WHOLE COTTONSEED RESEARCH & PROMOTION PROGRAM AT COTTON INCORPORATED

T.C. Wedegaertner and W.F. Lalor
Cotton Incorporated
Raleigh, NC

Abstract

The current cottonseed program was initiated after the record 1991 cottonseed crop exceeded the capacity of the storage and handling infrastructure and the price U.S. growers received for their seed fell to just $71 per ton. The goal of Cotton Incorporated's cottonseed program is to increase the value of cottonseed through research and marketing. Cottonseed marketing efforts include all aspects of a typical promotion campaign including advertising (print and radio) publicity, direct mail as well as direct contact (trade shows and nutrition conferences). The research program focuses on solving short-term problems through innovative approaches as well as long-term research efforts. The elimination of gossypol from the seed is the cornerstone of the long-term research. Other approaches to increasing the value of cottonseed include innovative solutions to storage and handling difficulties, such as the use of agricultural forage bags to store cottonseed and a starch coating process that facilitates handling. In addition, the use of cottonseed in beef range blocks is being evaluated. Based on a three-year running average of the total value of the cottonseed crop (at the grower level), these efforts are having a positive impact on total cotton grower revenue.

Introduction

Over the past 15 years, the price of cottonseed has averaged $99 per ton at the grower level. During this same time period the total gross revenue received by growers for their cottonseed was $567 million and cottonseed production averaged 5.7 million tons. Grower's revenue from seed was at a maximum during those years when production was close to 6 million tons. In 1991 the cottonseed crop hit a record of 7 million tons and the infrastructure in place to handle such a large crop was inadequate. Cottonseed storage facilities overflowed and the price received by growers plummeted to $71 per ton and gross revenue fell to less than $500 million (Table 1). This price drop was most severe in the Eastern U.S. where few oil mills existed and seed storage was insufficient. Some growers in this part of the Cotton belt received less than $45 per ton for their seed in 1991. Since the demand for cottonseed appeared to be grossly inadequate to consume a 7 million ton crop at decent prices, cotton growers decided to spend a small portion of their check-off funds to stimulate demand for cottonseed. This became especially important when most forecasters were predicting cotton crops in excess of 20 million bales (8 million tons cottonseed) for the foreseeable future. The goal of the cottonseed program at Cotton Incorporated is to increase the value of cottonseed through research and marketing.

Cottonseed Marketing

In recent years, a little more than half the cottonseed crop has been processed into value-added products by the crushing industry and slightly less than half was fed directly to livestock (mostly dairy cattle) without further processing. Marketing research, conducted by Cotton Incorporated, determined that cottonseed has been available at a price that is less than its true feed value in most areas of the county where large concentrations of dairy cattle exist. In addition, it was also determined that less than 30% of the dairy feed market had been penetrated by cottonseed, so tremendous potential existed for increasing demand in that market segment for cottonseed. A complete marketing and promotion campaign has been put in place that includes print and radio advertising, trade shows, publicity and direct mail. The primary target of this effort continues to be dairy producers. The feed industry, dairy nutritionists and beef producers are also targeted.

Cottonseed Research

Cotton Incorporated's research strategy to increase the value of cottonseed is divided into projects that are long term (10 years) and those that are short term (less than 5 years). The cornerstone of the long-term research strategy is the effort to remove gossypol from the seed. The objective is to eliminate gossypol from the seed while leaving it elsewhere in the plant where it acts as an insect deterrent. This research effort is now well on its way to accomplishing this objective.

Roasted cottonseed has been evaluated as a value-added feed ingredient for dairy cattle. A complete review of that research has been published (Wedegaertner and Lalor). The conclusion of that research effort was that cottonseed could indeed be heat treated in such a way as to increase the proportion of undegradeable intake protein (UIP). The ideal roasting conditions were determined to be 146ºC (295ºF) for 30 minutes. The milk production response from cows fed the heat-treated cottonseed has been inconsistent at best. One study showed a trend towards increased production during mid-lactation, but the difference was not significant ($p>.05$). Two feeding trials also investigated the blood gossypol response when roasted cottonseed is substituted for unroasted seed. A consistent response of increased plasma gossypol was observed when heat-treated seed was added to the diet. This increased plasma gossypol was not of great concern except where other gossypol-containing ingredients, such as cottonseed meal and hulls, were also in the diet. No further work on roasted cottonseed is planned

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:398-399 (1997)
National Cotton Council, Memphis TN

until more is known about the effects of heat treatment on gossypol availability.

The difficult handling and storage characteristics of cottonseed greatly limit its use in the feed trade. Several research projects have been conducted on cottonseed storage. A project in Mississippi (Willcutt and To) is investigating the engineering aspects of traditional storage systems. Lateral forces that are exerted by a cottonseed pile have been investigated in the hope that this information will prevent any further seed house failures. Air flow requirements and moisture migration are also being studied.

Alternative storage systems that could serve as emergency overflow or as storage for poor quality seed are being evaluated in Georgia (Bader, et al.). Silage bags appear to be suitable for storing good quality seed for extended periods, but the use of a common grain preservative did not seem to have any measurable effect on seed quality.

A simple, inexpensive system for putting a light starch coating on cottonseed to improve its handling characteristics has been developed (Laird, et al.). The process involves applying a hot, gelatinized cornstarch solution to fuzzy cottonseed, mix and then drying it in a belt conveyor dryer. The product, known as EasiFlo Cottonseed™, has been tested by several feed mills and it apparently meets their requirements for flowability. In addition to improved handling characteristics, the coated product has approximately a 25% increase in bulk density, compared to fuzzy cottonseed. Research is underway to evaluate its shelf life and storage characteristics.

Conclusion

Since the goal of Cotton Incorporated's cottonseed program is to increase the value of cottonseed, an evaluation of the program's success must consider the price of cottonseed and the total gross revenue received by growers for their seed. Figure 1 shows the five-year running average for the per ton price of cottonseed at the grower level. The five-year average is used to eliminate year-to-year fluctuations caused by various supply/demand forces. Note that during the period 1986 to 1989, cottonseed prices averaged about $90 per ton. From 1990 to 1995, the per ton price seemed to plateau at about $100. The effects of Cotton Incorporated's marketing program should be measurable within five years (1997). It is hoped that the increase in the average price in 1996 to near $110 per ton is the beginning of another period of a relatively higher price for cottonseed.

Figure 2 shows the three-year average gross revenue received by cotton growers for their seed. A three-year average is used here since the natural forces of supply/demand tend to eliminate year to year fluctuations i.e., a large crop and low price or a small crop and high price. Note that the U.S. cottonseed crop was worth about $400 million for the period 1984 to 1987. A gradual increase was observed over the next few years and it was not until 1993 that cottonseed revenue seemed to begin a steady increase. The cottonseed program at Cotton Incorporated will help contribute to a continued increase in cottonseed value.

References

Bader, M.I., J. West, L. Ely, S.M. Brown, T.C. Wedegaertner, and T.D. Valco. 1997. Alternate Storage Method for Whole Cottonseed. Beltwide Cotton Conferences.

Laird, W., T.C. Wedegaertner, and T.D. Valco. 1997. Coating Cottonseed for Improved Handling Characteristics. Beltwide Cotton Conferences.

Wedegaertner, T.C. and W.F. Lalor. 1997. Roasted Cottonseed for Dairy Cows. Beltwide Cotton Conferences.

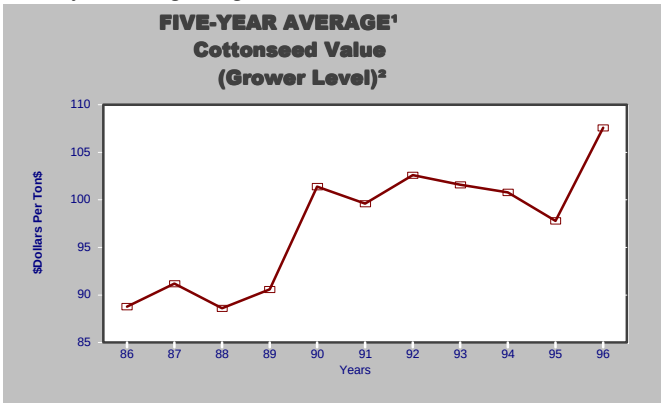
Willcutt, M.H. and S.D. To. 1997. The Affect of Aeration Rate of Cooling on Cottonseed in the Mid-South. Beltwide Cotton Conferences.

Table 1. Cottonseed Supply and Price

Crop Year	Production Million Tons	Price Received by Growers $/ton
82	4.7	71
83	3.1	131
84	5.1	95
85	5.3	67
86	3.8	80
87	5.8	83
88	6.1	118
89	4.7	105
90	6.0	121
91	6.9	71
92	6.2	98
93	6.3	113
94	7.6	101
95	6.8	106
96*	7.2	125

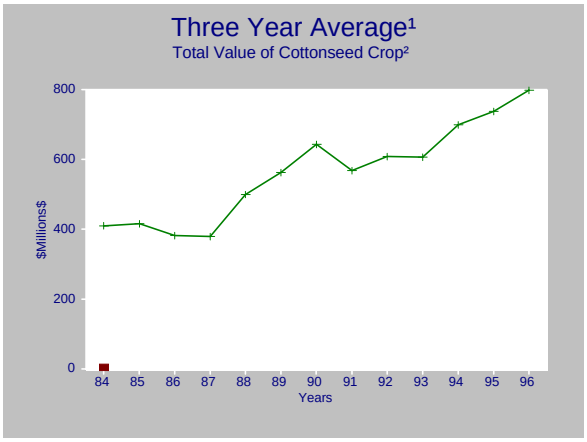
Source: USDA Cottonseed Update
*Estimate

Figure 1.
[1]Five-year running average



[2]Source: USDA Cottonseed Update based on price paid the grower

Figure 2.



[1]Three-year running average
[2]Source: USDA Cottonseed Update based on price paid the grower