

Rating Systems Used for Fungicide Assessments

Gary L. Cloud, Ph.D.
Ag Research Associates
Sycamore, GA

Ag Research Associates





Importance of Sound Rating System

- Some 40,000 + compounds screened every year.
- 30 to 50 compounds promoted to early stage development (stage 1F/2) yearly.
- Only 1 to 3 compounds can be selected/promoted for commercialization
- Must select the best of the best!

Most Important Factor – Start Off Right

- Positive ID of Pathogen

Many pathogens can look similar, ie. downy mildew and ASR on soybean

- Minimize the # of diseases present in a trial

Accomplished through varietal resistances, pesticides, cultural practices, etc.

- One evaluator per trial. Multiple evaluators per trial adds to variability



March 11

A photograph of a field of young green plants, likely a crop field, showing signs of stress or damage. The plants are densely packed and have several brown spots on their leaves, indicating potential disease or insect damage. The ground is dark and appears to be covered in mulch or soil. Two white stakes are visible in the background, marking the field. The date 'March 18' is printed in the bottom left corner.

March 18



March 24



March 31



Fungicide Label

- Crops
- Diseases
- Rates (lb/A, oz/A, pt/A, qt/A)
- Application directions
- IPM strategy
- Resistance management strategy

Criteria Required to Write a Label

- ❑ Diseases controlled/suppressed with active ingredient (a.i.)
- ❑ Rates needed to control each disease
- ❑ Timing of the application (preventative/curative)
- ❑ Spray interval timing if multiple application are used
- ❑ Tankmixture opportunities with other chemistry or adjuvants
- ❑ Rates of the tm ratios
- ❑ Compatibility of tm
- ❑ Residual disease control
- ❑ Rainfastness



Types of Fungicide Assessments

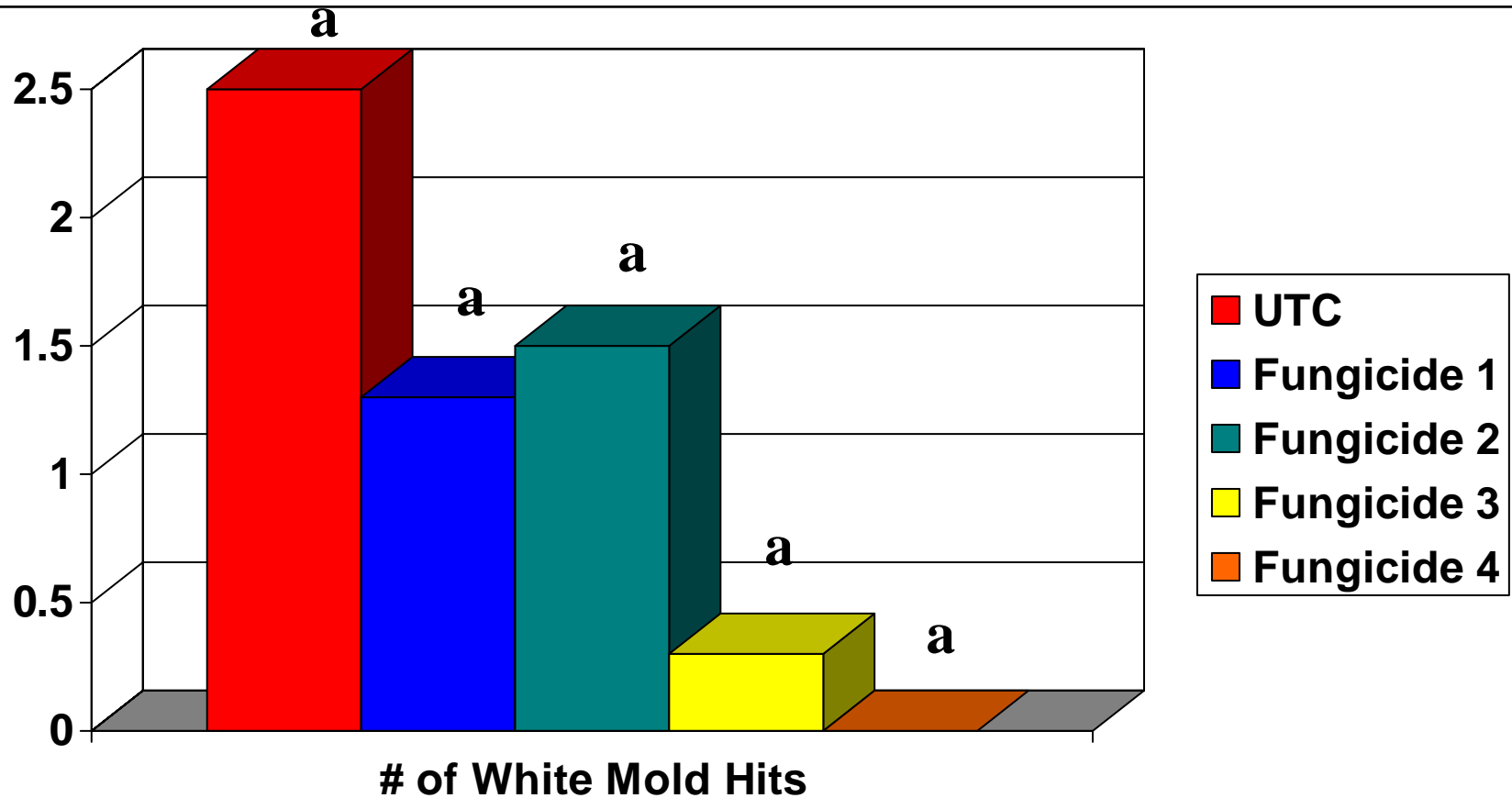
- Incidence – is a measure of disease based on individuals (plants, leaves, or any part of a plant)
- Assessments should be made in timely manner so progress curves can be incorporated.



Incidence Assessments

- Systemic effect
- A wilt
- Stem blight
- Soilborne pathogens
- Virus
- Foliar pathogens early in disease cycle

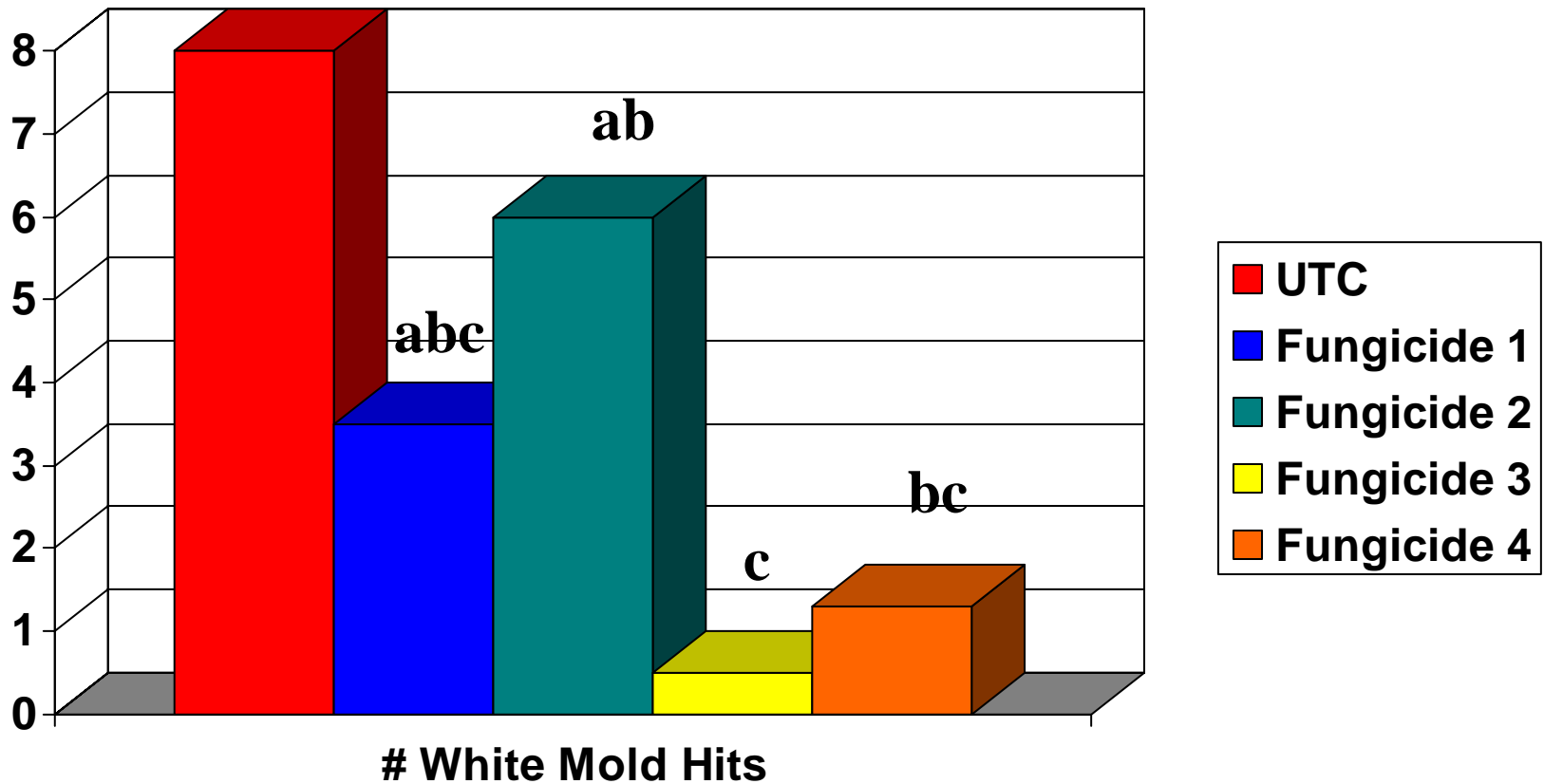
Peanut White Mold Assessment



Rating taken 4 weeks prior to harvest

Peanut White Mold Assessment

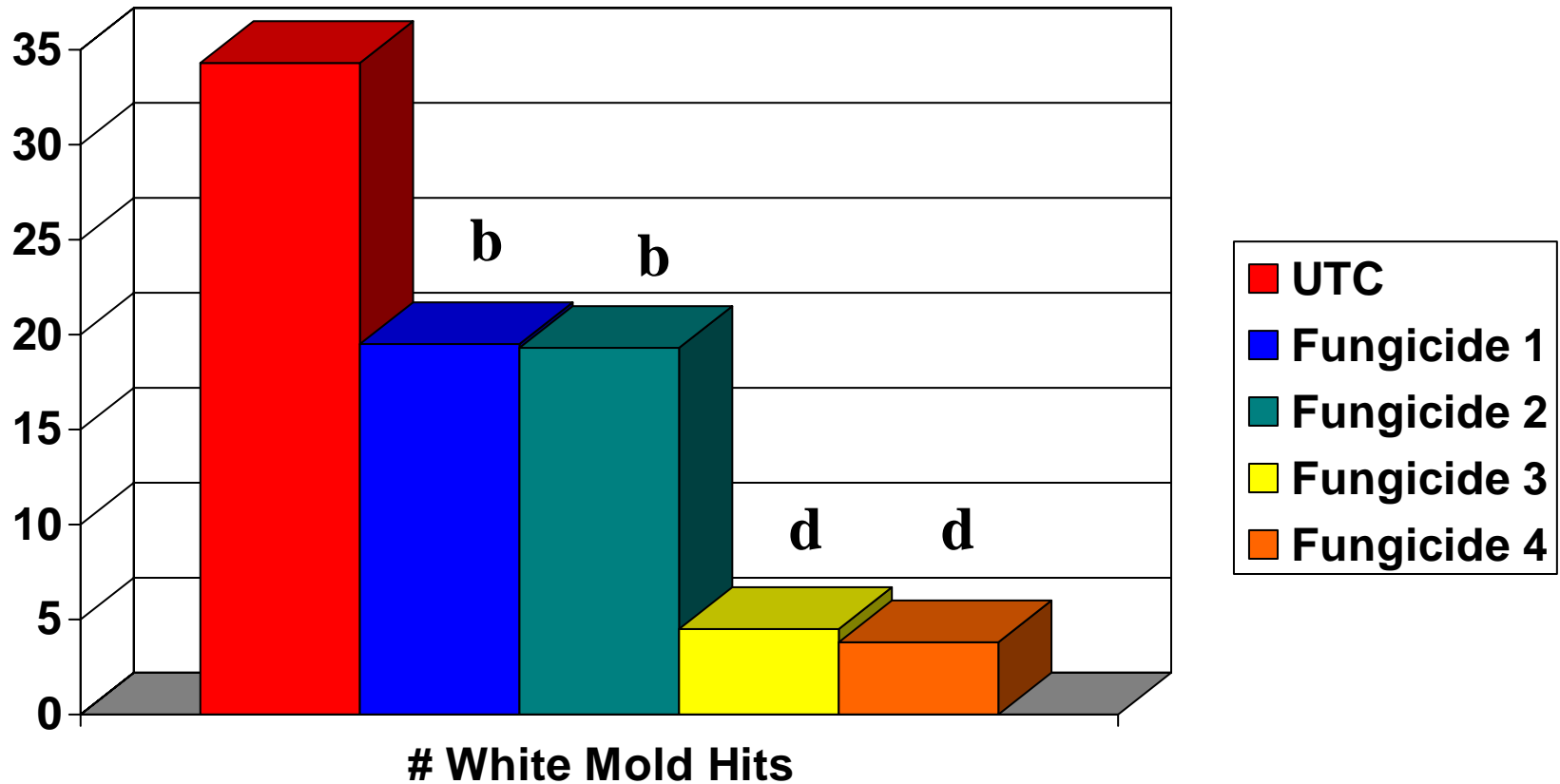
a



Rating taken 2 weeks prior to harvest

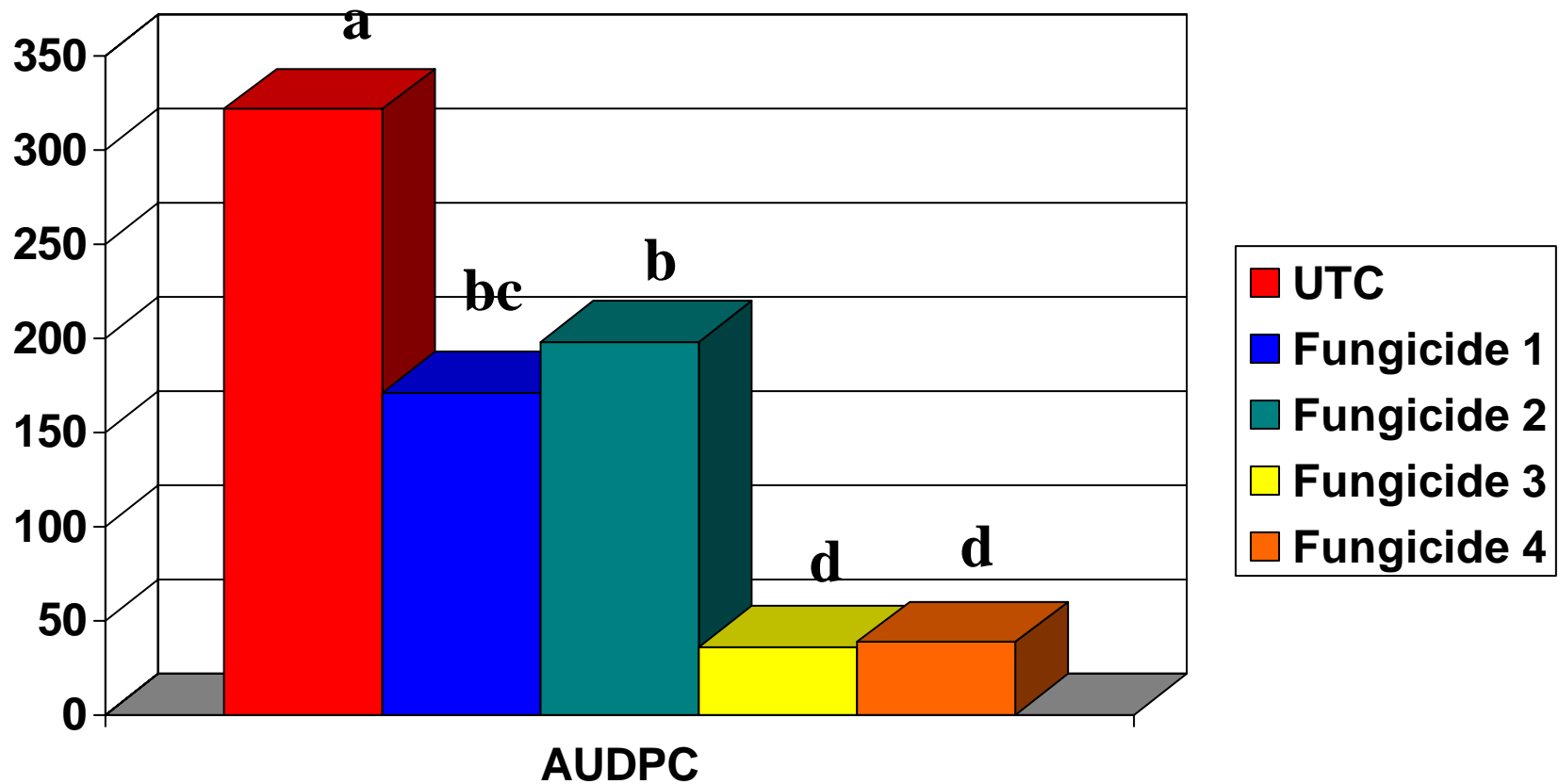
Peanut White Mold Assessment

a



Rating taken day of digging

Peanut White Mold Assessment



Combined of previous 3 ratings

Severity Assessments

- Category Systems – scale from 1 to 5;
1 = 0 to 10% and 5 = >75%
- Horsfall – Barrett Scale
12 classes or categories
- Standard Area Diagram – best method to assess severity because it is transferrable and standardized.



Diseases Associated w/ Severity Assessments

□ Foliar Pathogens – Primarily used

Downy Mildews

Rusts

Powdery Mildews

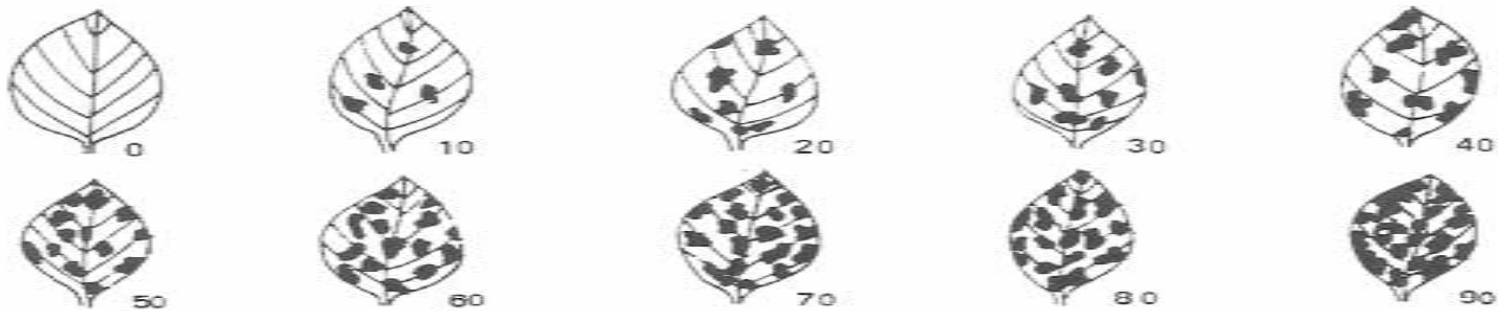
Septoria spp

□ Nematode Root Damage

R.K. galling damage

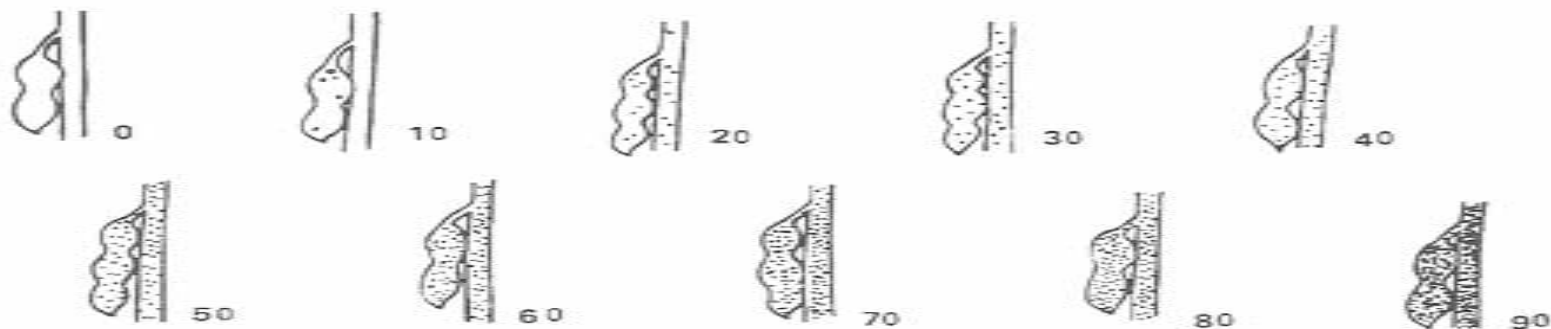
□ Virus

Extent of systemic damage



STAGES OF FOLIAR DISEASES OF SOYBEANS

SOUTHERN SOYBEAN DISEASE WORKERS



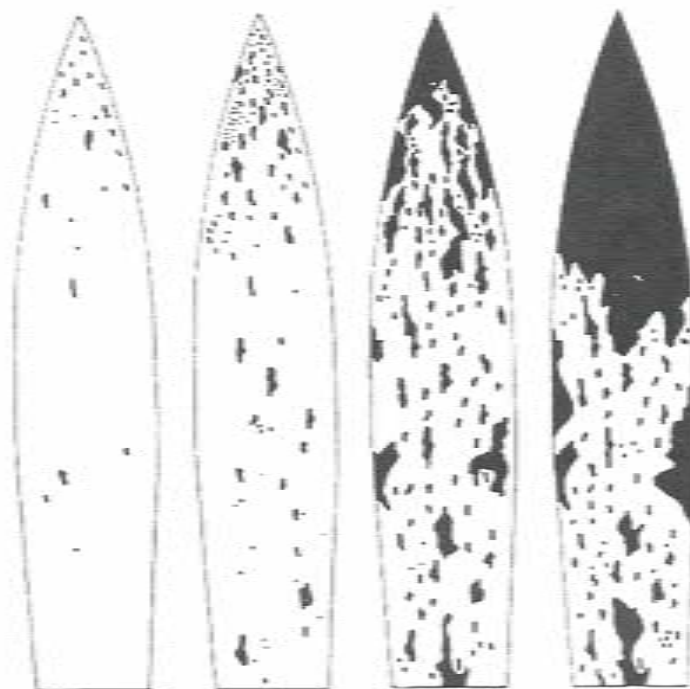
STAGES OF POD AND STEM DISEASES OF SOYBEANS

SOUTHERN SOYBEAN DISEASE WORKERS



Key No. 1.10

SOUTHERN CORN LEAF BLIGHT



1

5

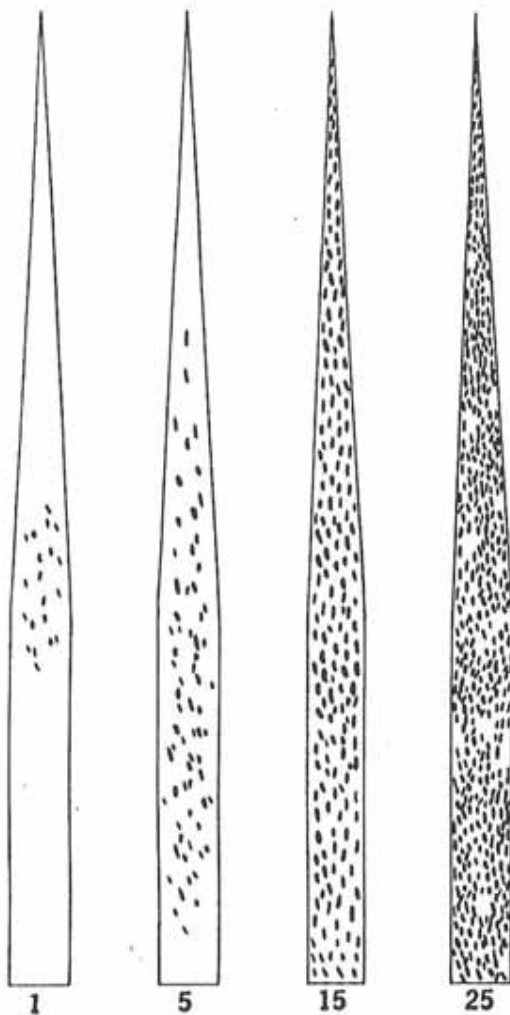
25

50

PERCENTAGE LEAF AREA COVERED

Key No. 1.2

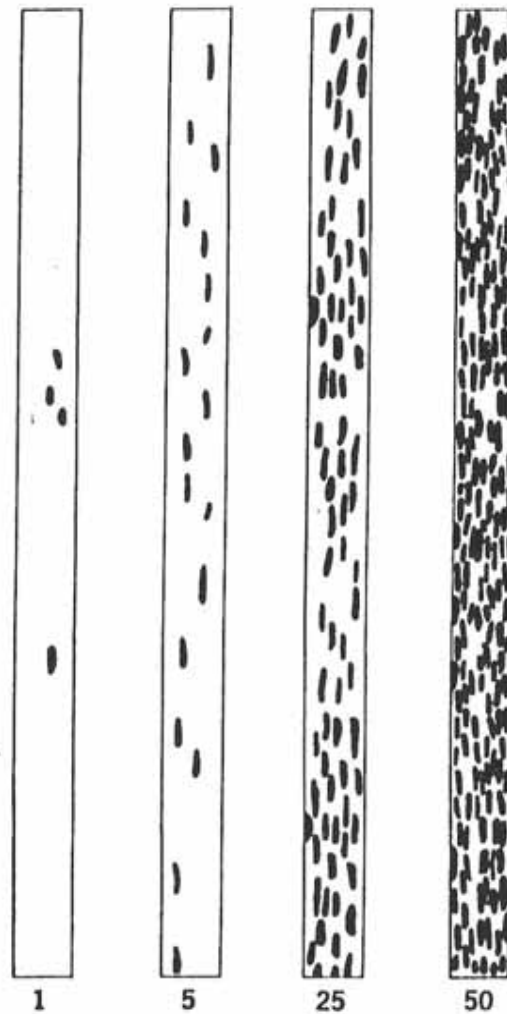
LEAF RUST OF CEREALS



PERCENTAGE LEAF AREA COVERED

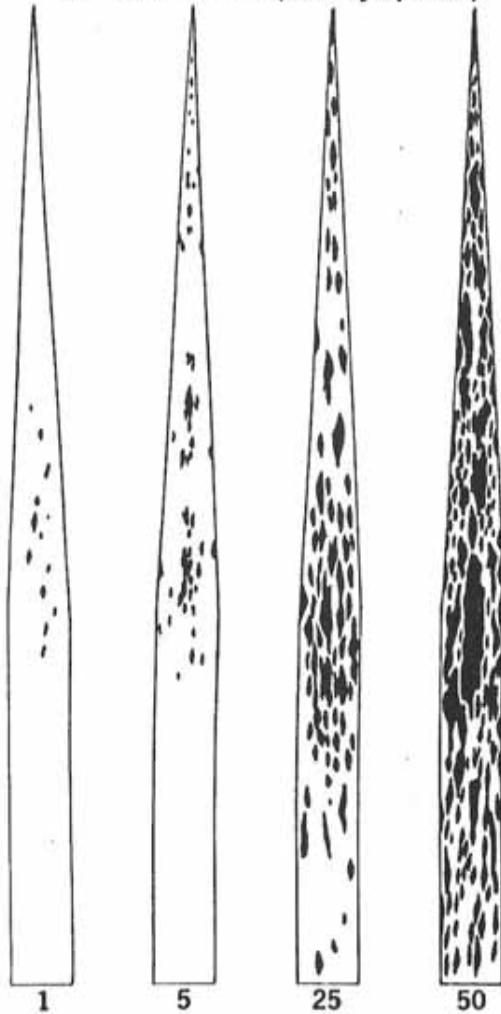
Key No. 1.3

STEM RUST OF CEREALS



PERCENTAGE STEM AREA COVERED

**SEPTORIA LEAF BLOTCH
OF CEREALS (Leaf symptoms)**



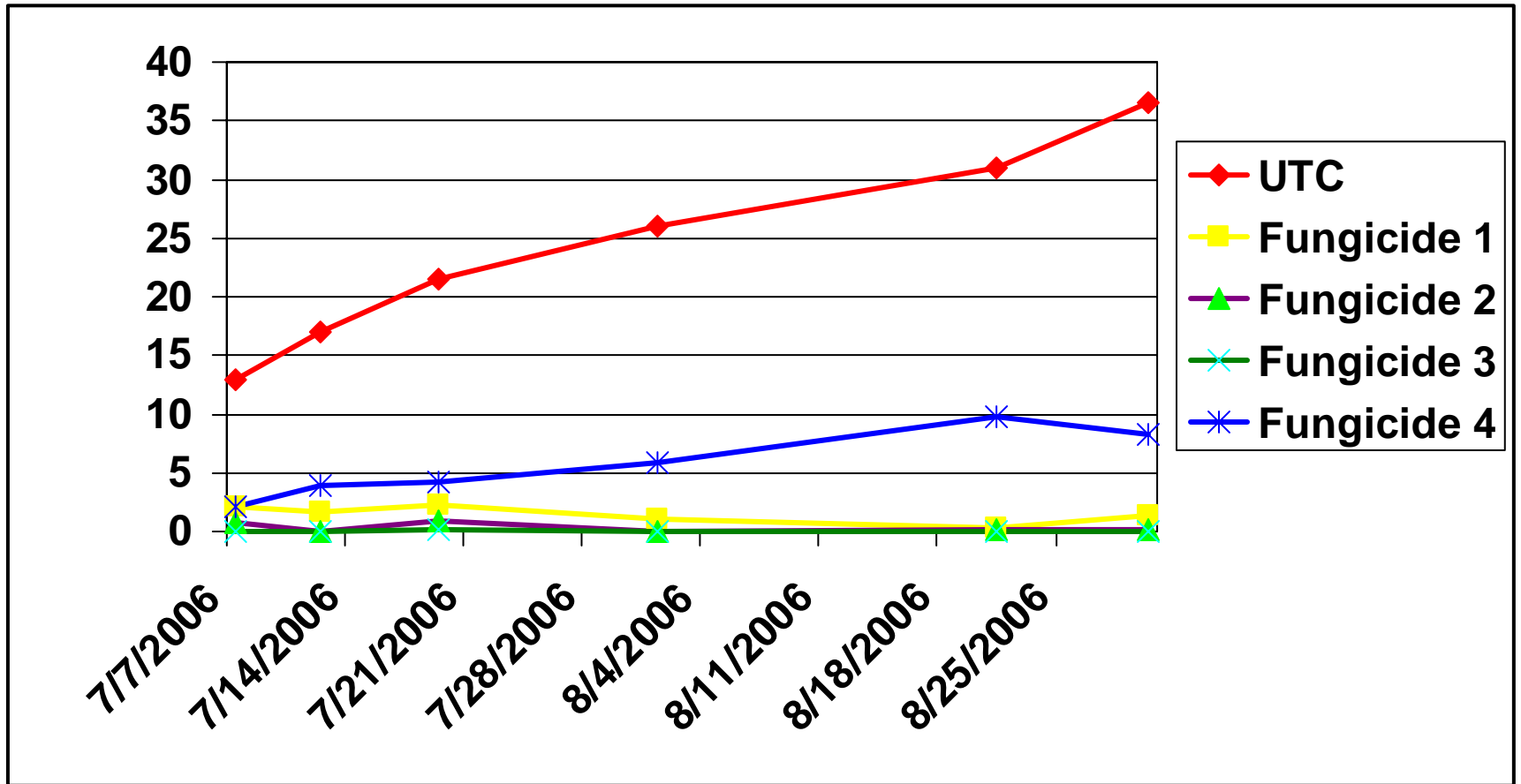
PERCENTAGE LEAF AREA COVERED

**SEPTORIA GLUME BLOTCH
OF WHEAT**

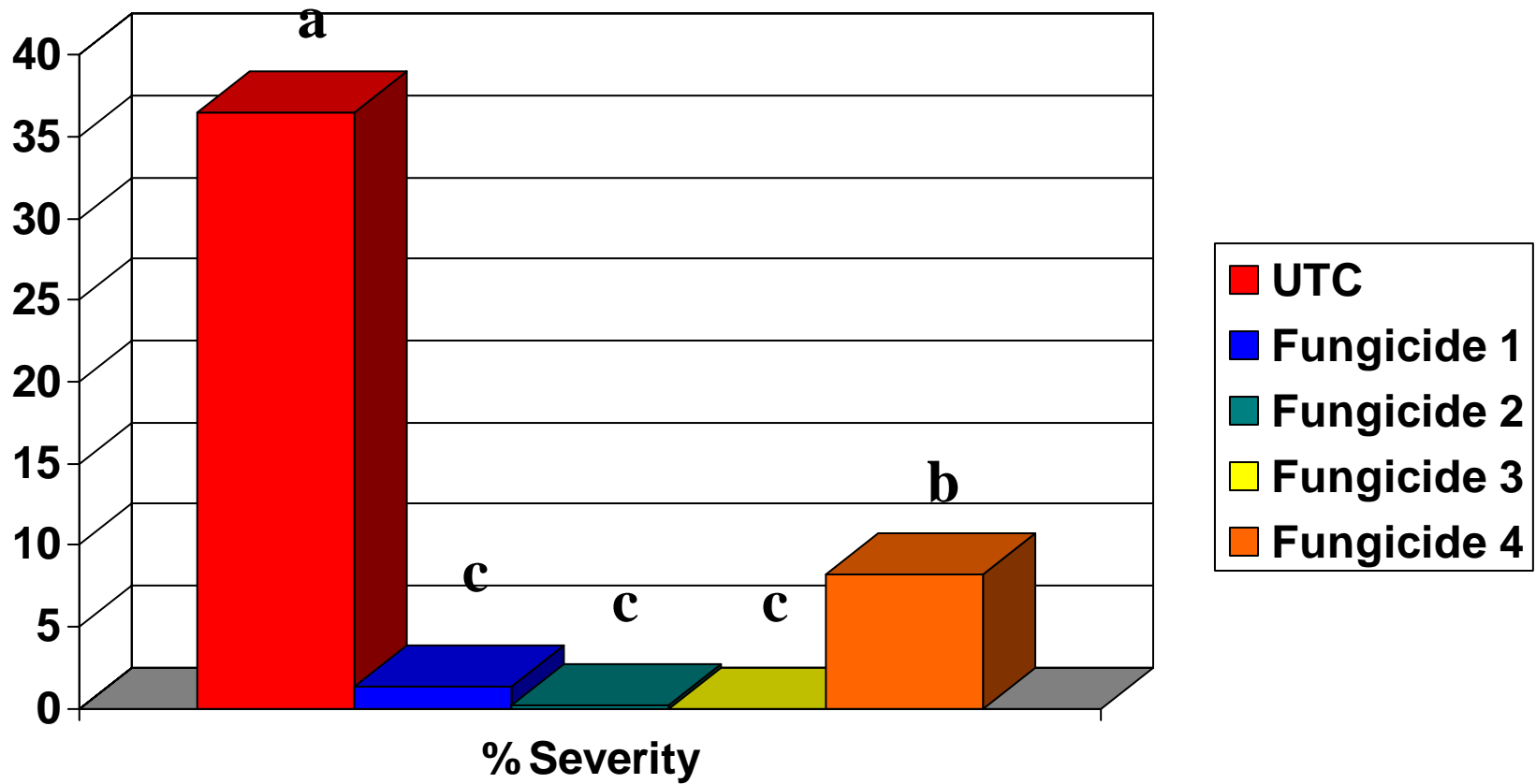


PERCENTAGE SPIKE AREA COVERED

Peanut Early Leafspot Severity Assessment

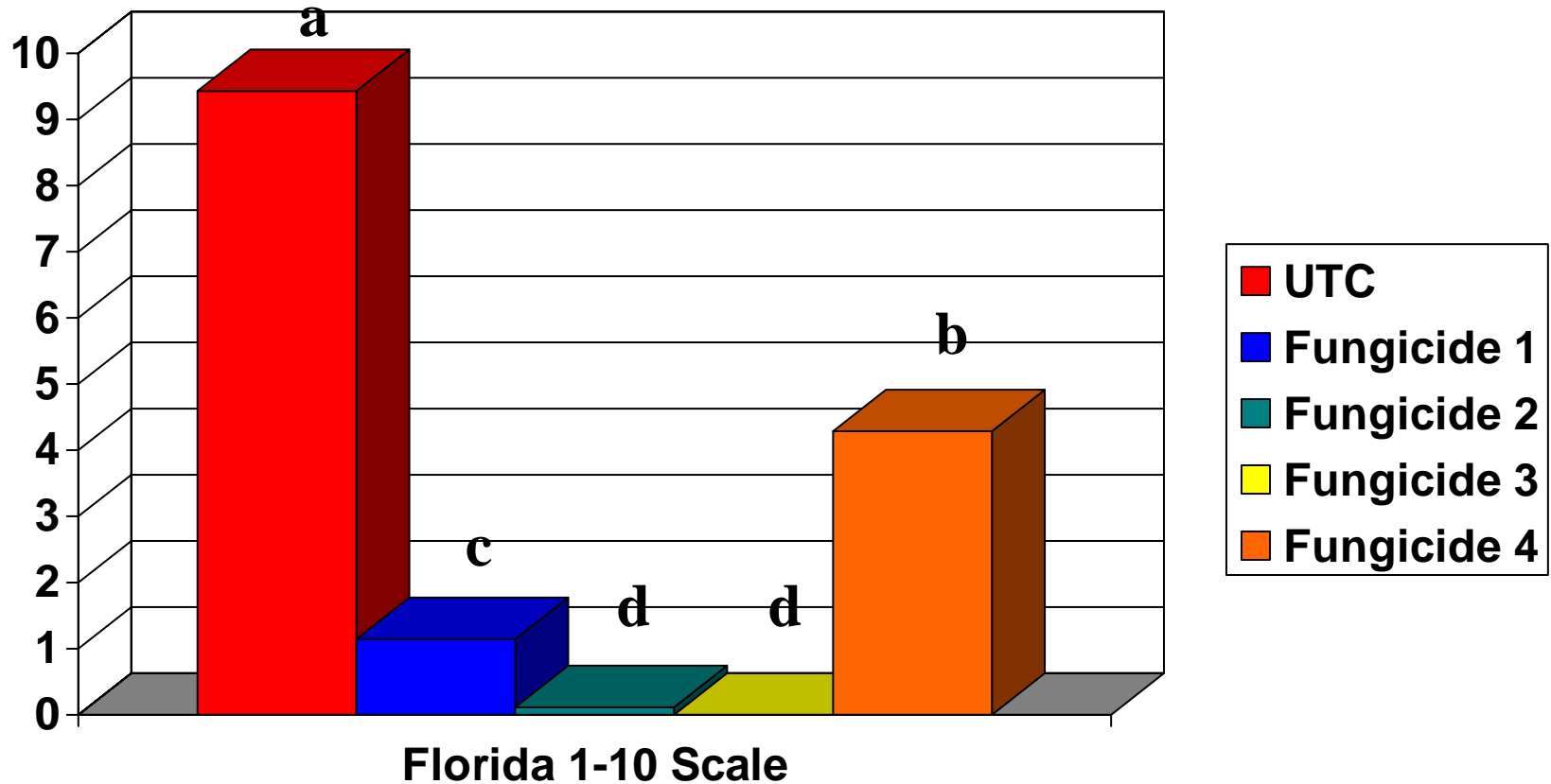


Peanut Early Leafspot Severity Assessment



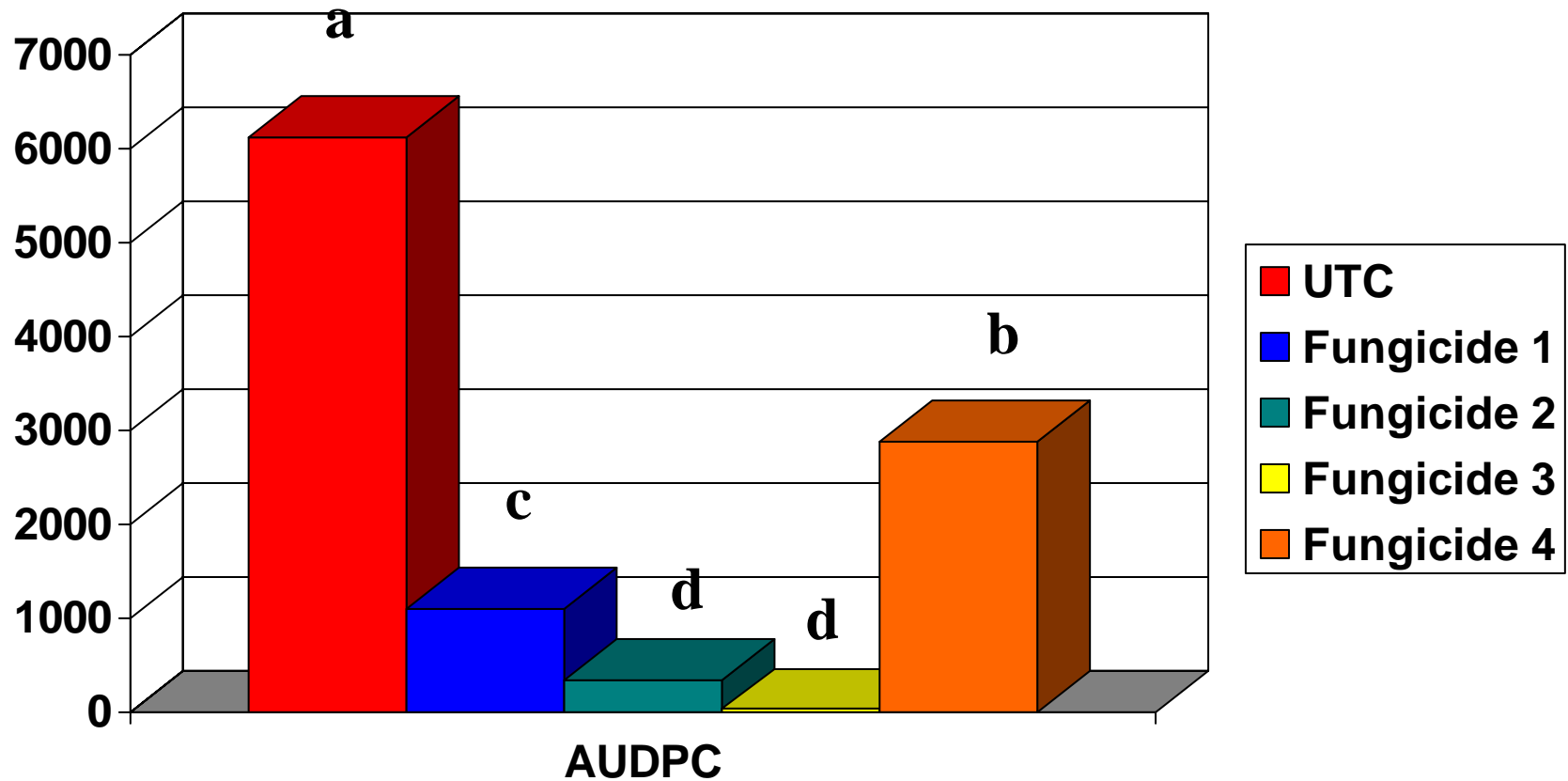
% Severity 0 to 100%

Peanut Early Leafspot Severity Assessment



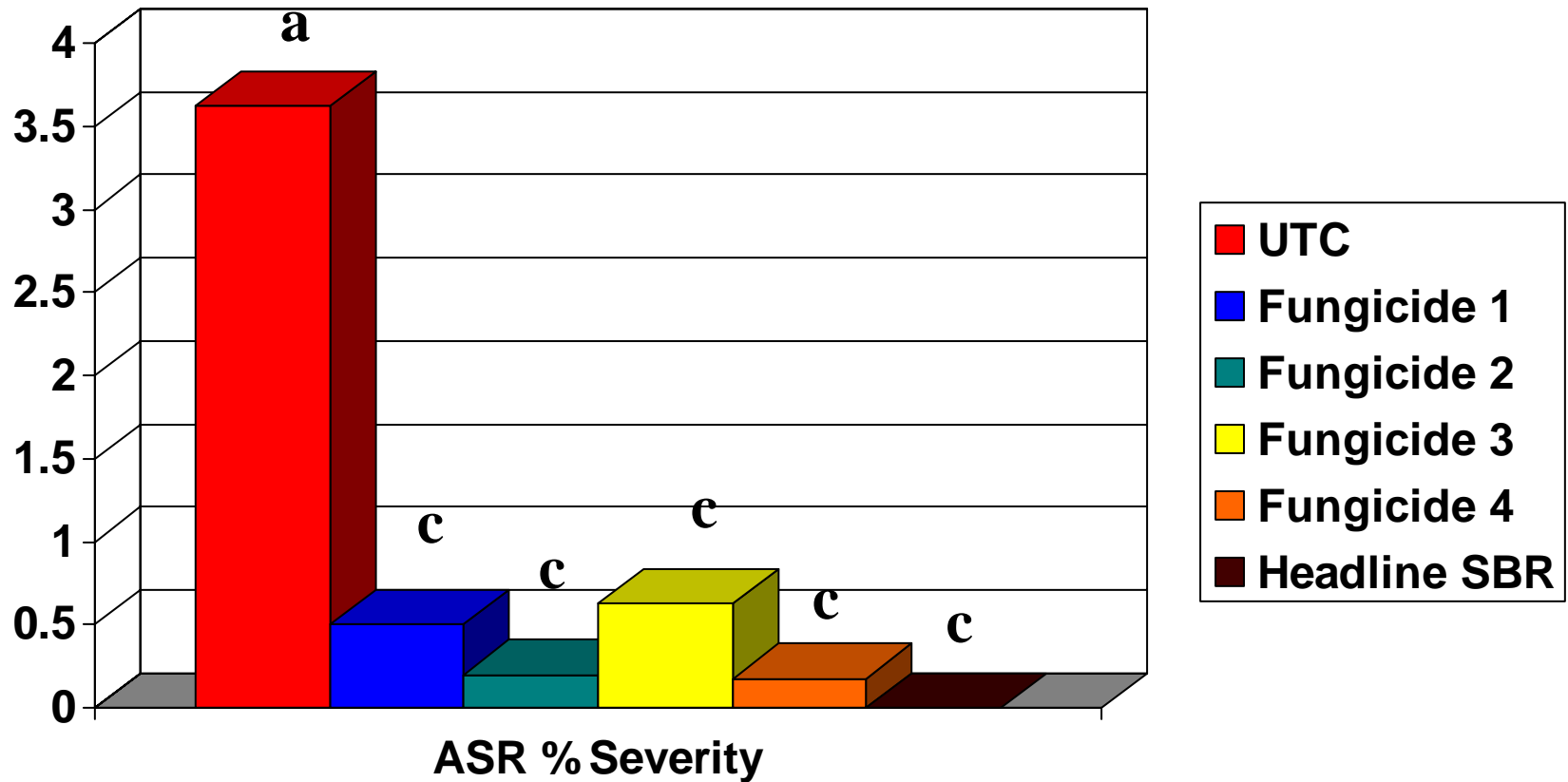
Florida 1 to 10 Scale

Peanut Early Leafspot Severity Assessment



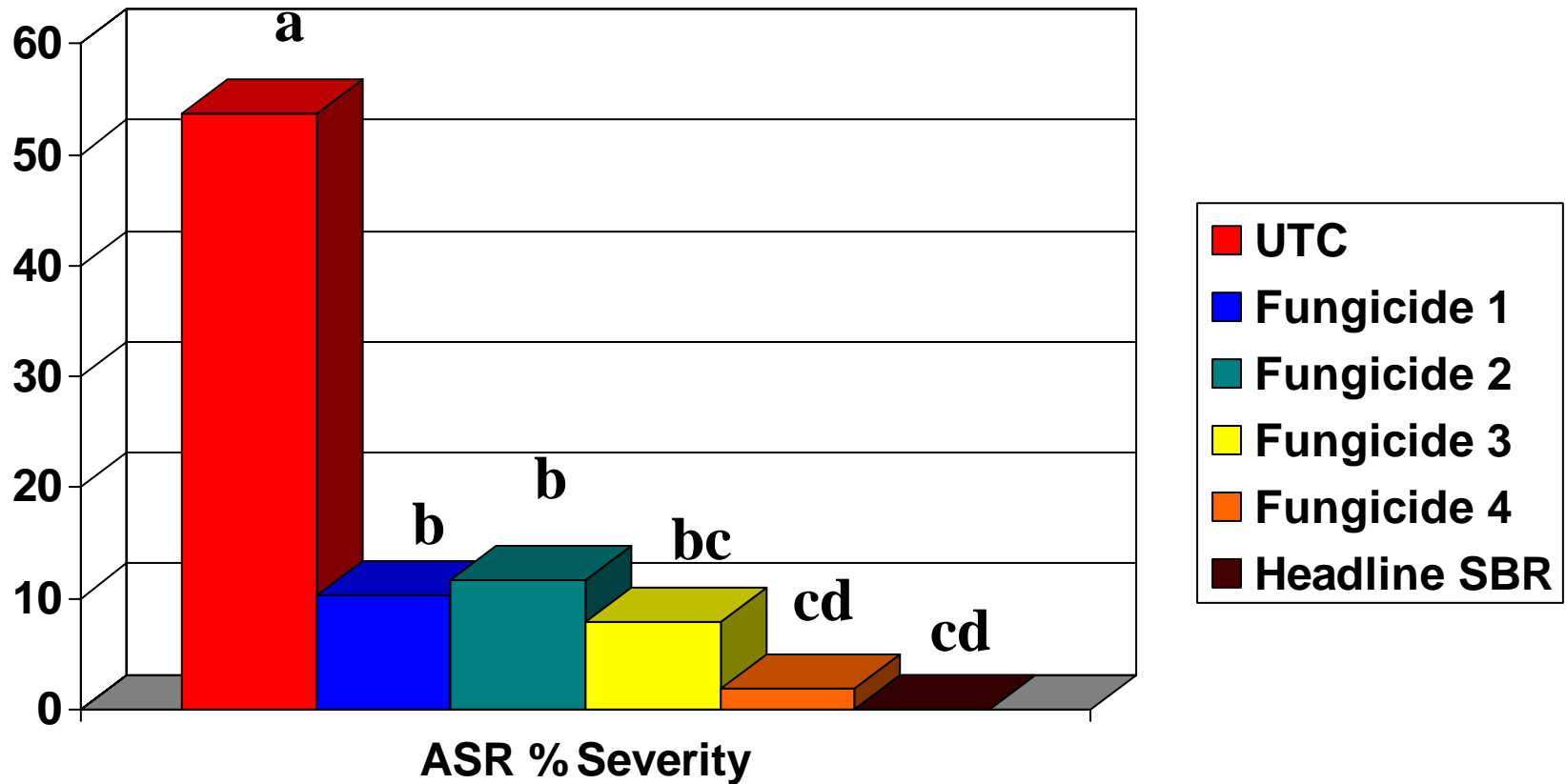
AUDPC Value

Soybean Rust Severity Assessment



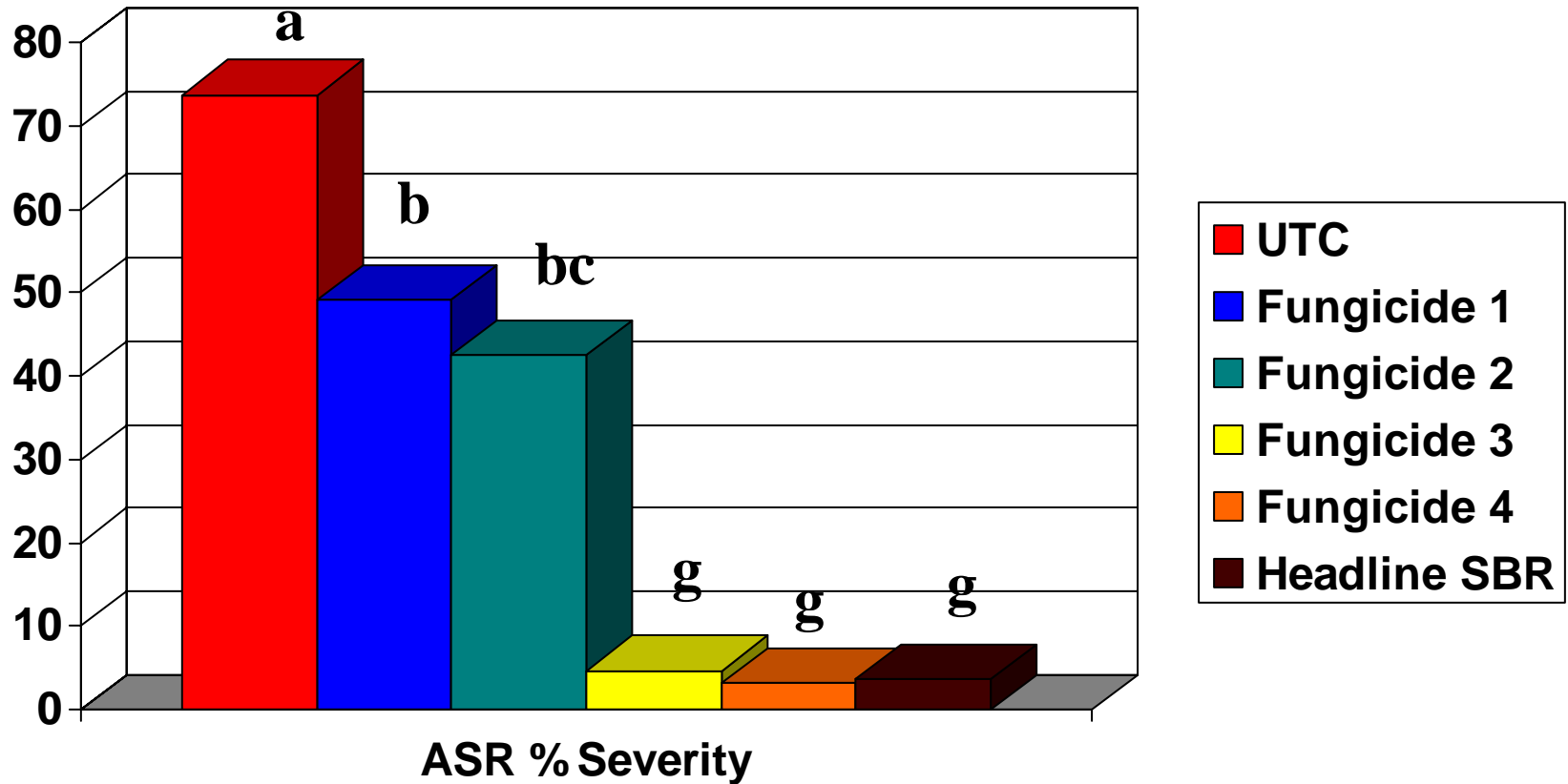
1st rating

Soybean Rust Severity Assessment



2nd rating

Soybean Rust Severity Assessment



3rd rating



Untreated



Fungicide A @ 0.25 lbai/A



Fungicide A 0.5 lbai/A



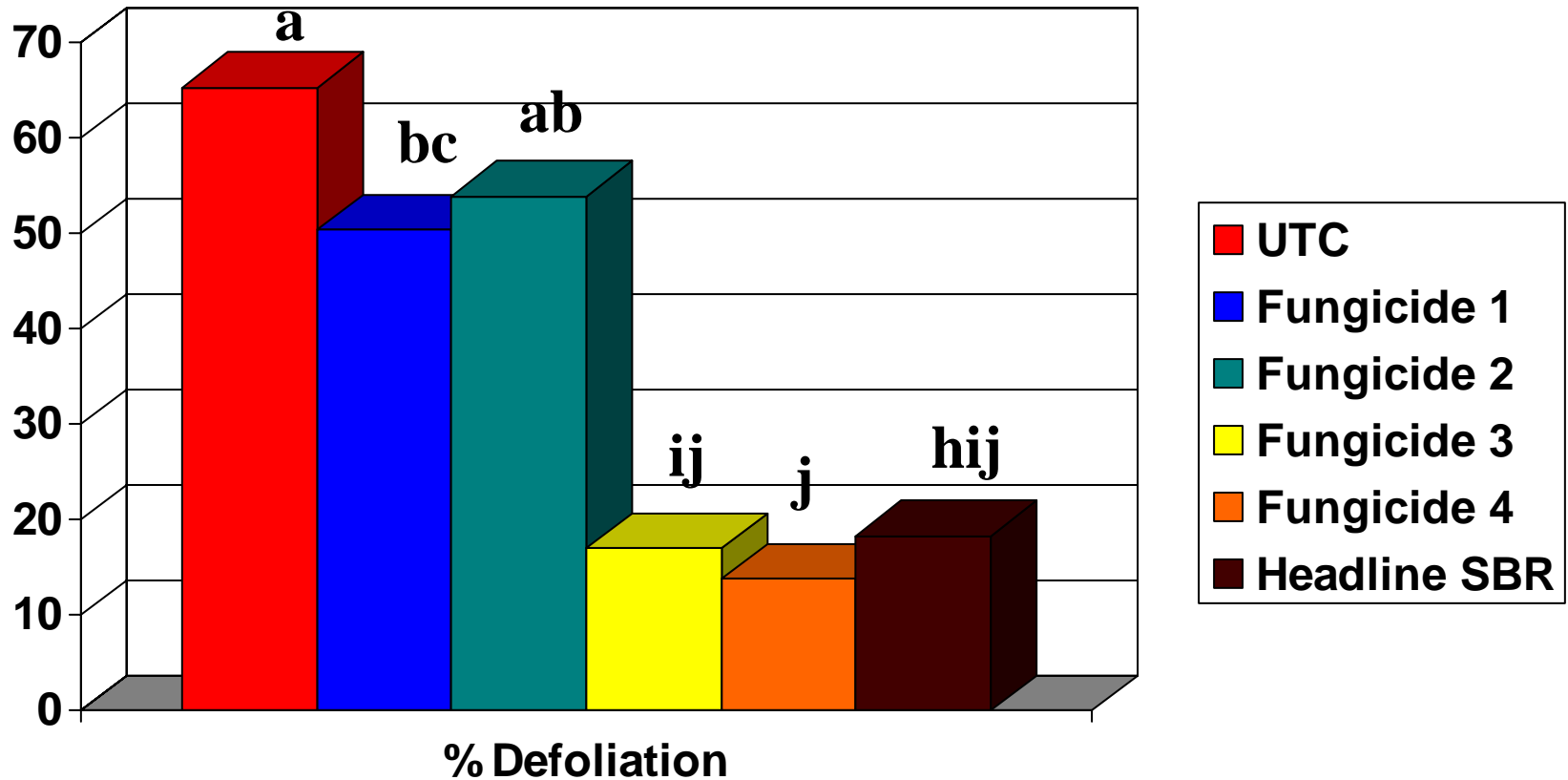
Headline + Folicur



Other Parameters to Assess

- Leaf Defoliation
- Plant Height
- Root Mass
- Vigor
- Yield
- Kernal/Seed Wt.

% Soybean Defoliation



3rd rating

Conclusions

- Due to the cost of developing several experimental fungicides, assessment techniques must be utilized to separate treatments based on efficacy.
- Several techniques are available from incidence to several types of severity ratings
- All are designed to find the “needle in the haystack”.