Nitrogen Spatial Distribution in Seepage-Irrigated Tomato Beds in Southwest Florida

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Soil Sampling

Tomato bed

BAND

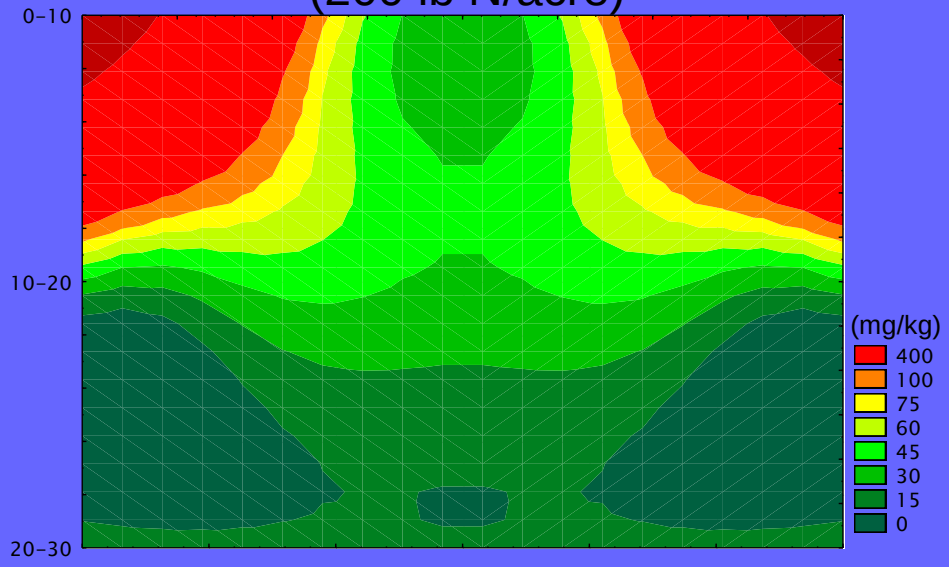
CENTER

At 3 depths
TOP: 0’-4’ (0-10cm)
MIDDLE: 4’-8’ (10-20cm)
BOTTOM: 8’-12’ (20-30cm)

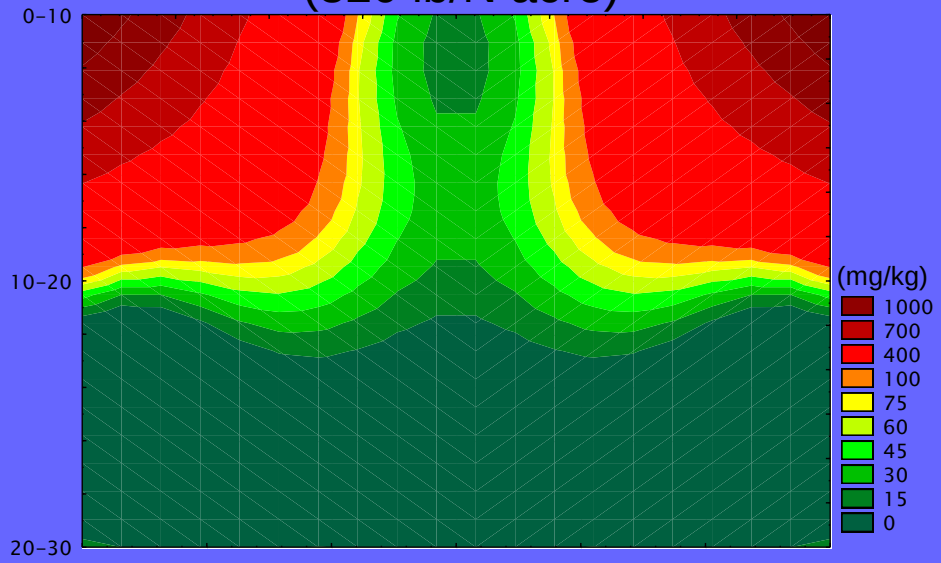
Ammonium on 1 wk after planting (WAT)

(= 3 weeks after fertilizer application)

(200 lb N/acre)



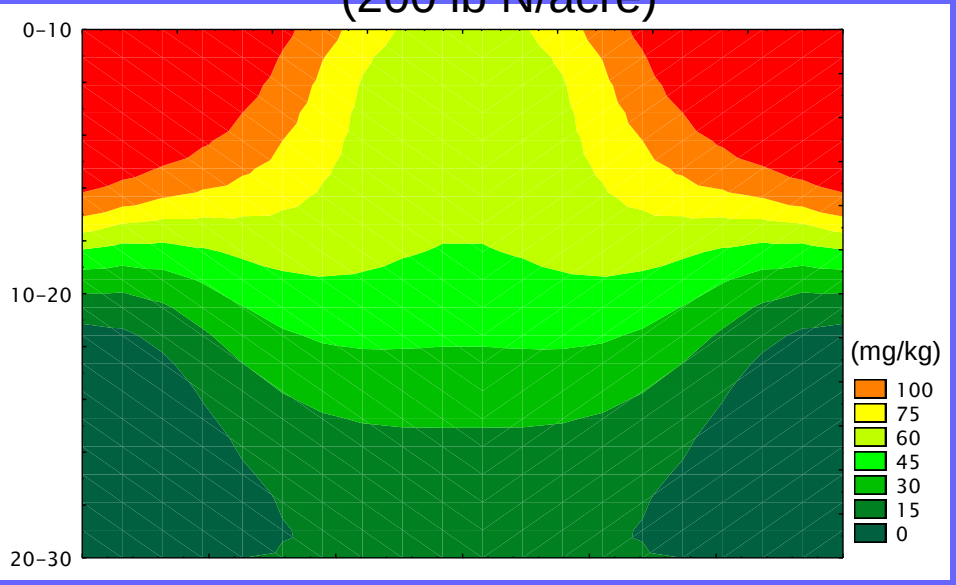
(320 lb/N acre)



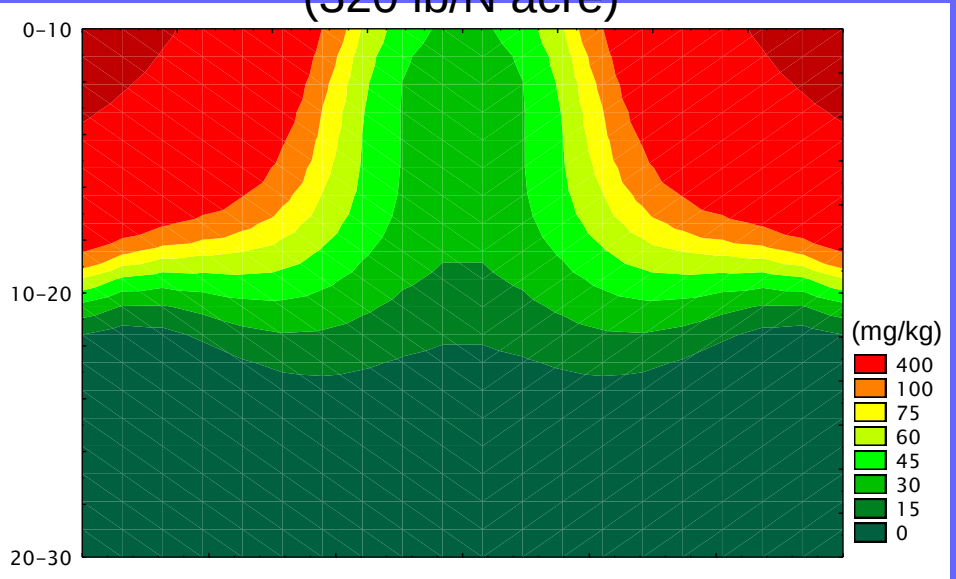
- Most of ammonium remained at TOP-BAND.
- Some lateral movement towards CENTER.
- Virtually no ammonium found at deeper than 20 cm depth.
- Overall higher ammonium with higher rate.

Ammonium on 4 WAT

(200 lb N/acre)



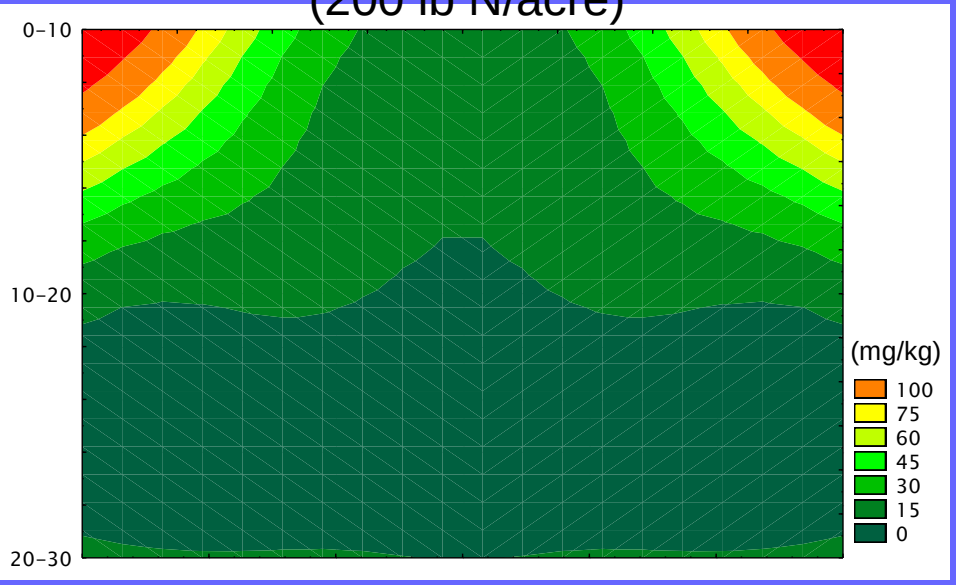
(320 lb/N acre)



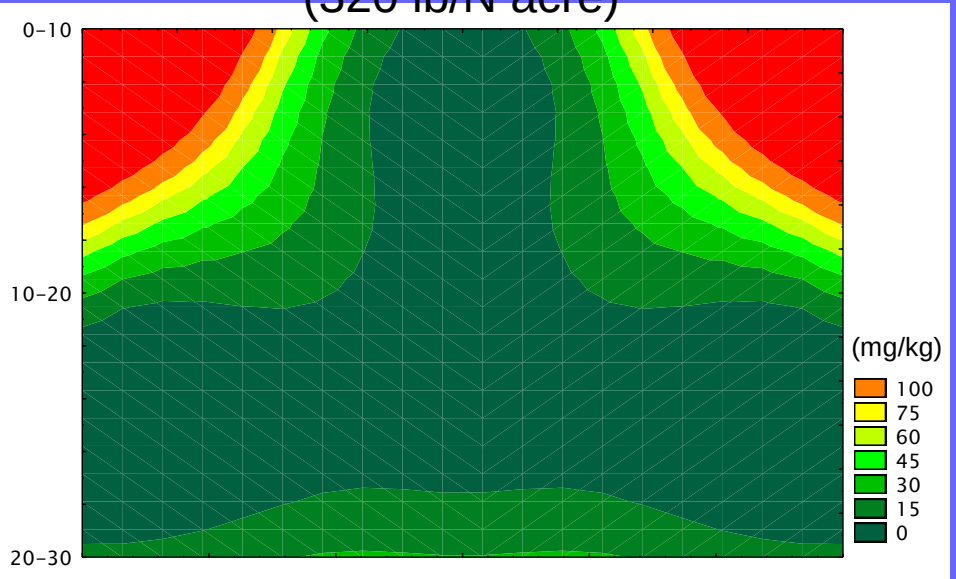
- TOP-BAND ammonium steadily decreased over time.
- More lateral movement over time (= higher ammonium at TOP-CENTER than 1 WAT).
- Virtually no ammonium found at deeper than 20 cm depth.
- Still lots of ammonium left at TOP-BAND with higher rate.

Ammonium on 8 WAT

(200 lb N/acre)

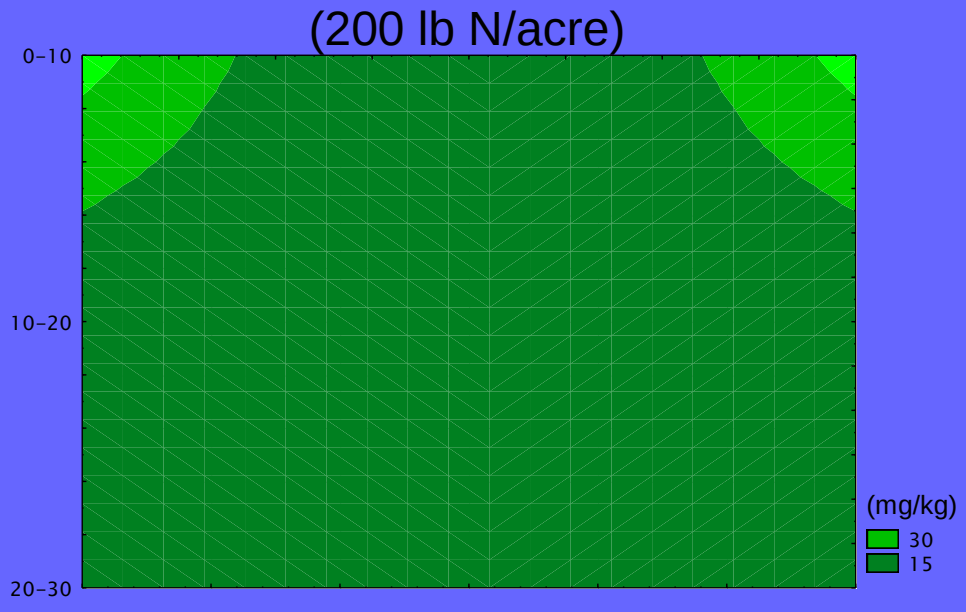


(320 lb/N acre)



- TOP-BAND ammonium continued to decrease.
- TOP-CENTER ammonium started to be insignificant for both rates.
- Virtually no ammonium found at deeper than 20 cm depth.
- TOP-BAND and MIDDLE-BAND ammonium larger with higher rate.

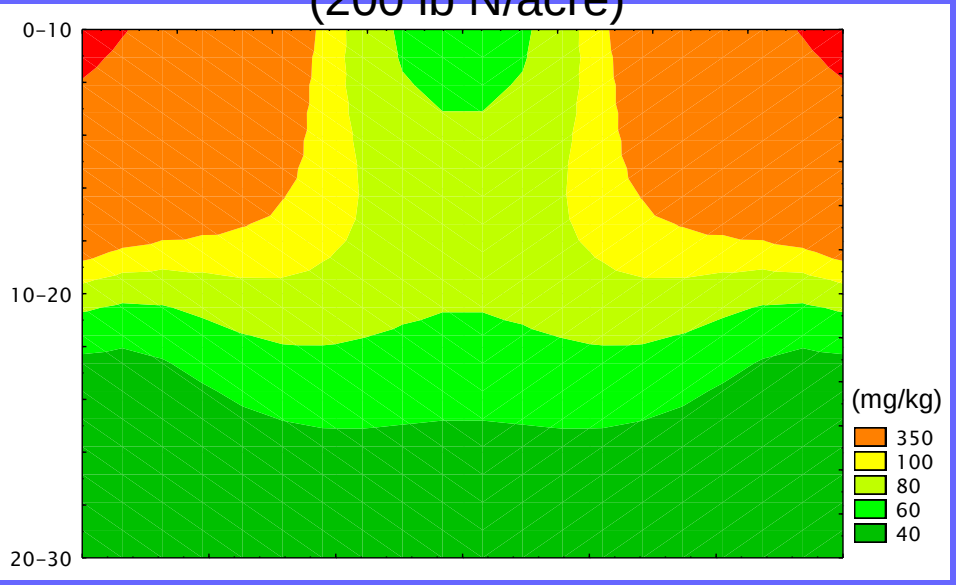
Ammonium on 18 WAT



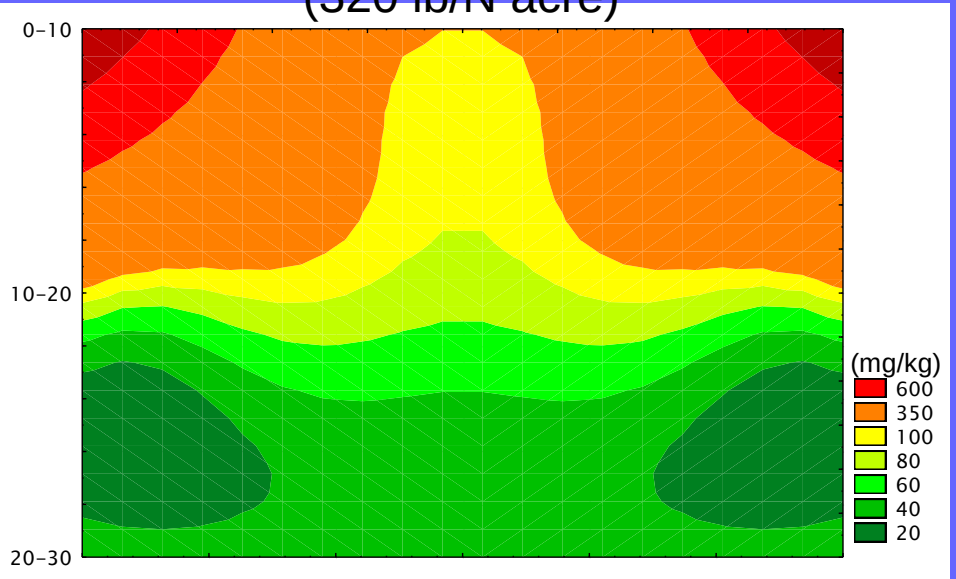
- Virtually all ammonium disappeared from tomato bed by the end of season with lower rate.
- With higher rate, still significant ammonium left especially at TOP-BAND.
- But virtually no ammonium found at deeper than 20 cm depth.

Nitrate on 1 WAT

(200 lb N/acre)



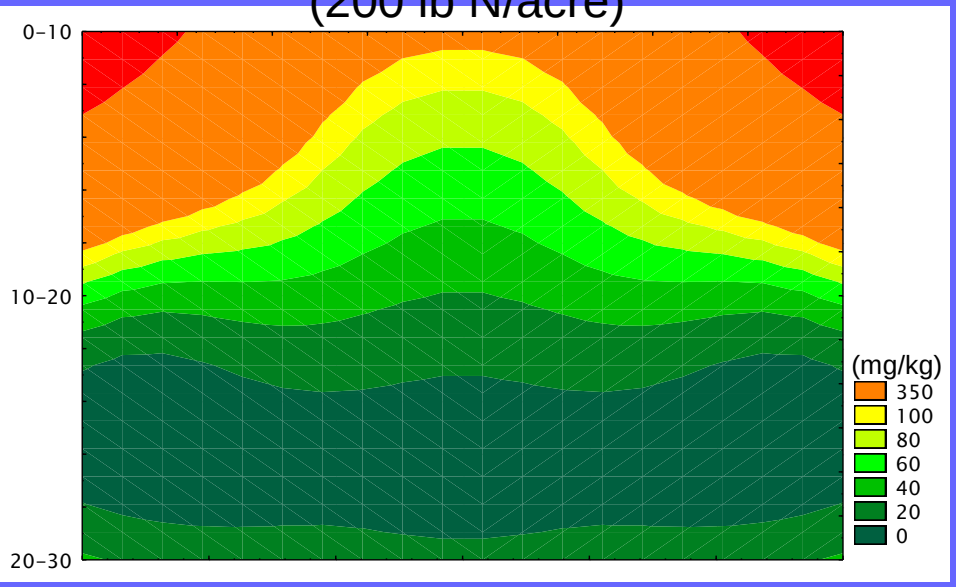
(320 lb/N acre)



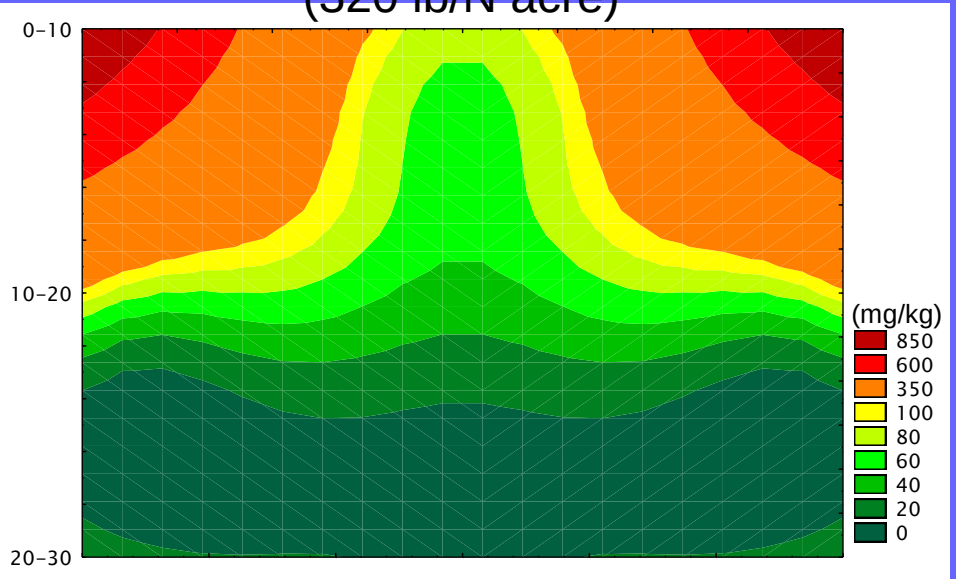
- Close distribution patterns of nitrate with ammonium (ammonium transforming into nitrate).
- Highest nitrate at TOP-BAND.
- Much higher nitrate at TOP-BAND and TOP-CENTER with higher rate.

Nitrate on 4 WAT

(200 lb N/acre)



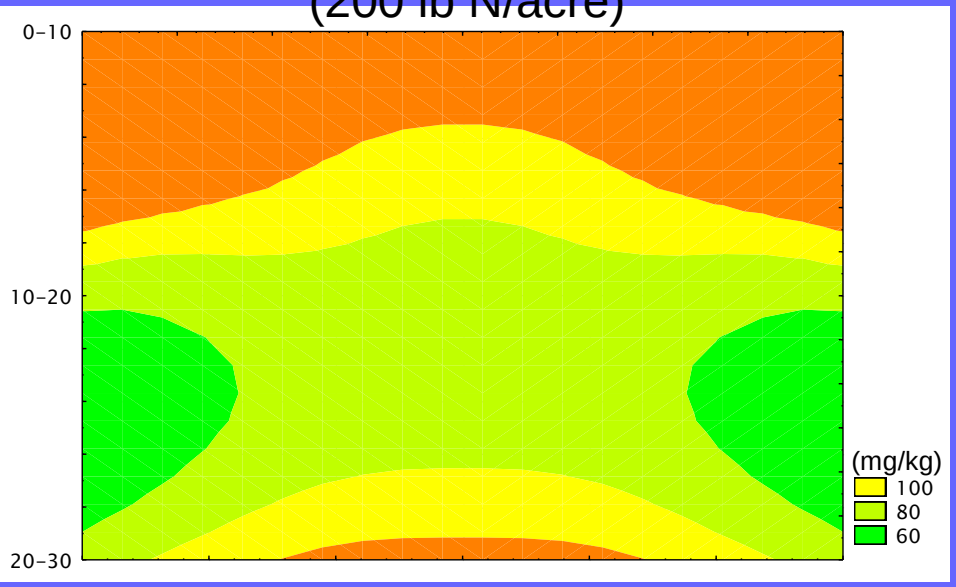
(320 lb/N acre)



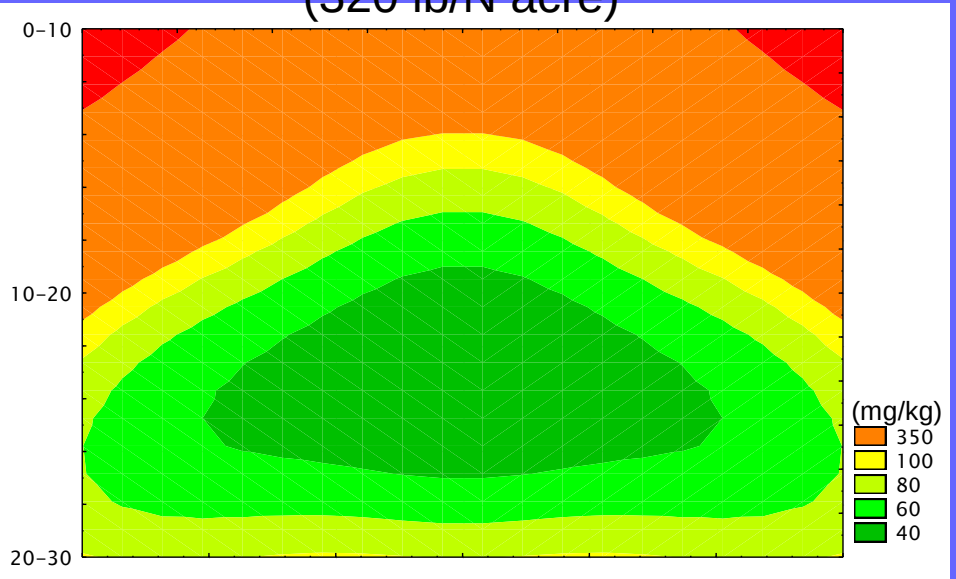
- Close distribution patterns of nitrate with ammonium.
- Overall higher nitrate in bed compared to 1 WAT.
- Nitrate at deeper than 20 cm depth is still insignificant.

Nitrate on 8 WAT

(200 lb N/acre)



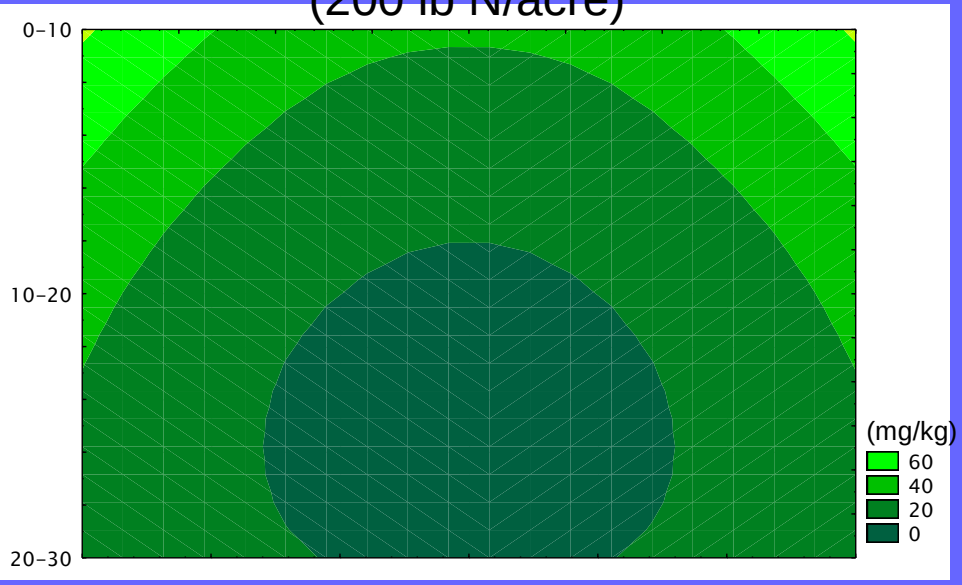
(320 lb/N acre)



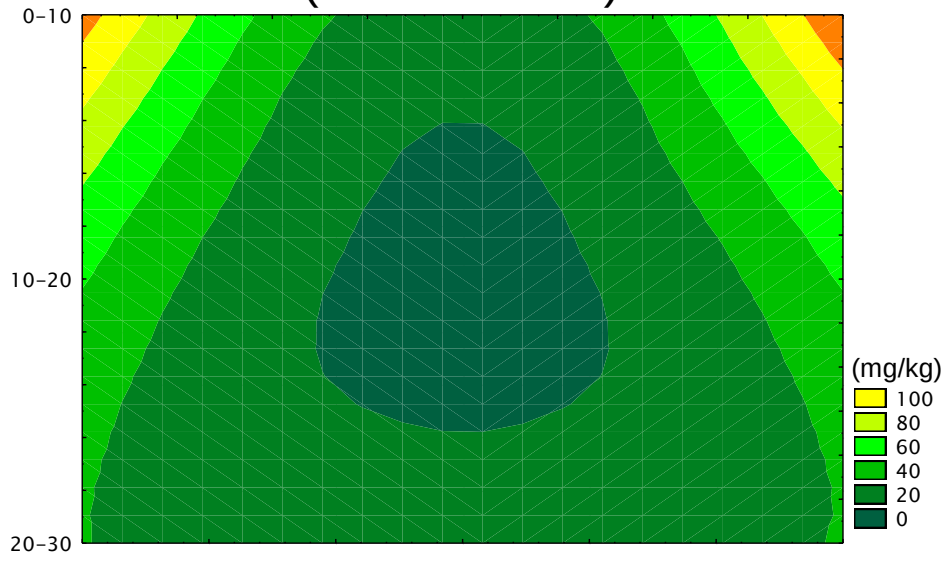
- Water table was raised 12 in on 5 WAT and brought down at 23 in on 8 WAT.
- No much change in nitrate at TOP compared to 4 WAT, but much higher nitrate at MIDDLE and BOTTOM after water table shift.
- Higher nitrate leaching (at MIDDLE and BOTTOM) with higher rate.

Nitrate on 18 WAT

(200 lb N/acre)



(320 lb/N acre)



- Some nitrate left at TOP-BAND.
- Insignificant nitrate for the rest of bed.
- Higher nitrate left at TOP-BAND with higher rate.

N Budget

Fertilizer:	200 lb N/acre	Fertilizer:	320 lb N/acre
Biomass:	- 171.5 lb N/acre	Biomass:	- 223.5 lb N/acre
Soil	- 12 lb N/acre	Soil:	- 25.6 lb N/acre
Net:	16.5 lb N/acre	Net:	70.9 lb N/acre
	8.3%		22.1%