

## NPK Cold Test

**PROOF**

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SoDak Labs, Inc. has developed a tool for farmers wishing to evaluate seed germination/emergence in the presence of cold soils and “salt solutions” to emulate starter fertilizer placement. We coined the name “NPK cold” as an easy reference for growers and as a test that more “directly” measures the impact of pericarp damage. SoDak Labs also offers the traditional “Pericarp Damage” (Gutormson 2020) test where damage is ranked as severe, medium, light or no damage. We feel the NPK cold seedling emergence percentage will be more understandable than a total percentage of seeds with pericarp damage. Ferrie (2020) recommends caution if pericarp damage is above 6% and to skip starter fertilizer if damage is above 10%. SoDak Labs compared 40 seed corn lots (Table 1.) which were grouped into four levels of pericarp damage. Seed lots with 0–5% pericarp damage (medium plus severe ratings) had tray colds (water solution) and NPK colds (salt solution) at 91% and 90% respectively. As pericarp damaged increased to 6–10%, 11–15% and > 15% NPK colds dropped 0%, 4% and 4% below tray colds to 89%, 89%, and 86%, respectively.



**FIGURE 1.** Seedling emergence at 120 GDDs in a NPK Cold test.

**TABLE 1.** Comparison of Four Pericarp Damage Ranges (Medium + Severe ratings) with NPK Cold, Tray Cold, and Saturated Cold emergence percentages when averaged across 40 seed corn lots.

Pericarp Damage Quality Range (%)	# of Tests per Quality Range	NPK Cold, %		Tray Cold, %		Saturated Cold, %	
		Strong Normal Seedlings	Slow Normal Seedlings	Strong Normal Seedlings	Slow Normal Seedlings	Strong Normal Seedlings	Slow Normal Seedlings
0–5	11	90	2	91	0	80	8
6–10	6	89	3	89	1	82	8
11–15	11	89	2	93	1	83	8
>15	12	86	2	90	0	79	9



**FIGURE 2.** Pericarp Damage Test: A) None: no visible damage to pericarp covering, B) Slight: tearing of pericarp area extending up less than 25% length of embryo pericarp margin/edge, C) Medium: tearing of pericarp extending up to 50% of length of embryo pericarp margin/edge and D) Severe: cracks over the embryonic axis and major breaks in seed or missing parts of the seed.

### REFERENCES:

1. Gutormson, T.J. Pericarp Damage in Seed Corn. April 2020. (<https://www.sodaklabs.com/corn/corn-pericarp-damage-test>). SoDak Lab, Inc. publication.
2. Ken Ferrie. April 2020. Some Concerns from Sampled Corn Seed Quality. Farm Journal Ag Web (<https://www.agweb.com/article/ken-ferrie-some-concerns-sampled-corn-seed-quality>).