

The Effect of Calcium on Peanut Seed Development and Germination

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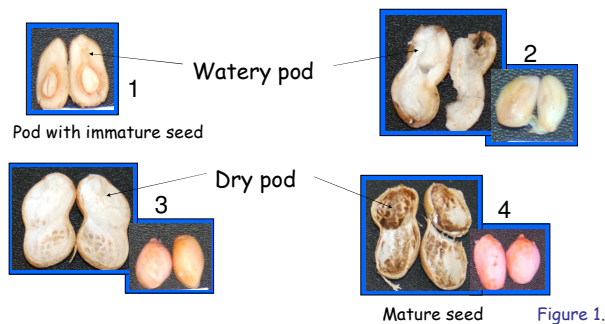
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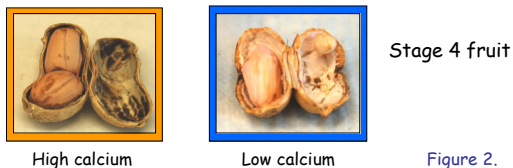
Introduction

- ❖ Low soil calcium can lead to peanut seed abortion and poor germination.
- ❖ Peanut pods must absorb calcium directly from the soil since little root-absorbed calcium is translocated to the developing underground fruit.
- ❖ Controlled growth chamber and field experiments were conducted to examine the effect of calcium levels on the timing and extent of seed development and germination.

Stages of Peanut Seed Development (1-4; Fig. 1)



Effect of Calcium on Seed Abortion in Field-Grown Peanuts



- ❖ Low calcium causes seed abortion in the large-seeded cultivar C-99R (Fig. 2).

Effect of Calcium Levels in the Pegging Medium on Early Fruit Development

- ❖ Controlled environment.
- ❖ Plants grown in soil.
- ❖ Pegs grow into rockwool blocks containing nutrients (Fig. 3).



Figure 3.

- ❖ Calcium sulfate supplied at
 - ❖ 0 μM
 - ❖ 25 μM
 - ❖ 2500 μM
- ❖ GP-1 (normal seed)
- ❖ C-99R (large seed)

- ❖ Developing fruit harvested at 10, 14, 20 or 24 days after entering rockwool.

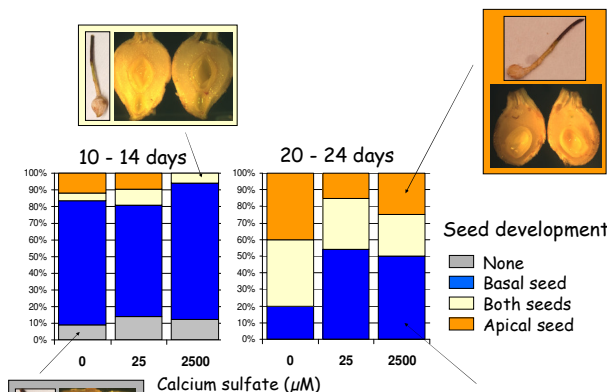


Figure 4.

- ❖ Calcium level did not affect early (stage 1) seed development (Fig. 4).
- ❖ Fruit development shows a tendency to be slower in the larger-seeded cultivar C-99R.

Effect of Calcium Levels on Seed Germination

- ❖ Soil germination.
- ❖ Four cultivars.
- ❖ Four calcium levels.

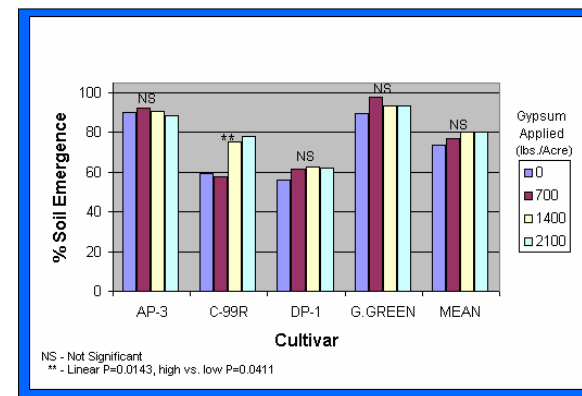


Figure 5.

- ❖ Soil emergence of C-99R (large seed) was maximized when at least 1400 lbs/acre gypsum was applied (Fig. 5).
- ❖ Insufficient calcium does not appear to be responsible for poor germination of DP-1.
- ❖ Calcium had no effect on soil emergence of AP-3, DP-1, or Georgia Green.

Conclusions

- ❖ Calcium is important to reduce seed abortion during late development.
- ❖ The large-seeded cultivar C-99R requires higher soil calcium for seed production and germination.
- ❖ The role of calcium in early seed development remains unclear.