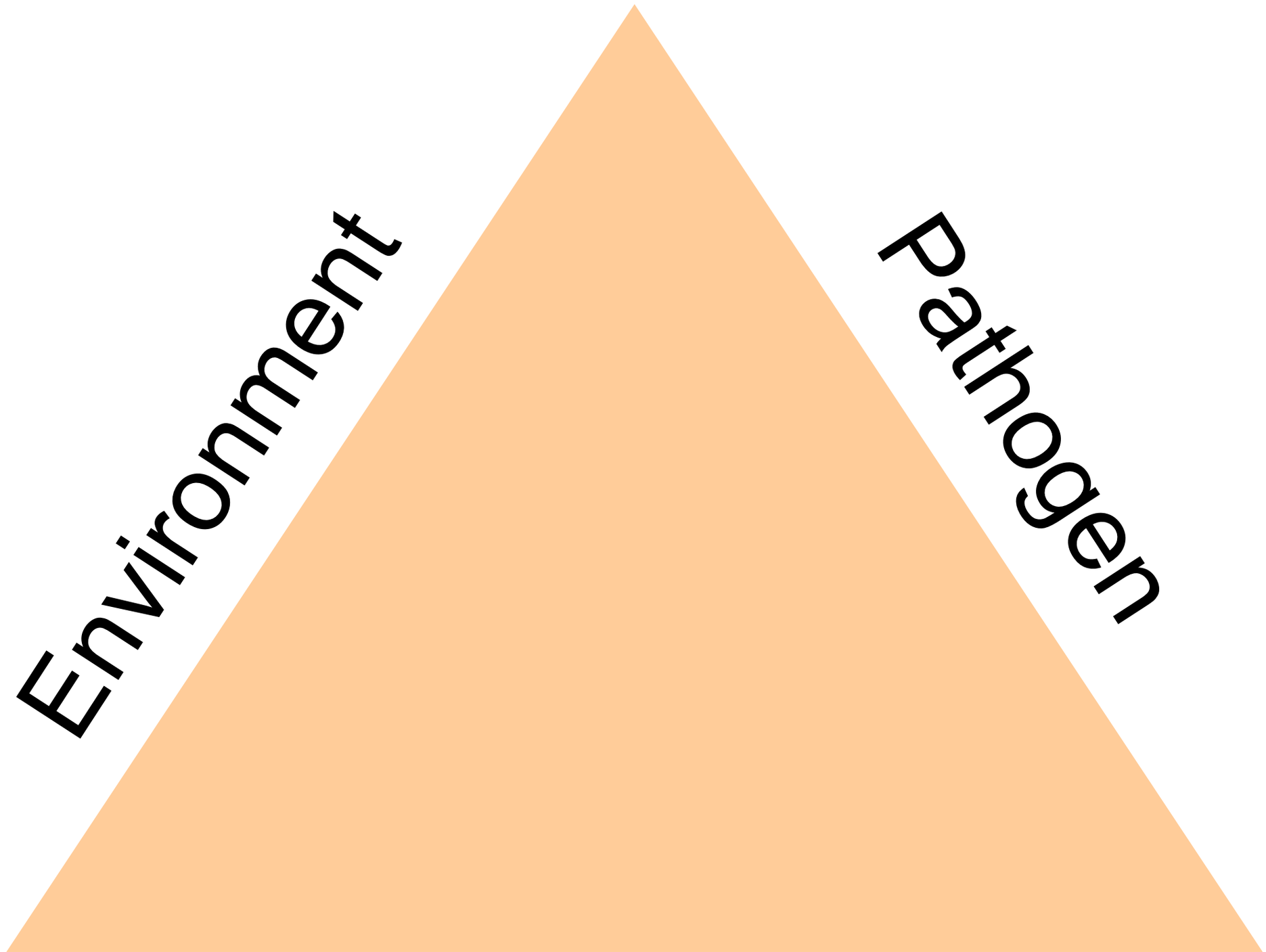
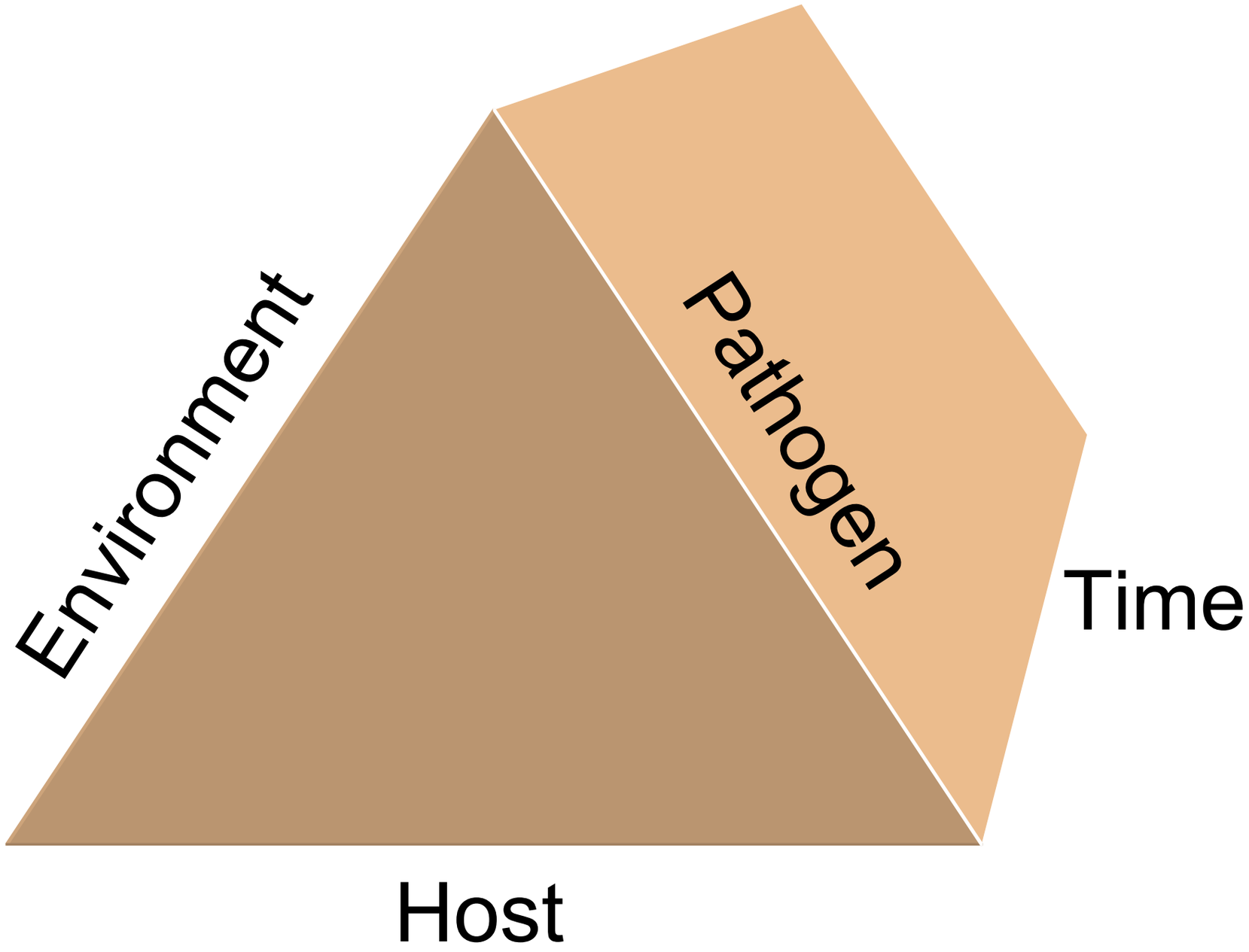
Historical Look at Disease Control

Brandon Horvath, Ph.D.
Assistant Professor
Turfgrass Pathology
University of Tennessee


Environment
Pathogen
Host

Epidemiology Matters



More with Less?

Fungicide performance is determined by several factors that YOU can control.

Factors Affecting Fungicide Performance

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Deposition Factors

- application rate
- application interval
- application timing
- application volume

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- degradation processes
    - photodegradation
    - biodegradation
    - metabolic transformation
- removal of deposit

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Disease Pressure

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Disease Pressure

Fungicide Resistance

Techniques for Improving Fungicide Performance

1. Maintain healthy turf
2. Get an accurate diagnosis
3. Select the best fungicide
4. Time applications properly
5. Put the fungicide where the pathogen is
6. Provide uniform coverage of the target site
7. Prevent fungicide resistance

An apple a day will keep the doctor away....

What does a turf plant need to be healthy?

1. light
2. air (oxygen)
3. food
4. water

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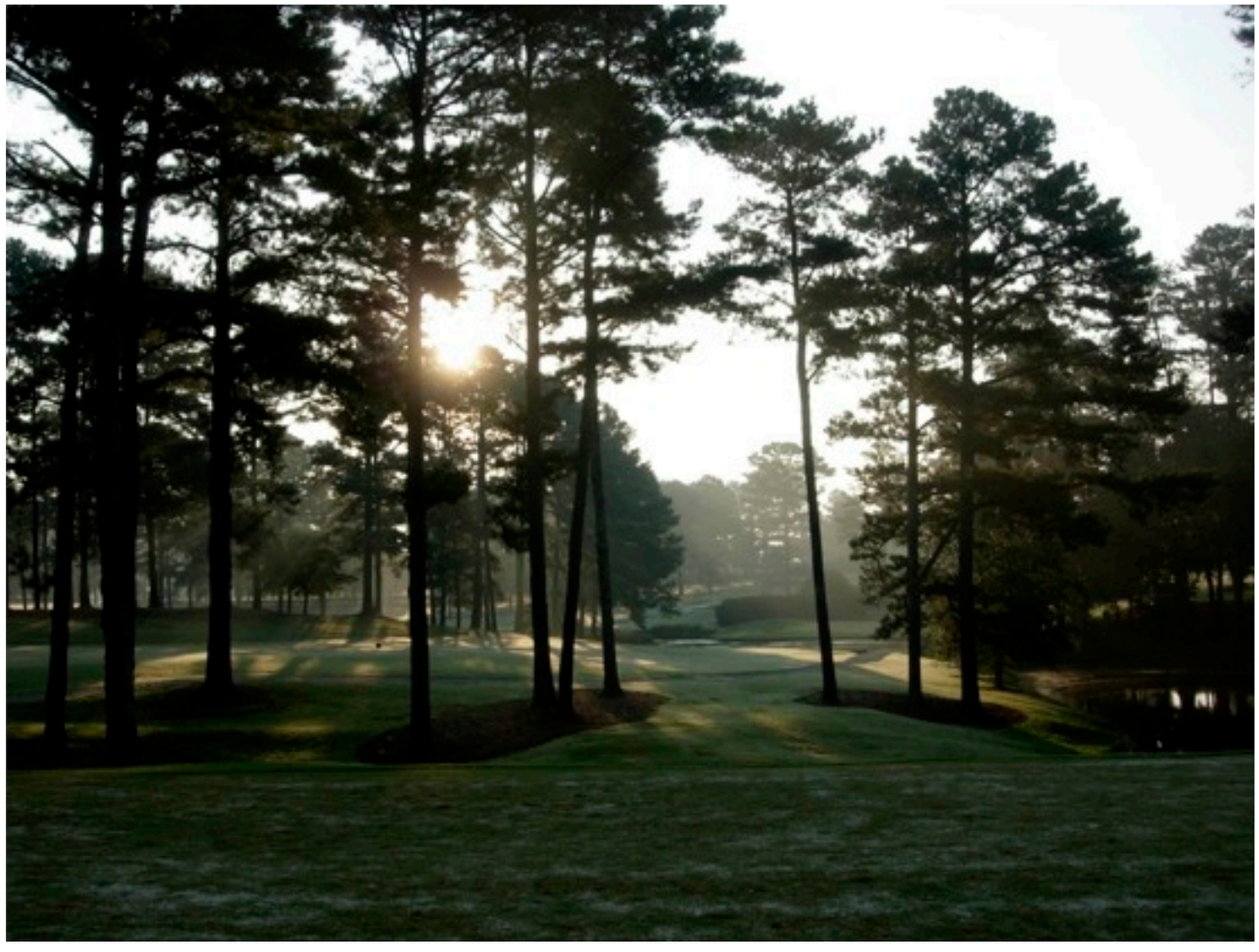

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Get an accurate diagnosis!

- some diseases can be diagnosed easily in the field

- many cannot and a lab diagnosis is essential

Proper sample collection and shipment are essential to getting an accurate diagnosis.

No disease?
What NOW?!?!?

- nutrient analysis - soil and tissue
- monitor soil health
    - drainage
    - layering
    - black layer

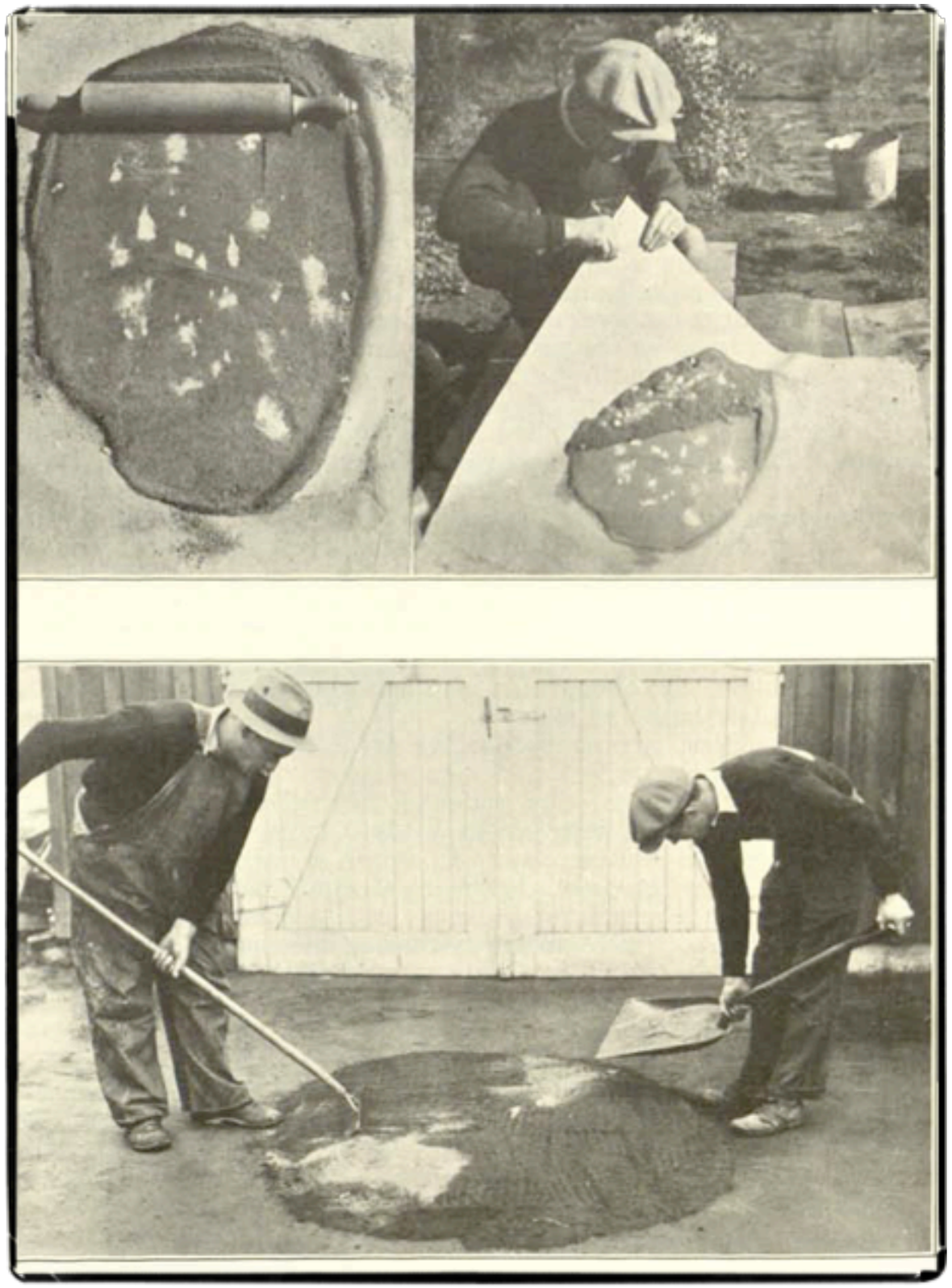
What you need to know about fungicides

Topical Mode of Action

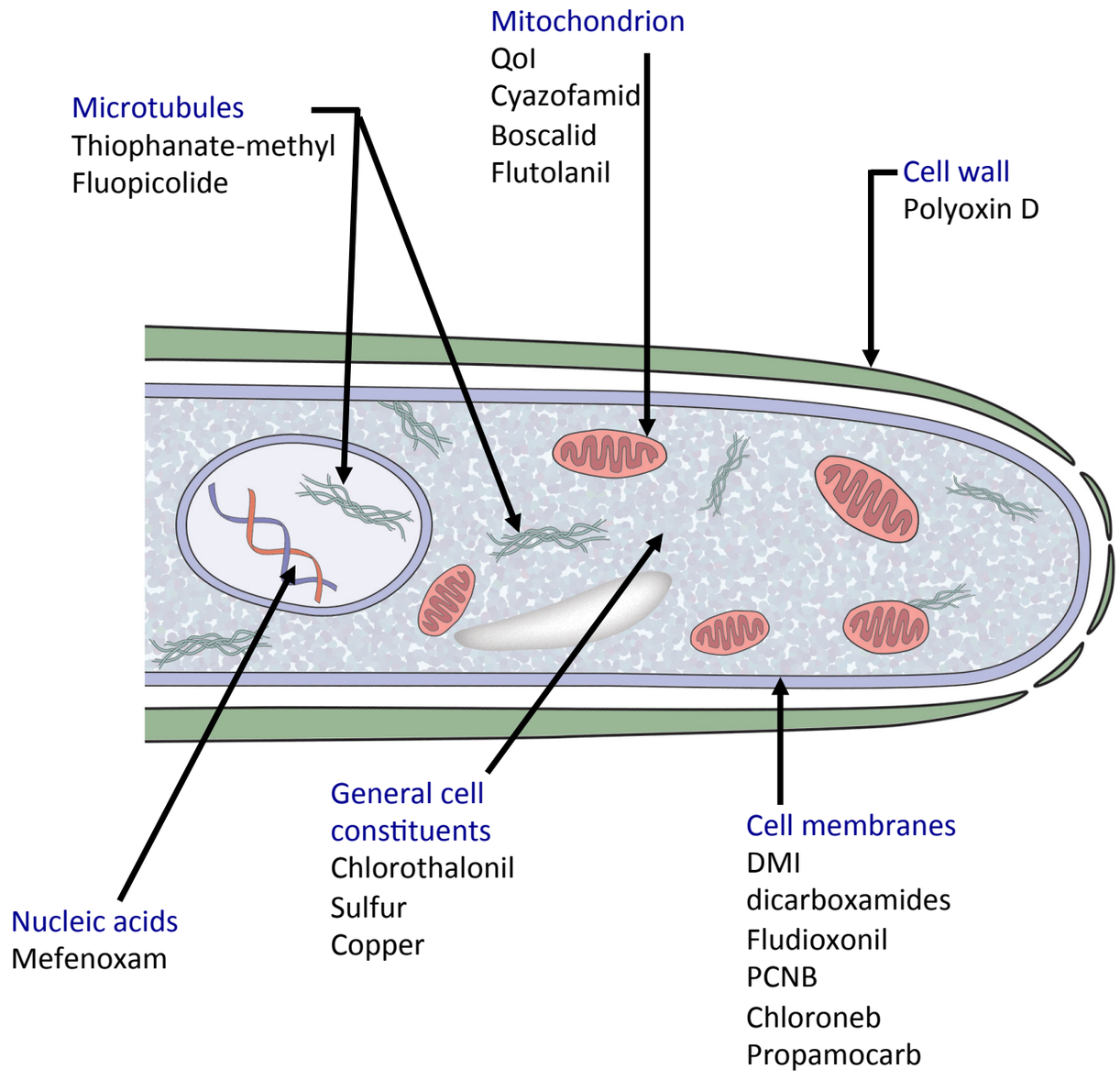
- how does the fungicide move on/in the plant after application?

Biochemical Mode of Action

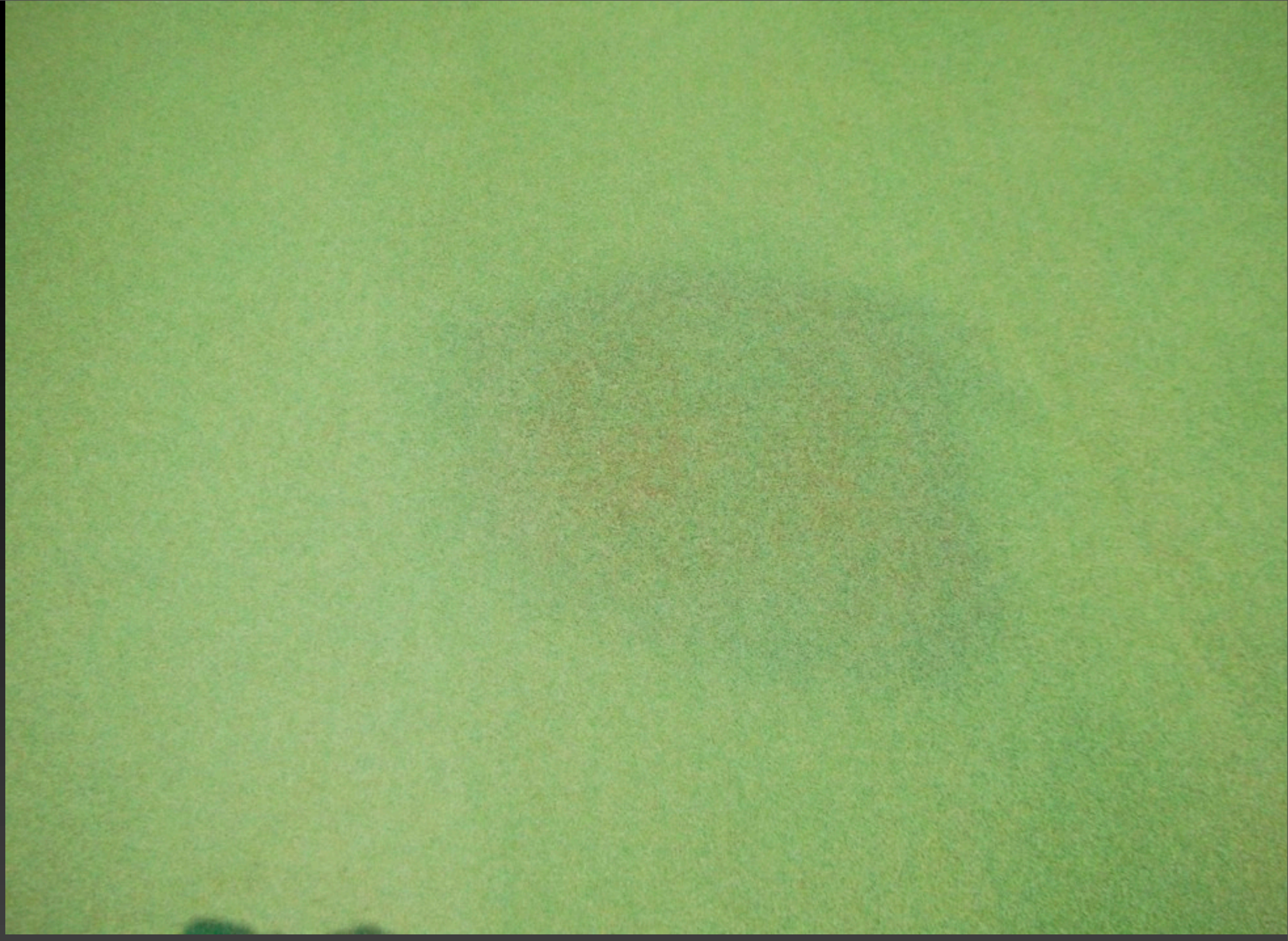
- what is the risk for fungicide resistance?
- single-site or multi-site inhibitor



Fungicide Effects on Pathogen



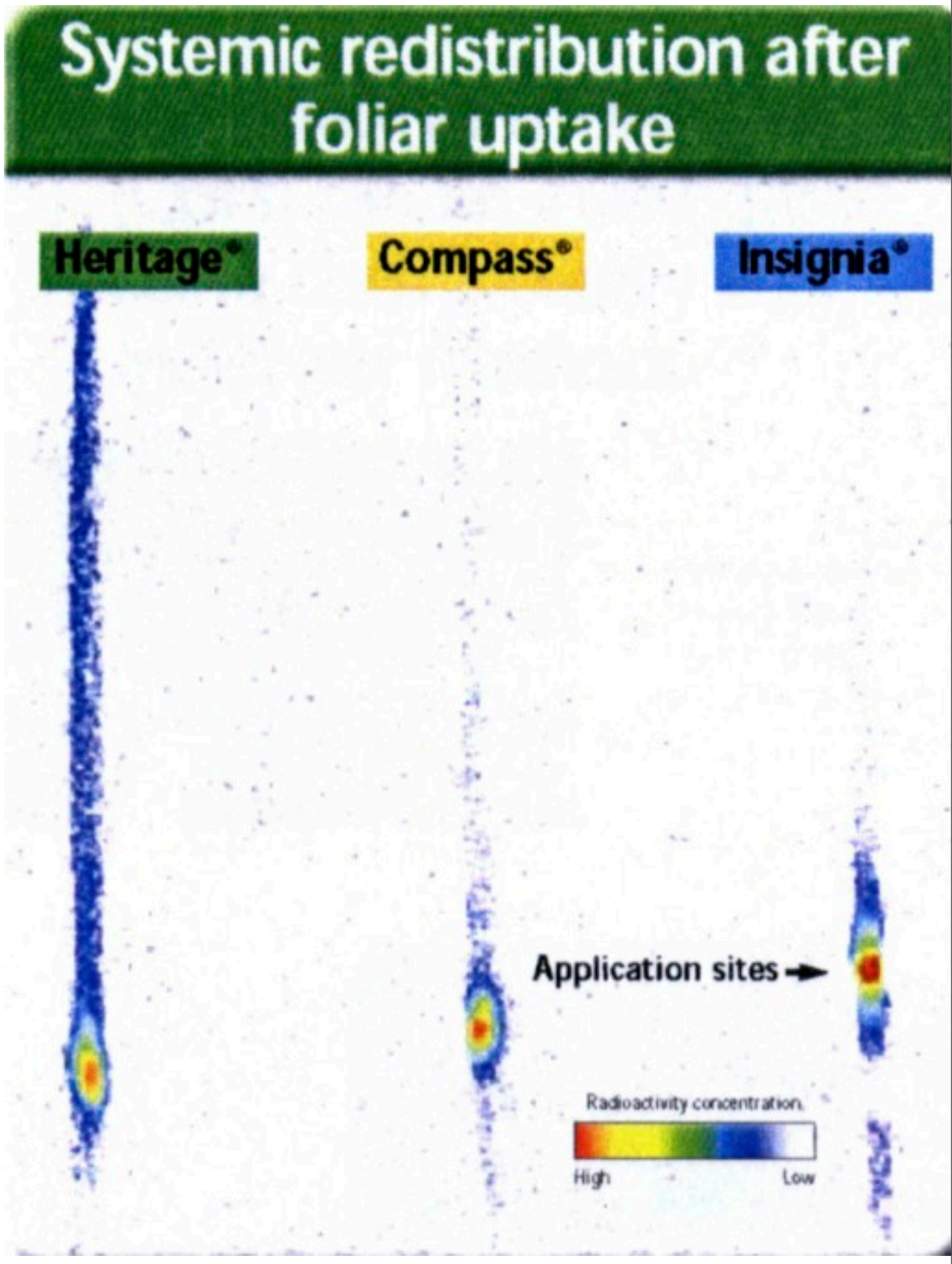
Latin, 2011 Practical Guide to Turfgrass Fungicides



Topical Mode of Action

How the fungicide moves on/in plant after it is applied

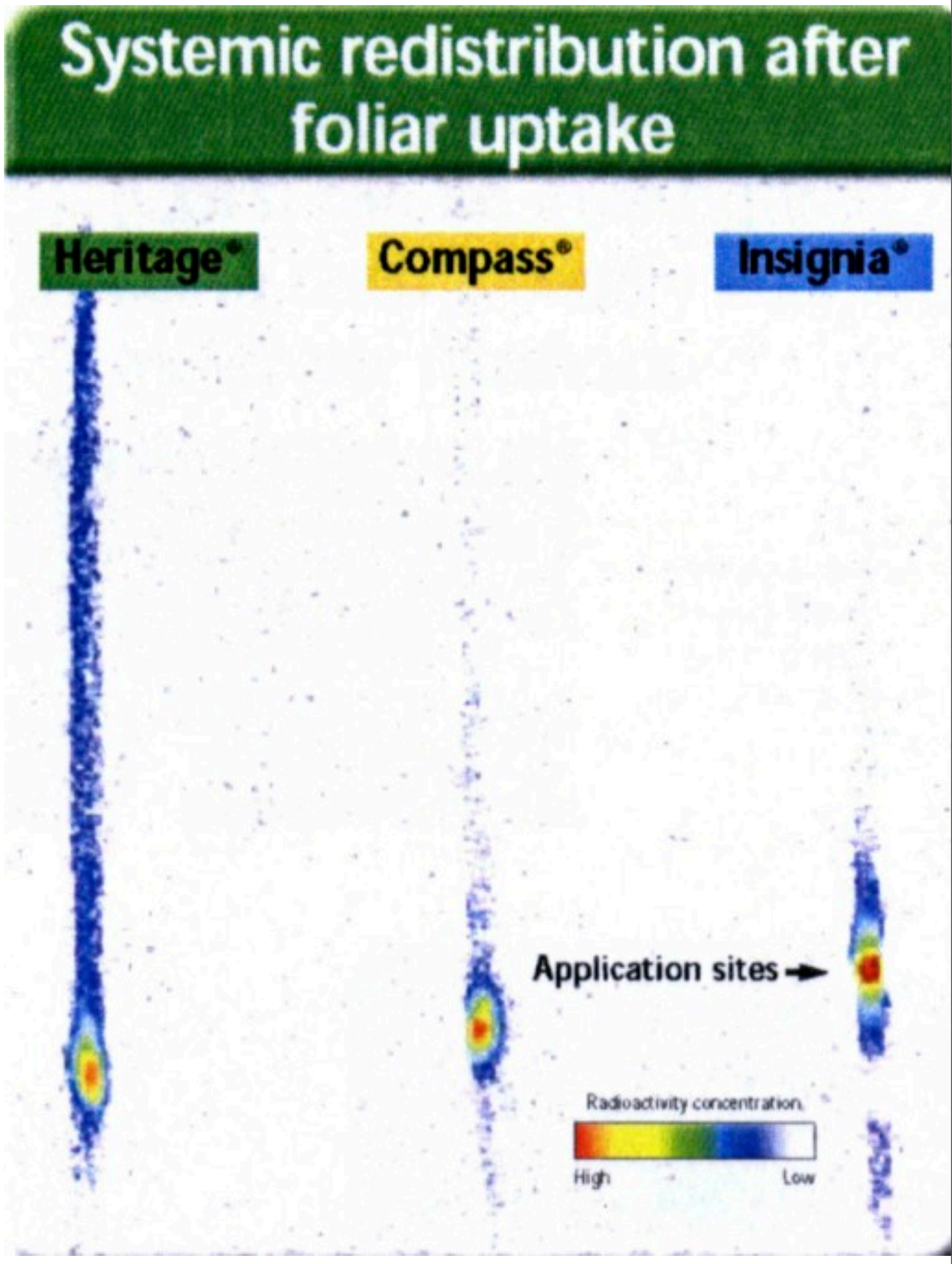
- contact
- localized penetrant
- systemic
  - acropetal penetrant
  - true systemic



Topical Mode of Action

How the fungicide moves on/in plant after it is applied

- contact — stays on leaf surface
- localized penetrant
- systemic
  - acropetal penetrant
  - true systemic



Topical Mode of Action

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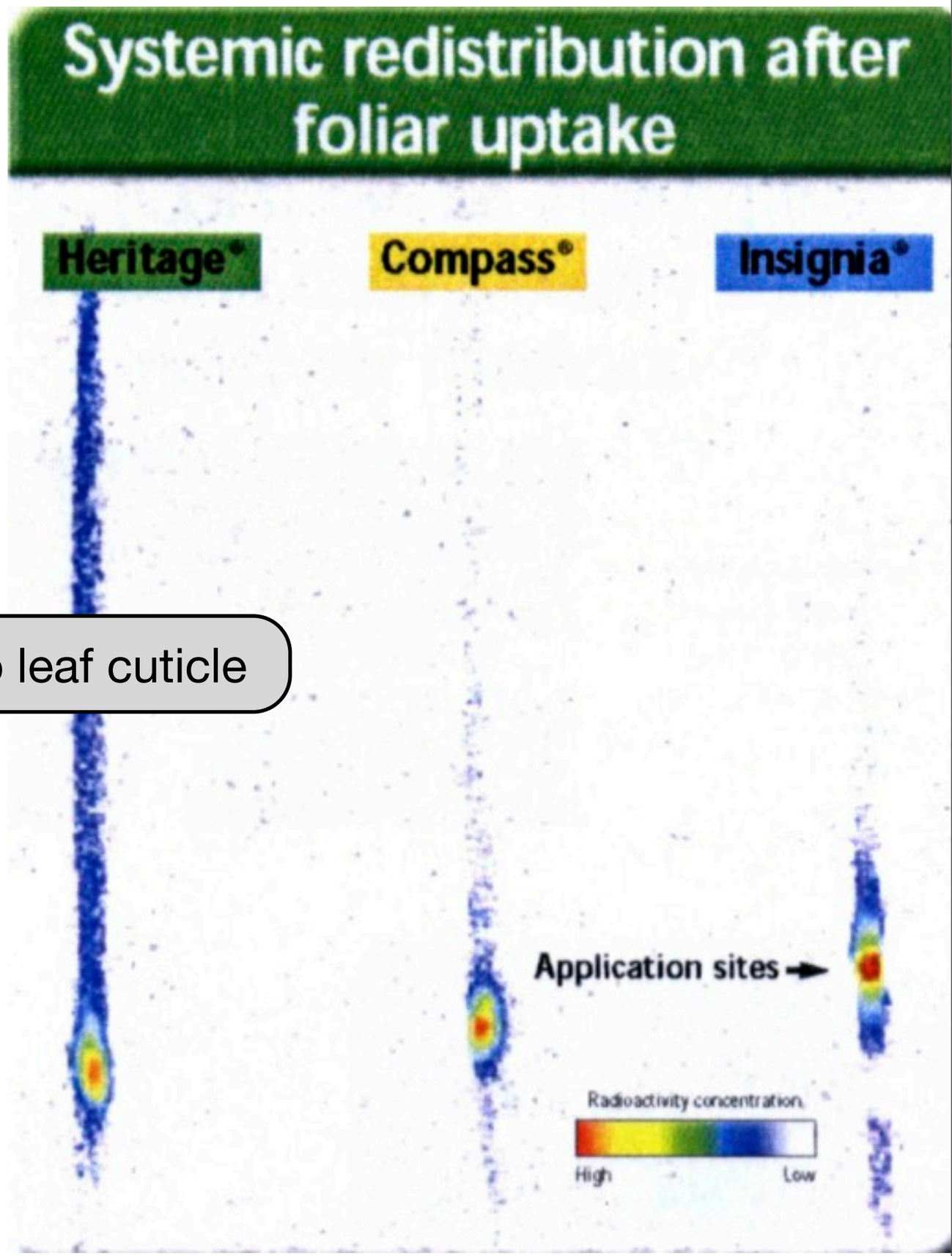
absorbed into leaf cuticle



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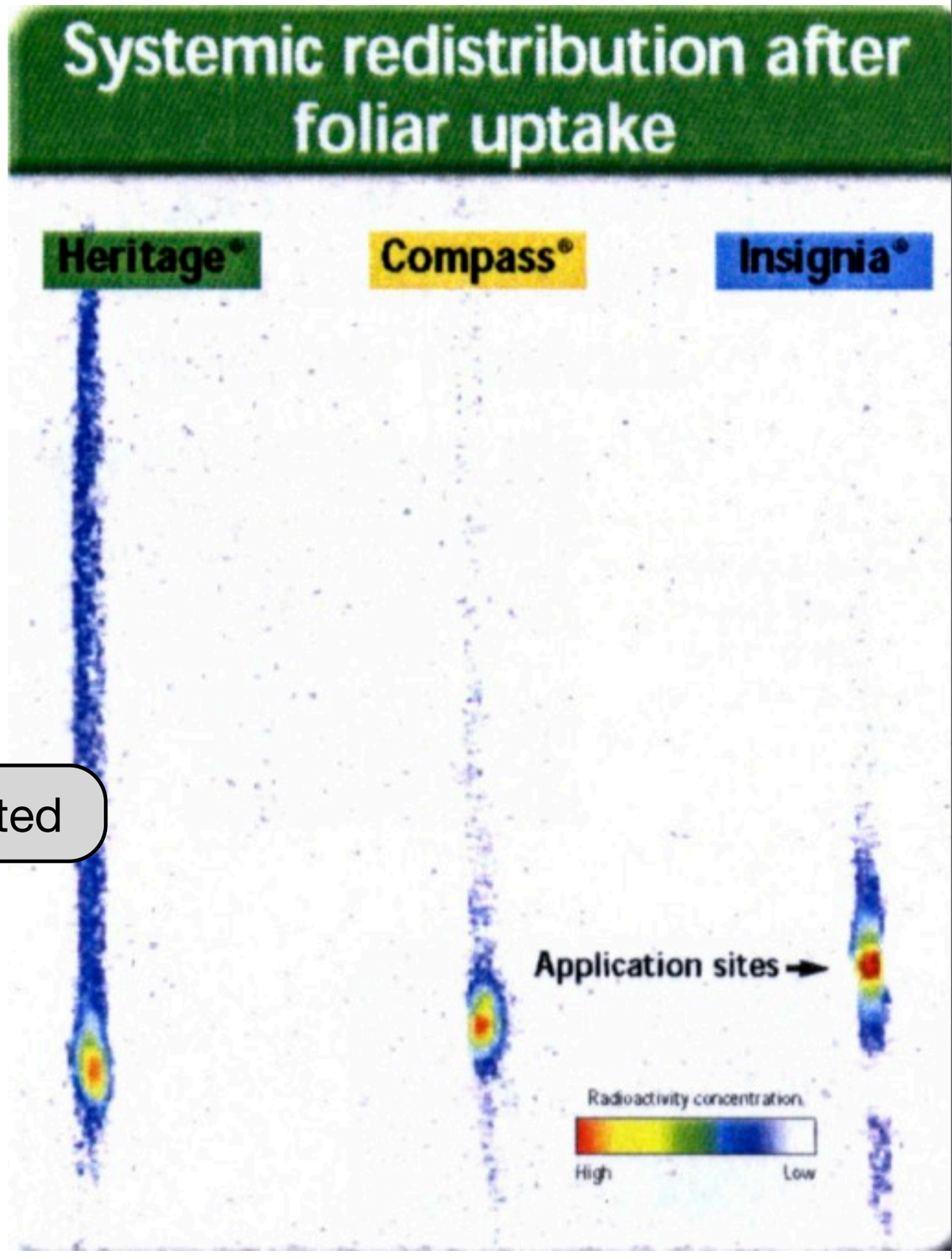
  absorbed and translocated

  - acropetal penetrant
  - true systemic



Topical Mode of Action

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  - acropetal penetrant
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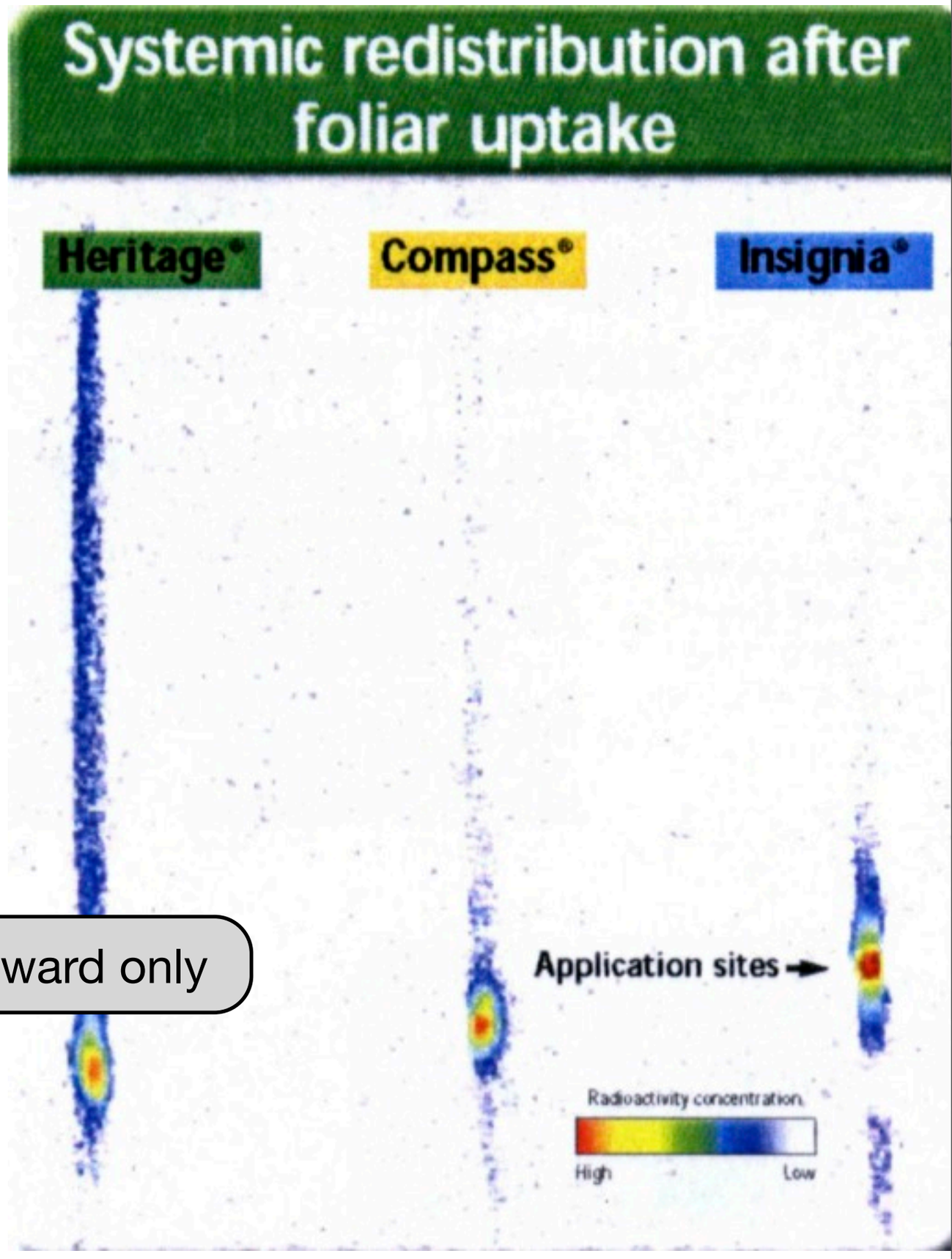
moves upward only



Topical Mode of Action

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  - acropetal penetrant
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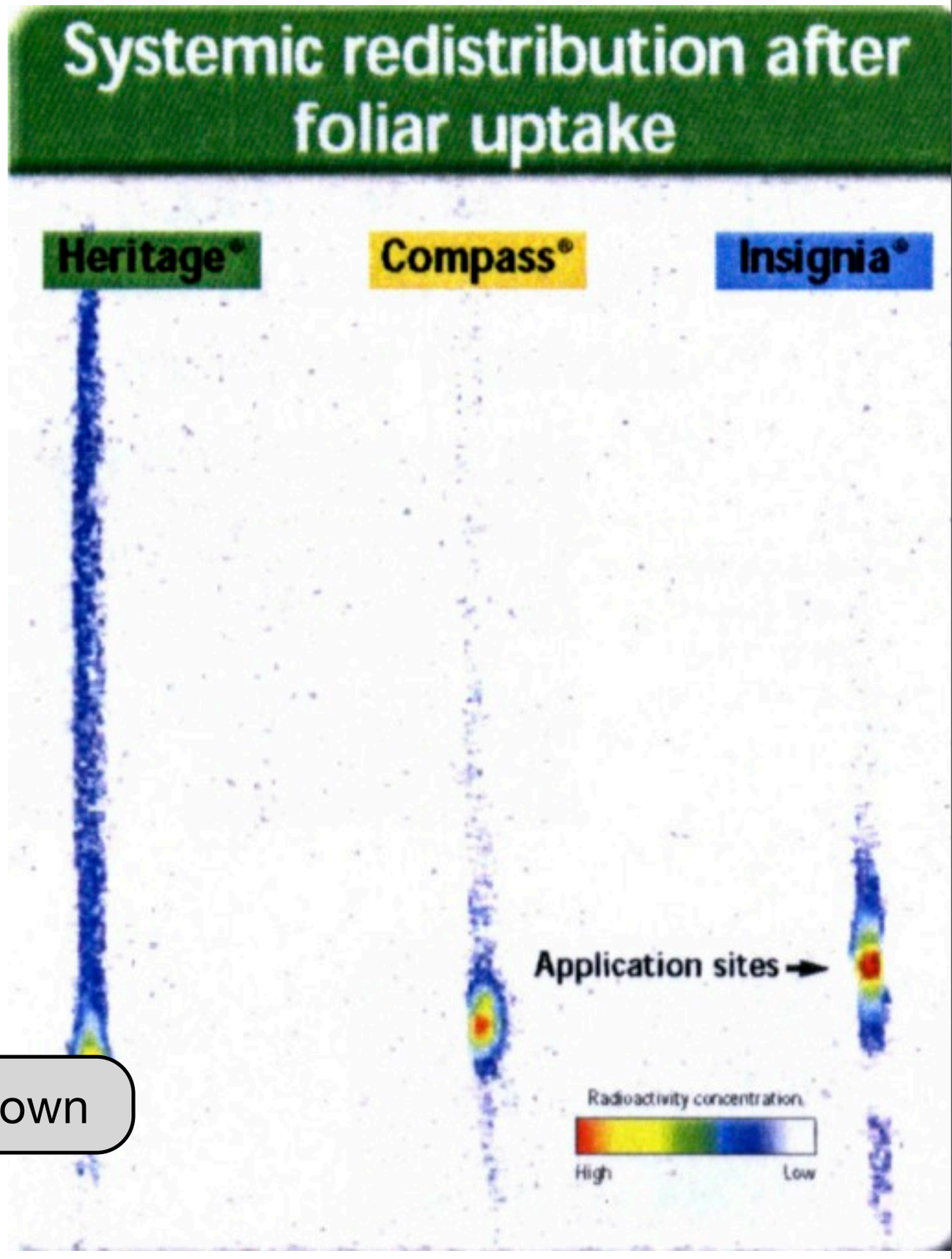
moves up and down



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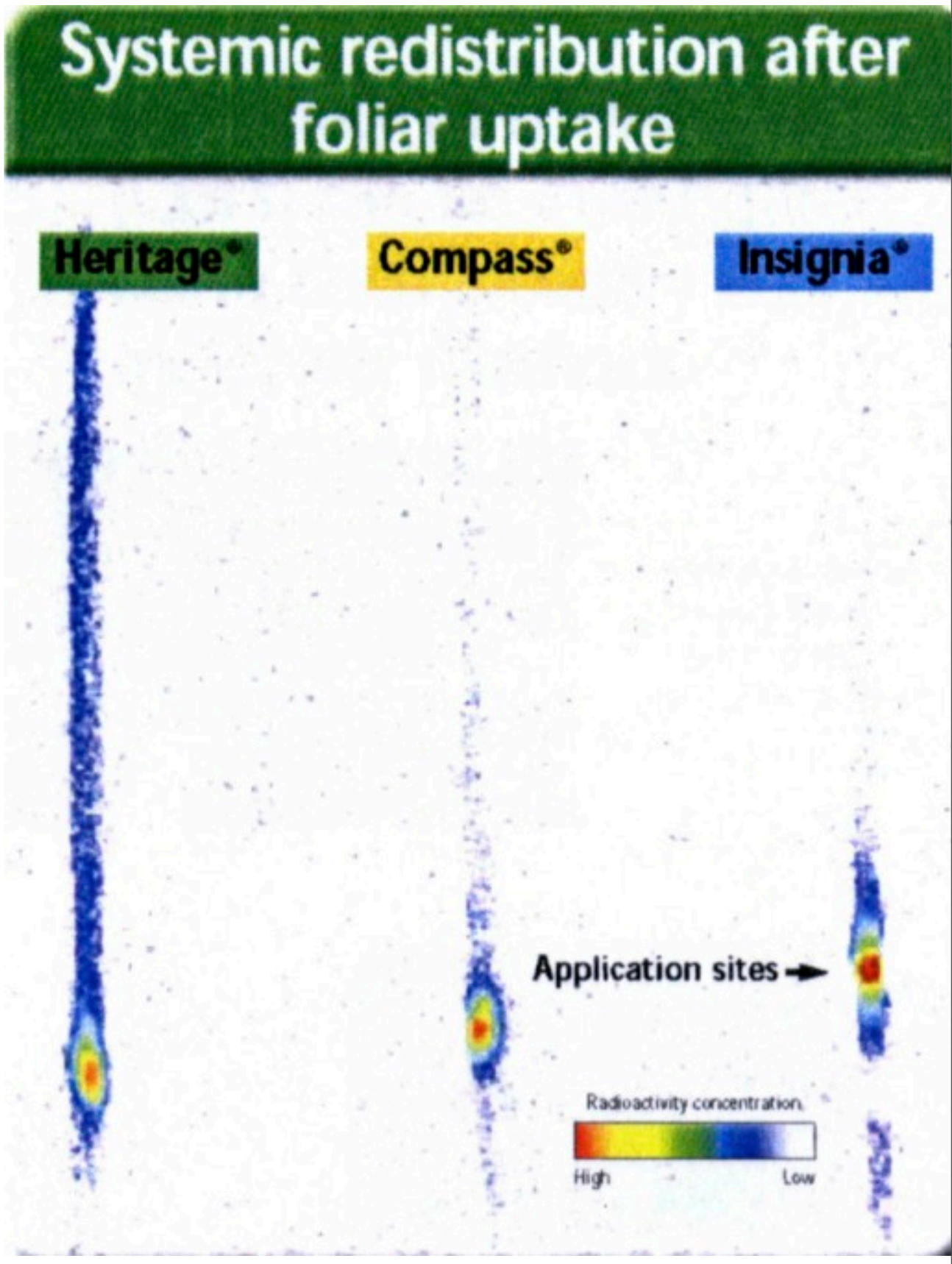

Why is topical mode of action important?

- determines length of residual control
- contacts and localized penetrants less effective for curative applications
- acropetal penetrants and true systemics best for control of root diseases
- when tank mixing to improve disease control, mixture components should have different topical modes of action

Selecting an Application Rate

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Preventative Applications

- before fungal infections occur
- use low rate on short intervals or high rate at long intervals
- all topical modes of action are effective

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Curative Applications

- after fungal infections occur
- use high rates at short intervals
- acropetal penetrants are best
- tank-mix with a contact fungicide is often beneficial

Integrated Turfgrass Health Management

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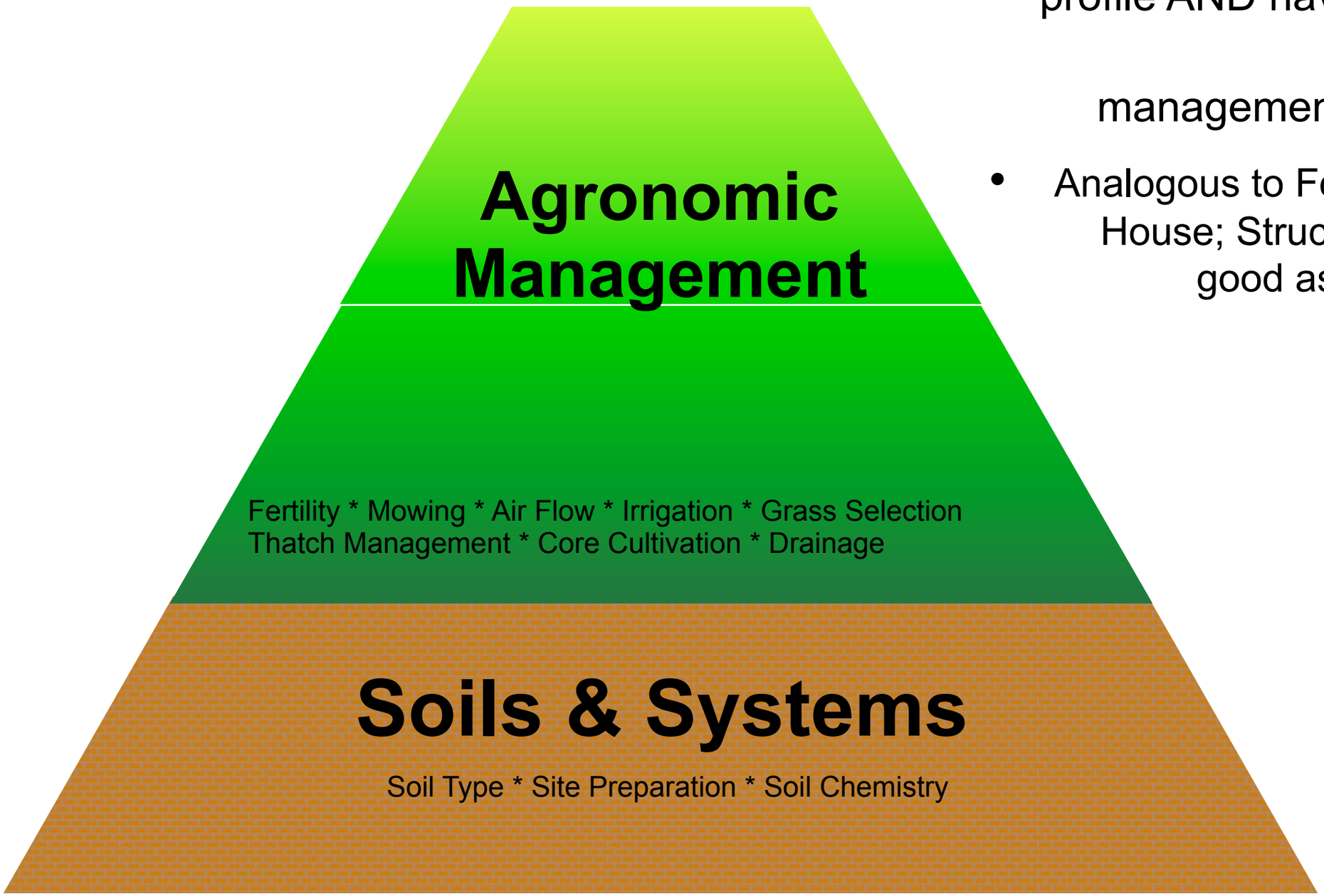
- The foundation of all Integrated Turfgrass Health Management Programs is a sound understanding of your SOIL profile AND having a solid agronomic management program!
  - Analogous to Foundation in House; Structure only as good as foundation below.

Integrated Turfgrass Health Management



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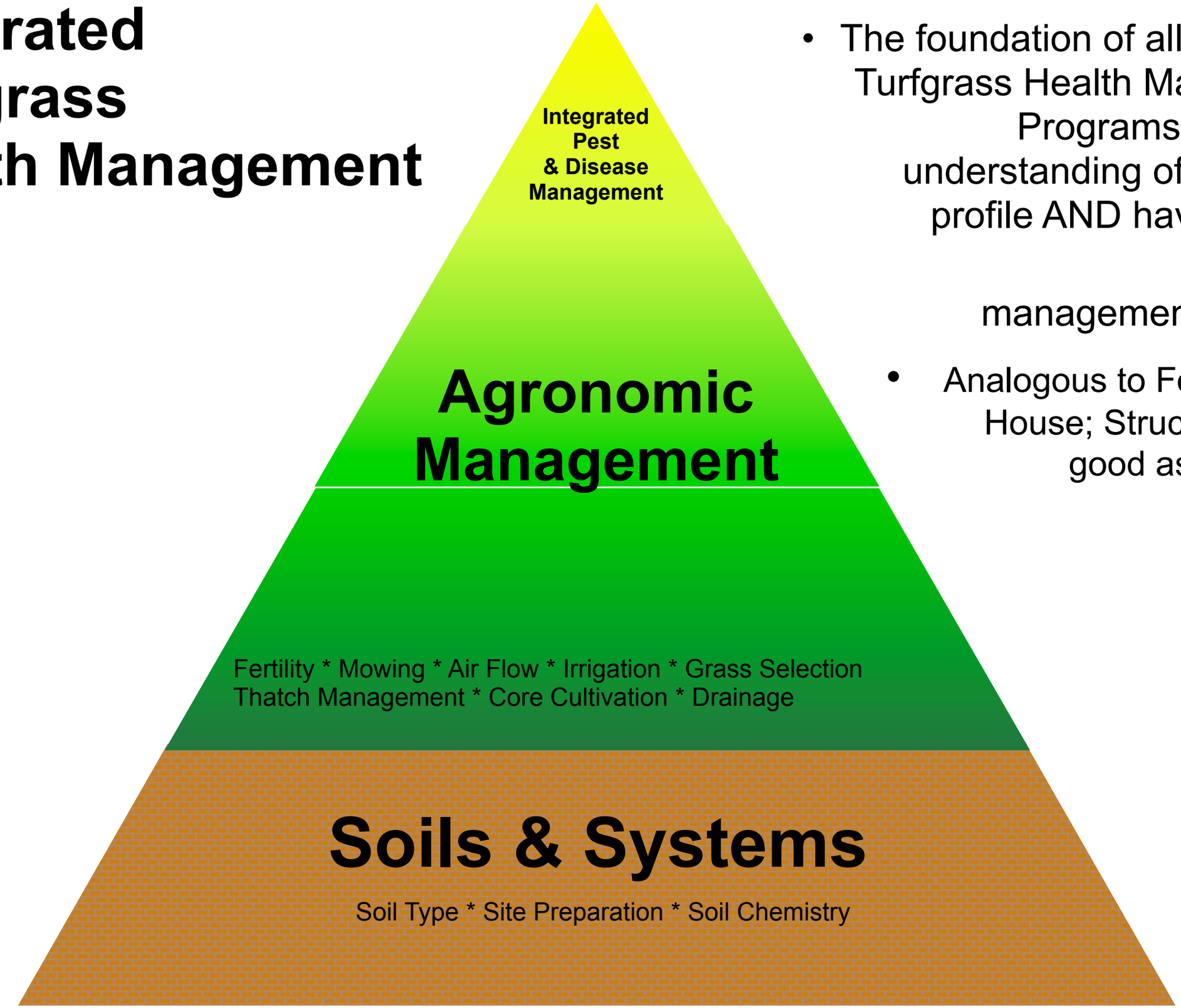

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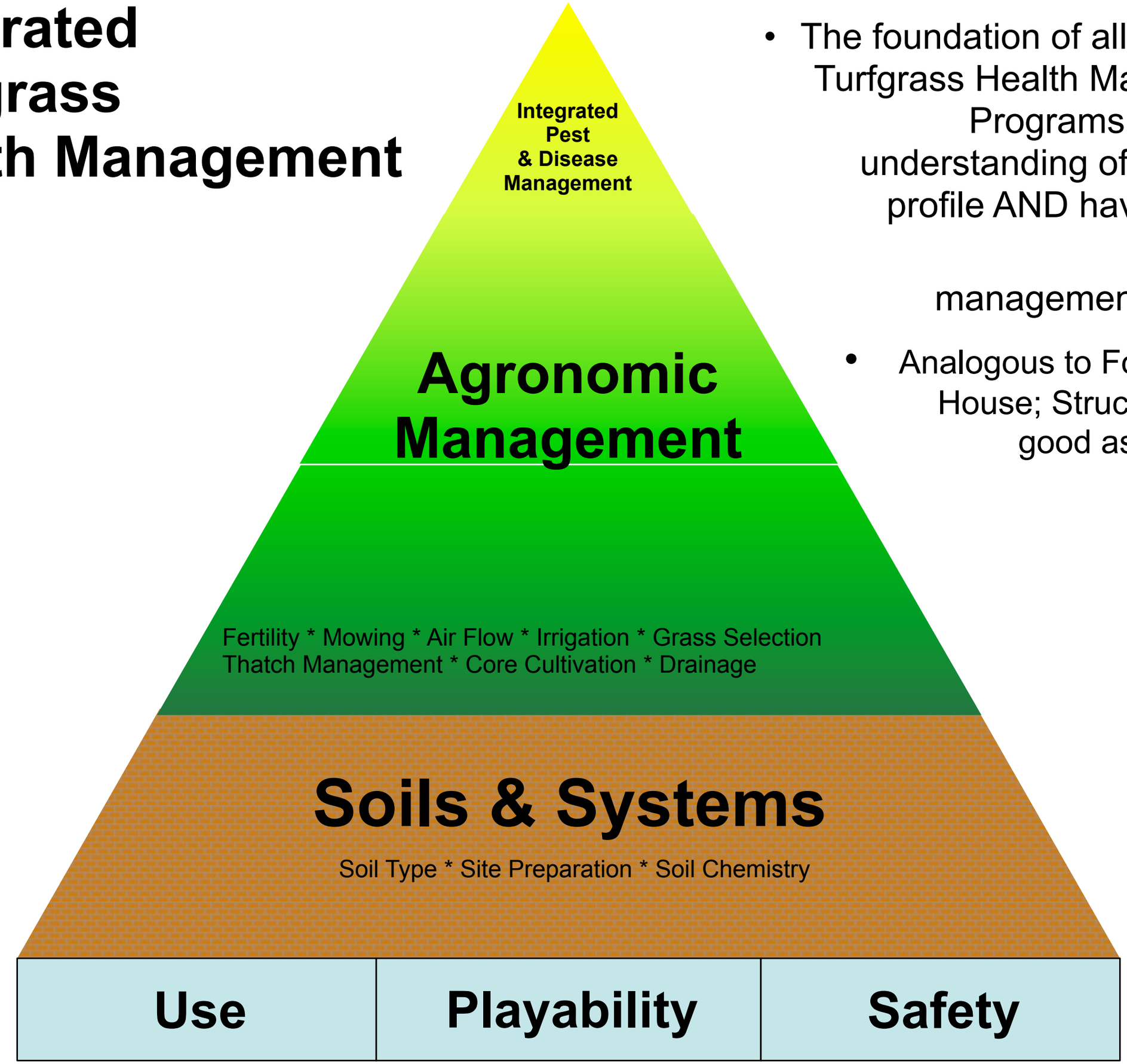

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