



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY

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# OPTIMAL NUTRIENT REQUIREMENT FOR CBD HEMP IN PIEDMONT NORTH CAROLINA

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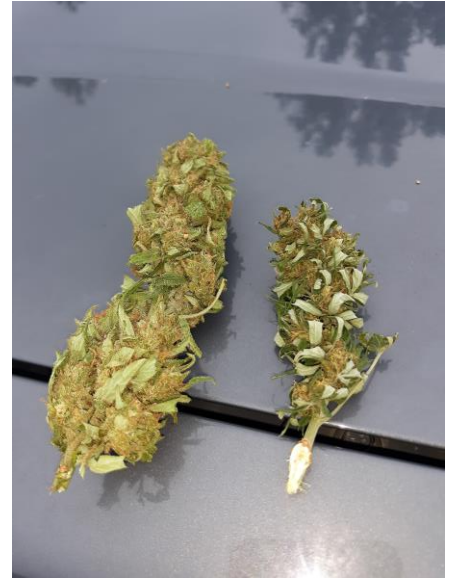
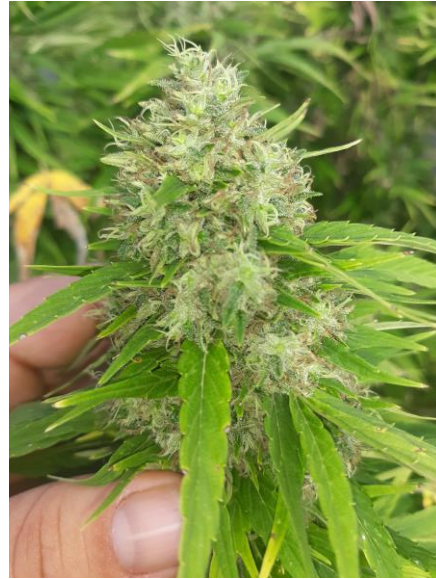
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Office of Ag research & USDA NIFA Evans Allen

AGGIES **DO**

## *Background*

- Hemp differs from its cousin marijuana on the basis of THC (0.3%)
- Hemp plants are used to produce seeds, fiber, and cannabinoids (CBD)
- After legalization there has been an emerging market for CBD hemp that has medicinal properties
- Not much information available on agronomic practices (e.g. N fertilizer requirements, harvest etc.)



Source: John Ivey, Research Technician

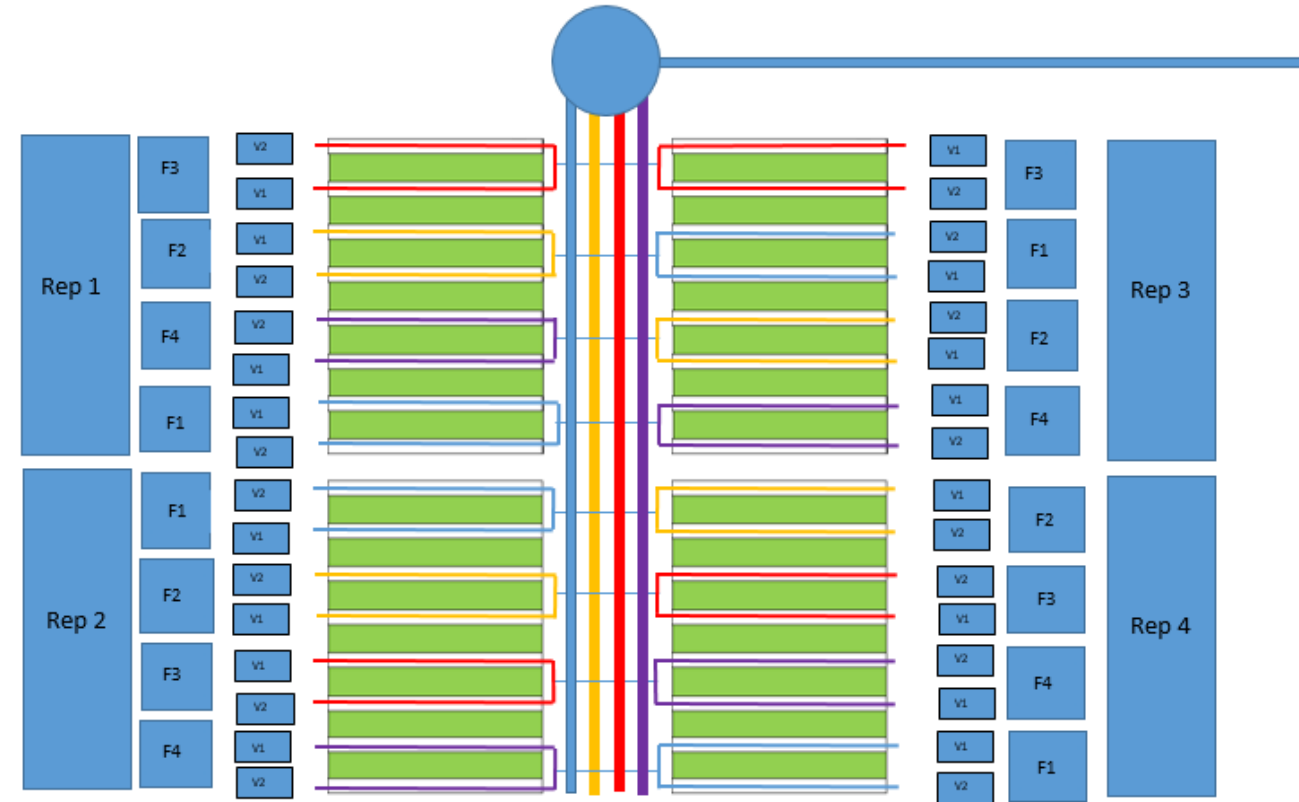
## Research Objective

To determine the effect of different nitrogen fertilizer rates and time of harvest on performance of 2 CBD hemp varieties.

Measurements: 1) cannabinoids (CBD and THC) concentrations, 2) plant tissue testing, 3) soil testing, 4) yield during the growing season.

## Treatments

- 1) **Varieties:** Therapy and Spectrum
- 2) **Fertilizer rates:**  
0 (F1), 50 (F2), 100 (F3) and 200 (F4)  
kg N ha<sup>-1</sup>



Randomized complete block design with 4 replicates in the field at NCA&T research farm on 1/3<sup>rd</sup> of an acre

## *Hemp Planting for 2019 growing season*

Seeds were sown in pots at greenhouse on May 1<sup>st</sup> and transplanted to field on June 4<sup>th</sup>

Clones were planted on June 4<sup>th</sup>



Source: John Ivey, Research Technician





*Hemp plants in the field during July*





*Hemp plants from August*





*Pictures from the September (pre-harvest)*



## *HARVEST*





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## *Conclusions*

1. Plant tissue analysis indicated that Mg levels dropped below sufficiency levels at initiation of flowering
2. Harvest time on the basis of highest CBD % depends on the type of variety planted (early Therapy vs late Spectrum maturity)
3. Average fresh weight floral yield ranged from 500-3000 g per plant at harvest (post harvest depends on the target market)
4. No significant increase in yield and CBD% was observed between 100 and 200 kg N ha<sup>-1</sup> fertilizer application rates





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*Thank you, Aggie Pride!*

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*A&T Industrial Hemp Page- <https://www.ncat.edu/caes/hemp-program/>*