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Current Research on Band Application of Fertilizer To Burley Tobacco

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Present Status: Generally, past research conducted in the United States has shown that only one-half to two-thirds as much fertilizer is required to produce maximum crop yields when the fertilizer is properly banded as when it is broadcast. However, the magnitude of plant response to banding compared to broadcast applications varies widely with soil nutrient levels, soil temperature, soil pH, and the mobility of the nutrient being applied. Greatest benefits from banding result from (a) applications to soils having low or very-low soil test levels of the nutrient in question, (b) applications to crops grown in cool climates, (3) applications to either acid or alkaline soils, and (d) applications of nutrients designated as being immobile. In contrast, broadcast and band applications have about equal efficiencies on soils with medium to high soil test levels, neutral pH, high temperatures, and the nutrient is considered to be a mobile nutrient in soil. Because of the potential for greater efficiency from banded banding may be one way to lower fertilizer costs under certain conditions.

Banding Fertilizers To Tobacco: In addition to the potential for greater efficiency of nutrient use from banding, recent research at the University of Kentucky has suggested other advantages may accrue from band applications to tobacco. These advantages include less manganese toxicity, improved early growth, fewer days to maturity and increased cured leaf yields (Table 1). These advantages occur primarily because the fertilizers are placed in the middles between rows allowing plants to become established after transplanting before roots permeate the fertilized soil zone. Applications of high rates of commercial fertilizers to tobacco soils through commonly used broadcast methods greatly increase the salt concentration of the soil solution and decrease soil pH 0.5 to 1.0 pH unit. Such changes in the soil may result in damage to plant roots, cause nutrient toxicities and deficiencies, and adversely affect plant growth and yield. Separating the bulk of the fertilizer from the plant for a short time by banding appears to alleviate many of these problems.

The best system for banding has not been determined as yet but research in this area is proceeding along several avenues. Results to date suggest that a band of N-P-K fertilizer placed 12 inches on each side of the row at first cultivation offers several advantages over broadcast applications. This band application should be made no later than the first or second week after transplanting, especially on low fertility soils.

Studies either planned or underway include those designed to (a) determine the best distance from the row to place fertilizer, (b) determine the correct time of application after transplanting for banding, (c) develop a fertilizer to use in transplant water (starter fertilizer to include some nitrogen, phosphorus, potassium, and molybdenum), (d) evaluate various combinations of band and starter solutions, and (e) evaluate various combinations of band and broadcast applications. Finally, an attempt will be made to merge those practices offering greatest efficiencies from banding with practices minimizing the detrimental effects of fertilizer salts and fertilizer induced soil acidity.

Table 1. Effect of Broadcast and Band Applied Fertilizer on Burley Tobacco.

	Location			
	Frankfort		Lexington	
Characteristic	Broadcast	Band*	Broadcast	Band*
Plant Manganese 45 days, ppm	153	114	365	195
Dry wt., 45 days grams/plant	50	62	29	35
Days to flower	--	--	71	69
Cured Leaf Yield, lbs/Acre	2802	2963	3005	3274
Value, $/Acre	---	---	4297	4282

*Band was made 12 inches from the row, 4 to 5 inches deep, and 5 days after transplanting.