

Feasibility of Cotton as a Crop for Pennsylvania

Polly S. Leonhard

Cotton (*Gossypium hirsutum* L., Malvaceae) is grown primarily in the southern and southwestern United States with an upper limit of about 37° latitude. A study was undertaken to determine if cotton might be adapted to Pennsylvania (40°–42°), specifically under the conditions of Lancaster County where farmers are seeking an alternate crop to replace or supplement tobacco which is currently under disease stress (blue mold) and price constraints. Although ordinary white cotton is a questionable crop under current pricing, higher prices can be obtained for colored, “organically grown” cotton. The rationale for considering cotton production in this area is that (1) existing tobacco nursery transplant facilities could be used to start cotton plantings; and (2) there may be a niche market for organic, colored cotton. The lack of any cotton production in the area facilitates the production of naturally colored cotton, which cannot be grown in the presence of white cotton due to cross-pollination problems.

EXPERIMENTAL

In order to evaluate the feasibility of production of cotton in Pennsylvania, several types of cotton, including naturally colored cotton ones, were evaluated for three years in Akron, Pennsylvania to determine agronomic performance and cotton quality. These included white cotton originally from Arkansas, and brown, green, red, mocha, and natural cotton originally from Texas. Fiber analyses were carried out on all cotton samples including fiber strength, elongation, upper length, short fiber content and micronaire (the measure of resistance of a plug of cotton to air flow to determine fineness and maturity). Fiber wax content was also evaluated by Soxhlet extraction with ethyl alcohol (Conrad 1994).

Few problems were faced in growing cotton in Pennsylvania, with the exception of some insect pests, including bud/bollworms and Japanese beetles, but they were controlled with insecticidal soap. Some of the brown cottons had the shortest seasons and hybrids made with brown cottons were among the faster growing types. Estimated lint yields ranged from 1,122 to 7,051 kg/ha. The average lint percent among all of the plants was 33.2 which falls within the “normal” range of 30 to 45%. The average number of bolls per plant was 14.9 and the average weight of the seed cotton per boll was 4.1 g. Based on fiber evaluations, the cotton produced in Pennsylvania appeared to be competitive in most respects. The majority of the samples had excellent strength, elongation, upper length, short fiber content, and micronaire values. The white, natural, and brown samples had the best fiber characteristics and high yields.

CONCLUSION

These results indicate that it is potentially feasible to produce cotton with suitable fiber qualities in northern areas. It is uncertain if so-called organic cotton could be produced economically based on a three-year study. The use of *Bt* cottons would be helpful to reduce insect damage but it would not be clear if such genetically transformed cottons would be accepted in the “organic” market. The absence of infrastructure for cotton production (such as on-farm harvesting equipment, and ginning facilities) is an issue that would have to be addressed to make cotton an economically viable crop. The major constraints to cotton production would appear to be economic, i.e. would the prices received in light of the expected yields be sufficient to establish a niche industry for established tobacco growers.

REFERENCES

Conrad, C.M. 1994. Determination of wax in cotton fiber: A new alcohol extraction method. *Indust. Engin. Chem.* p. 748–749.