

Endophyte

Mycology

- 1) Fungus found
- 2)
- 3) Classic seed-borne "disease"
- 4) Fungus is,
- 5) sexual phase only found.....
- 6) Species specific:
 - o Tall fescue (.....) *Neotyphodium*
 - o Ryegrass (.....) *Neotyphodium*
- 7) Variation in fungal races –
- 8) Endophyte-free plants
- 9) Endophyte viability








The Association

- ▶▶ Symbiotic relationship with its host
 - the fungus only draws
 - the host derives
 - together the association is
 - plant variety-fungal race
- ▶▶ The fungus originates in
 - It is most concentrated in
 - It can also spread up
 - During flowering the (and readily grazed)
- ▶▶ The symbiosis produces – neither can produce these alone.
The most important is (less important in ryegrass)
Lolitrems and peramine
- ▶▶ Ergovaline has
Some alkaloids are highly water soluble and

Effects on plants

- ♣ No visual symptoms
- ♣ Production –
- ♣ Persistence –
- ♣ Seasonal variation in alkaloid concentration,
- ♣ Variable drought effects.....

Effects on animals

-  The effect varies depending on which alkaloid is involved.
 - In ryegrass lolitrem is a nervous trematogen – control and have a staggering walk hence
 - Ergovaline is a, and cuts blood supply to animal extremities – in severe cases can result in
- extremely sensitive,intermediate sensitivity, least sensitive, very sensitive
-  Clinical effects – rough coat, staggers, fescue-foot, abortion, elevated temperature (.....)
-  Sub-clinical effects –
-  increases exposure (especially in sheep and horses)
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So what? – practical implications

‡ dilemma – use endophyte-..... ryegrass or tall fescue because it is productive and persistent, or use endophyte-..... seed because it has better animal performance.

‡ The seed industry has adopted a standard of (<5% of seed being infected). Overwhelming evidence shows this has production than when endophyte is present – but it has, and fields become infected after several years (~20% point per year). Factors contributing to breakdown of endophyte-free status:

- a.– infected seed from previous stands (can last in the soil 2 years)
- b.from cultivation – suggest 2 years out of ryegrass/fescue (cropping) to ensure fields are clean
- c.
- d. Contaminated
- e. Contaminated seed
- f.

‡ Avoid

- it will be endophyte infected.
- Do not on turf or sport fields.
- Never includein pasture sowings.
- Never from turf
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‡ A new option available to farmers is tall fescue with

- This has the same endophyte species – but a naturally occurring fungal isolate that has, and in some cases has beneficial alkaloids having no animal effects (e.g. insect resistance).
- MaxQ is the only nontoxic-endophyte tall fescue available.
- this has the same establishment criteria as endophyte-free seed (two years free of fescue, clean seed, clean seedbed, no hay feeding, pre-grazing on orchardgrass, bluegrass or alfalfa)