SURVEY OF VITAMIN E CONCENTRATION IN UPLAND COTTON

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Abstract

Vitamin E is the subject of increasing scrutiny because of its association with human health benefits when consumed in large quantities compared with current recommended daily allowances. Clinical and epidemiological studies have found consumption of large quantities of vitamin E to be significantly associated with improved immune system function and decreased risk and/or severity of a wide range of human diseases including cancer, cardiovascular diseases, cataracts, Parkinson's, and Alzheimer's. Although vitamin E is rarely deficient in humans, the levels which are linked to human health benefits far exceed its level in the diet—leading to the development of a supplemental vitamin E industry in the United States worth greater than $300 million annually. Natural sources of vitamin E are more potent than chemically synthesized forms, so it seems wise to look to natural sources to provide the increased levels of the vitamin required for health benefits. Photosynthetic organisms are the only organisms capable of synthesizing vitamin E, and several oilseed crops have already been shown to be rich sources of vitamin E. Preliminary efforts are underway to assess the potential to breed for increased vitamin E levels in cotton seed. Seed vitamin E concentrations were determined for commercial cultivars and experimental strains evaluated for agronomic performance at College Station, Chillicothe, and Lubbock, Texas in 1997 and 1998. Results were encouraging, because a significant amount of genotypic variation for seed vitamin E concentrations was detected. However, there were also significant environmental influences. The level of the most active form of vitamin E (a-tocopherol) ranged from 59 to 312 mg/gfw among 132 cotton genotypes over three locations and two years.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:520-520 (2000)
National Cotton Council, Memphis TN