

**PARTITIONING OF RECENT AND RESERVE
PHOTOSYNTHATE IN COTTON CULTIVARS
DIFFERING IN DETERMINACY**

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Abstract

The yield of cotton is strongly affected by the partitioning of photoassimilate between various organs of the plant. Previous research has shown that leaves close to bolls are important sources of photosynthate. This research project was conducted to determine the importance of leaves on the main stem (MS) and the importance of nonstructural carbohydrates to reproductive growth of short- and long-season cultivars. Vegetative and reproductive plant parts were sampled two, three, and four months after planting. $^{14}\text{CO}_2$ was applied to the uppermost fully expanded leaf (UL) on the MS 48 hours before the first two samplings. ^{14}C -starch was injected into the MS of the cotton plants three weeks before the third sampling. At each sampling the dry weight, ^{14}C content, and nonstructural carbohydrate content was determined for each plant part. Lack of rain in one of the years caused the two years to differ greatly. The short-season cultivar shifted partitioning to favor reproductive branches, boll wall, and seed at the expense of the MS and vegetative branches more than the long-season cultivar in the good year. Early in the season the ^{14}C -photosynthate from the UL on the MS was partitioned to the MS and vegetative branches. Late in the season it was partitioned to reproductive branches, boll wall, and seed. Nonstructural carbohydrates were stored in the stem and root late in the season. The MS and vegetative branches were the main sink for these carbohydrates.