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Trends in Alfalfa Production and the Beef and Dairy Industries in Kentucky During 1989-98

Dennis Hancock and Michael Collins

Introduction

On suitable soils, alfalfa produces the highest yield of nutrients possible from a perennial forage crop. However, high production costs and restrictive soil requirements have limited the production of alfalfa in Kentucky. High producing dairy cows respond well to premium quality forage, so alfalfa is a preferred forage crop in dairy production. Thus, alfalfa production is primarily contingent on the producer's method of marketing the crop.

Because production conditions in Kentucky limit visual characteristics of hay, domestic alfalfa production is used primarily in dairy and beef enterprises, instead of the horse industry. However, the high costs of alfalfa production may prevent its use and/or purchase by many dairy and, especially, beef enterprises as these operations realize shrinking profit margins. Agronomists believe that the limitations of alfalfa production can be minimized by use of advanced cultivars and new technologies such as round bale silage for reducing harvesting losses. Knowledge of relationships between

alfalfa production and dairy and beef enterprises would assist extension personnel in developing and directing educational and research activities appropriately. Therefore, the objectives of this study are to describe trends in alfalfa production and in the dairy and beef industries in Kentucky during 1989-1998 and determine if there are relationships between these industries.

Data Source and Analysis

Data were collected from the United States Department of Agriculture-National Agricultural Statistics Service's online database (1999) and annual publications from the Kentucky Agricultural Statistics Service (1989-98). Kentucky's total hay¹, alfalfa hay, and other hay data were collected for each year from 1945-1998. Indices for dairy and beef production, which included total dairy cow populations, average milk produced per cow, and total milk

¹ All hay production = Other hay production + Alfalfa hay production

production² and total beef cow populations were also collected for this period. To describe current trends in alfalfa production and the dairy and beef industries for Kentucky during the past ten years (1989-1998), only the yearly totals from this period were used. The use of annual totals for each parameter (variable) resulted in a relatively small number of observations (10) for this analysis. Although the predictive utility of the equations would have been greater if the trends were analyzed over a longer period of time to increase the number of observations, this reduction was necessary to allow us to assess recent trends. Regression equations were generated to determine if there was a trend in alfalfa production, other hay production, beef cow population, dairy cow population, average milk produced per cow, and total milk production over the past ten years.

Results and Discussion

Since 1945, alfalfa production has been increasing only moderately while all other hay production has increased several-fold (Figure 1). The dairy industry has also declined since 1945 while the beef industry has increased during this period (Kentucky Agricultural Statistics, 1997-98) (Figure 2). When alfalfa production is expressed as a percentage of total hay production for this period, a pattern is apparent (Figure 3). Alfalfa has traditionally been a major hay crop in Kentucky, especially before the mid 1960's. The steep drop in alfalfa production and alfalfa percentage during

1966 and 1967 is blamed primarily on the invasion of the alfalfa weevil (Pass, 1999, personal communication; and Kentucky Agricultural Statistics, 1968). Alfalfa production held at a low but fairly stable level until the mid-1980's. Alfalfa production as a percentage of all hay has declined since it reached a 23 year high in 1989 (Figure 3).

Current Trends:

All other hay production and the number of beef cows increased steadily between 1989 and 1998. Alfalfa hay production, total milk production, and the number of dairy cows have steadily declined during this same period (Figures 4, 5, and 6). Average milk production per cow has not changed during this same time period (Figure 7). Increases in milk production per cow have not been sufficient to offset declining dairy cow numbers, so total milk production has decreased substantially (Figure 6).

Alfalfa production is closely tied to the dairy industry. Production of milk, as with any other animal product, requires a ration, or mix of feedstuffs, at a certain quality and quantity to obtain a given level of productivity. Because the nutrient requirements of lactating dairy cows are higher than those of beef brood cows, the main beef enterprise in Kentucky, alfalfa is more often grown and/or purchased for use in the dairy industry than in the beef industry. In comparing alfalfa production and the dairy industry in Kentucky, one might postulate that the decline in alfalfa production may be associated with the decline in the dairy industry during the past decade.

However, the decline in the dairy industry does not explain all of the variation in alfalfa production. The

² Total milk production = Average milk production x Dairy cow numbers

decrease in alfalfa production has been slower than the decrease in total milk production and dairy cow numbers with each year. The significant increase in beef cow numbers during the past ten years may have resulted in slightly more alfalfa consumption, partially offsetting the effects of the decline in the dairy industry. However, more analysis is needed to determine how and to what degree these enterprises have affected the overall decline in alfalfa production in Kentucky. Increased usage by the beef industry might indicate that educational activities directed toward those producers during the past two decades have been successful.

The indications of these relationships, however, are that the future of the dairy industry, and perhaps alfalfa production, in Kentucky is not bright. If the current downward trend continues unchanged, the regression equation for dairy cow numbers predicts that they will reach zero in 2015 and the prediction for alfalfa acreage reaches zero two years later. If Kentucky beef producers make greater use of alfalfa, this trend could be altered. Increased backgrounding of calves or grazing of stocker cattle could utilize significant amounts of alfalfa as stored forage or pasture.

Conclusion

With the decline in the number of dairy cows and total milk production over

the past ten years, Kentucky's dairy industry is weakening. Alfalfa production in Kentucky has also decreased substantially in the 10 years since its 54 year high in 1989. It appears that the decline in the dairy industry has played a major role in declining alfalfa production but an expanding beef industry in Kentucky may offset reduced usage by dairy enterprises. Educational and extension activities should be adapted to changing patterns of alfalfa usage in Kentucky. Emphasis should be given to how the high yield and quality characteristics of alfalfa can be used to greater advantage by the beef industry in Kentucky.

References

Kentucky Agricultural Statistics. 1968, and 1989-1990 to 1997-1998. Kentucky Agricultural Statistics Service Louisville, Kentucky.

National Agricultural Statistics Service: On-line county database. 1999. www.usda.gov/nass

Pass, B. C. 1999. Personal Communication on the History of the Alfalfa Weevil in Kentucky.



Extension Soils Specialist

Figure 1: Kentucky hay production (1945-1998).

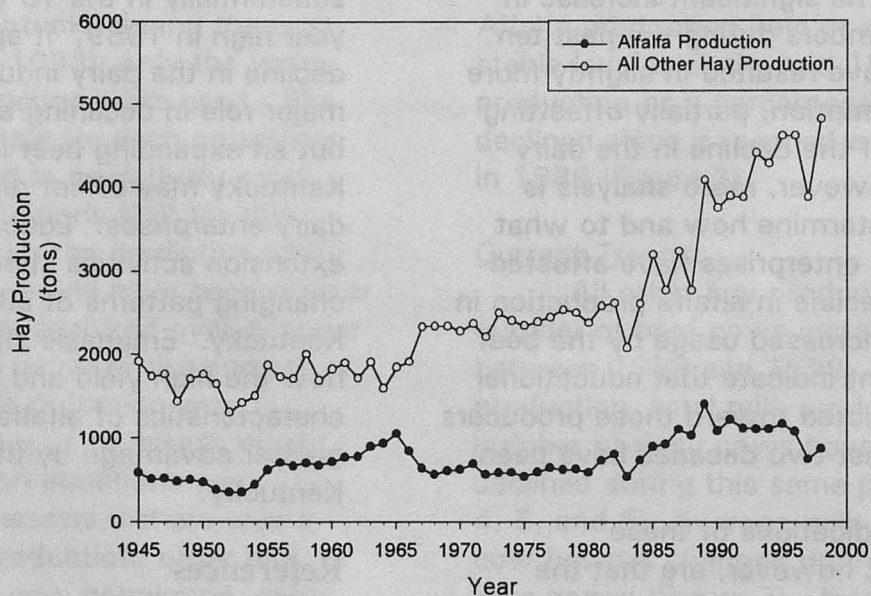


Figure 2: Beef and dairy cow numbers (1945-1998).

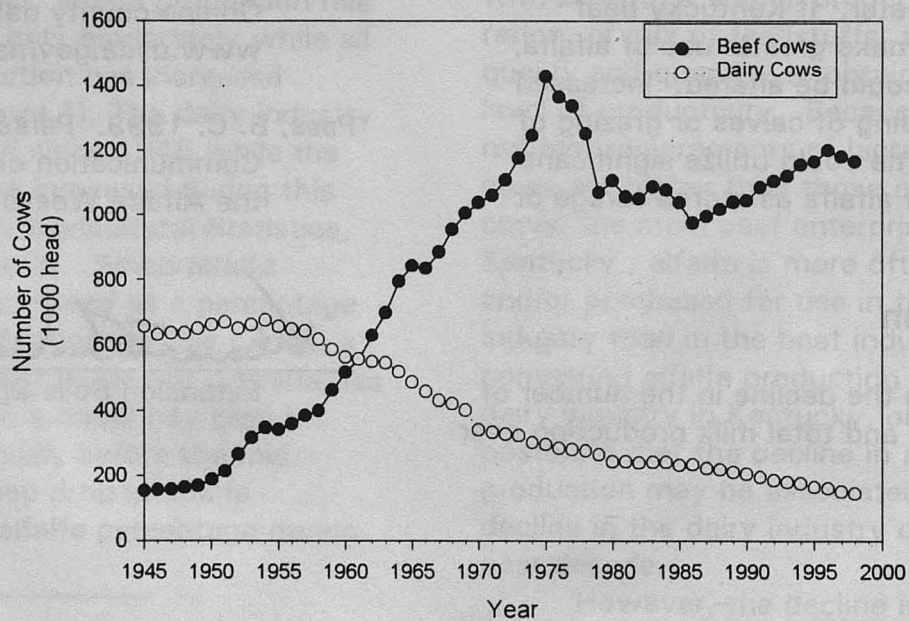


Figure 3: Alfalfa production, expressed as a percentage of all hay production (1945-1998).

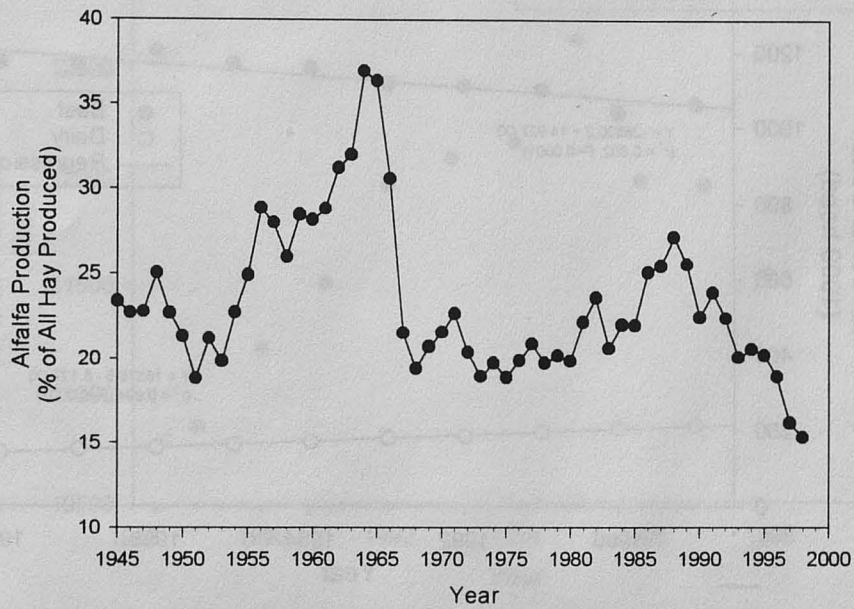
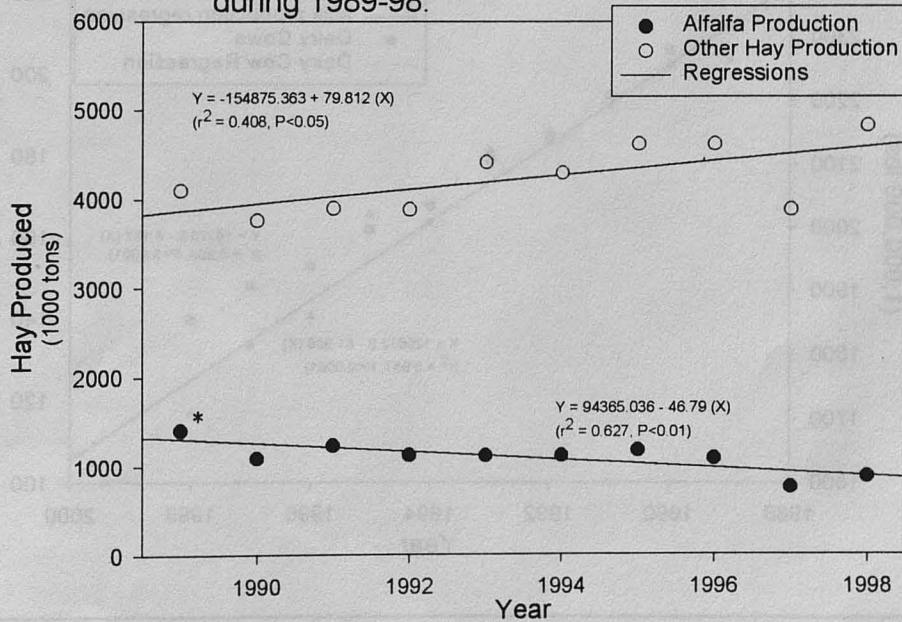


Figure 4: Alfalfa and other hay production in Kentucky during 1989-98.



* Alfalfa production was at a 50 year high in 1989.

Figure 5: The number of beef and dairy cows in Kentucky during 1989-1998.

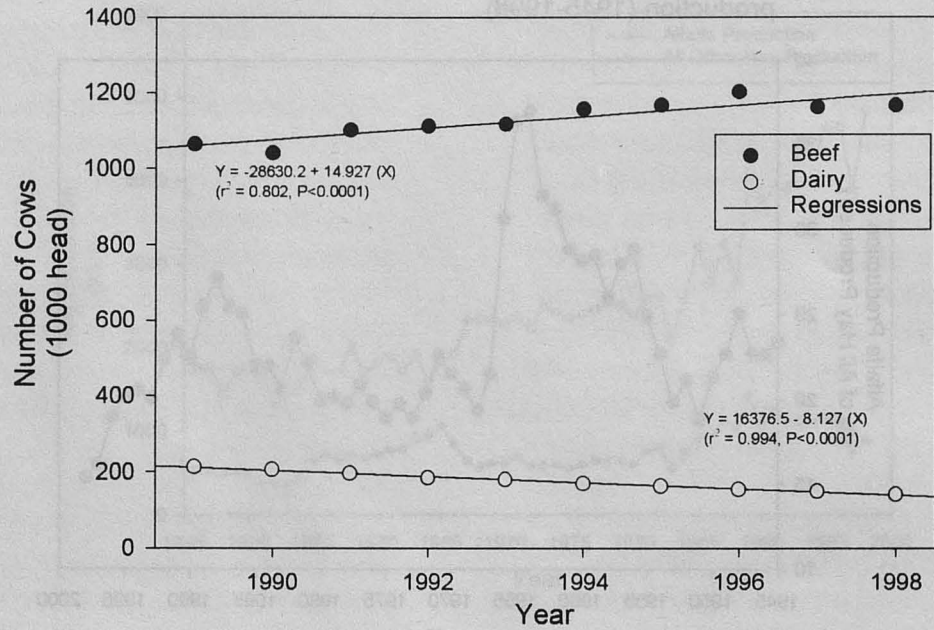


Figure 6: The decline in total milk production and the number of dairy cows in Kentucky during 1989-98.

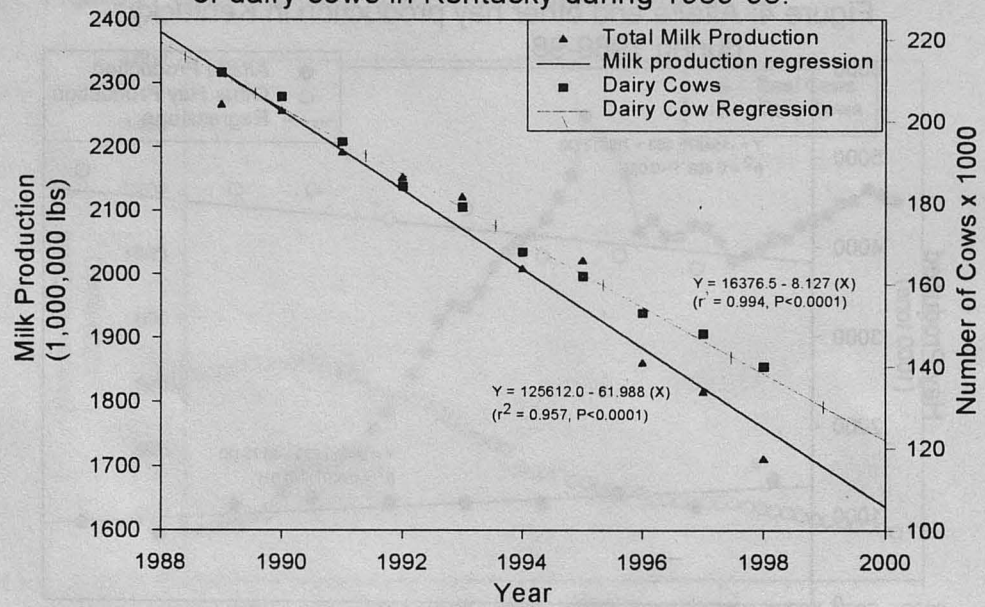
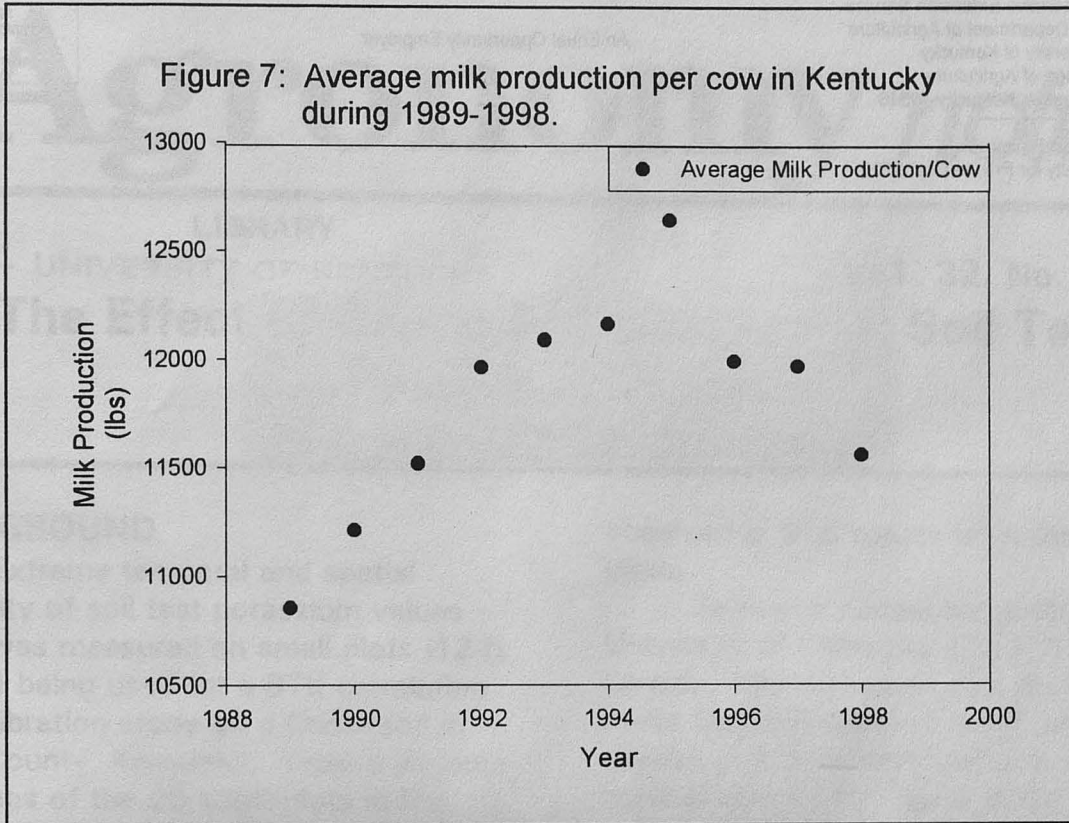


Figure 7: Average milk production per cow in Kentucky during 1989-1998.



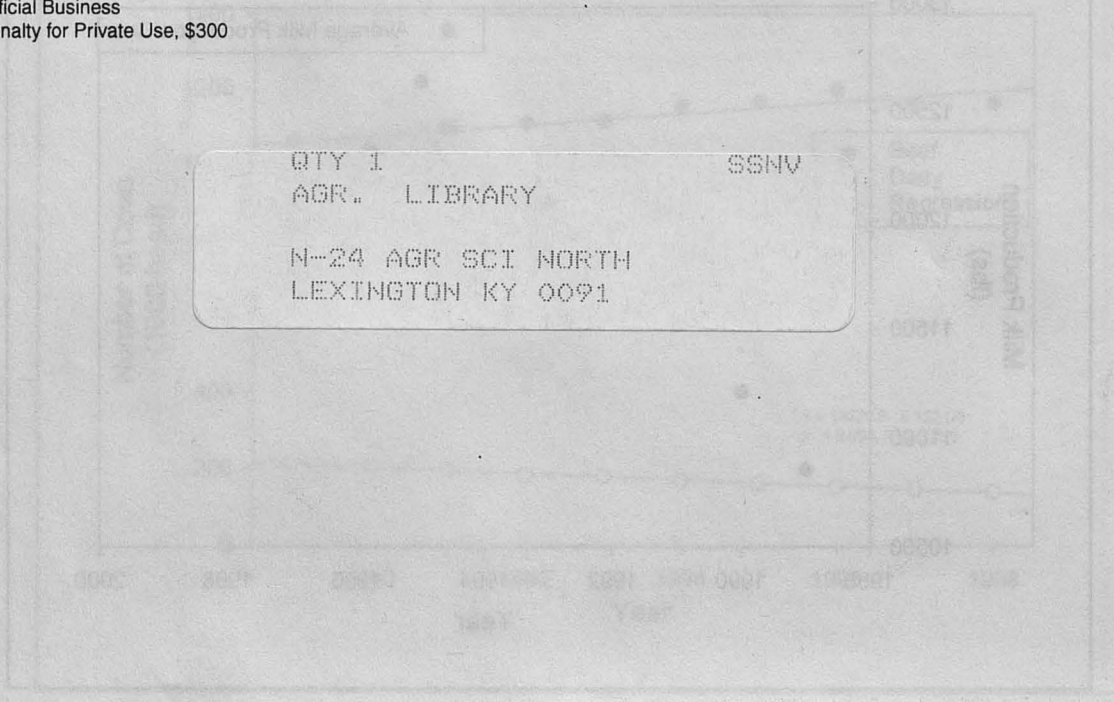
showed as much as 10% differences in many of the potassium, spatial variability of milk yield was much as 10% and the small parts of the farm... similar treatment... cause wide variations in... recommended... needed. Several... variability were... investigation... All... by the University of Kentucky... testing laboratory... quality control system... every 20... sample of... results of... them, indicated... not a likely cause of the...

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