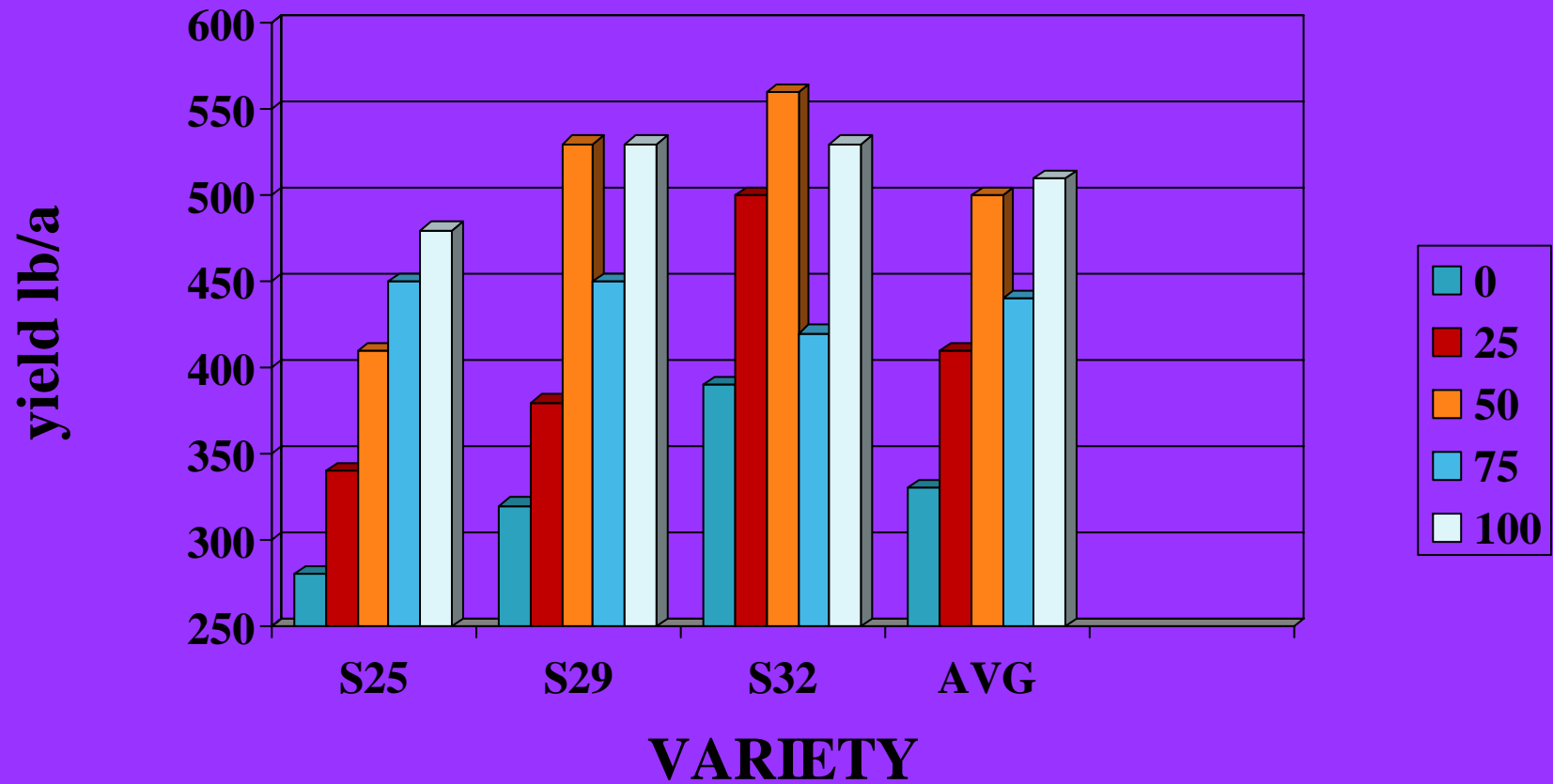
Fertility management: (cont.)

- **Split application best with half preplant and half at pre-reproductive stage.**
- **All N preplant can deplete moisture for reproduction and result in excessive vegetative growth.**
- **Under high residue rates or double-crop disked wheat stubble, consider increasing an extra 20 units N preplant to compensate for immobilization.**
- **No fertilizer in seed furrow!**
- **30 lb/acre of N returned to soil in sesame residue on average.**

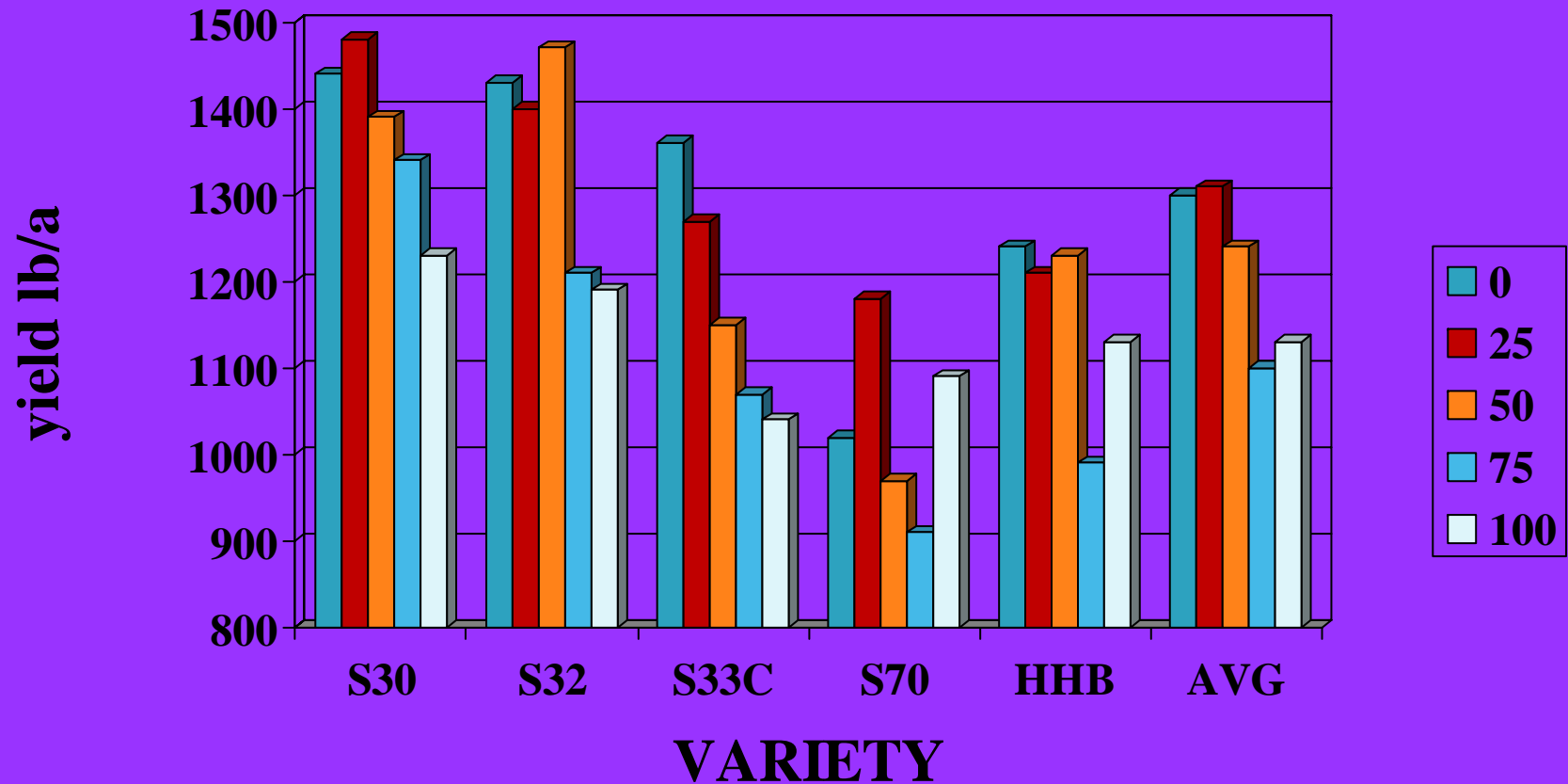
2007 Sesame N-Rate X Variety



2008 Sesame N-Rate X Variety



2009 Sesame N-Rate X Variety



Cultural Practices

Water management:

- **Producers should do everything possible to conserve soil moisture.**
- **While an extremely drought tolerant crop, but adequate moisture is necessary for acceptable yields.**
- **With moisture for germination and emergence and a decent soil moisture profile, sesame can produce adequate yields with no precipitation during the growing season.**
- **If irrigating, pre-irrigation is preferable to “watering” up the crop.**
- **Under-irrigation is better than over-irrigation.**
- **High early soil moisture levels inhibit taproot development.**

Cultural Practices

Diseases:

- **Current varieties have good tolerance to all potential diseases.**
- **Sesame root rots – combination of *Fusarium oxysporum*, *Phytophthora parasitica*, and *Macrophomina phaseolina*. Normally only found when sesame is planted on top of sesame. Current varieties tolerant but not resistance.**

Cultural Practices

Insects:

- **Current varieties have good tolerance incorporated.**
- **Beneficials normally abundant when sesame is growing.**
- **Bollworms and garden webworms have been found but not reached an economic threshold.**
- **Grasshoppers can be problems in dry years but normally only on field edges.**
- **Only labeled pesticides are Bt (*Bacillus thuringiensis*) and neem (*Axadirachtin*).**

Cultural Practices

Harvest:

- **Sesame self-defoliates.**
- **Harvest aids may speed dry down but none are currently labeled.**
- **Sesame is an oilseed crop and must be harvest at <6% moisture. Drying is not cost effective.**
- **Direct cutting only.**

Cultural Practices

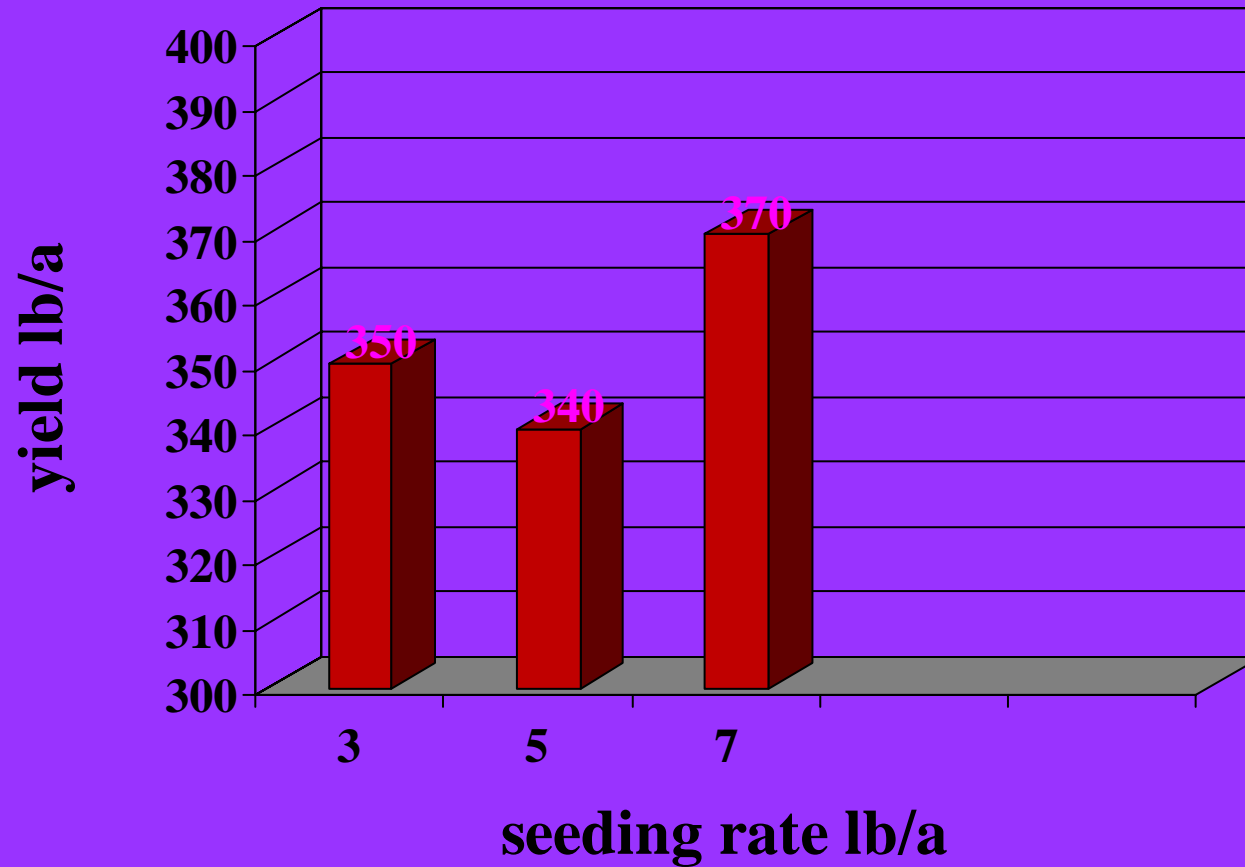
Combining:

- **Any well-maintained, properly set combine can successfully harvest sesame with minimal losses and damage.**
- **Header height set to lowest capsule, typically 1-1.5'. No matter the spacing, a platform header is typically used.**
- **Bat reel is best for minimizing seed loss. Set reel to minimize contact prior to entering header. Reel speed should match ground speed.**
- **Cylinder/rotor speeds set low – 350-400 rpm.**
- **Concaves 1/2 - 1" to minimize seed damage.**

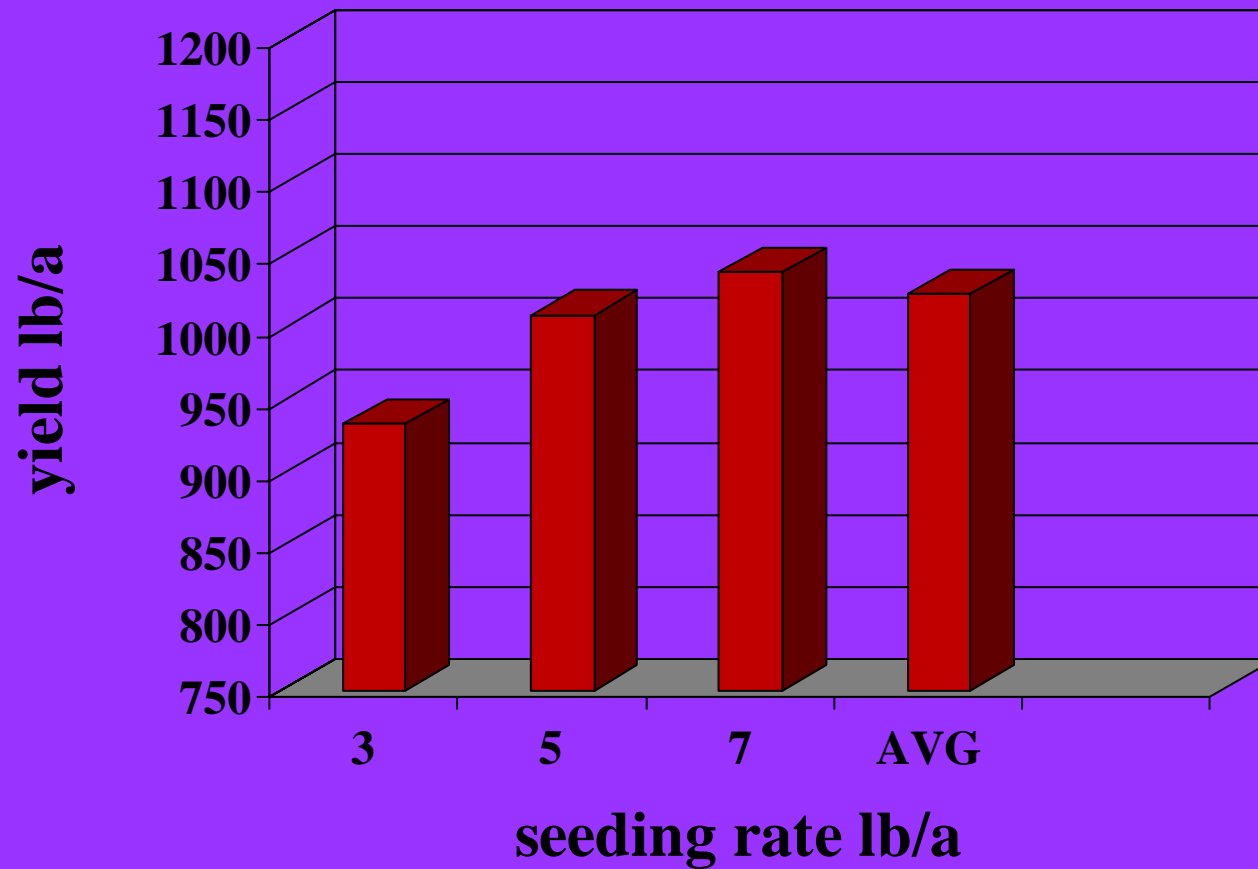
Cultural Practices

- **Current varieties are all obtained through Sesaco.**
- **Currently available varieties: S30, S32, S33C, S70, HHB**

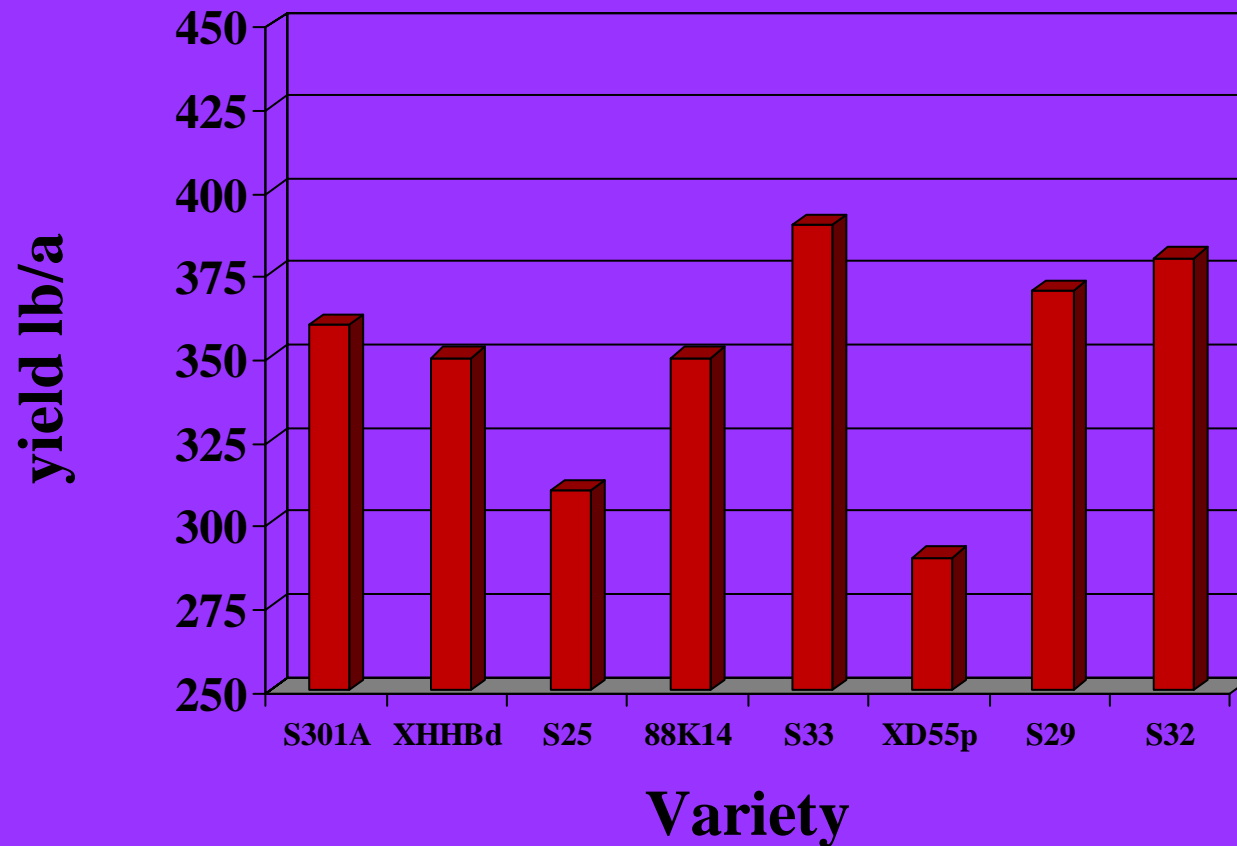
2008 Sesame Seeding Rate Across Hybrid



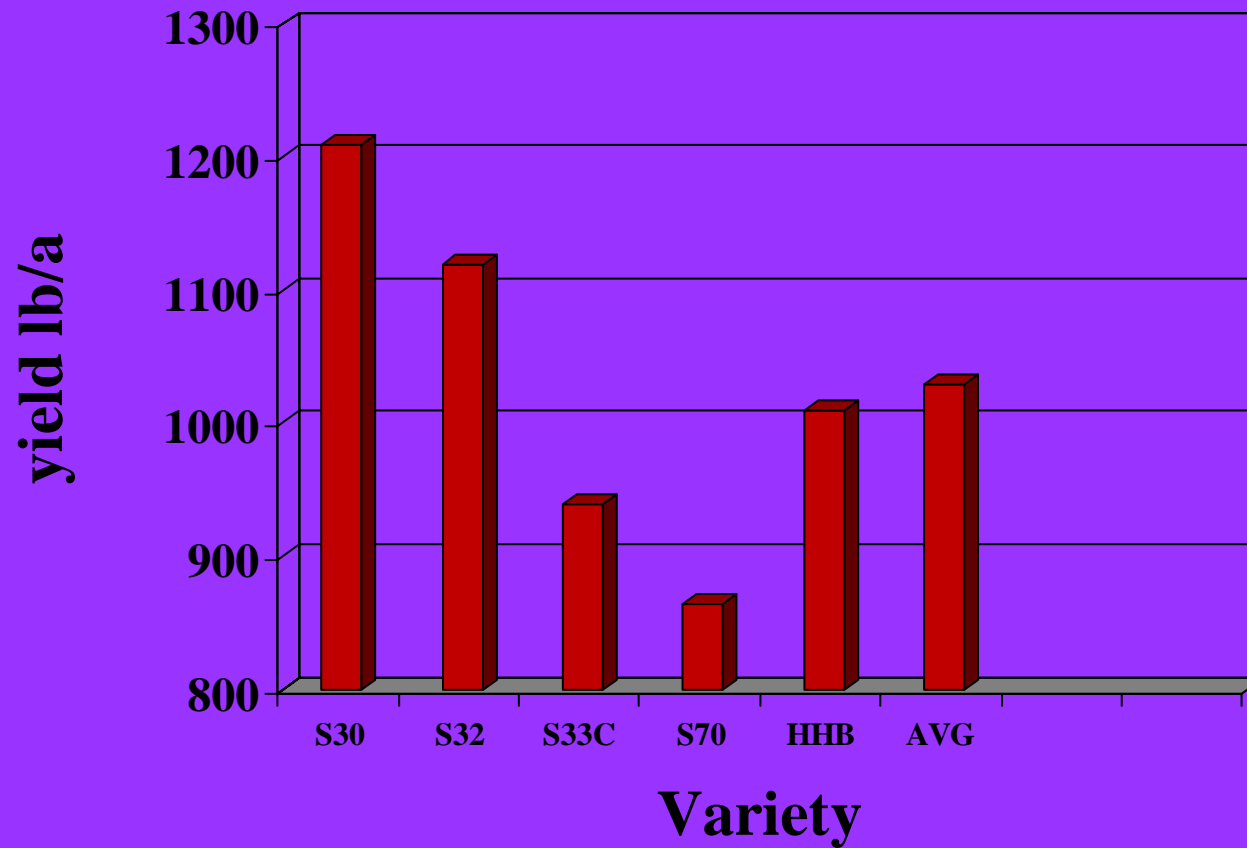
2009 Sesame Seeding Rate Across Hybrid



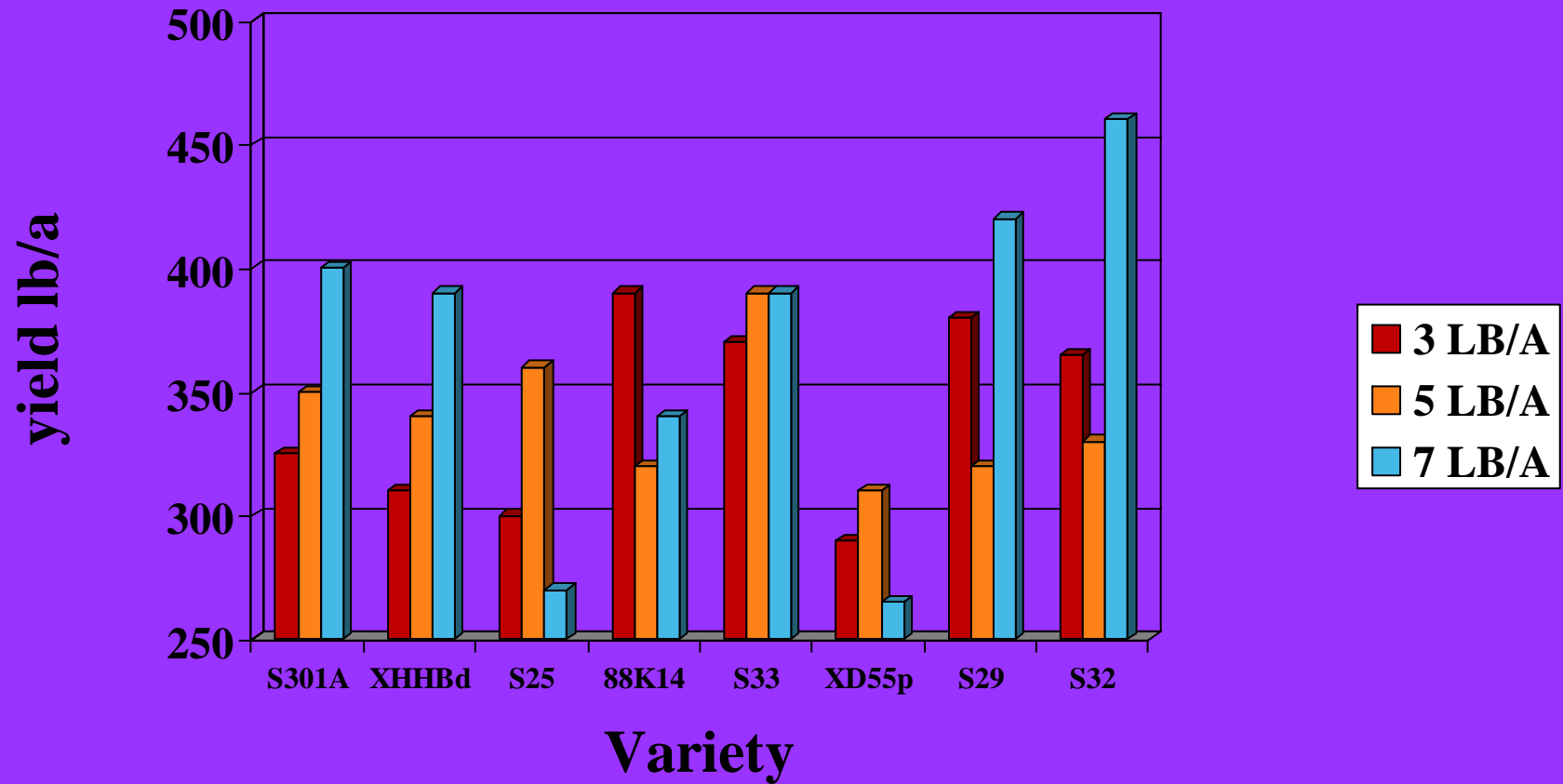
2008 Sesame Variety Trial Across Seeding Rate



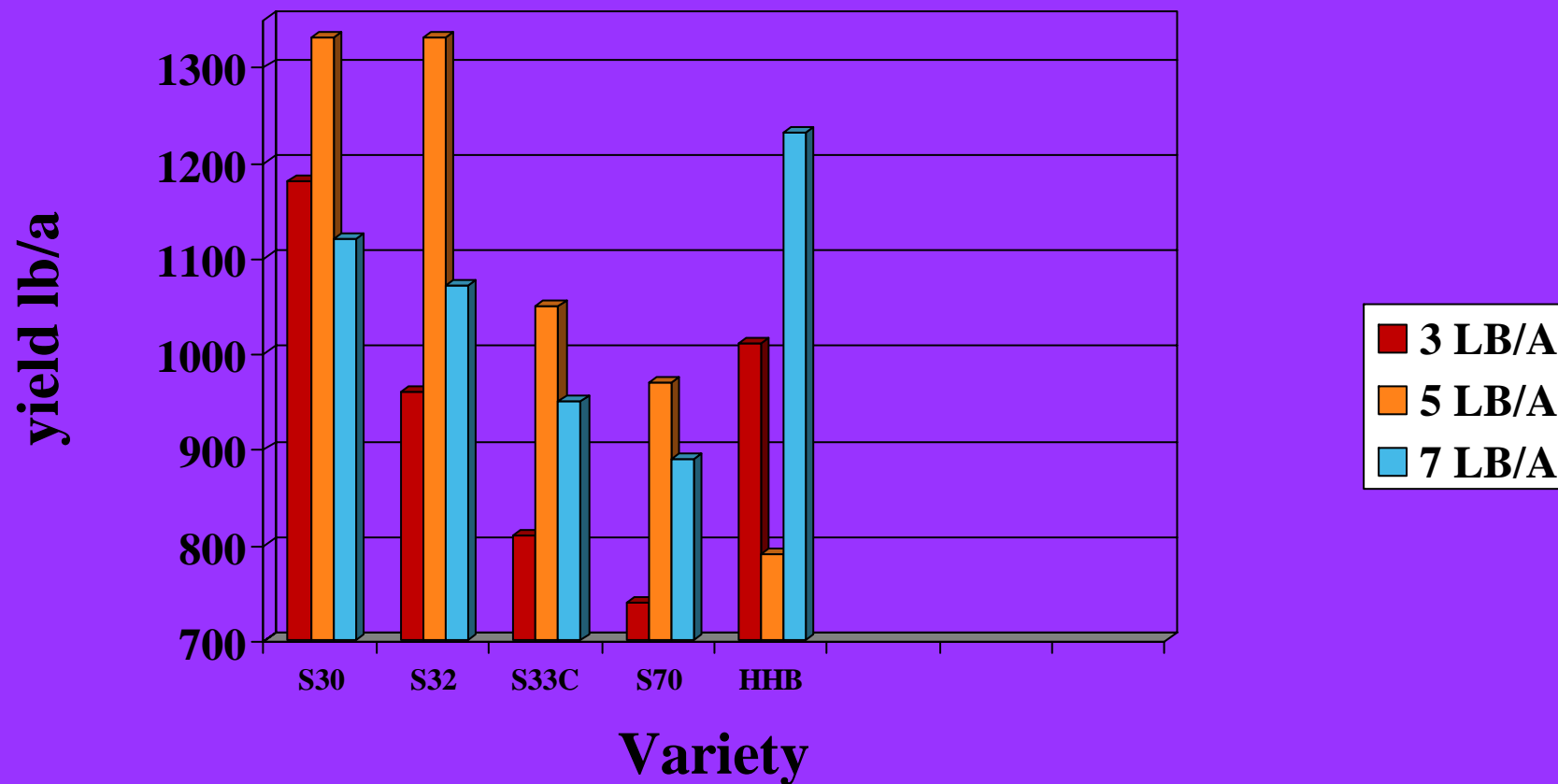
2009 Sesame Variety Trial Across Seeding Rate



2008 Sesame Variety X Seeding Rate



2009 Sesame Variety X Seeding Rate



Sesaco

- **Supplier of seed**
- **Contractor for production**
- **“Act of God” contracts**
- **Currently 30 cents per pound**
- **Delivery points**
- **www.sesaco.com**
- **www.sesamegrowers.org**
- **Danny Peeper ©580-623-1017**

















