

**Virginia Agricultural Council
Second Year Funding Request and Progress Report
March 2022**

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Project Title: Introducing Mung bean as an alternative or rotation crop to Tobacco in Virginia

Virginia Agricultural Council Project Number: 777

Report Covering Period: April 13, 2021 – February 14, 2022

VAC Grant Funding Received: \$17,000

Second Year Funding Requested: \$17,000

Second Year Detailed Budget (salary costs, administrative/overhead charges, and termination/severance costs are ineligible):

BUDGET ITEM	YEAR 2 (2022)
Trials for Southern Piedmont AREC and two on farm locations	\$8,500
Travel (From Blacksburg to Southside and to conferences)	\$3,5000
Student wage	\$5000
Indirect cost @ 0%	\$0
Total cost	\$17,000

Purpose and Methodology of Project:

Purpose: The long-term goal of this project is to introduce mung bean as an alternative or rotation crop for Virginia tobacco growers. The specific objectives are to 1) introduce mung bean as a niche-market crop to tobacco farmers in Southside Virginia, and 2) develop and promote mung bean through diverse extension activities.

Methodology: We used a 2-pronged research, and demonstration approach: 1) researcher-managed on university land, and 2) farmer-managed on-farm sites (key to receive farmers feedback). The farmer-managed on-farm sites were used to introduce the local farmers new crops and brainstorm techniques to finetune mung bean production and integration to the existing farming systems. Both the on-farm and the researcher-managed trials at the Southern Piedmont Agricultural Research and Extension Center (SPAREC) will continue in year two. The overarching strategy of our research and on farm trials will focus on integration of mung bean into existing cropping systems with tobacco and promote farmer participation.

Seed and field preparation

Seeds were inoculated with Rhizobium before planting for nitrogen fixation since none of the fields had been planted with a legume crop within the past five years. At all sites, land was prepared to provide good seed soil contact. Pre and post emergent herbicide were used to control weeds at all fields where mung bean was planted.

Planting and harvesting

Mung bean at the SPAREC was planted June 6 and June 21, 2021, and harvested September 27 and October 4, 2021, respectively. At the Goldman farm, mung bean was planted on June 16 and June 25, 2021 and both planting dates were harvested on October 4, 2021. Due to high weed pressure and other unforeseen circumstances, we did not harvest mung bean from the Moody farm.

The two center rows of the 4- row plots we harvested for yield calculation. Five random plants were obtained from each treatment replication to document plant height, wet biomass, number of pods/ plant, seeds/ pod, and seed size (g/100 seeds).

Yield, seed size, seed pod numbers per plant, seed per pods and plant height of mung bean at SPAREC and Goldman Farm (Table 3)

Table 3. Agronomic and seed traits of Berken and OK2000 at two locations in VA in 2021

		Avg./ Plot	Avg. 5 Sample Plants/ Plot			
		Yield (lbs/ac)	Seed Size (g/ 100 seed)	Pods/ Plant	Seeds/ Pod	Plant Height (cm)
Berken	Overall	771.03	4.44	63.64	10.64	91.11
	Early	766.56	4.34	71.15	10.57	91.68
	Late	775.51	4.53	56.13	10.71	90.55
	SPARE C	770.22	3.54	54.55	10.83	111.68
	Goldman	771.85	5.33	72.73	10.44	70.55
OK2000	Overall	728.81	4.81	54.91	10.57	78.21
	Early	807.29	4.80	57.28	10.45	77.18
	Late	650.34	4.83	52.55	10.69	79.25
	SPARE C	793.16	4.16	47.8	10.69	89.08
	Goldman	664.46	5.47	62.03	10.45	67.35

Yield: Berken and OK2000 showed similar yields of 771.0 lb/ac and 728.8 lb/ac, respectively across all locations and planting dates. The interaction of planting date and location did affect yield at the SPAREC with early planting yielding more between both cultivars at 871.63 lb/ ac, and SPAREC, late planting yielded significantly less at 781.33 lb/ac between both cultivars.

Seed size: OK2000 has a significantly larger seed size of 4.81 g/ 100 seeds than Berken of 4.44 g/100 seeds. Location greatly affected seed size with the Goldman farm having an average seed size of 5.40 g/ 100 seeds and the SPAREC having an average of only 3.85 g/ 100 seeds.

Number of pods per plant: Location again greatly affected the number of pods per plant with the Goldman farm having an overall mean of 67.38 and the SPAREC having an overall mean of 51.18 pods/ plant.

Plant height: Location, cultivar, and the interaction between the two factors significantly affected the plant height. The SPAREC had significantly taller plants that averaged 100.38 cm as compared to the Goldman farm where plant height averaged 68.95 cm. Berken was taller (91.11 cm) than OK2000 (78.21 cm). When comparing the interaction of cultivar and location on overall plant height, Berken at the SPAREC had the highest average, followed by significantly lower OK2000 at the SPAREC, and further by the significantly shortest plants equally Berken and OK2000 at the Goldman farm.

Seeds per pod: All plots produced 10-11 seeds per pod, so seeds per pod were not affected by any factors.

In summary,

- The first year data suggest that there is little to no impact on yield regarding cultivar, location, or planting date.
- Overall seed quality such as seed size from the SPAREC was significantly lower in both cultivars when compared to the Goldman farm. We need a second-year data to determine the effect of location, environmental factors as well as management practices on yield components (like seed numbers per pod, seed weight, etc.).
- Given the fact that mung bean was introduced to the south side of Virginia for the first time, the mung bean yield was within the range reported elsewhere. However, building on the first year experience, we hope to improve yields both at the SPAREC and farmer managed sites.
- Another year of data is required to make any conclusions as well as experimenting on mung bean's effect on rotation with tobacco and better production practices.

Is project on schedule? Yes