Native Legumes
Possibilities for Minnesota Agriculture

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Research with Indigenous Legumes - Evaluation of Agronomic Potential

Species evaluated to date:

- **Blue wild indigo** ***(Baptisia australis)***
- **Wild senna** ***(Senna hebecarpa)***
- **Illinois bundleflower** ***(Desmanthus illinoensis)***
- **Hog peanut** ***(Amphicarpaea bracteata)***
- **Round headed bush clover** ***(Lespedeza capitata)***
- **Pale pea** ***(Lathyrus ochroleucus)***
- **Veiny pea / Wild pea** ***(Lathyrus venosus)***
- **Beach pea** ***(Lathyrus maritimus)***
- **False indigo** ***(Amorpha fruticosa)***
- **Leadplant** ***(Amorpha canescens)***
- **Purple prairie clover** ***(Dalea purpureum)***
- **White prairie clover** ***(Dalea candidum)***

Species evaluated to date (cont'd):

- **Silky prairie clover** ***(Dalea villosum)***
- **Wild licorice** ***(Glycyrrhiza lepidota)***
- **Canada milkvetch** ***(Astralagus canadensis)***
- **Ground plum** ***(Astralagus crassicarpus)***
- **Small wild bean** ***(Strophostyles leiosperma)***
- **Showy tick trefoil** ***(Desmodium canadense)***
- **Wild lupine** ***(Lupinus perennis)***
- **Scurfy pea** ***(Psoralea tenuiflora)***
- **Breadroot** ***(Psoralea esculenta)***
- **Prairie indigo** ***(Baptisia bracteata)***
- **Dwarf false indigo** ***(Amorpha nana)***
- **Partridge pea** ***(Chamaecrista fasciculata)***
- **Maryland senna** ***(Senna marylandica)***
- **American vetch** ***(Vicia americana)***
- **Ascending purple milkvetch** ***(Astralagus striatus)***

Native Legume Garden, St. Paul (K-9)

Native Legume Large Plots, St. Paul (Keller Block)

Blue wild indigo (*Baptisia australis)*

Plant type: perennial, herbaceous, erect, non-spreading

Potential use: grain, forage, biomass, horticulture

Blue wild indigo in large plot – full bloom

Wild senna ***(Senna hebecarpa)***

Plant type: perennial, herbaceous, erect, non-spreading

Potential use: grain, biomass, fiber, wildlife

Illinois bundleflower (*Desmanthus illinoensis)*

Plant type: perennial, herbaceous, erect or prostrate, non-spreading (but readily volunteers)

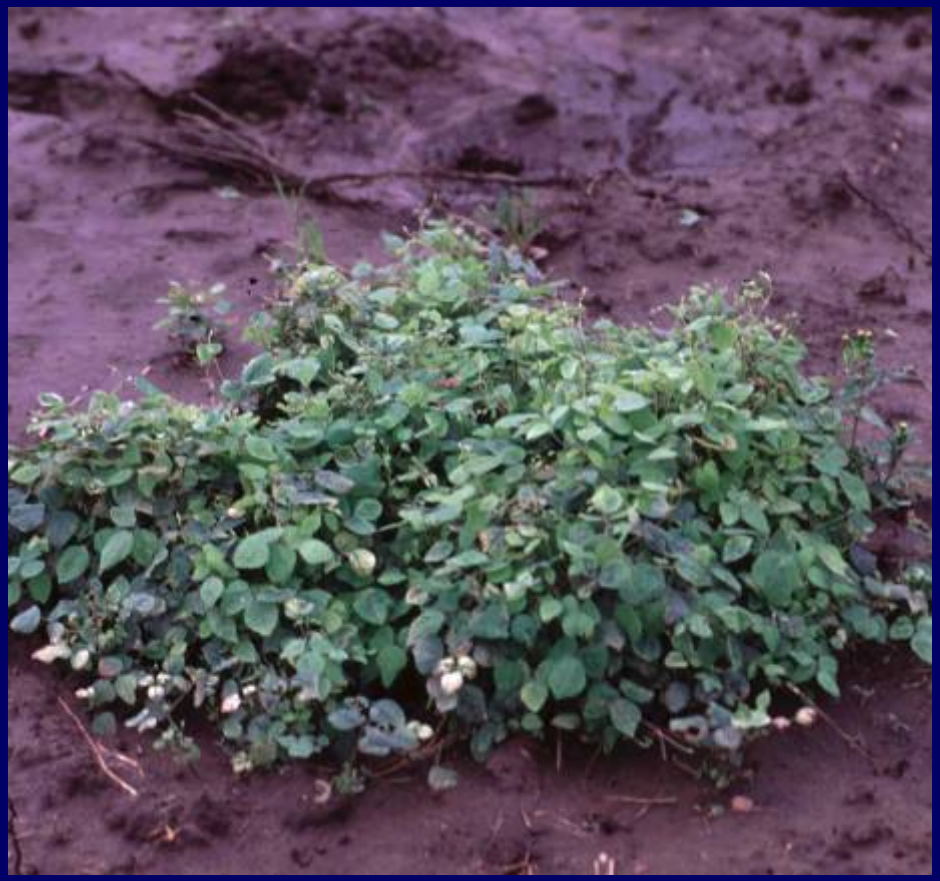
Potential use: forage, grain, fiber, wildlife, cover, horticulture

5/22/98

6/10/98

7/9/98

9/14/98



Hog peanut *(Amphicarpaea bracteata)*

Plant type: annual, herbaceous vine, spreading, functions as perennial through nutlet

Potential use: cover, natural food

Soybean with Hog peanut cover crop

Round headed bush clover (*Lespedeza capitata)*

Plant type: perennial, herbaceous, erect, non-spreading

Potential use: horticulture, fiber, wildlife

Pale pea *(Lathyrus ochroleucus)*

Plant type: perennial, herbaceous vine, rhizomateous, spreading

Potential use: forage, grain, biomass, cover

Veiny pea (*Lathyrus venosus)*

Plant type: perennial, herbaceous vine, rhizomateous, spreading

Potential use: forage, grain, horticulture, cover

Beach Pea ***(Lathyrus maritimus)***

Plant type: perennial, herbaceous vine, rhizomateous, spreading

Potential use: forage, cover

False indigo ***(Amorpha fruticosa)***

Plant type: perennial, woody, non-spreading

Potential use: silvopastoral, biomass, hort., wildlife, agro-forestry, pharmaceutics

6/2/98

7/9/98

8/11/98

9/14/98

Leadplant (*Amorpha canescens)*

Plant type: perennial shrub, erect, non-spreading

Potential use: forage, horticulture, wildlife

Purple prairie clover ***(Dalea purpurea)***

Plant type: perennial, herbaceous, non-spreading, erect

Potential use: forage, horticulture, wildlife

White prairie clover ***(Dalea candida)***

Plant type: perennial, herbaceous, non-spreading,erect

Potential use: horticulture, forage, wildlife

Silky prairie clover ***(Dalea villosum)***

Plant type: perennial, herbaceous, non-spreading, semi-erect

Potential use: horticulture, forage, wildlife

Wild licorice (*Glycyrrhiza lepidota)*

Plant type: perennial, herbaceous, erect, aggressive spreading

Potential use: biomass, fiber, ground cover

Canada milkvetch (***Astralagus canadensis)***

Plant type: perennial, herbaceous, semi-erect, non-spreading

Potential use: forage, wildlife

Ground plum (***Astralagus crassicarpus***)

Plant type: perennial, herbaceous, prostrate, non-spreading

Potential use: natural foods, wildlife, horticulture

Ascending Purple Milkvetch ***(Astralagus striatus)***

Plant type: perennial, herbaceous, prostrate, creeping-spreader

Potential use: forage, wildlife

Small wild bean ***(Strophostyles leiosperma)***

Plant type: annual, herbaceous, creeping-prostrate

Potential use: forage, cover, companion crop

Showy Tick Trefoil ***(Desmodium canadense)***

Plant type: perennial, herbaceous, upright, non-spreading (except through clinging seeds)

Potential use: horticulture, fiber, wildlife

Wild Lupine ***(Lupinus perennis)***

Plant type: perennial, herbaceous, upright, non-spreading

Potential use: forage, grain, horticulture, wildlife

Scurfy pea *(Psoralea tenuiflora)*

Plant type: perennial, herbaceous, upright, non-spreading

Potential use: forage, grain, horticulture, wildlife

Breadroot ***(Psoralea esculenta)***

Plant type: perennial, herbaceous, upright, non-spreading, large tuberous roots

Potential use: natural food, wildlife

Prairie Indigo ***(Baptisia bracteata)***

Plant type: perennial, herbaceous, quite prostrate, non-spreading

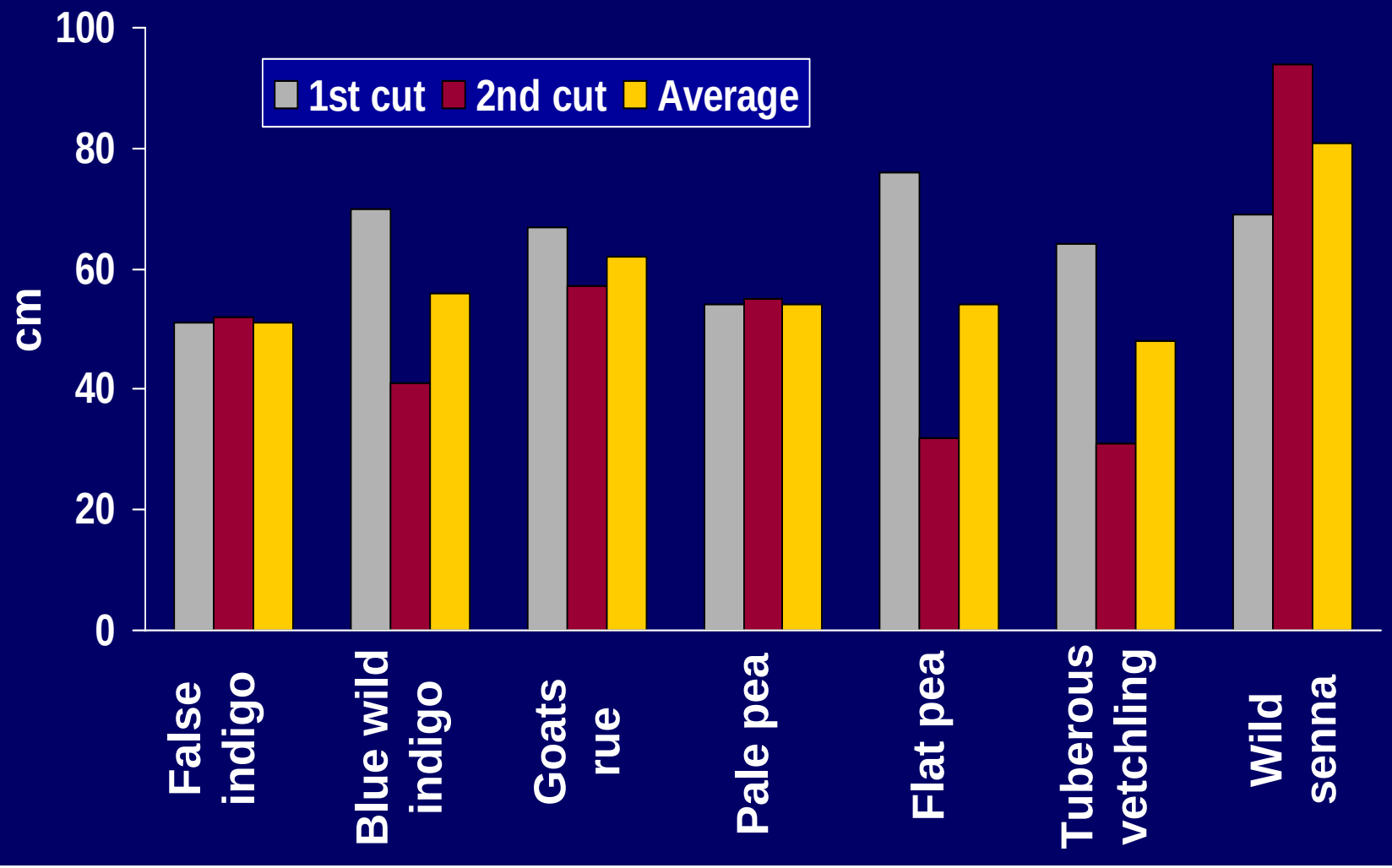
Potential use: horticulture, grain, hay

Dwarf/Fragrant False Indigo *(amorpha nana)*

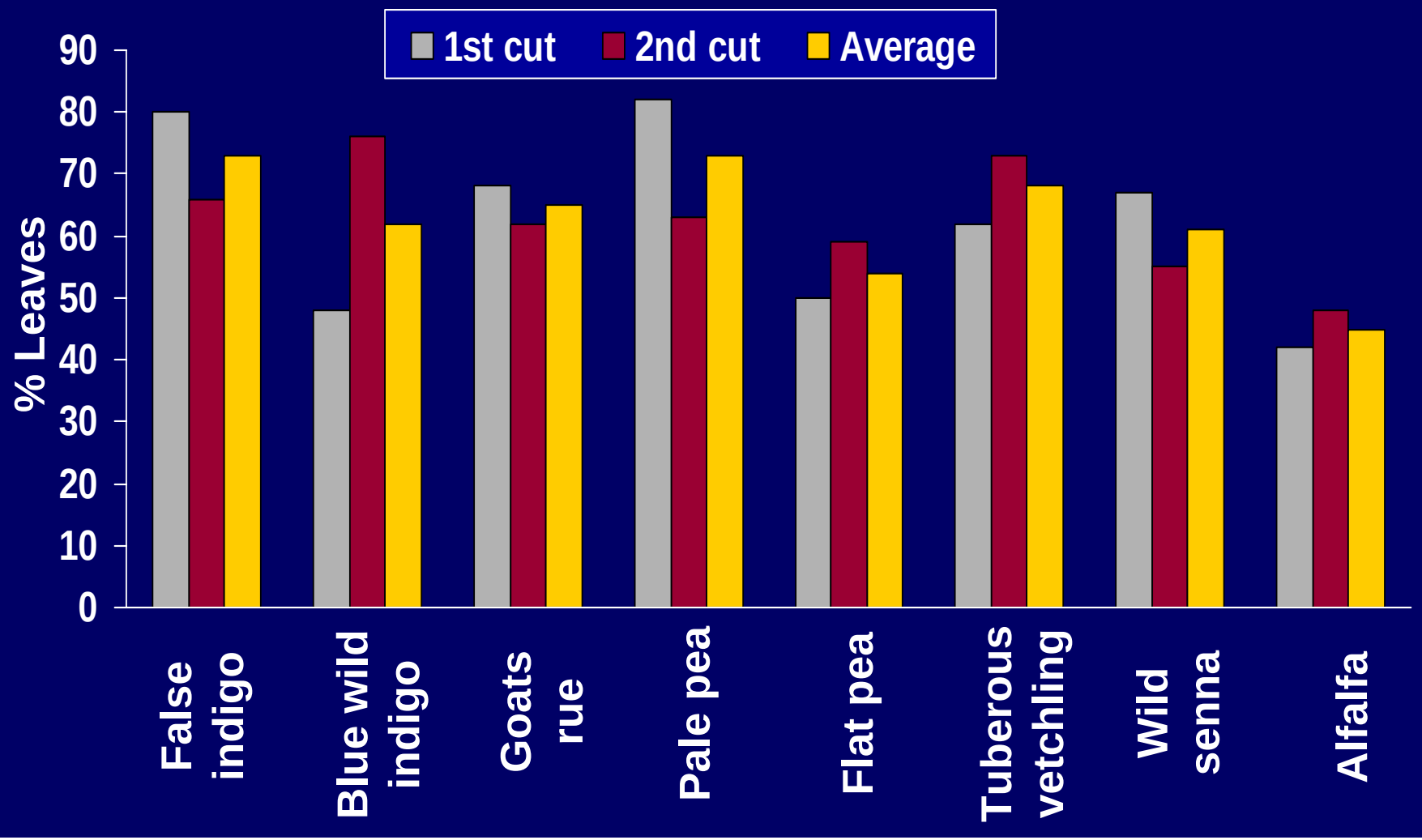
Plant type: perennial, woody, non-spreading

Potential use: horticulture, wildlife, pharmaceutics

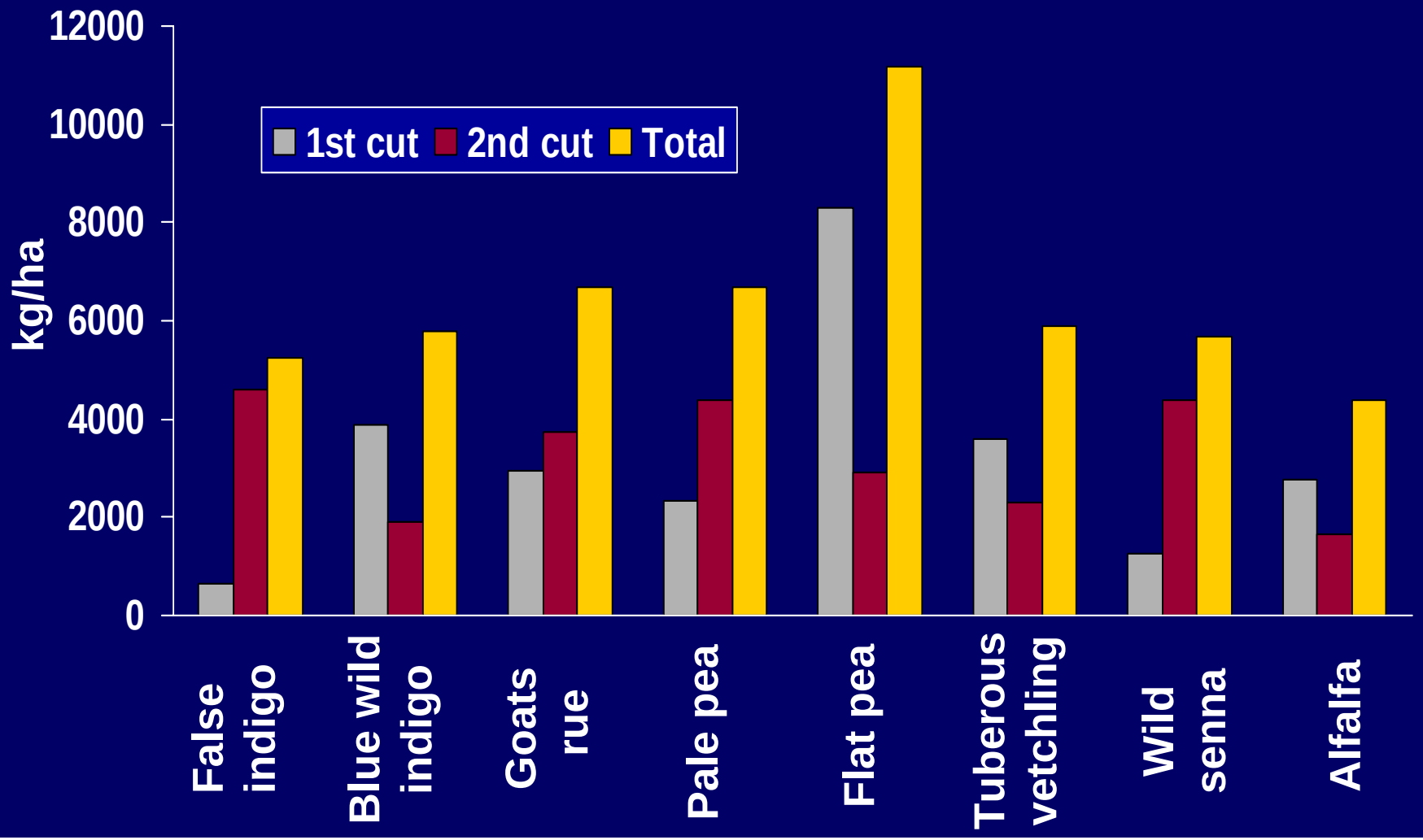
Perennial Native Legume Plant Heights at Harvest



Perennial Native Legume
% Leaf Tissue

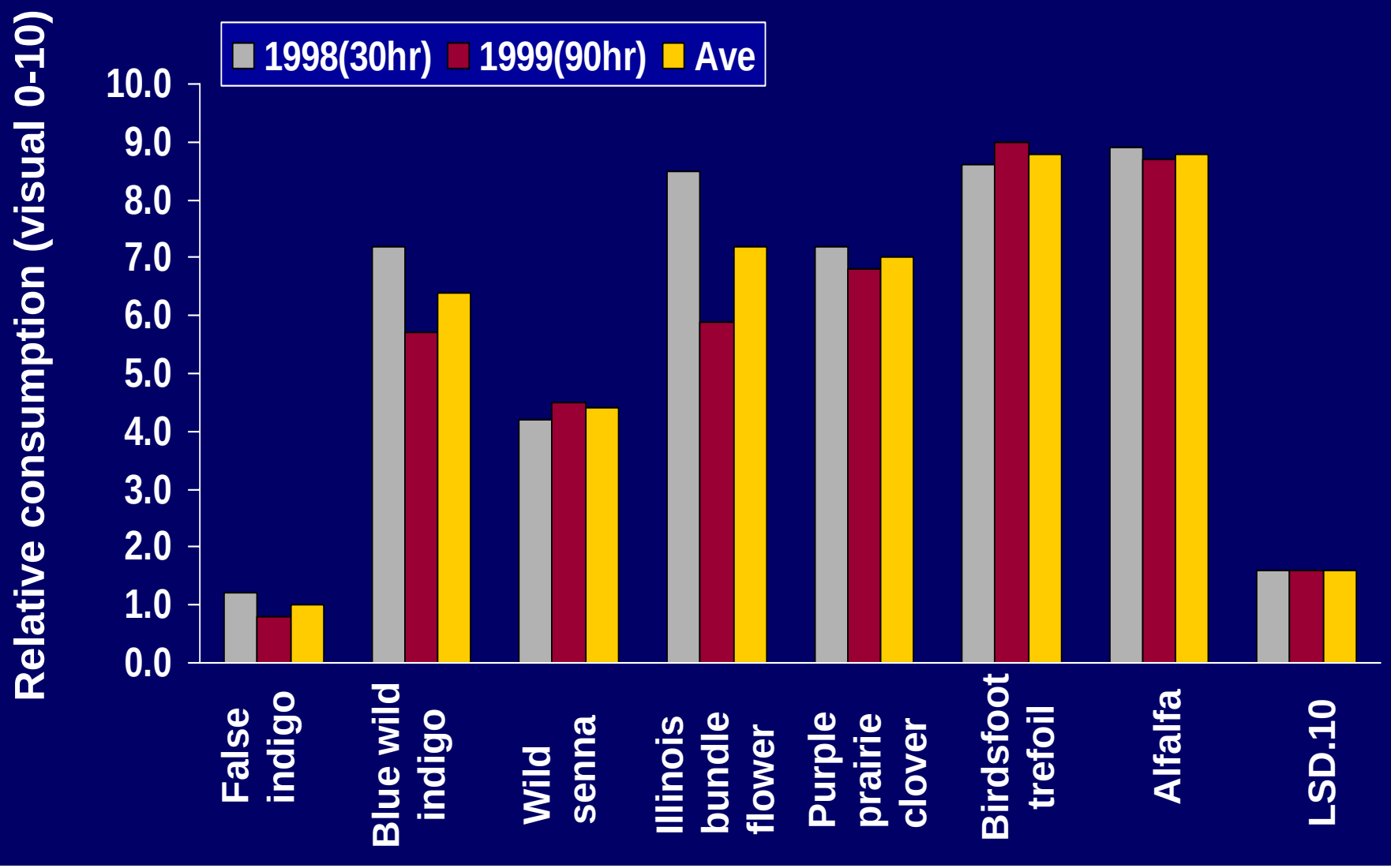


Perennial Native Legume Dry Matter Production



False indigo – cutting management

Perennial Native Legume Relative Palatability



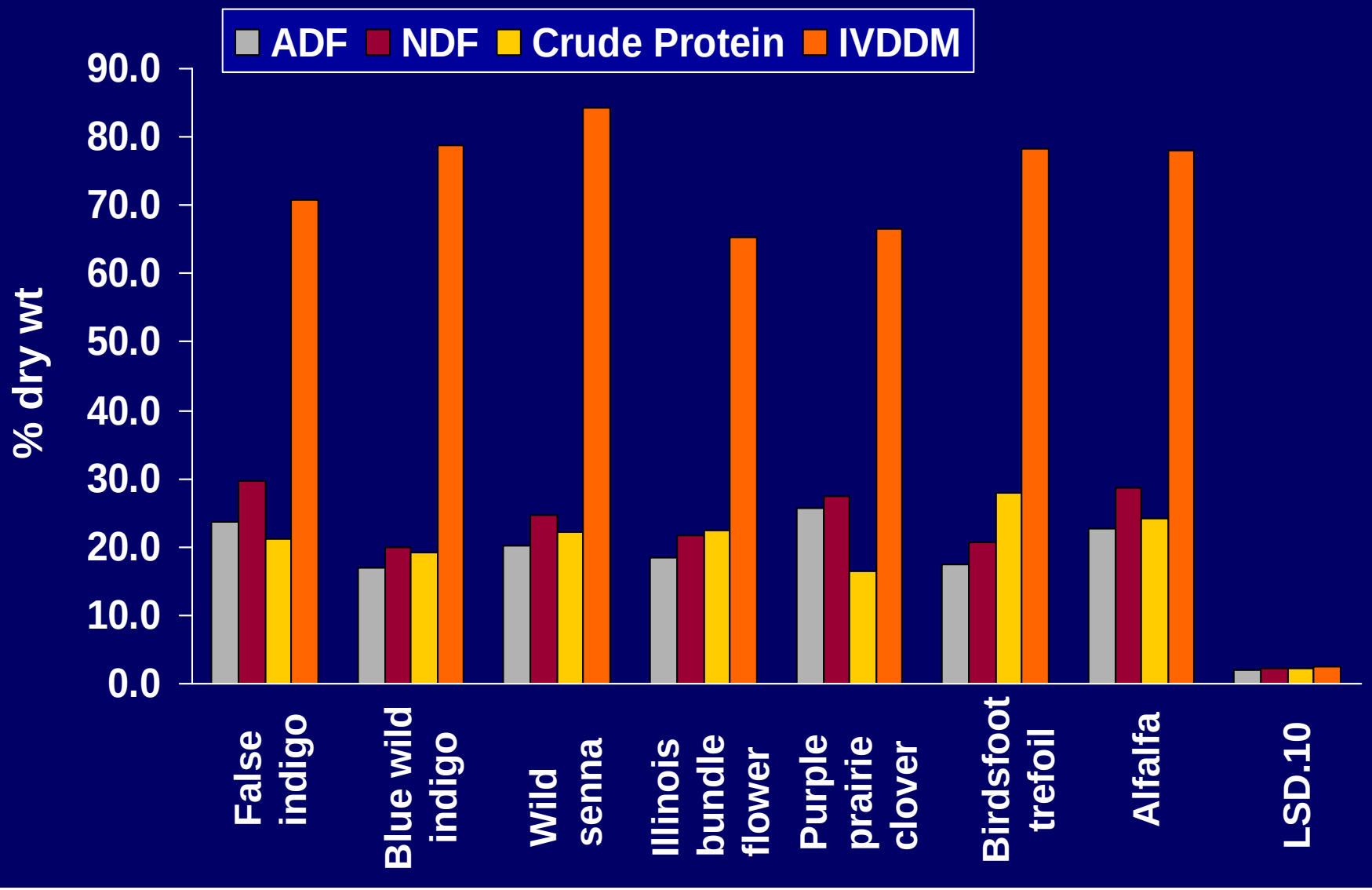
Prior to palatibility trial

24 hrs grazing by sheep

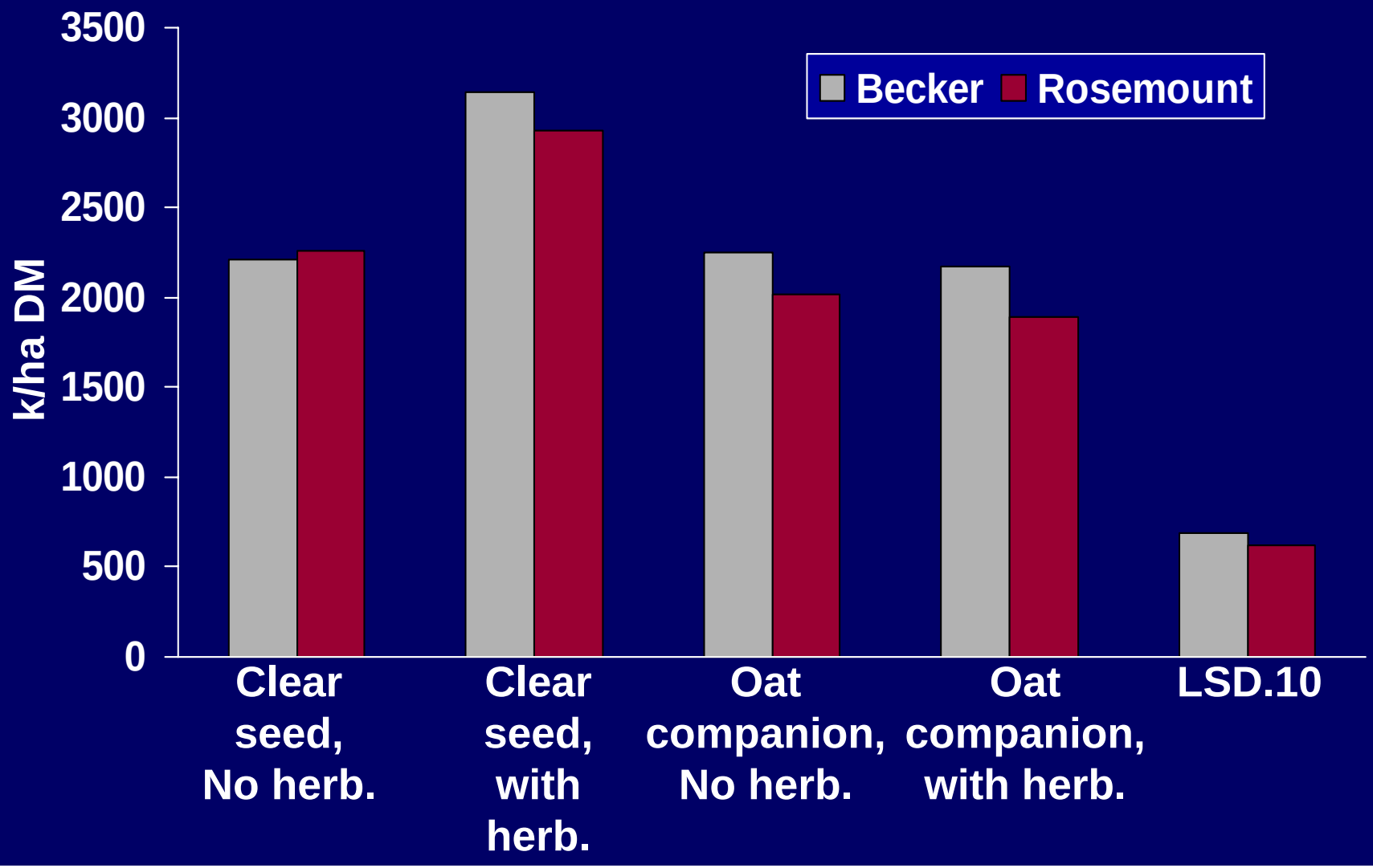
90 hrs grazing by sheep

Sheep with False indigo

Perennial Native Legume Leaves Forage Quality

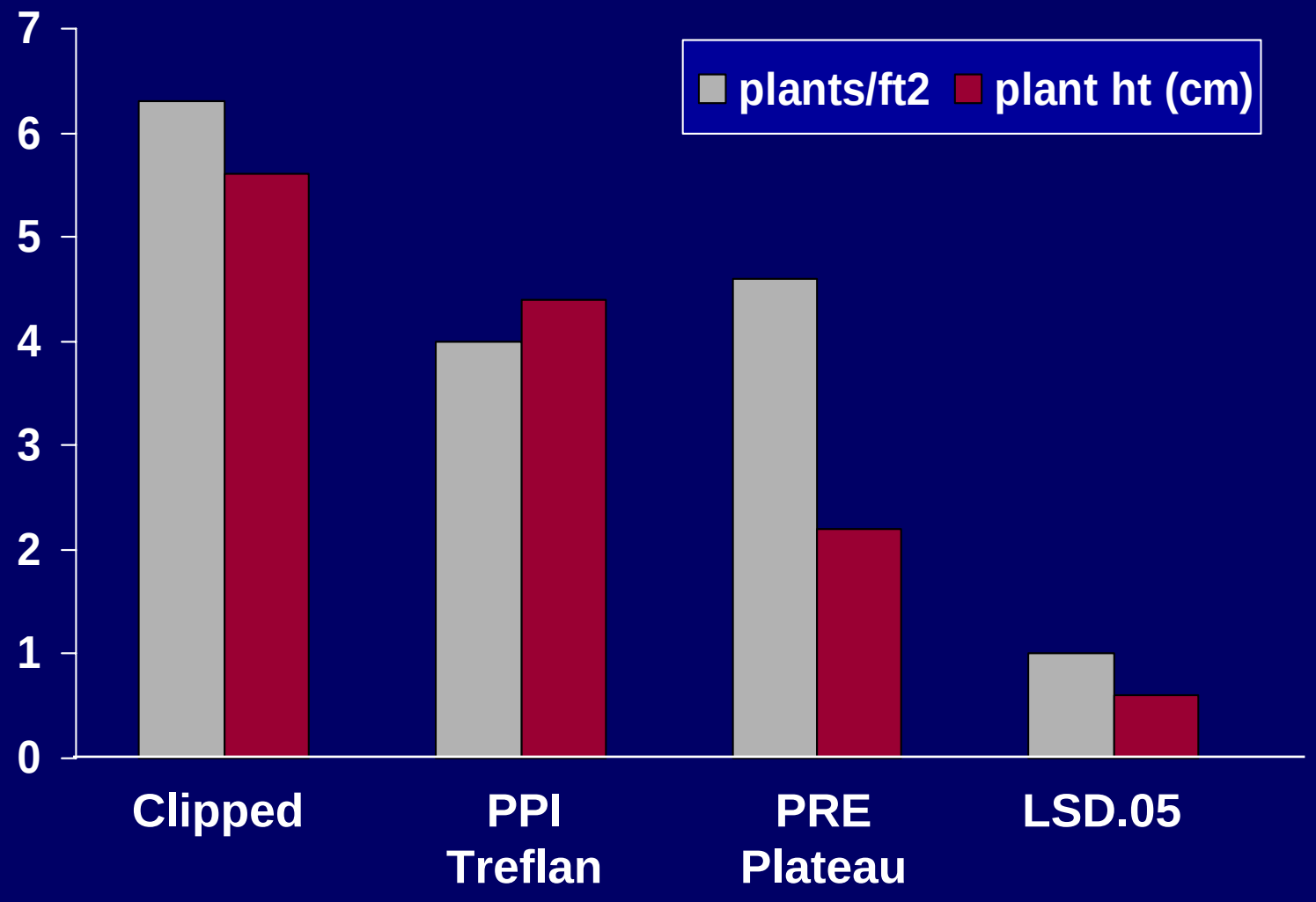


Amorpha fruticosa Establishment - 2nd year Dry Matter Yields



Native Legume Establishment (30 DAP)

5 species seeded 6/16/99 @ 12.5 PLS/ft2



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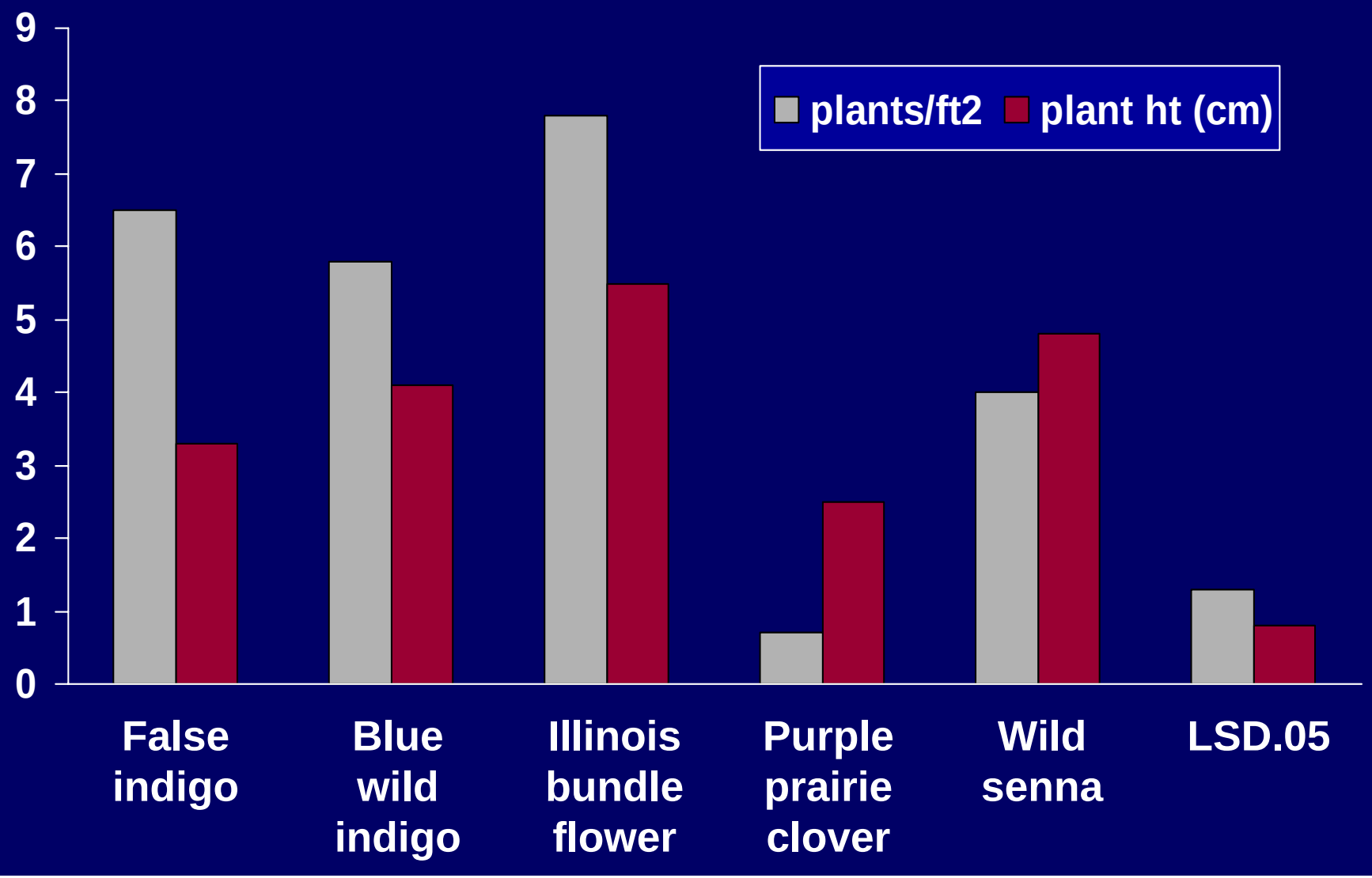
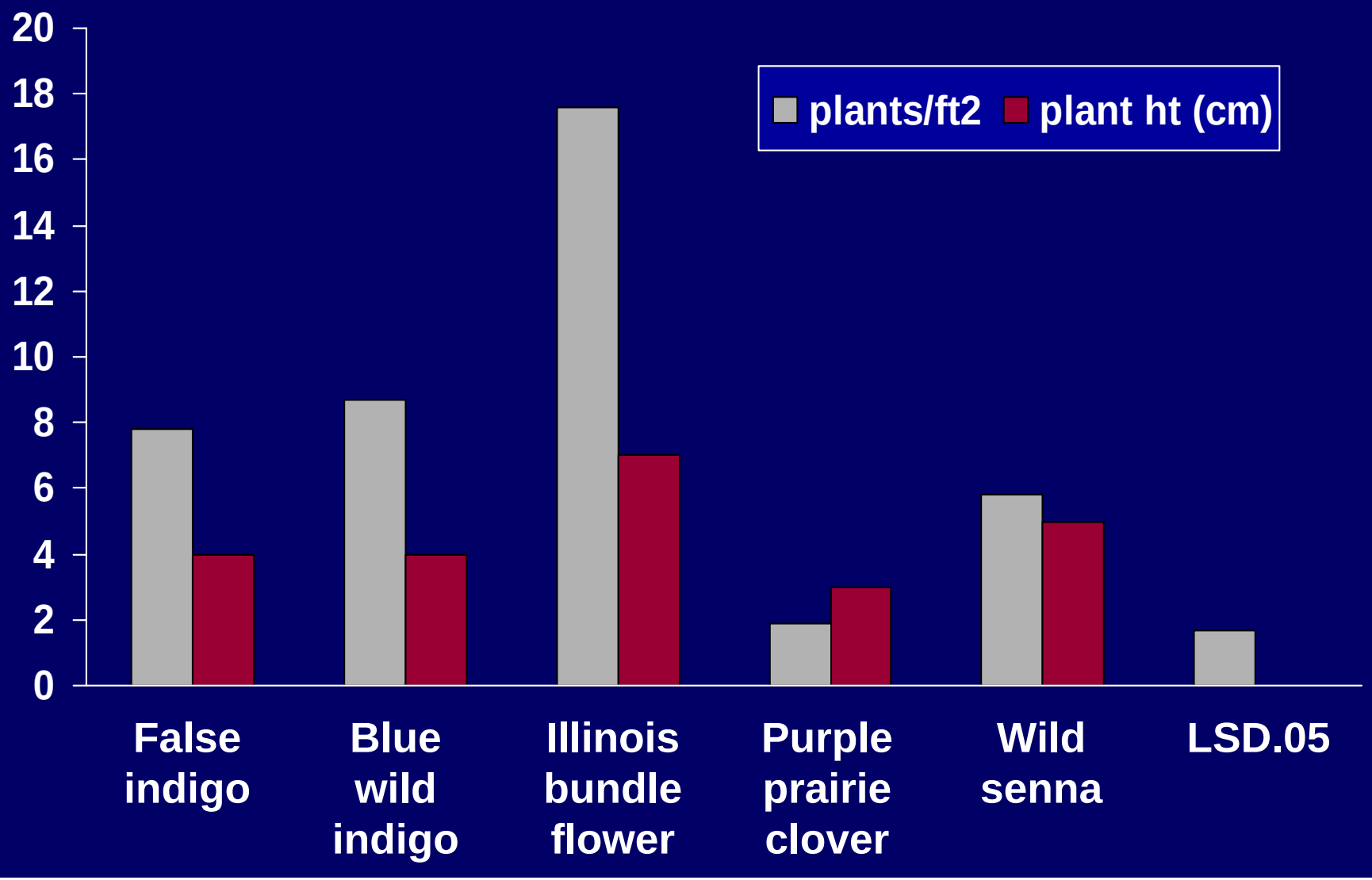


Management of Native Legumes in Establishment Year (30 DAP)

Management of Native Legumes in Establishment Year (1 year AP)

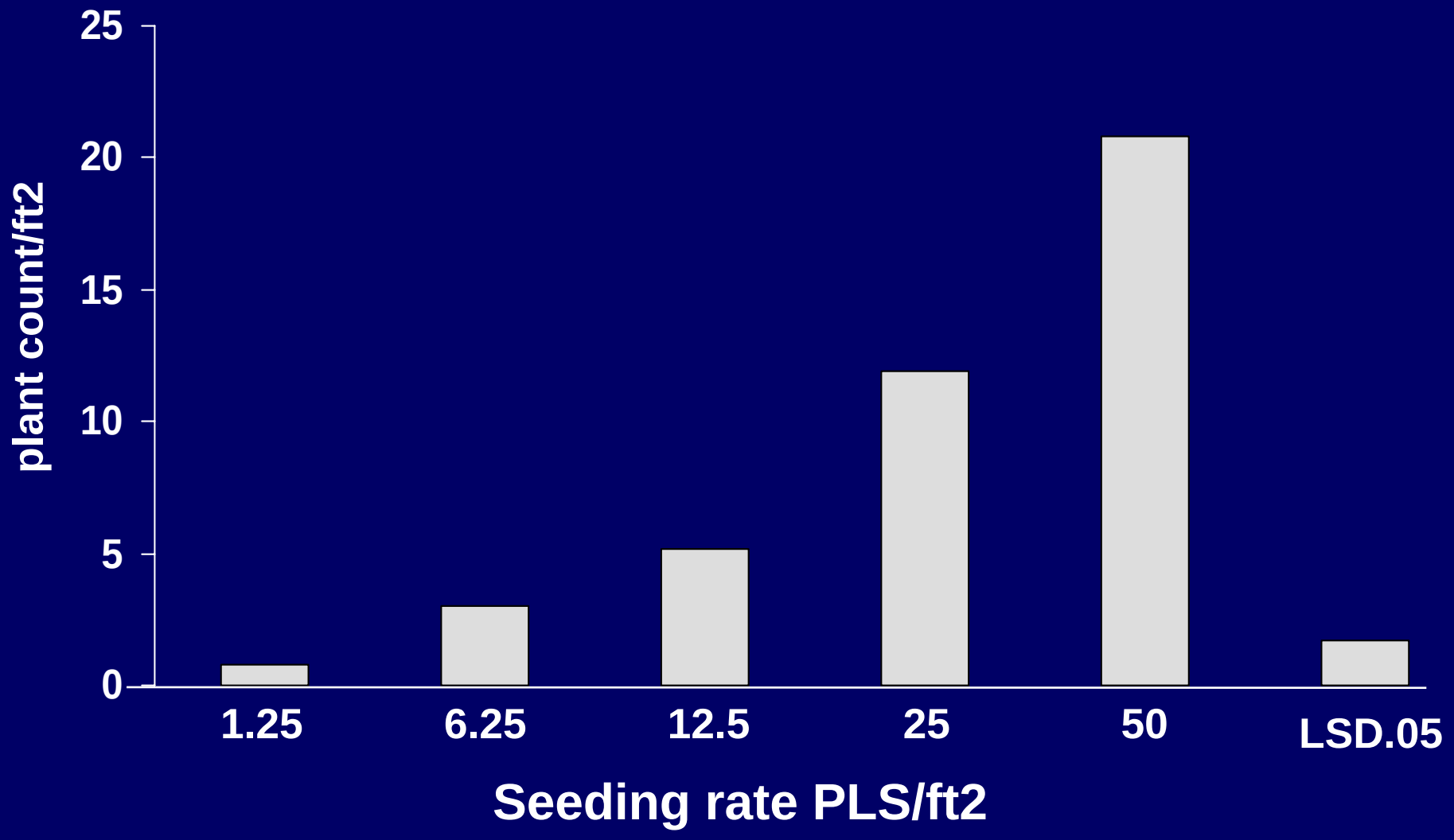
Native Legume Establishment (30 DAP)

5 species seeded 6/16/99 @ 5 rates



Native Legume Establishment (30 DAP)

5 species seeded 6/16/99 @ 5 rates



Native Legume Establishment (30 DAP) **5 species seeded 6/16/99 @ 5 rates**

Ongoing Programs

Ecological / Agronomic Effects:

- Adaptation to diverse environments (SE & W MN)
- Compatibility with other species (warm and cool season)
- Effective legume – rhizobium symbiosis (J. Byun)
- Establishment strategies

Evaluation of Diversity Among Ecotypes of *Amorpha fruticosa* and *Desmanthus illinoensis* (Lee DeHaan)

- **20 Ecotypes of each species**
- **Three locations**
- **Three years**
- **Measured traits: seed yield, biomass yield, height, width, maturity, winter survival, leaf width, leaf length, insect resistance number of stems**
- **Most traits influenced heavily by location (environment) and ecotype**

Indigenous plants, especially legumes, provide new possibilities for Minnesota agriculture, whether it be for fiber, fuel, forage, grain, natural foods, or pharmaceutics.

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