

Which Sorghum/Sorghum-
sudangrass hybrids have higher
allelopathic toxicity against soil-
borne pests?

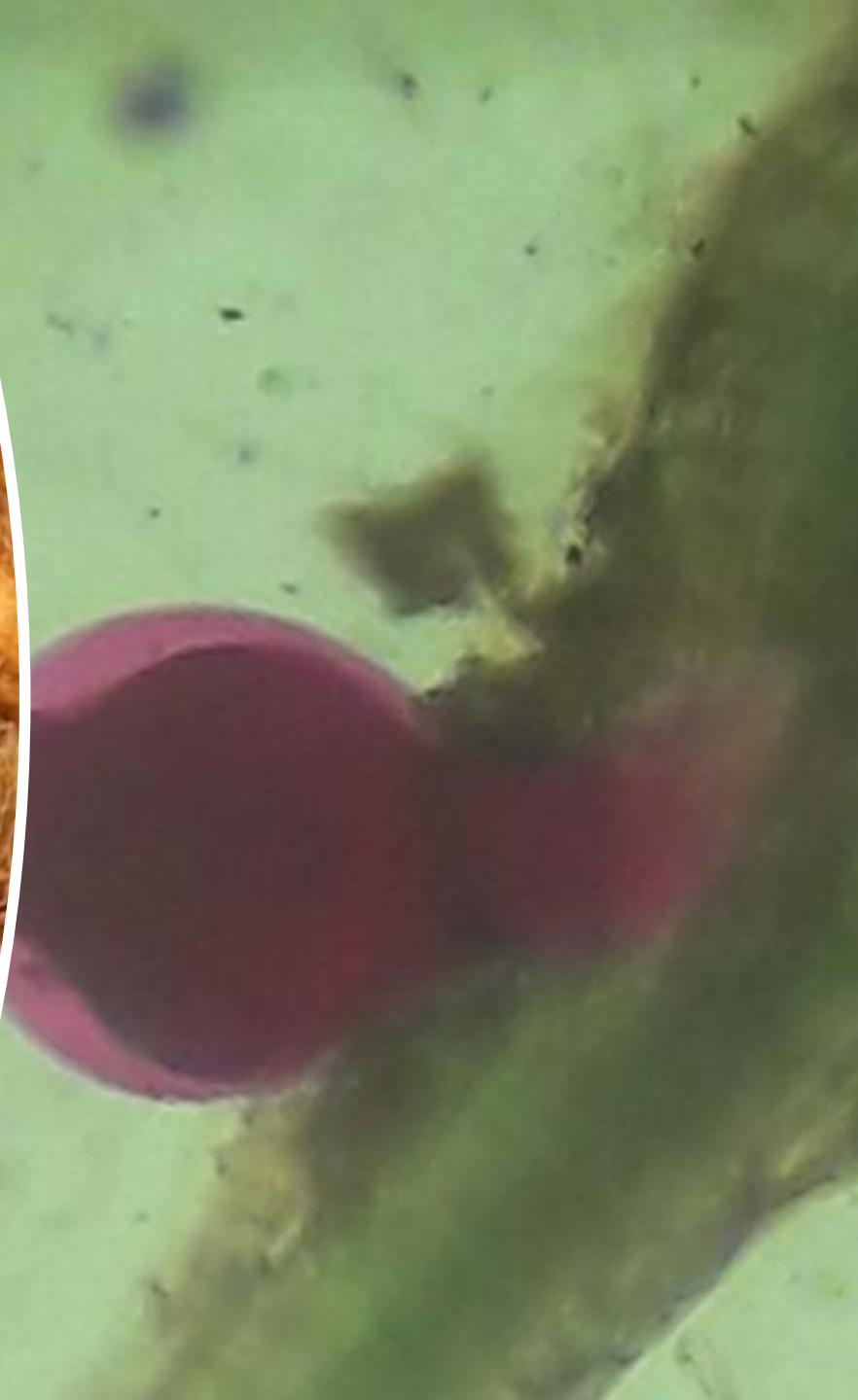
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Root knot nematodes

- Root knot nematodes (*Meloidogyne* spp.) are the most common and destructive plant parasitic nematodes.
- Root knot nematodes (RKN) have extremely wide host ranges.
- They cause stunted growth, yield losses, and collapse of plants.



Management of Root-knot Nematode



Chemical control

- Pre-plant fumigants, but costly and difficult to apply
- Post-plant nematicides, limited to minor crops

Host-plant resistance

- *Mi* genes in tomato (not consistent results)
- *N* genes from peppers (ineffective at higher temperatures)

Cultural control

- Cover crops that are non-host
- Cover crops that are allelopathic: e.g. sunn hemp, *Sorghum bicolor*, *Sorghum sudanense* and *S. bicolor* x *S. sudanense*

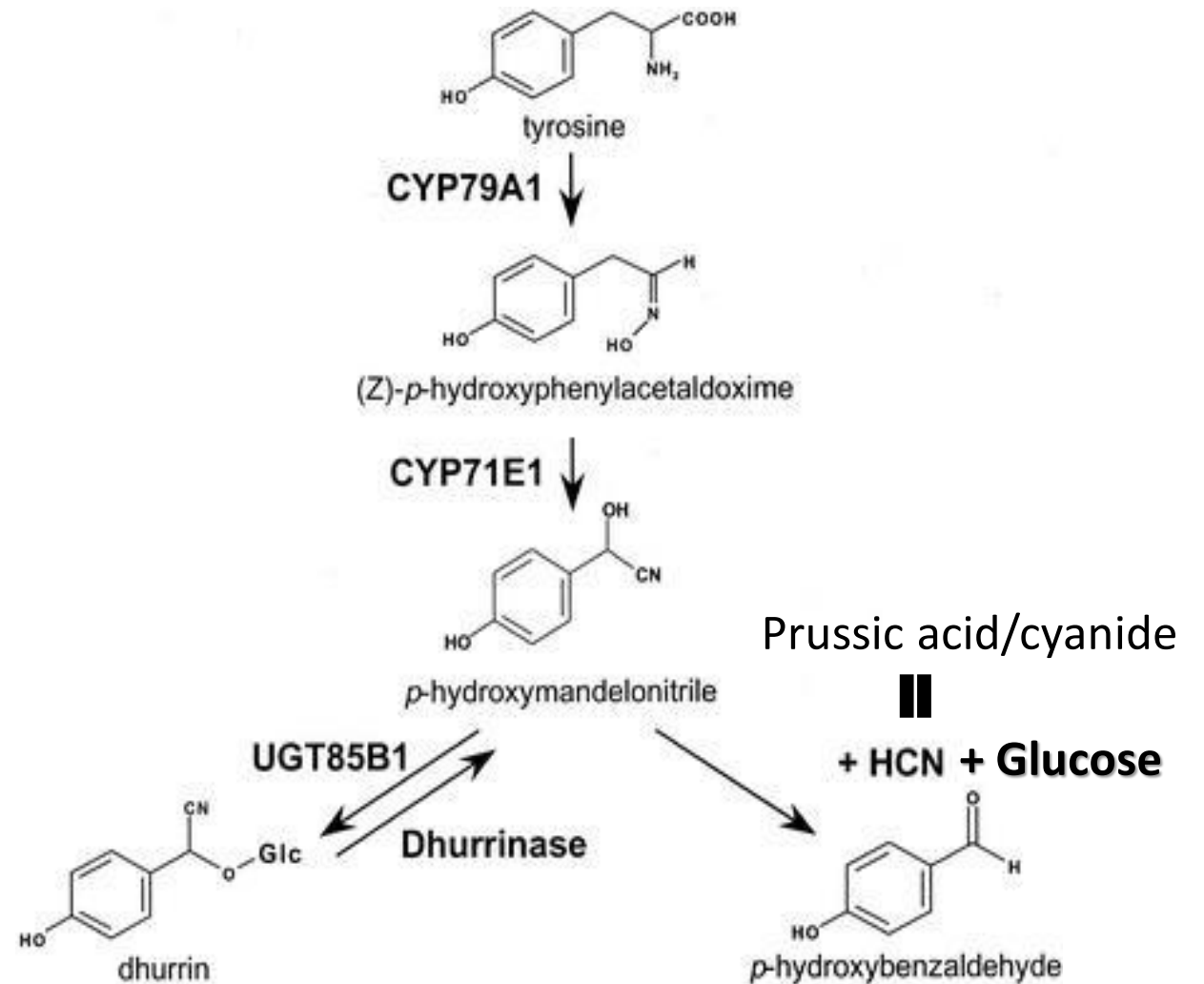
Problem of sunn hemp

- *Fusarium* wilt caused by *Fusarium udum* f. sp. *crotalariae* (*Fuc*)
- Most recently, two viruses were found on sunn hemp in Hawaii: tobacco streak virus (TSV) that causes necrosis and seedling death in India, and an unclassified tobamovirus that is mechanically transmitted.
 - Reduces plant biomass and hampers sunn hemp seed production.



Why Sorghum/Sorghum-Sudangrass (SSgH)?

- Larger amount of biomass – adds organic matter= Soil builder.
- Deep root system –drought tolerant and nutrient scavenging.
- Poor /non-host to *Meloidogyne incognita*.
- Shoot tissues release HCN (nematicidal) upon hydrolysis of dhurrin (= Biofumigation).
- Root leachate is weed suppressive (sorgoleone)
- Dual purpose cover crop (forage, grain, energy crop)
- Tolerate high and low soil pH



Busk and Moller, 2002

Sorghum/Sorghum-sudangrass hybrids (SSgH) Screening

Forage Sorghum



- Big Kahuna Plus
- Cow Vittles
- Bundle King
- Monster II

Sudangrass



- Piper

Sorghum-Sudangrass hybrid



- Latte
- Latte BMR
- 51214
- 53514

Energy sorghum



- NX 4264
- NX-D-61



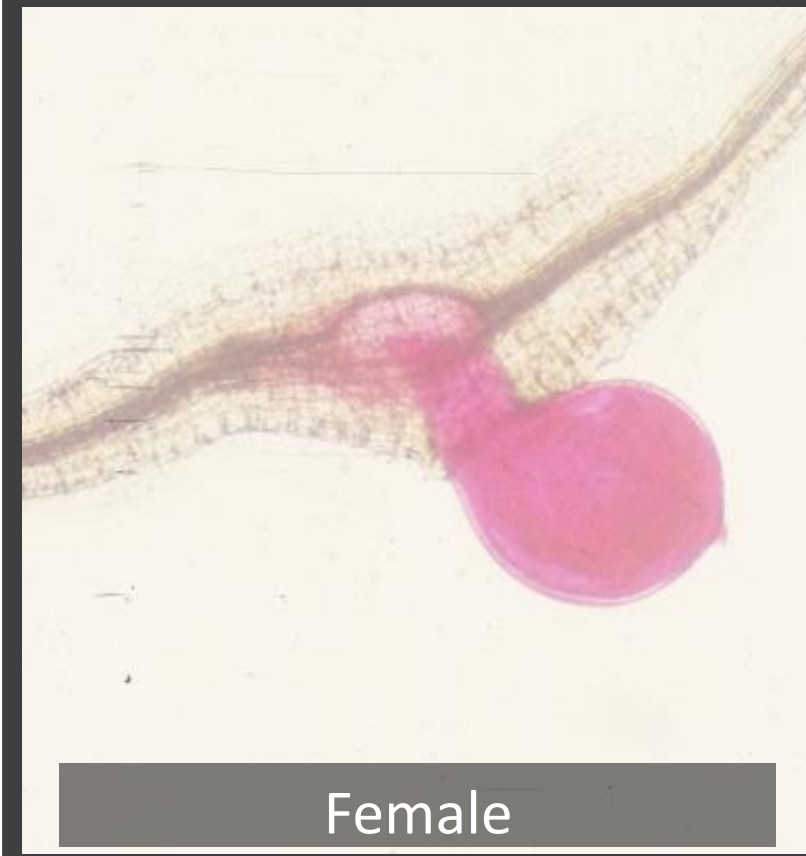
SSgH Variety Screening Trial



Infective stage (J2)



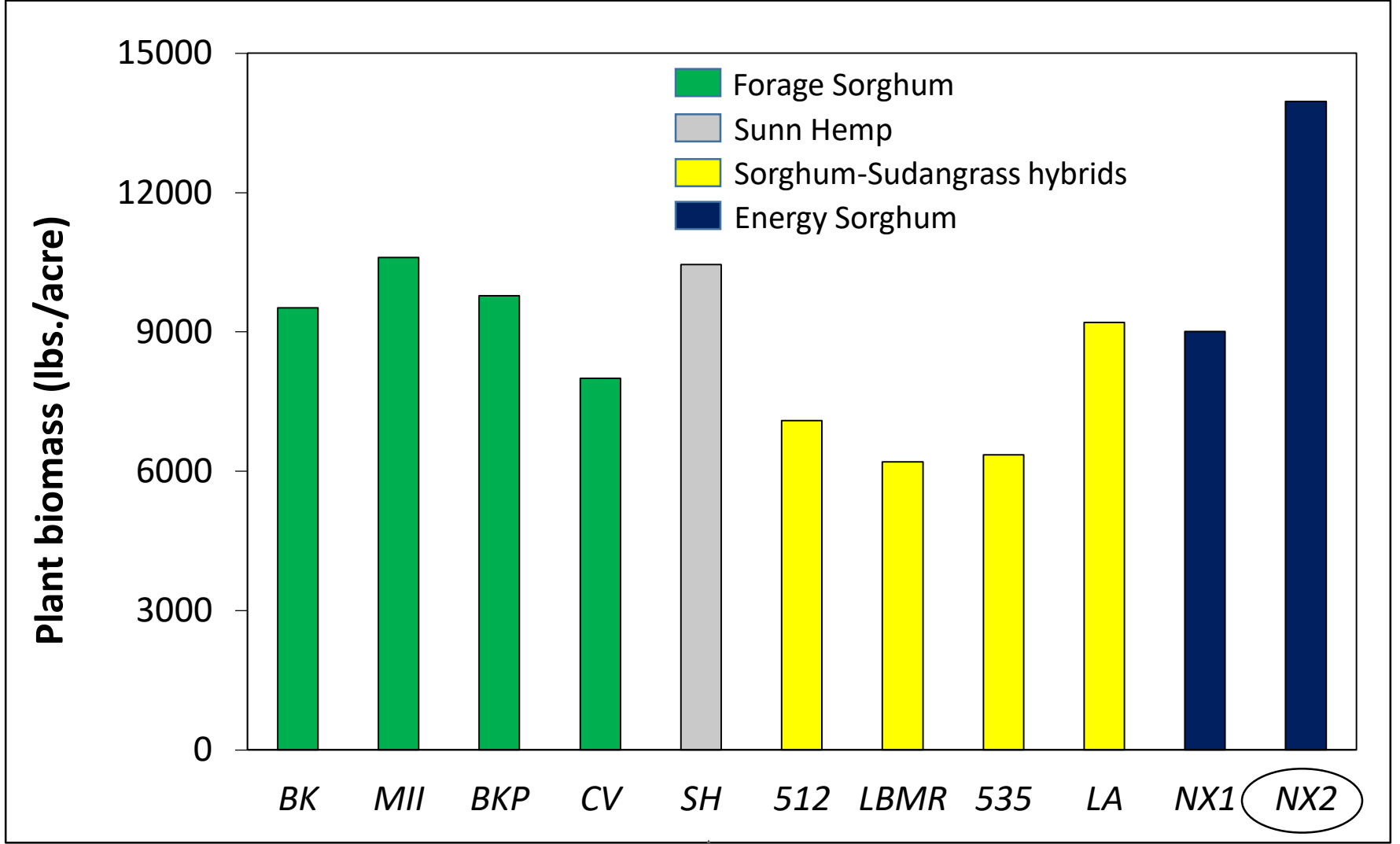
3rd or 4th stage juveniles



Female

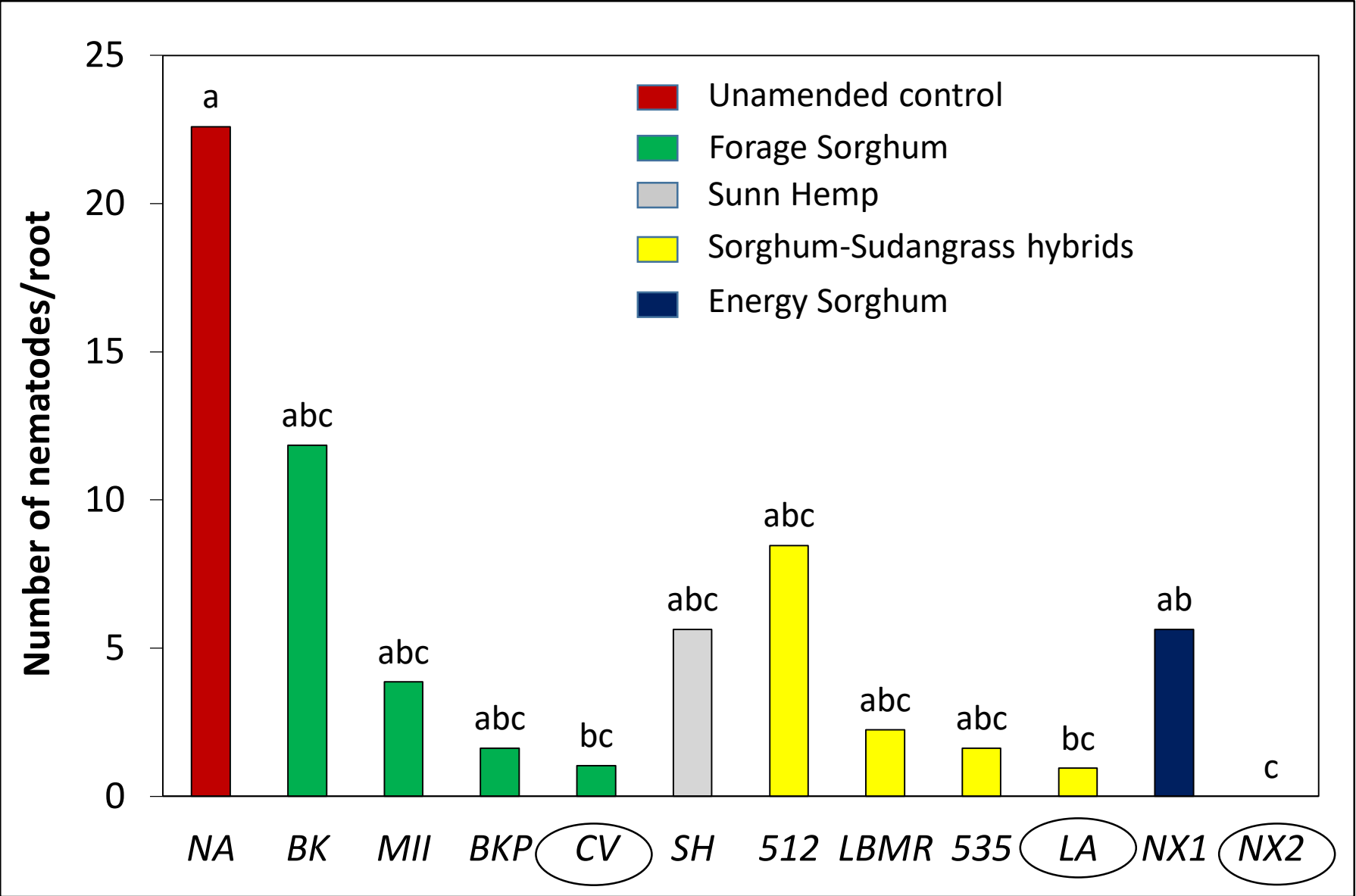
Root Staining

Results:
One-month
old biomass



Some produce more biomass than sunn hemp

Results :
Nematode
suppression



Some are more suppressive than sunn hemp

Discussion

- Sorghum/Sorghum-Sudangrass cultivars are promising candidates for use as cover crop.
 - NX2 in particular is outstanding in biomass production and root-knot nematode suppression.
- Experiment is in progress to determine the best cultivar for soil health improvement.
 - Other soil health properties being monitored include water infiltration rate, soil organic matter, and soil microbial activity in the field.
 - Suppressive to *Fusarium oxysporum f. sp. udum* that caused sunn hemp wilt

