Cover crops and drought: implications for climate resilience

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QUESTION
How does cover cropping impact maize yield under late summer drought conditions?

HYPOTHESES

1 Cover crop transpiration reduces soil plant available water (PAW) if spring rains are inadequate
2 Cover crop N provisioning reduces maize drought stress and N immobilization increases drought stress

H1 Cover crop transpiration did not affect soil PAW at termination

More late-summer droughts projected

METHODS

ORGANIC FIELD EXPERIMENT
3 entries, 4 blocks
Full tillage

CORN-SOY-WHEAT ROTATION
Cover crops planted after wheat
- 2013/14: planted 8/8 and terminated 5/8-9
- 2014/15: planted 8/15 and terminated 5/4
Silage corn planted after plow-down
- 2014: planted 6/2 and harvested 9/17

FERTILIZED WITH MANURE
45 Mg/ha dairy bed pack
- Applied at cover crop termination
- Incorporated with cover crop residues

5 COVER CROP TREATMENTS
- Fallow (tilled to control weeds)
- Red clover (Trifolium pratense)
- Cereal rye (Secale cereale)
- Radish (Raphanus sativus)
- 3 Species Nitrogen Mix:
  - cereal rye, red clover, Austrian winter pea (Pisum sativum)

RAINOUT SHELTERS PAIRED WITH CONTROL PLOTS
20 pairs of plots

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