

Comparison of Fumigation Methods in Potatoes

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Potato Early Dying

- Primarily caused by *Verticillium dahliae*
- Interaction with the root lesion nematode



Metam Sodium and Potassium

- Effective against *Verticillium dahliae*.
- Some nematicide activity
 - **Root lesion**
 - Root knot
- Some weed control
- High active ingredient load
 - 40 gallons/acre = 170 lb a.i.
- Expensive
 - \$4.90/gallon x 40 gallon/acre = **\$196/acre**
- Regulatory headache


vapam HL[™]
 SOIL FUMIGANT

Sectagon[®]-42
 Agricultural Fumigant


k-pam HL[™]

Sectagon-K54[®]
 Agricultural Fumigant

Broadcast Fumigation



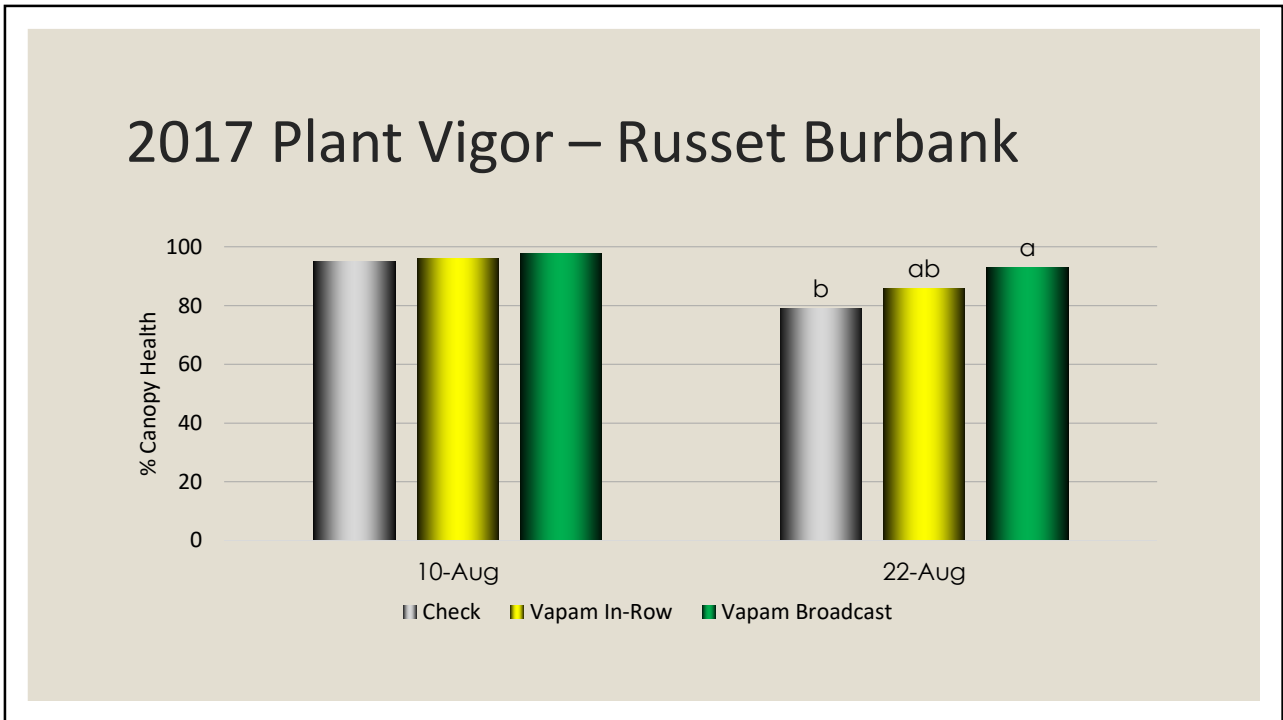
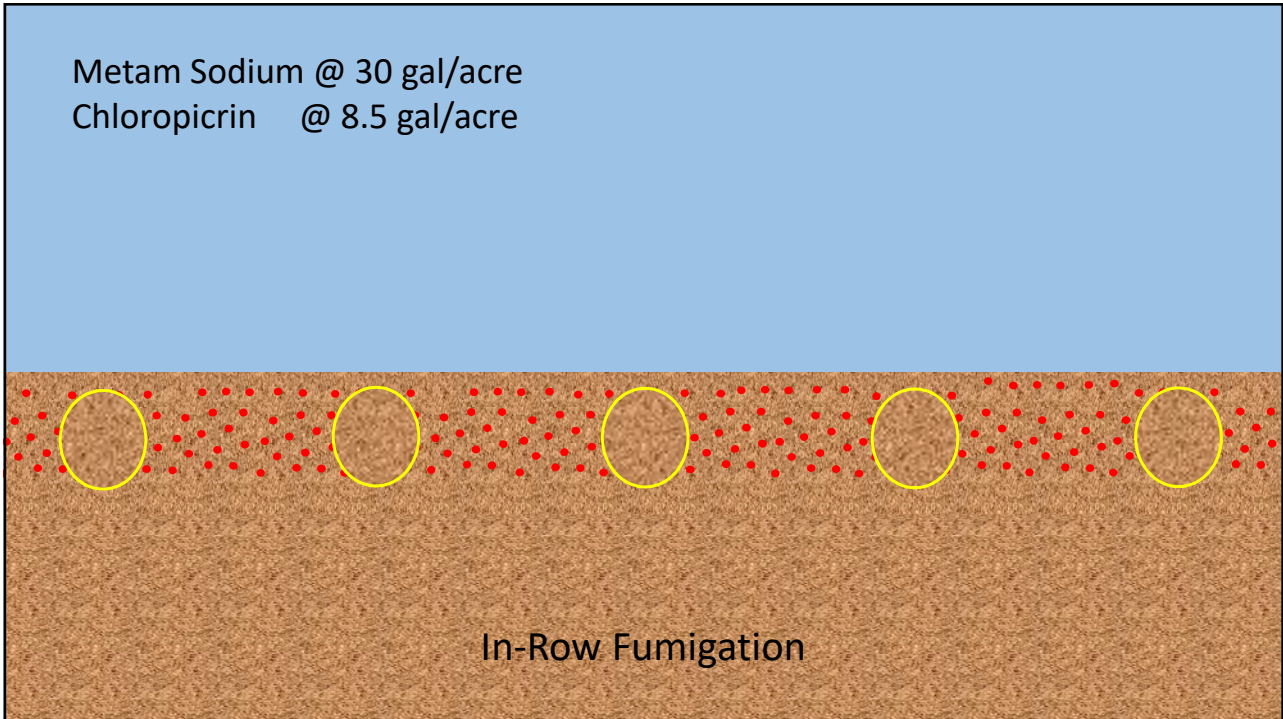
Metam Sodium @ 40 gal/acre

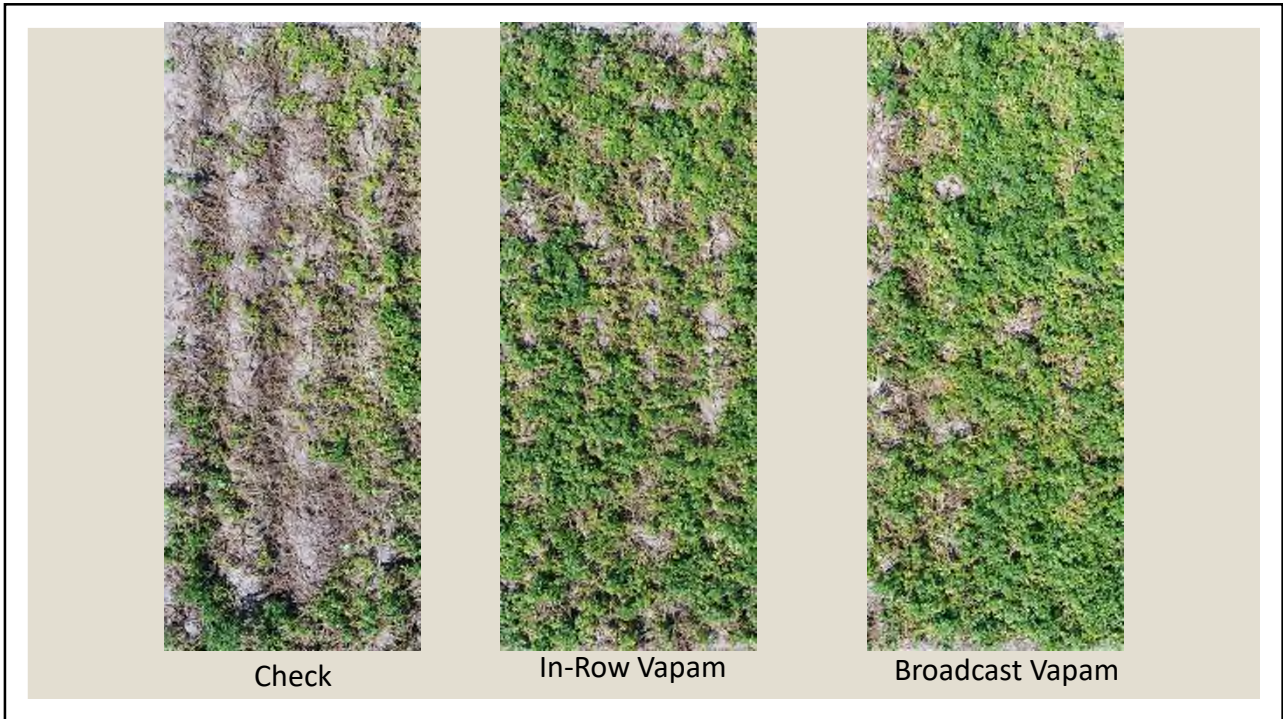
Broadcast Fumigation

In-Row Fumigation

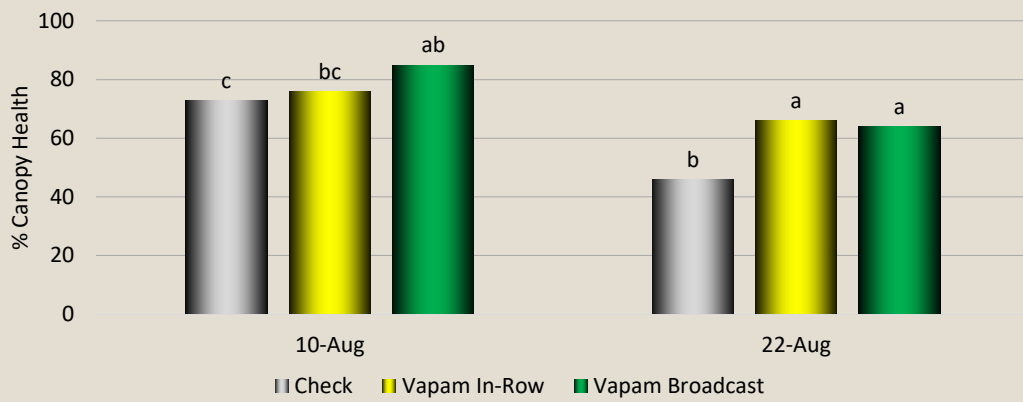
- 20-30 gal/acre
- 85-127 lb ai/acre
- \$98-\$147/acre
- One less pass through field



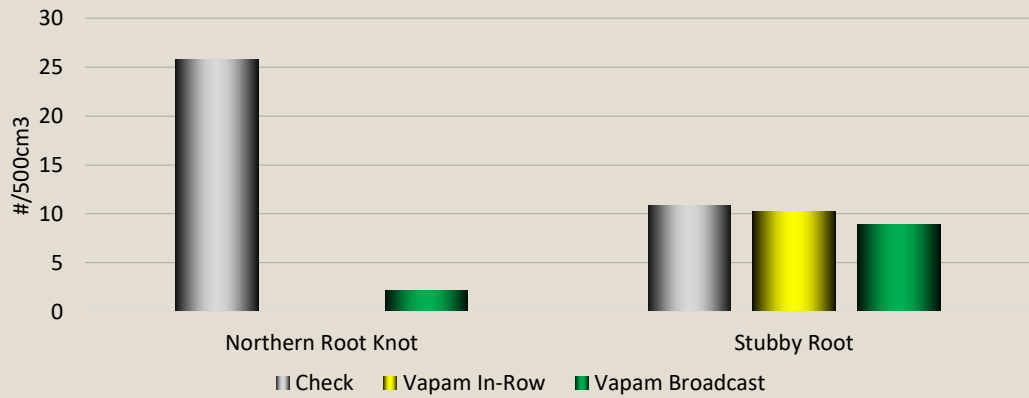




2017 Plant Vigor – Russet Norkotah 296

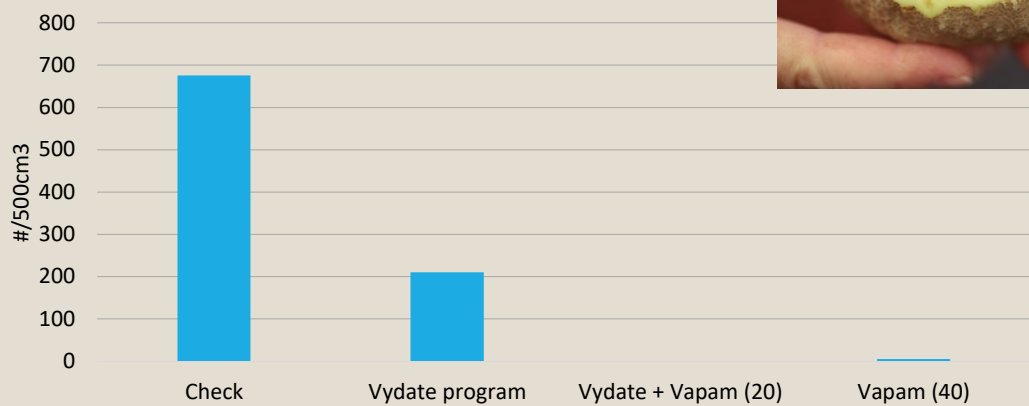


2017 – Effect on Nematodes

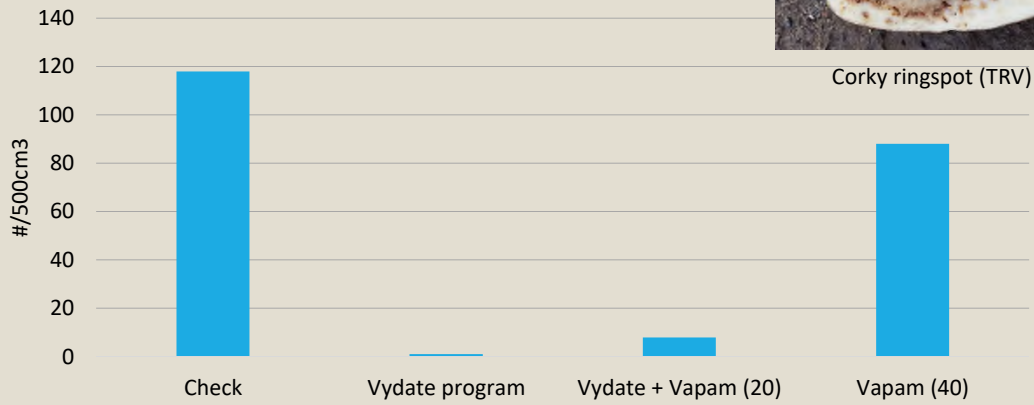


Very little root lesion nematodes

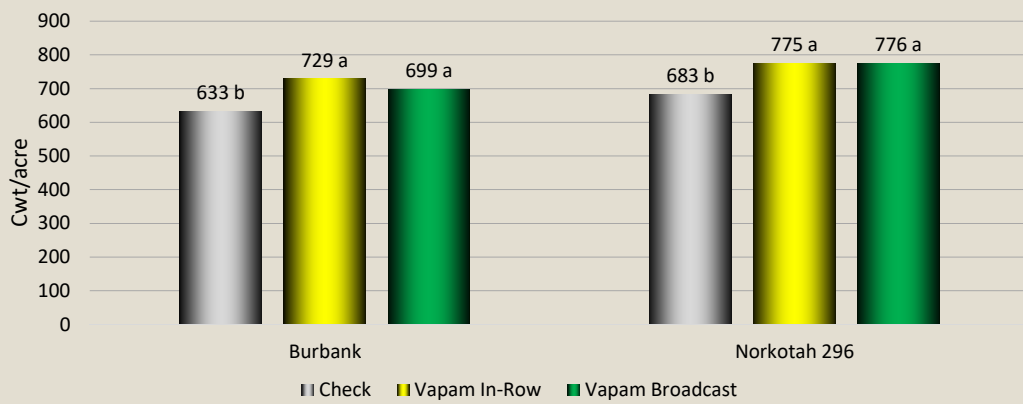
2014 – Columbia Root Knot



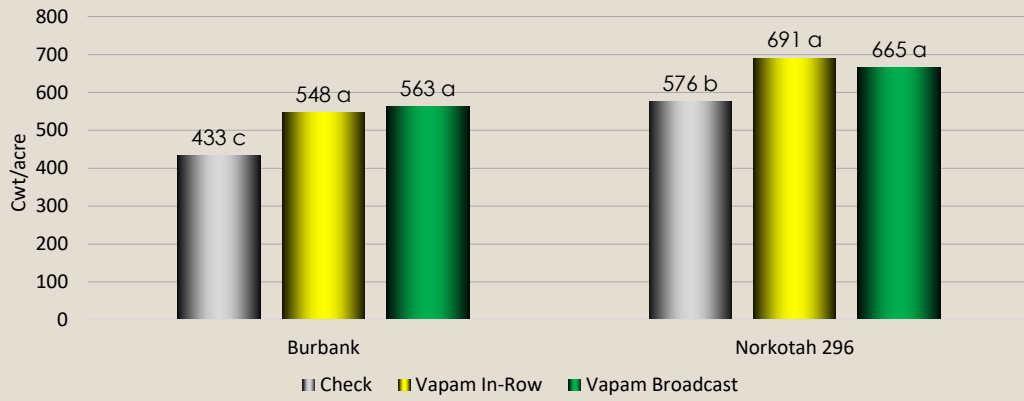
2014 – Stubby Root



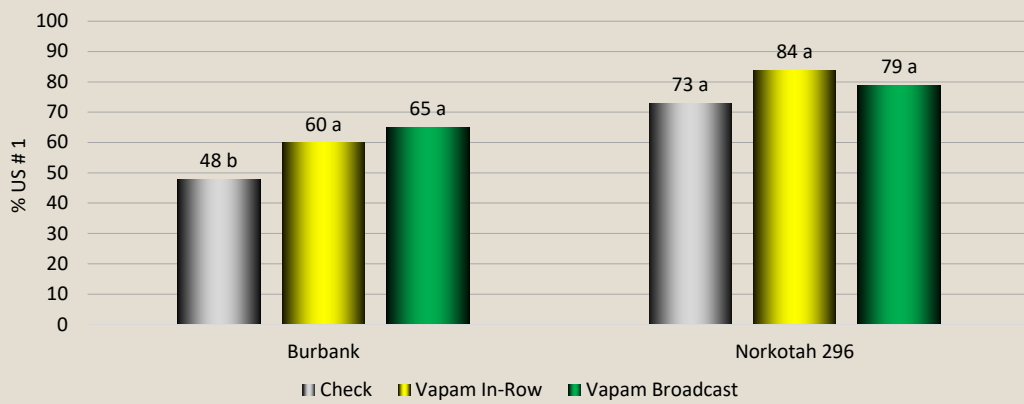
2017 – Total Yield



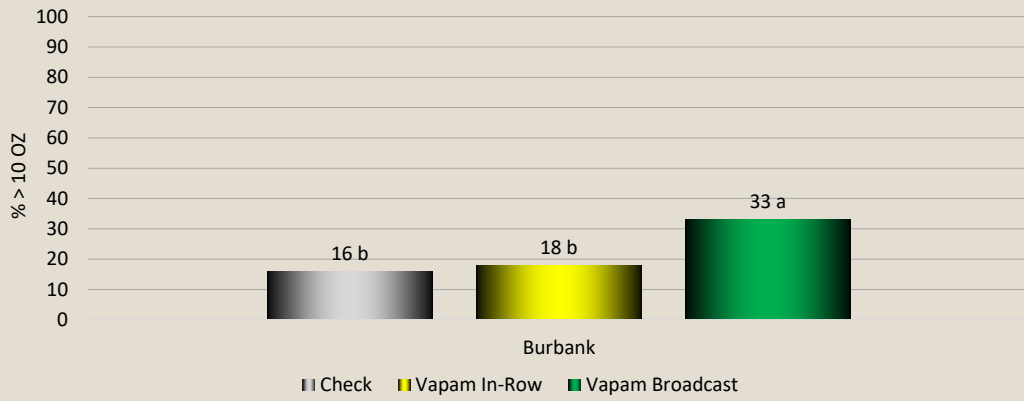
2017 – Marketable Yield



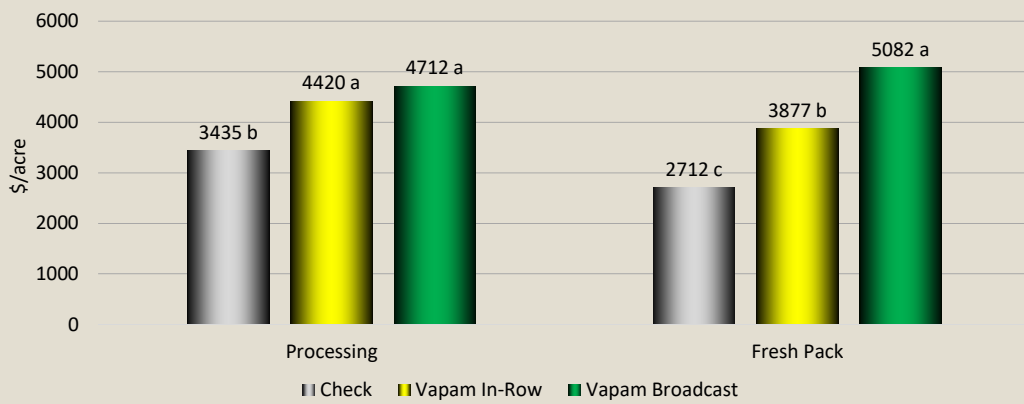
2017 – % US #1



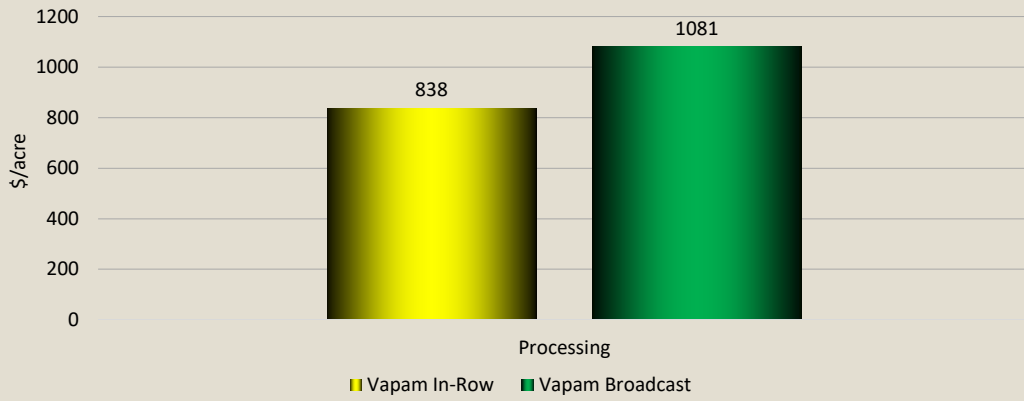
2017 – Percent > 10 OZ



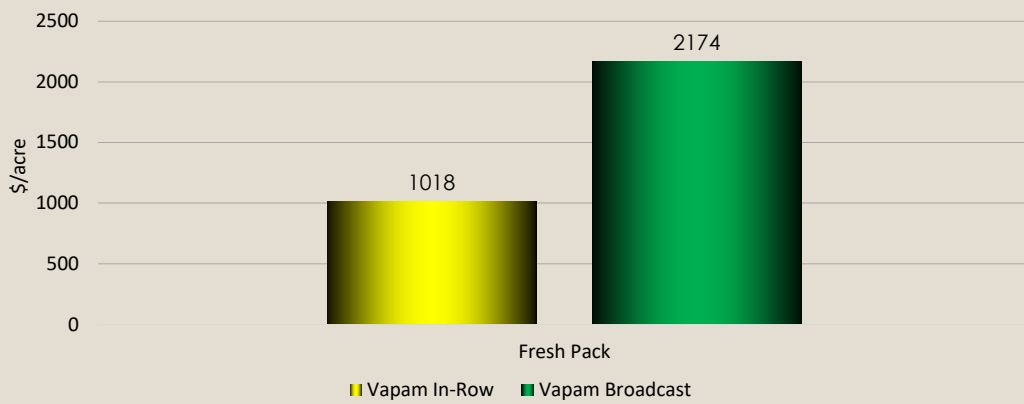
2017 –Gross Return Burbank



2017 –Net Return Burbank



2017 –Net Return Burbank



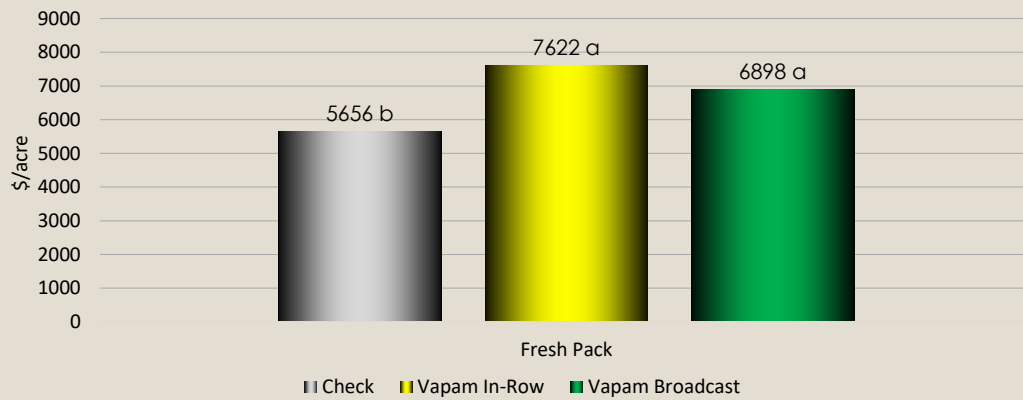
2017-Dollar Return Processed

- In-Row Vapam \$1 → \$5.70
- Broadcast Vapam \$1 → 5.52

2017-Dollar Return Fresh Pack

- In-Row Vapam \$1 → \$6.93
- Broadcast Vapam \$1 → 11.09

2017 –Gross Dollar Return Norkotah



Summary – 2017

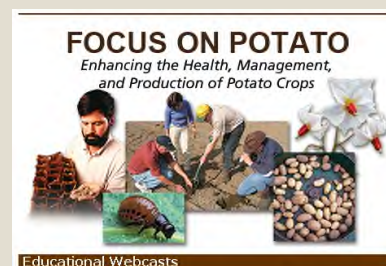
- Nematode counts **very** low.
- Both methods increased yields for Burbank and Norkotah.
- Broadcast Vapam results in increased size in Burbank.
- All methods similar for yield and quality on Norkotah 296.

Fumigation Research Summary

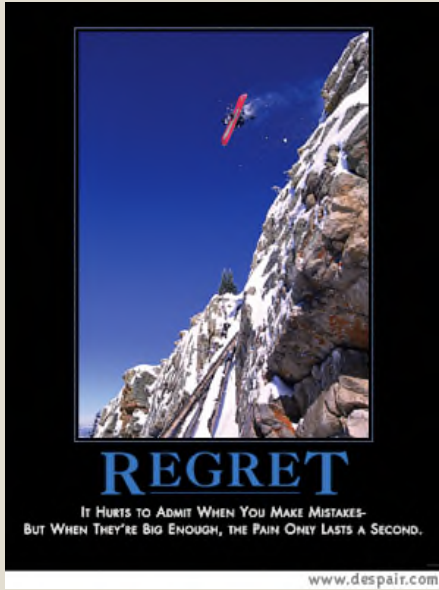
Year	Trial Type	Variety	Broadcast vs. UTC	In-Row vs. UTC	Broadcast vs. In-Row
2014	Field	Burbank	Yes	Yes	No
2014	Field	Norkotah 278	Yes	No	Yes
2014	Field	Canella	Yes	No	Yes
2014	Field	Norkotah 285	Yes	Yes	Yes
2015	Small Plots	Norkotah 296	Yes	Yes	Yes
2015	Field (2)	Burbank	--	No	--
2016	Small Plots	Norkotah 296	No	No	No
2017	Small Plots	Burbank	Yes	Yes	No
2017	Small Plots	Norkotah 296	Yes	Yes	No
2018	Small Plots	Norkotah 296	Yes	No	No

Optimizing Shank Injection Fumigation Using Metam Sodium

- Cooler temperatures are better (< 50 F)
 - 39 F was better than 59 F or 55 F
 - MITC movement in soil is slower
- Single injection depth just as effective as two
 - 10" vs 6 + 10"
- Metam rate more critical at higher temps
 - Rate response (40, 50, 60, 70 gallons) at 55 F
 - Higher (70 gal) can be more effective than lower (40 gal)
 - All rates similar at 39 F
- Marketable yield higher at 39 F fumigation



-Neil C. Gudmestad, Ph.D



Questions?