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
Rescue treatment: re-booting sprouted seed

Untreated 5/21

DMN treated 5/21
Field view, 4 weeks after planting

Planted: 06/02
Pictured: 06/29
Control: Far Side
Treated: Near Side
1,4GROUP

Seed Trial — Harvested Yield

- 1,4SEED: 420
- Control: 280
“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