

Factors Increasing Boll Rots And Fatty Acids in Cotton Seed

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The high free fatty acid content which occurred in many lots of seed in the 1954 cotton crop, in a smaller number in 1955, and in relatively few lots in 1956, is correlated directly with the per cent of seed with discolored kernels. This is shown in a tabulation of data from

*This project was financed by a research grant from the Oil Mills through the Arizona Cotton Planting Seed Producers.

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Controls Disease

4. Artificial insemination assists in control of certain diseases. Dairy cattle are subject to venereal and other service-transmitted diseases which could be spread through a herd by natural service, and spread from herd to herd in areas where neighboring farmers might share ownership or use of the same bull.

A proved sire is one that has demonstrated his ability to sire desirable high producing daughters, as indicated by comparing records of his daughters with records of their dams. At present the supply of favorably proved sires for dairy-men and breeding associations has not met the demand. Less than 40 per cent of the sires in the 1,500 bull studs in the United States are proved sires. Many partially proved and carefully selected young sires are being used.

Best Genes Spread Widely

Instead of a bull servicing 50 to 75 cows a year or even less by natural service, bulls in A.B. serviced an average of 2,210 cows each per year in the United States bull studs in 1955. In 1956 some 2,553 sires serviced 5¾ million cows in 673,970 dairy herds in the U.S. Of this number, 883 had daughters that averaged 11,265 pounds of milk and 476 pounds of butterfat, an increase of 690 pounds of milk and 40 pounds of butterfat over the production of their dams. Sires that have been re-proved in bull studs show about this same increase on their daughters. Two outstanding proved Holstein-Friesian sires have serviced over 50,000

460 samples of cotton seed from the 1955 crop in Arizona fields.

Sampling Procedure

Seed samples were carefully chosen by random sampling from each lot of cotton seed. An attempt was made to grade seeds by the condition of the short lint. Seeds covered by dense lint were considered healthy, those showing over one-fourth of seed surface bare, "black seeds" were considered diseased, and those with less than one-fourth the surface black were considered doubtful.

Cutting the seeds showed that this method of grading was usually accurate.

cows each. One bull already has 35,000 progeny, the other 30,000.

The use of A.B. for dairy cows and heifers has reduced the demand for pure-bred sires and consequently the number of bulls registered by the dairy breed associations. At the same time, the A.B. program has increased the value of proved sires and well bred young sires.

The extent of the adoption of the use of A.B. is shown by the number of pure-bred artificially sired animals registered by the breed associations. This number increased from 10 per cent in 1946 to more than 30 per cent in 1955. The Holstein-Friesian Association registered more than 41 per cent from artificial service in 1955.

A. B. Growing In Arizona

The use of A.B. in Arizona dairy herds has not increased as rapidly as in the dairy states, due perhaps to the cost in the larger herds in the state and to the fact that the dairy herds outside of Maricopa County are too widely scattered to use the services of a technician economically. It is estimated that more than 10,000 Arizona dairy cows were serviced last year by A. B. organizations in addition to several hundred cows serviced artificially within the owners' herds. Several organizations in Arizona are offering the services of well proved sires and interest in the plan is increasing. The use of frozen semen has extended the use of A.B. to isolated herds.

Adequate feeding and good management are the most rapid and the most important factors in maintaining high production in our dairy herds but A.B. is a potent means of extending the inheritance of superior sires.

Most of the "black" seeds (about half of the doubtful) and very few of the healthy seeds showed discolored kernels. There was usually a close correlation between the percent of discolored kernels and the percent of free fatty acid. About four per cent discolored kernels gave an increase of one per cent free fatty acids.

Seeds were surface sterilized, cut in half and the kernel halves plated on sterile agar. Fungi present were identified as they produced spores.

Various Fungi Isolated

The fungi most frequently isolated from infected kernels were diplodia, aspergillus, and fusarium, in that order, all boll rots. A half dozen other organisms occurred less frequently.

Boll Rots Seasonal

The occurrence of boll rots was seasonal. They were prevalent and severe in early pickings in some districts. Boll rots were scarce in the main picking season, but increased sharply in late pickings, especially the final cleanup pickings. This correlates with moisture conditions as summer rains occur during early pickings, the weather is dry during fall months, but the late pickings often contain many immature bolls which are subject to morning dews.

Boll rots become prevalent under conditions of high humidity around the cotton bolls. The major factors influencing boll rots (exclusive of boll worm and other insect injuries) are those which increase humidity such as (1) rankness of growth, (2) close spacing of cotton in the row and (3) poor aeration.

List 3 Suggestions

Possible remedies are (1) control of excess rankness by reducing irrigation and fertilizer, (2) spacing not less than six inches in fields producing large plants, and (3) improving aeration by bottom defoliation. Skip row planting (plant four, skip four) greatly improves aeration as half the rows are outside rows, and even the inside rows are better aerated.

The presence of free fatty acids in excess of 0.5% to 0.7% in cottonseed oil is very objectionable to oil mills as it gives the oil a darker color and rancid flavor. While such oil can be reclaimed, the treatment is an added expense.

Oil mills may expect to encounter high free fatty acid in early pickings and in very late pickings. Poor lots could be detected either by cutting samples on the spot, or by free fatty acid analysis before the lot is mixed with good seed. Years when free fatty acid content is high will probably be infrequent, but oil mills should run a careful check to detect these bad years.