Prohexadione Calcium Effect on Yield, Kernel Size, and Peanut Maturity -Second Year

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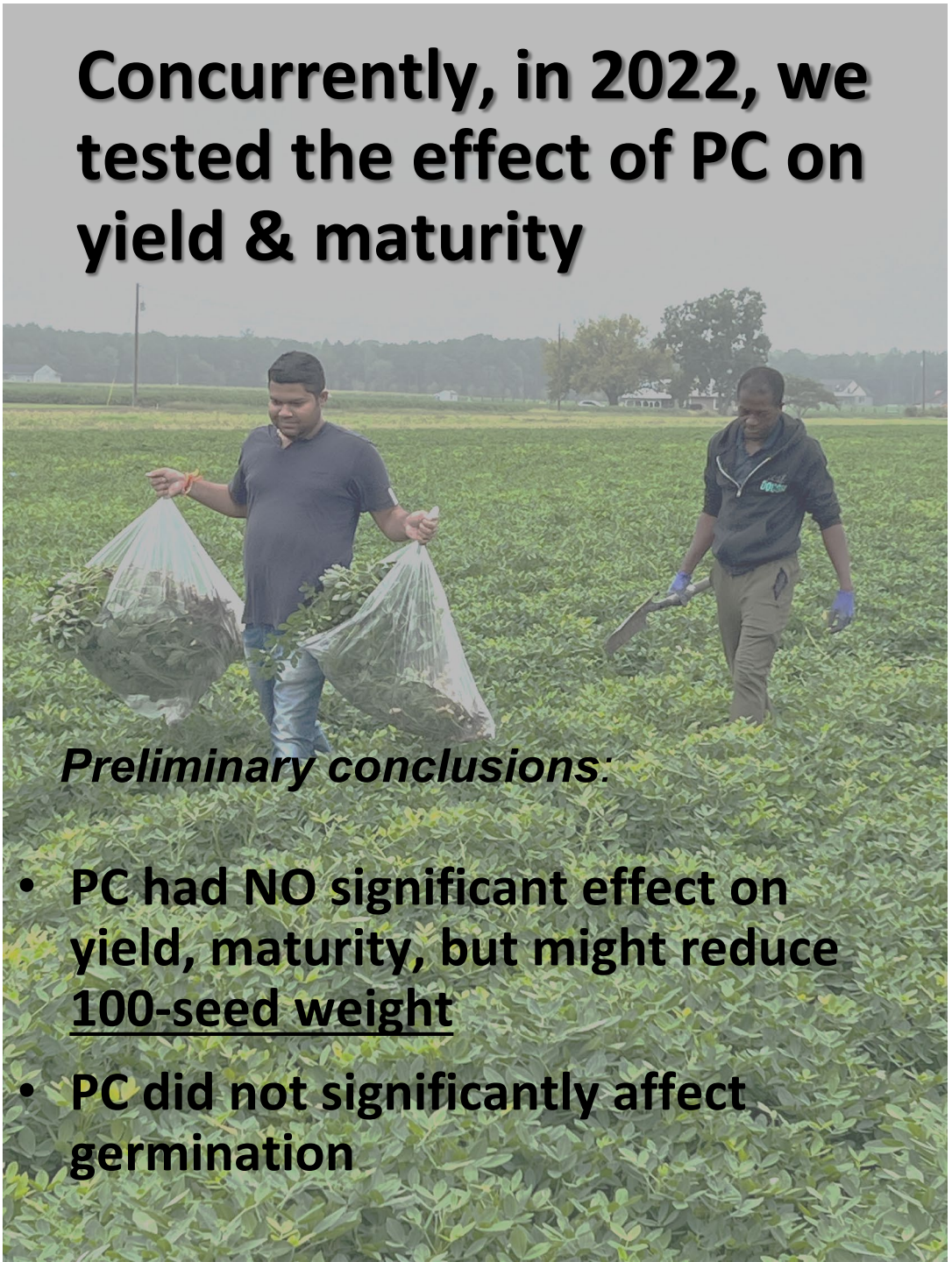
The Problem:

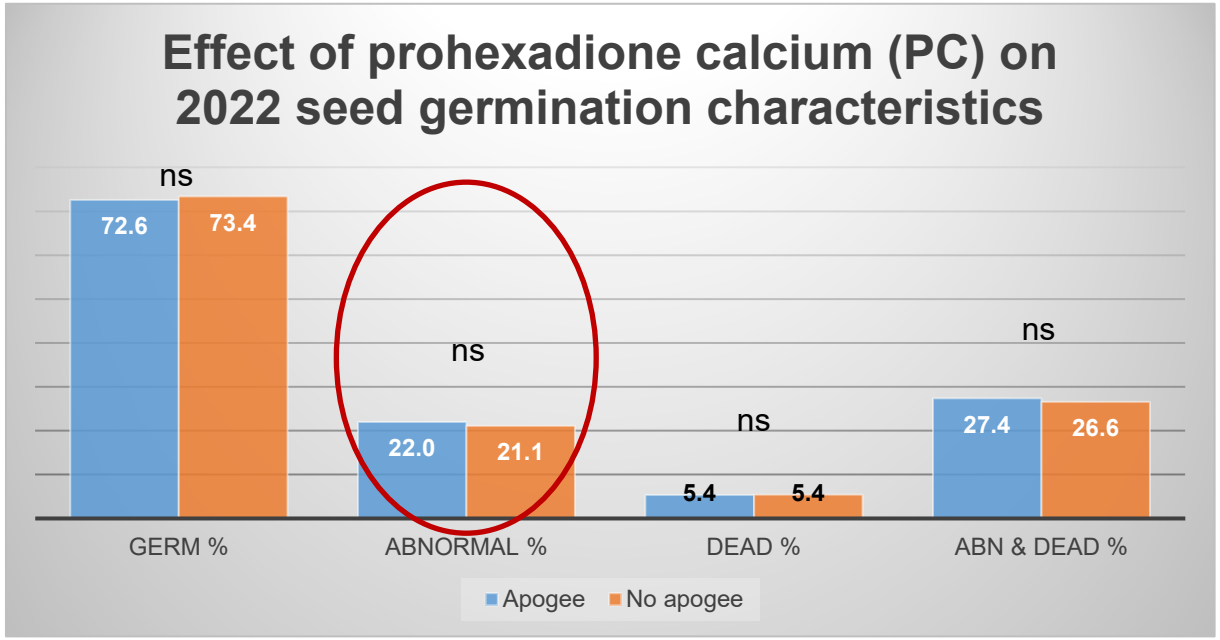
- VDACS Seed test lab indicated stubby root development on young seedlings from 2022 seed
- Dr. Langston diagnostic did not indicate any disease …
- … but hypothesized that stubby roots are on seed from **crop receiving PC in dry fields**

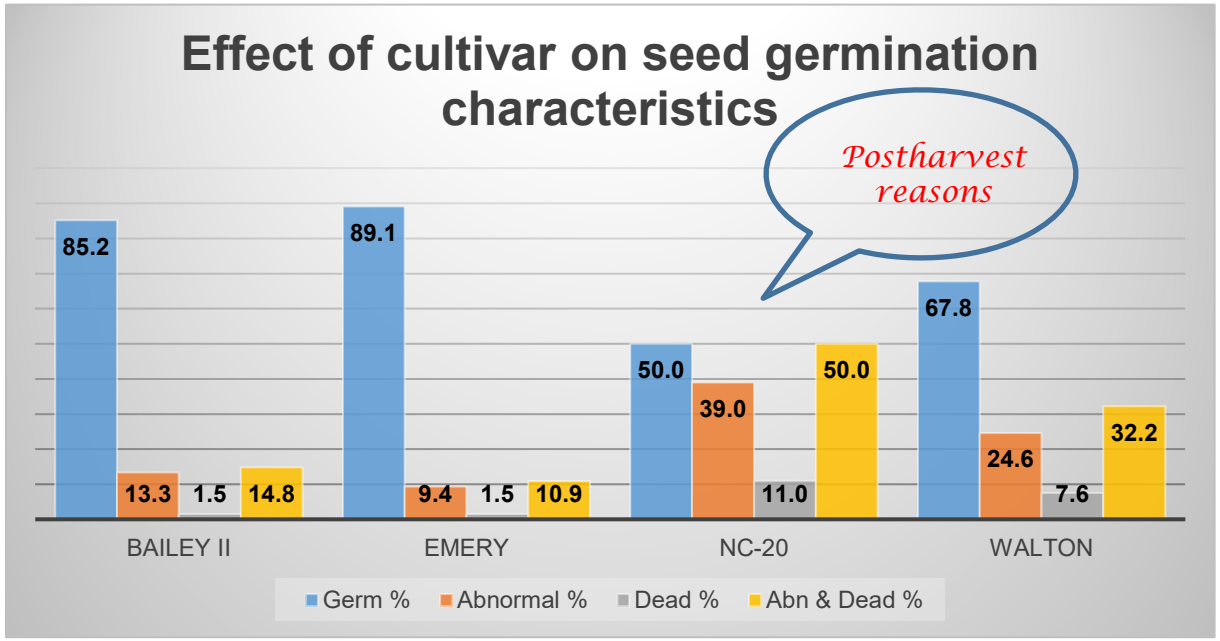
Concurrently, in 2022, we tested the effect of PC on yield & maturity



Preliminary conclusions:

- PC had NO significant effect on yield, maturity, but might reduce <u>100-seed weight</u>
- PC did not significantly affect germination





2023 Objectives:

Can PC change maturity?

Can PC affect yield?

Or pod number & kernel weight?

Can PC affect germination?

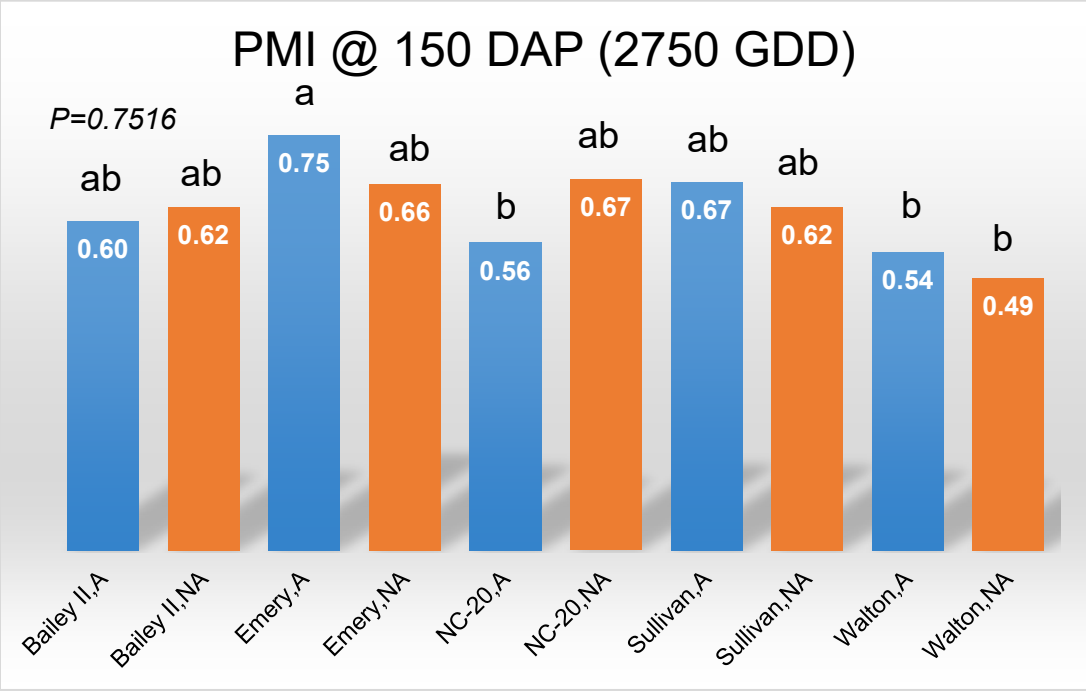
Methods:

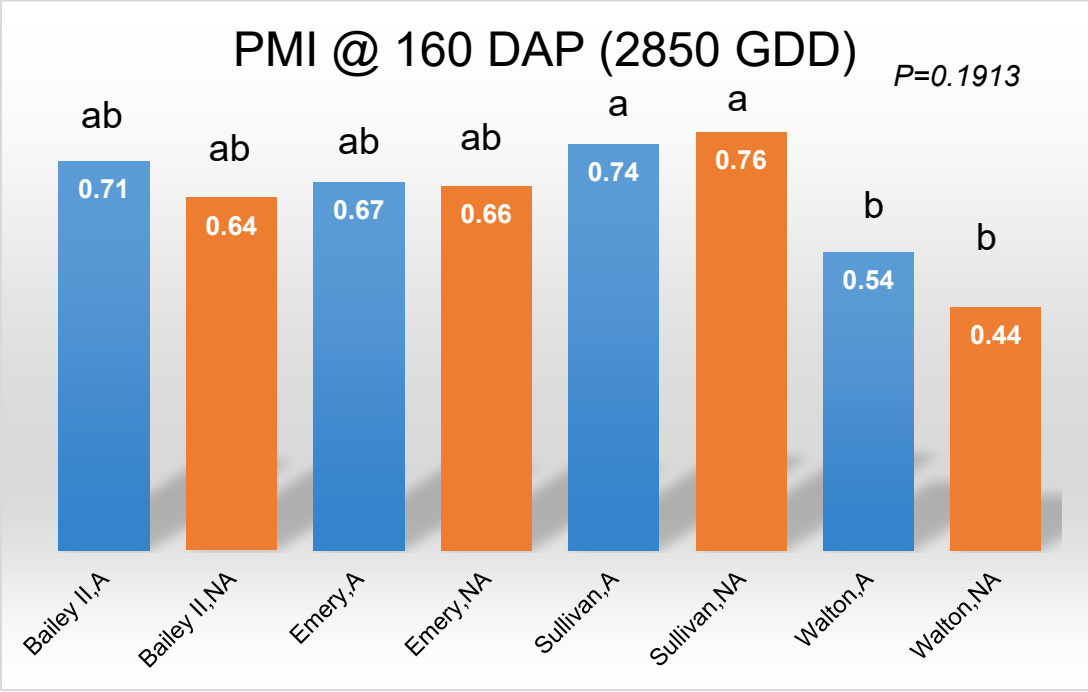
- Design: Factorial (cultivar, PC treatment, digging date)
  - 4 fields (1-3 acres each), each planted May 7-11 with one or two cultivars
  - Emery & Sullivan, Bailey II, Walton and NC 20
  - 5-row strips randomly received or not Apogee (4 strips/reps each)
  - Early dig (Oct 2 ~150 DAP), late dig (Oct 16 ~160 DAP); 11-22 days on the ground, 33-44 days
  - Yield (1,272-3,060 ft^2 in 2023 *vs.* 420 ft^2 in 2022)
  - Germination (VDACS Seed Lab using 1,600 seeds per cultivar & 800 seeds per cultivar per PC treatment), 100-seed weight & shelling percentage
- PC (Apogee) applications
  - Twice, 7.25 oz/A with 16 oz UAN and crop oil were applied at 50% touching and 14 days after (@ 15 GPA)
- Peanut maturity index (PMI)
  - 120; 127; 134; 141; 149; 154; 162 DAP, number of pods per plant
  - 2 samples per rep, 3 to 8 plants per sample

PC effect on peanut maturity

No significant PC effect on cultivars with significant differences in maturity …

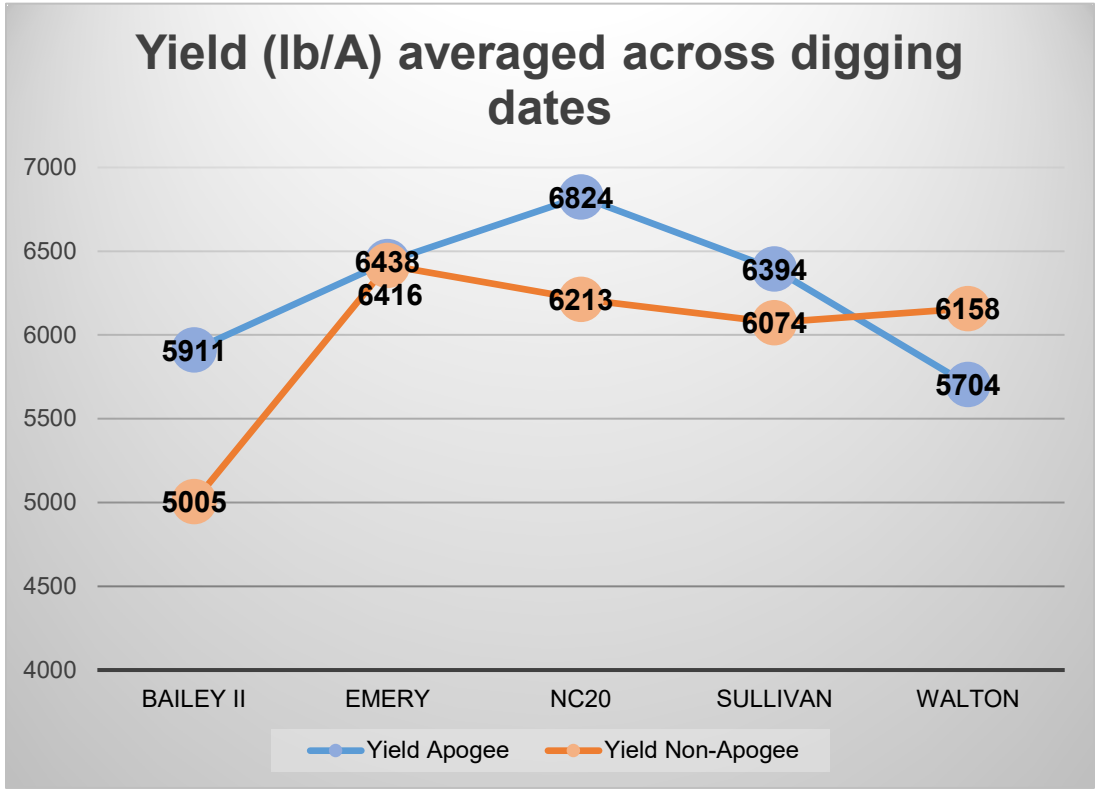
… similarly for early (*P=0.7516*) or late dig (*P=0.1913*)



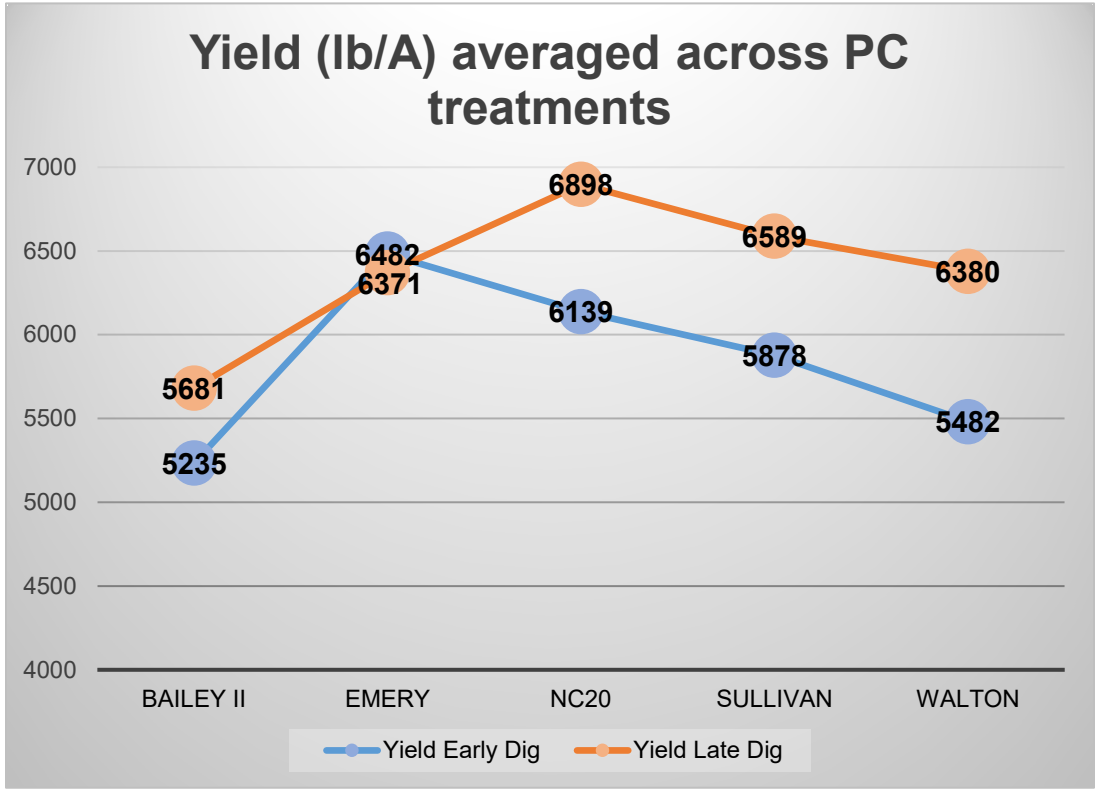


PC effect on yield

- Yield was significantly affected by PC (*P=0.0398*), cultivar (*P<0.0001*), and their interaction (*P=0.0218*)

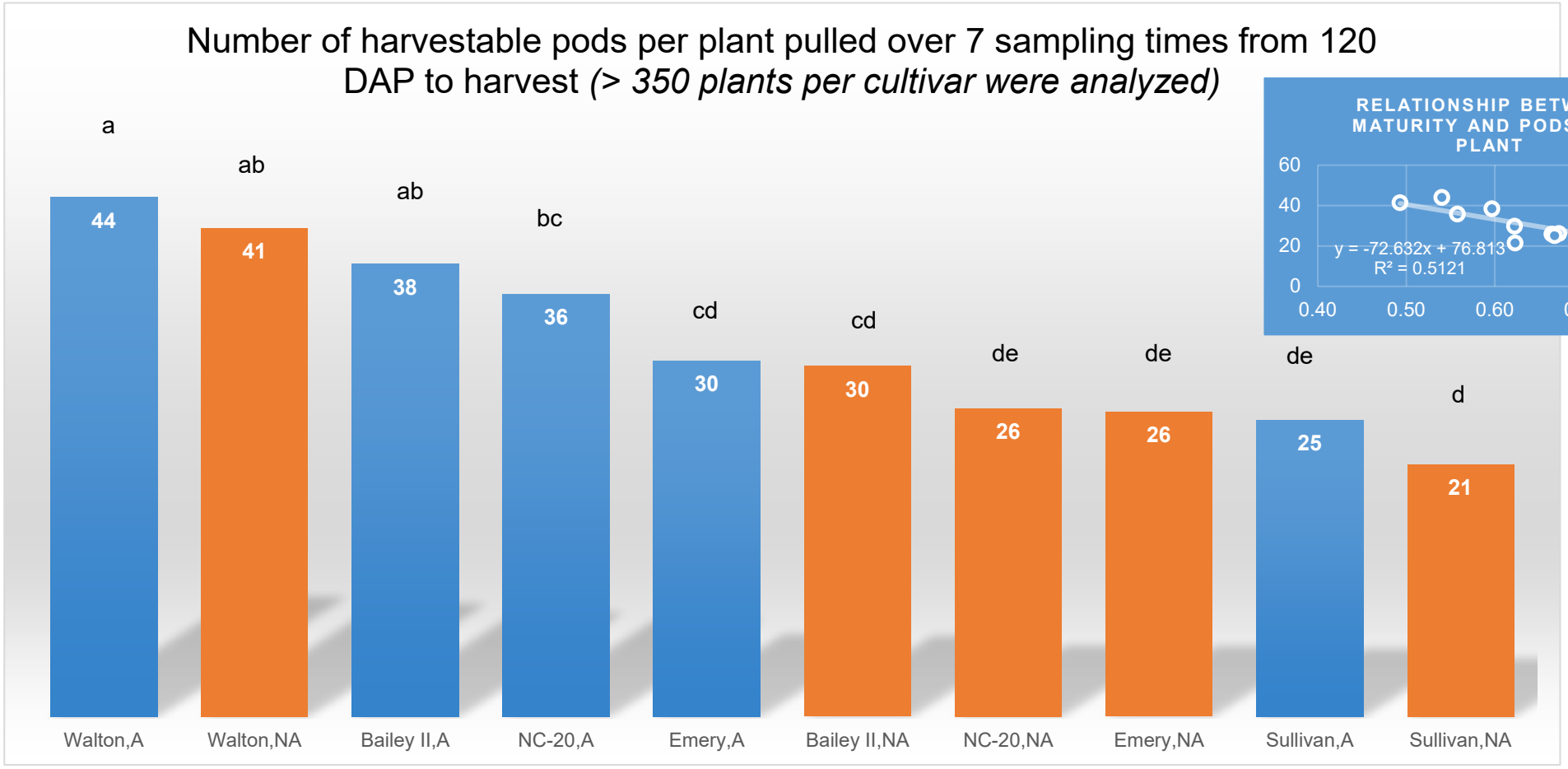


- Regardless the PC application and cultivar, digging date had a significant effect on yield (*P=0.0002*)



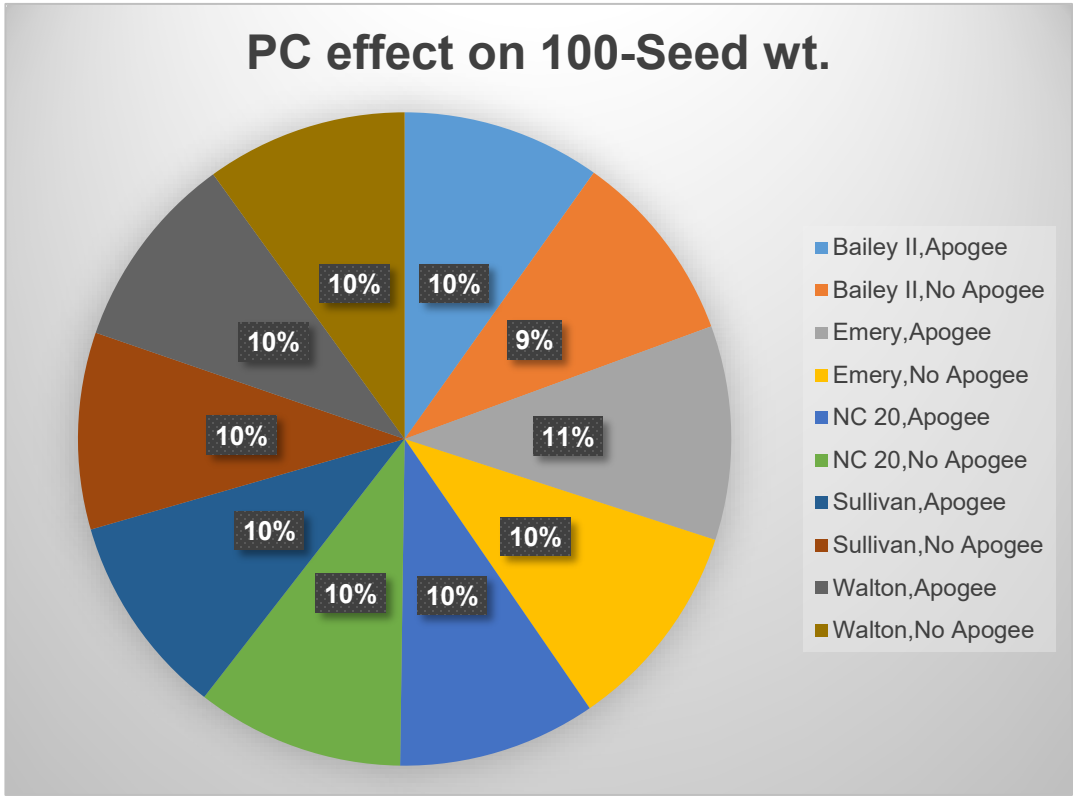
PC effect on pods per plant

- PC had a significant effect on number of pods per plant (*P<0.0001*); also the cultivar (*P<0.0001*)

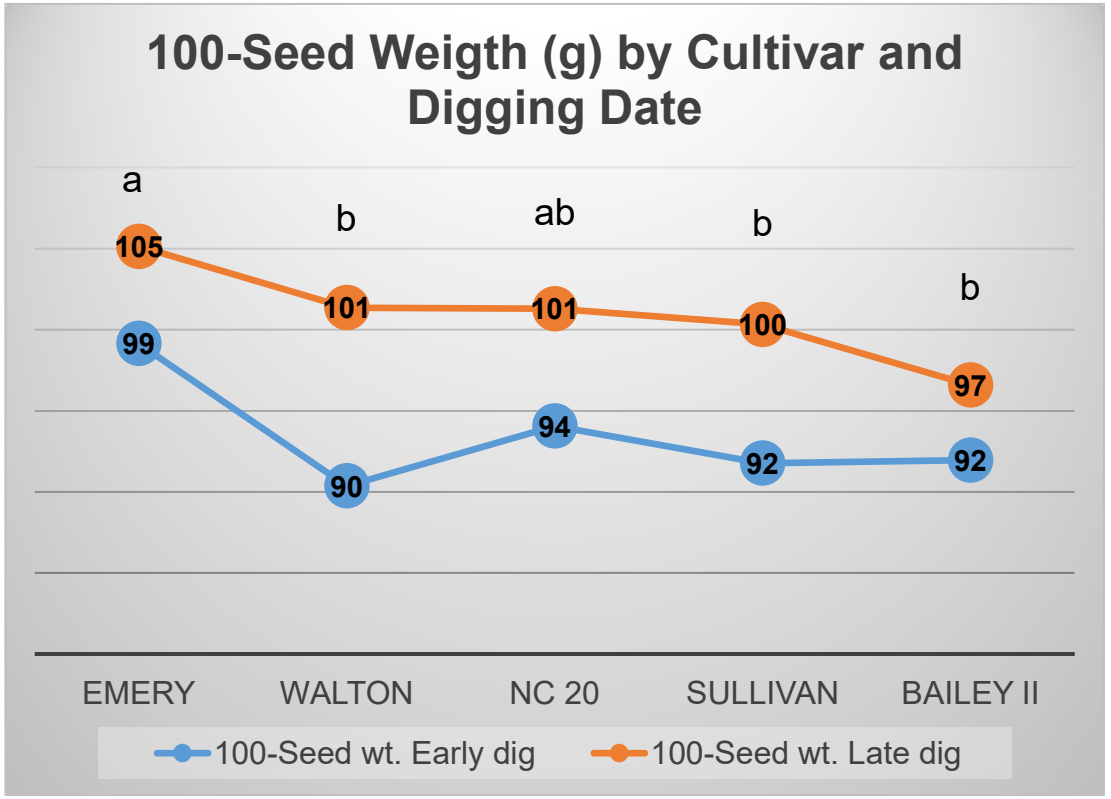


PC effect on 100-seed weight

- PC had no significant effect on 100-seed weight, regardless of cultivar and digging date (*P=0.9569*)

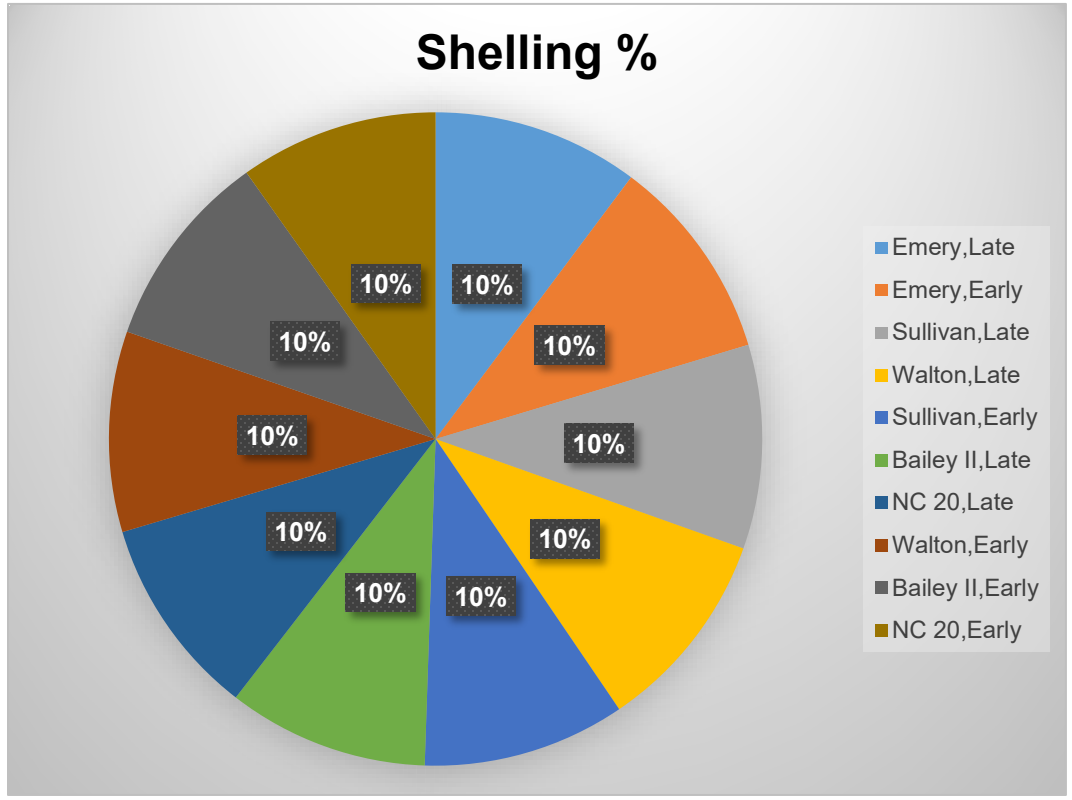


- Regardless the PC application and cultivar, digging date had a significant effect on 100-seed weight (*P<0.0001*)

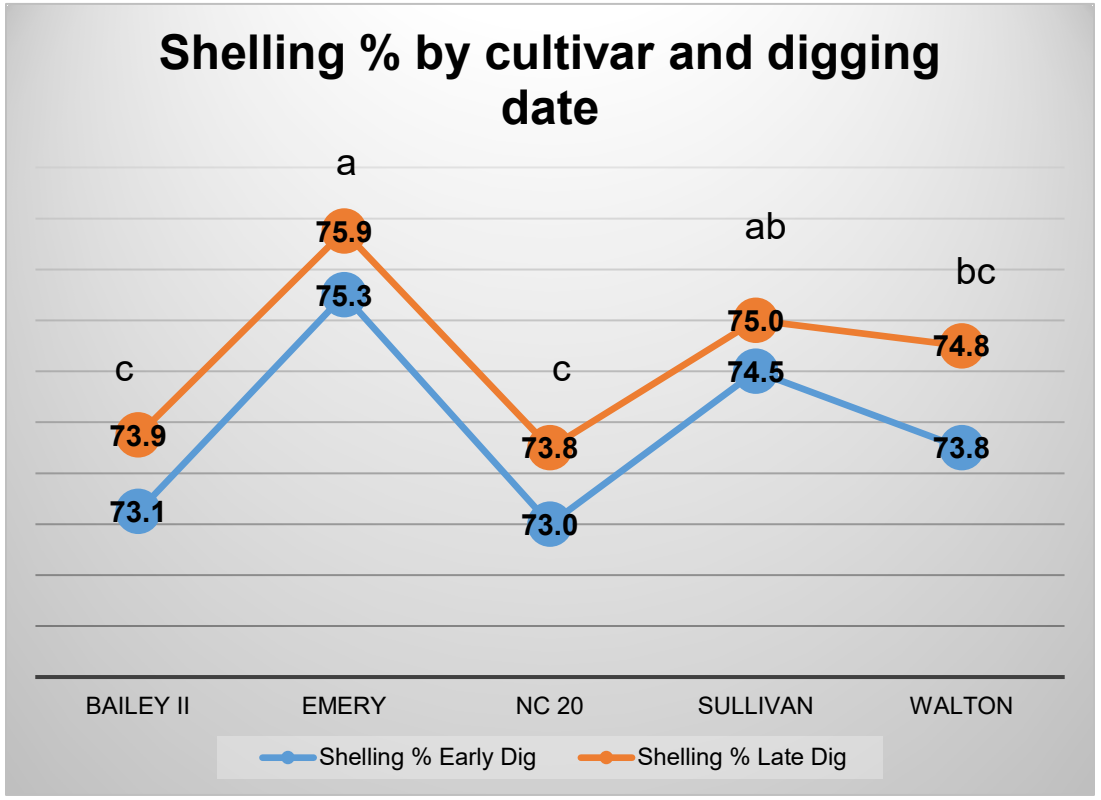


PC effect on shelling percentage

- PC had no significant effect on shelling %, regardless of cultivar and digging date (*P=0.9156*)

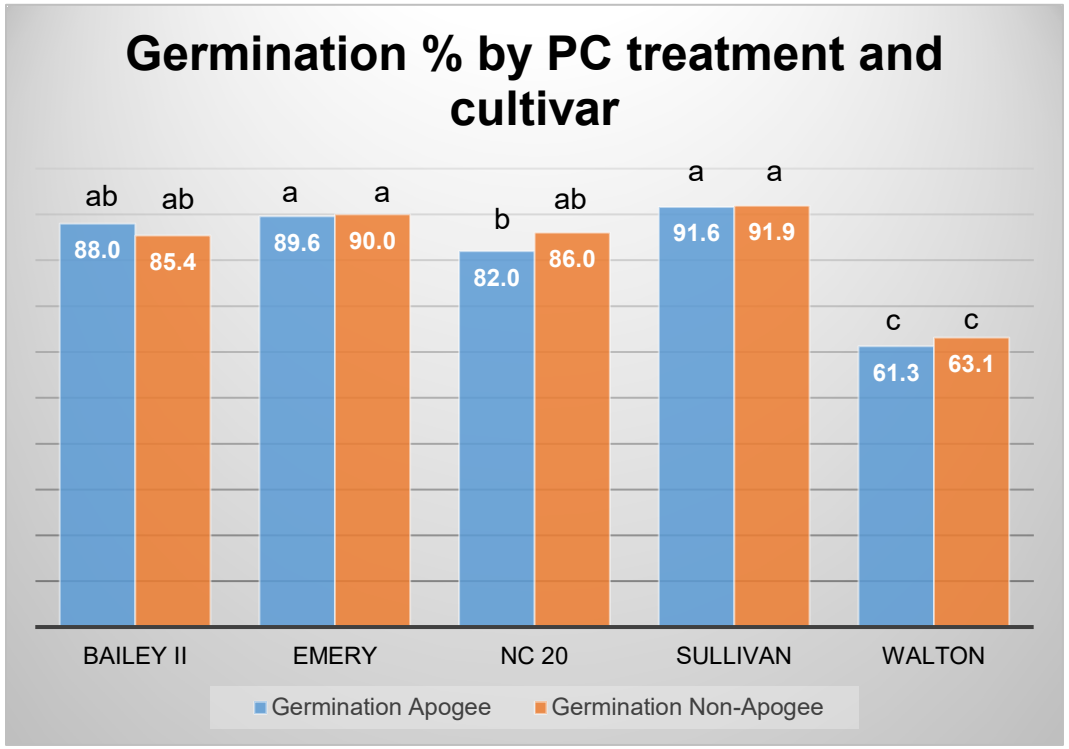


- Regardless the PC application and cultivar, digging date had a significant effect on shelling % (*P<0.0001*)

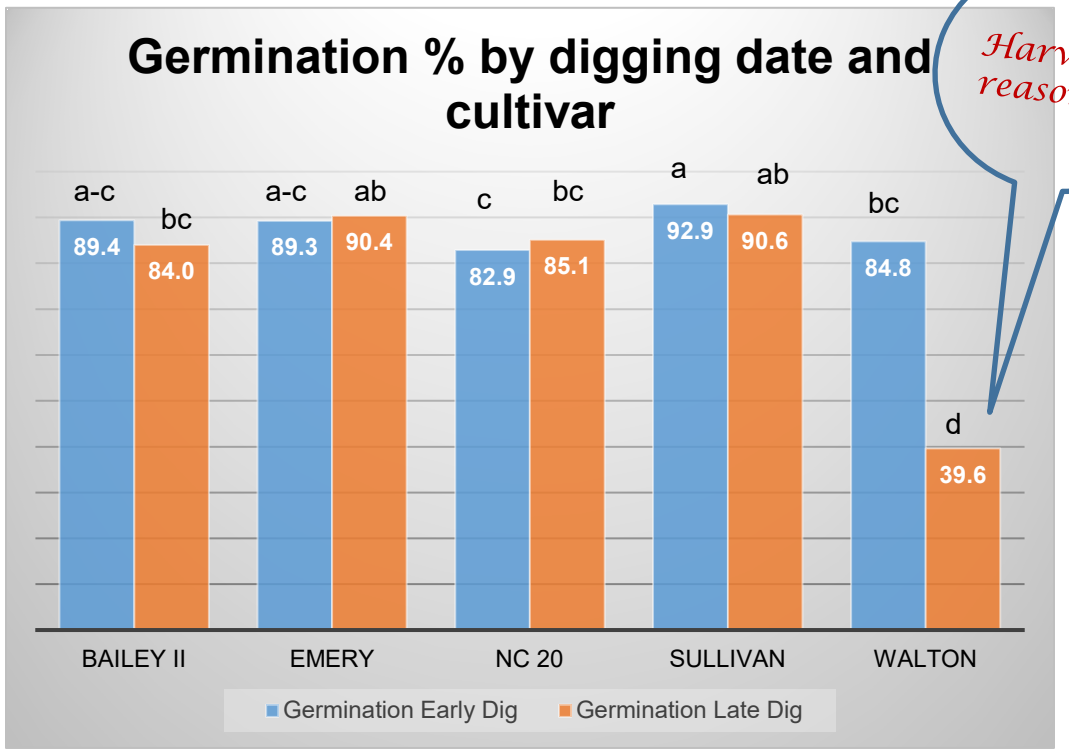


PC effect on germination percentage

- PC had no significant effect on germination % (*P=0.3759*), but cultivar effect was significant (*P<0.0001)* …

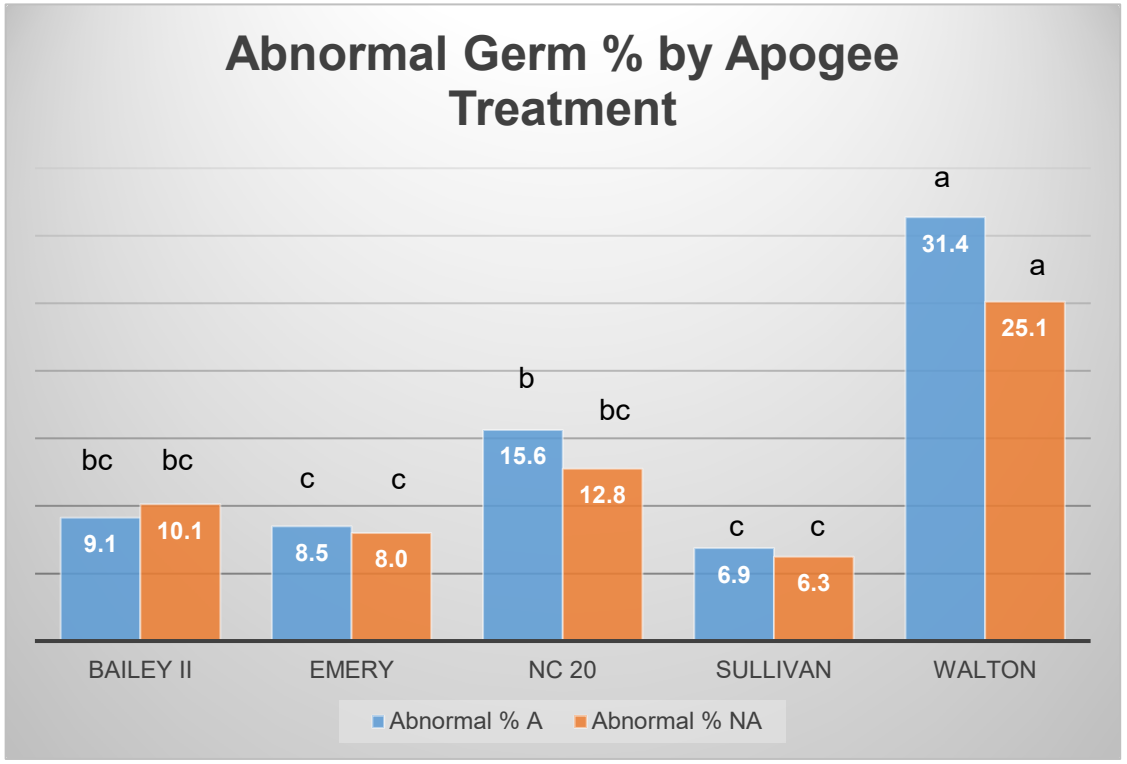


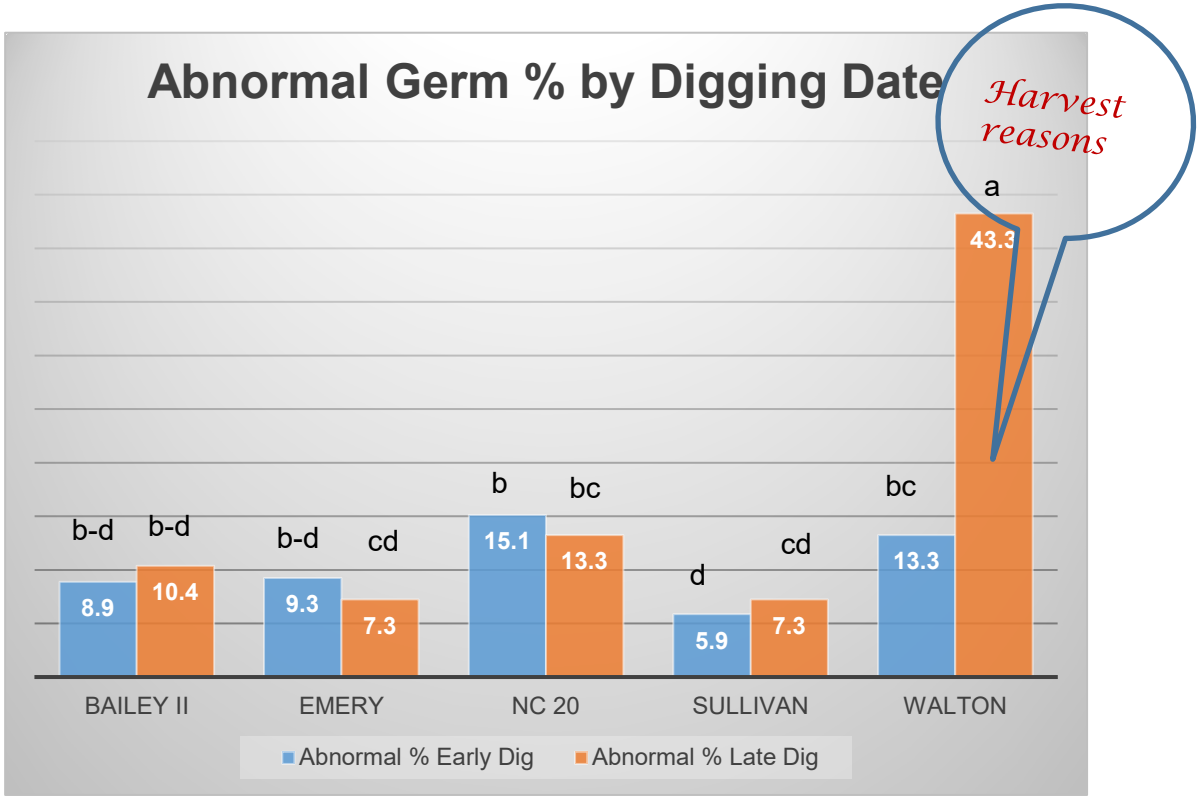
- … and interaction of cultivar and digging date was significant(*P<0.0001*)



PC effect on abnormally germinated seed percentage

- PC had significant effect on abnormal germination % (*P=0.0473*), along with cultivar (*P<0.0001)* …
- … and digging date (*P<0.0001*) and interaction of cultivar and digging date (*P<0.0001*)





Summary:

- PC had no significant effect on peanut maturity, delay or accelerate, regardless of digging time.
- PC had significant effect on yield, possibly because of positive PC effect on the number of pods per plant; but that was dependent on the cultivar.
- PC had no significant effect on 100-seed weight and shelling percentage.
- PC increased the percent of abnormal germinated seeds, but had no effect on germination percentage.
- Yield, 100-seed weight and shelling percentage were significantly affected by cultivar and digging date.

Conclusions and future work:

- In farmers' fields as opposed to small research plots, PC may have a yield benefit, but this depends on cultivar (earliest and latest maturing will not respond) and year.
- 2850 (160 DAP) *vs.* 2750 GDD (150 DAP) had a significant and positive effect on yield, 100-seed weight and shelling % regardless cultivar and PC treatment, even though PMI showed little change from 150 to 160 DAP.
- Germination was affected by harvest and post-harvest conditions rather than PC application in both years, but can PC increase % abnormally germinated seeds?
- What implications may be then for seed producers and crop establishment?

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