Dormancy control in seed potatoes

1, 4 Seed® (1, 4 dimethylnaphthalene – “DMN”)

- temporarily suppress cell division and sprout growth
- normal sprout growth resumes when chemical residue dissipates
- DMN very volatile – residues decline relatively rapidly, especially when seed is vented or handled
- Registered for seed use since 1999

Chemical characteristics and activity of DMN and CIPC are completely different

- CIPC – sprout inhibitor
  - Very low volatility
  - Fogging results in crystal deposits on potato
  - Long lasting residues
  - **Irreversible**; can't use anywhere near seed
- DMN – dormancy extender
  - High volatility
  - Chemical vapor absorbed into skin and eyes
  - Residues decline relatively rapidly, especially when seed is vented or handled
  - **Completely reversible and safe for seed use**

1,4 DMN on seed

- Why use it?
  - Many factors can cause seed to sprout too early in storage
    - Short dormancy varieties
    - Aged or stressed seed
    - Loss of storage temperature control
    - Extended shipping season
  - **Mechanical de-sprouting during handling and shipping will dramatically delay emergence and reduce productivity of planted seed**

Sprout Control: 1,4Seed®

UTC (8 wk @ 50F)

7-10ppm DMN (8 wk @ 50F)

Effect of 1,4 DMN on early season performance, seed decay, Rhizoctonia stem canker and yield of three potato varieties. Nolte et. al. University of Idaho, Idaho Falls, ID; Poster 19, 88th Annual PAA meeting, Scottsbluff, NE, August 8-12, 2004

- Two-year study with DMN applied at 0, 5, 10, & 20 ppm, 30 and 60 days before cutting and planting of RB, RN, RR
- Emergence slightly delayed when highest rate used and slightly accelerated with low rate
- No significant difference in emergence three weeks after planting
- Stem number slightly increased at high rate in yr1 but not yr2
- Seed decay slightly lower DMN-treated RN and RR, slightly higher in RB
- Rhizoc unaffected in RB and RR, lower in DMN-treated RN
- Total and marketable yield higher with low rate DMN(vs control) in yr1 but not yr2.

Summary-12 years of commercial use

- 600 gallons 1, 4 SEED® sold annually in the USA
  - 6.6MM cwt seed treated per year
  - Enough to plant >300,000 acres/yr
  - No reported adverse effects
- Only “side-effect” is tendency to increase stem number due to breaking of apical dominance
  - Potential negative for commercial Russet Norkotah
  - Neutral to positive for almost any other variety used for commercial fresh, fry, or chip market
  - Positive for seed production
  - More uniform emergence
- Excellent results for rescue treatment

Rescue treatment: “re-booting” sprouted seed

Untreated

DMN 10ppm

Rescue treatment: re-booting sprouted seed

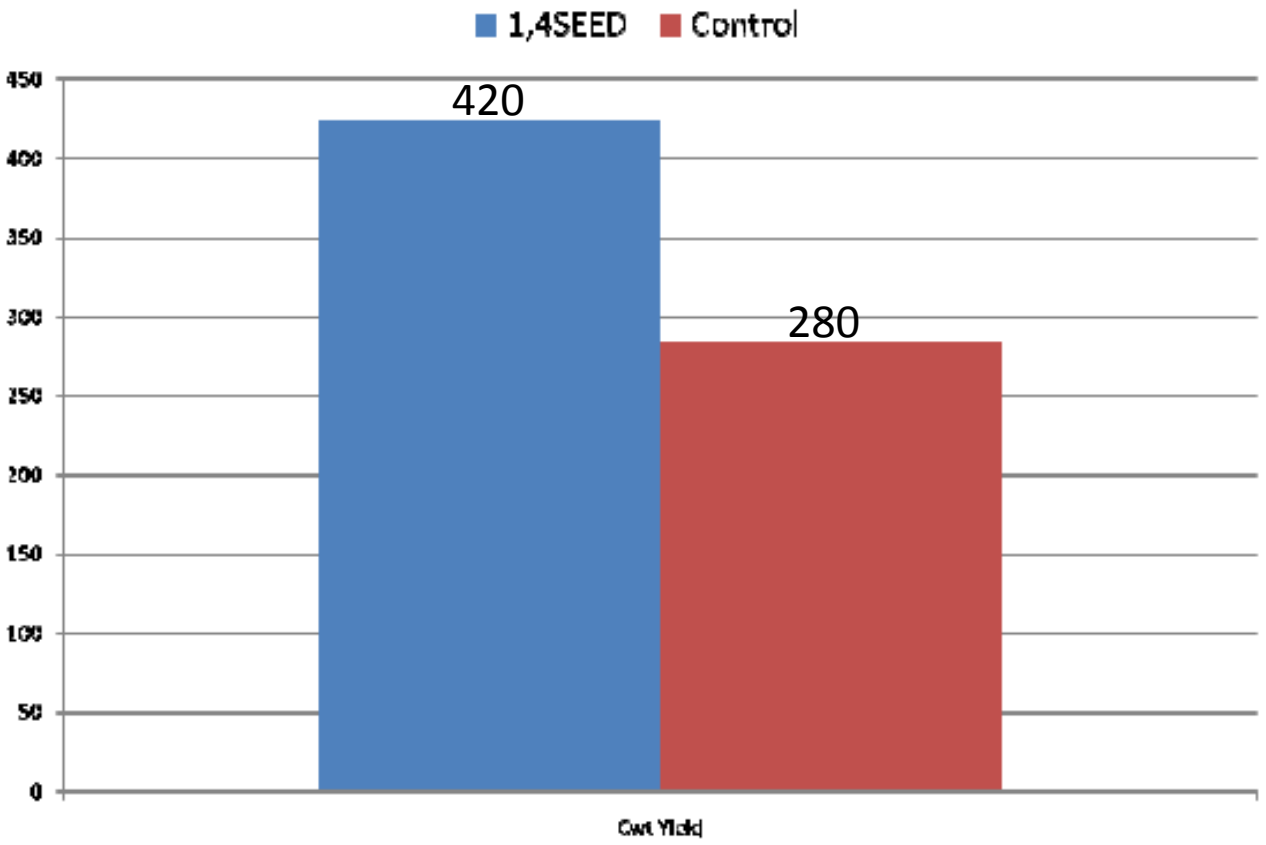
Untreated 5/21

DMN treated 5/21

Field view, 4 weeks after planting

1,4GROUP

Seed Trial – Harvested Yield



"We have used 1, 4 GROUP's DMN products for several years. We apply 1, 4 SIGHT shortly after we place our potatoes into storage. It helps control sprouts and extends dormancy, safeguarding the potato quality into late summer. 1, 4 SEED® is applied to our seed potatoes when sprouting gets out of control. It works great."

Doug John, Field Manager
Potandon Produce, LLC, Idaho Falls, Idaho