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**LABOR
TURNOVER**

on Alabama
Dairy Farms

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LABOR TURNOVER on ALABAMA DAIRY FARMS*

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IN RECENT YEARS, farmers have had problems in securing and maintaining an adequate supply of qualified labor. Among the apparent factors affecting farm labor turnover is the wide disparity between farm and nonfarm wages.¹ Comparison of average hourly wages for farm and manufacturing workers in Alabama in 1974 indicated a difference of \$2.00 per hour, \$1.84 versus \$3.84 (3,9). Such differences in wages may partially explain the 3,000-person decline in the number of hired farm workers between 1971 and 1974, 18,000 versus 15,000 (1).

Also, labor turnover within agriculture is important. In either case, labor turnover upsets the continuity of the affected operation. The farm manager must strive to maintain productivity until a new employee can be hired. Two possible actions to meet this contingency involve distributing the work load among the remaining employees or securing temporary labor, either family or hired. The former action might involve a strained employer-employee relationship and additional labor problems while the latter action would entail familiarizing and training the temporary employee relative to the work task. Either situation probably will result in reduced labor efficiency. Once an acceptable employee is hired, the familiarization and training process must be initiated. Again, productivity may lag during this transition period. After the new employee has been trained and is performing satisfac-

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¹ Labor turnover represents the ratio of the number of full-time employees leaving a particular farm to the number of employees on the farm.

torily, there is no guarantee that he will not change jobs. Obviously, the time, effort, and costs associated with labor turnover can be large. However, effective management decisions relative to the work environment can minimize the impact of labor turnover and result in increased productivity and larger profits.

Labor is an important input for the dairy enterprise. This requirement is generally met by both family and hired sources. A 1971 Alabama study found that 90 percent of the dairy farms sampled utilized some hired labor (5).² After imputing a value for family labor, this study and a more recent analysis (4) indicated that total labor costs (hired and family) comprised approximately 20 percent of total costs.

The dependence on hired labor coupled with the disparity between farm and nonfarm wages and the apparent resulting decline in the supply of quality farm labor have resulted in labor being one of the major problems facing Alabama dairymen. The recent high unemployment rates have made it possible for some Alabama dairymen to acquire temporarily adequate numbers of laborers. However, this situation has occurred in only a few isolated cases near the larger industrial centers of the State.

Exit of some dairymen from the industry can, in part, be attributed to inadequate labor. The number of Grade A dairies in Alabama declined from 850 in 1969, to 694 in 1971, and to 585 in July 1974 (2,6). These declines would be expected to alleviate some of the problems by freeing workers for employment on the remaining operations. However, economic and social impediments to mobility have limited the impact of this occurrence.

Some dairymen have attempted to minimize the impact of variations in the quantity and quality of hired labor by decreasing or at least not expanding the size of their operation. Thus, they must rely primarily on family labor. However, some of these smaller units may not be able to achieve economies of operation or generate acceptable levels of income.

The future of the Alabama dairy industry is dependent to a large degree on an adequate supply of qualified full-time labor. The quality of farm labor, capabilities of management, and characteristics of the dairy farm are of prime importance in achieving higher productivity per man hour, holding a good labor force, and competing with non-agricultural job opportunities. This study

²Full-time hired labor is defined as a person who is or would be employed 200 or more days per year and who works 30 or more hours per week.

will analyze the labor situation on Alabama dairy farms with particular emphasis on isolating farm related factors affecting the rate of turnover of full-time hired labor. More specifically, characteristics of the farm manager, farm employee, and the farm will be analyzed to ascertain factors that are important in attracting and retaining full-time hired labor.

DATA AND MODEL

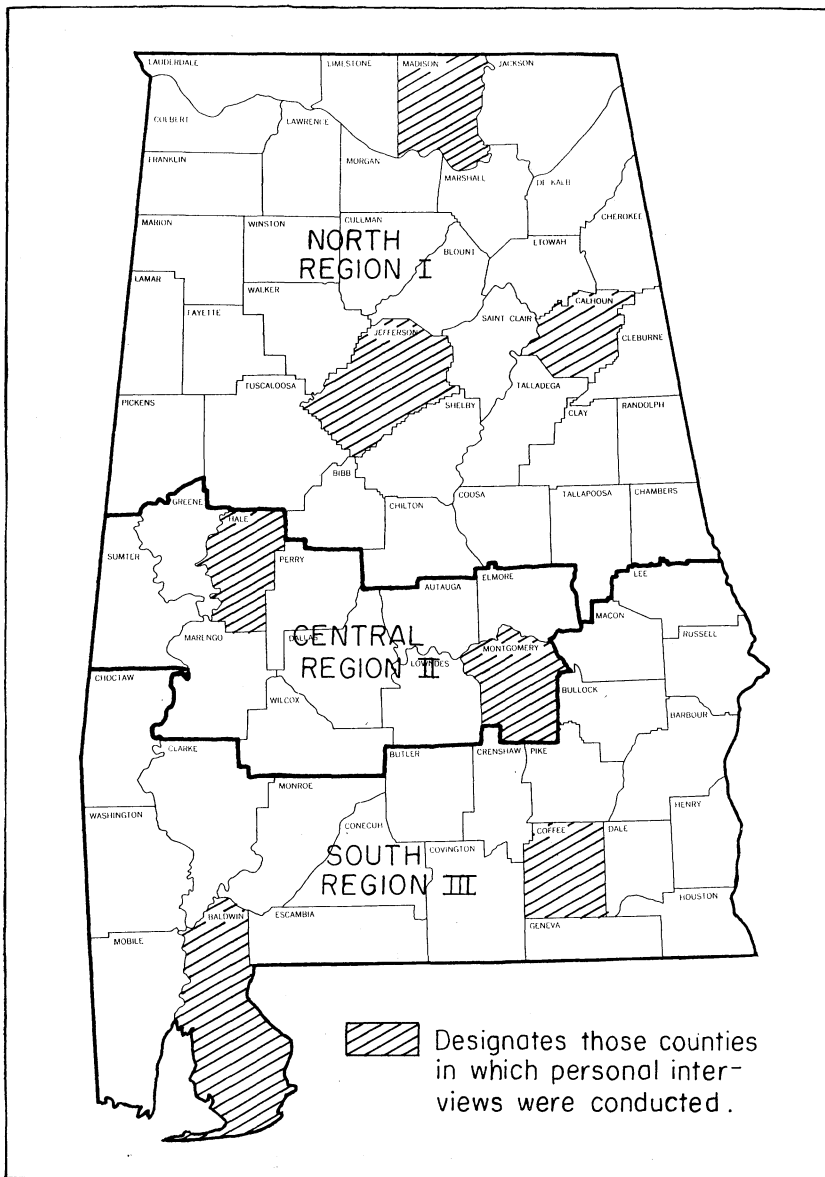
Data were collected by personal interview of 60 dairymen in 1971. The State was divided into three regions: north, central, and south, with the central section being the Black Belt counties, see figure.³ Seven counties were selected for intensive study based on two criteria: geographic dispersion of dairies within each region and concentration of dairies within the respective counties. To ensure that each sample farm would employ full-time labor, only dairies with milk sales of more than 300,000 pounds during the 6-month quota building period of 1970-71 were included in the sample. This procedure biased the sample toward larger units and away from farms with low annual production and small herds. However, these smaller units would likely be more dependent on family labor and thus would be of less importance in this analysis.

The theoretical basis of labor turnover in agriculture is not fully developed. Wage rates, working conditions, perquisites, and other remuneration merit consideration as important factors influencing labor turnover. However, the relationship of other factors to labor turnover has not been well-defined.

The agricultural related factors hypothesized to influence labor turnover can be separated into three groups: (1) factors primarily related to the farm, (2) factors primarily related to the farm employee, and (3) factors primarily related to the farm manager. The first grouping includes farm location, hourly wage rate, value of perquisites, type of ownership, number of cows, years facility has been in use, number of workers, bonus paid, vacation provided, percent of income from dairying, and overtime required. Factors primarily related to the worker are race, age, education, health status, occupational background, lifetime back-

³The decision to partition the State into three regions was based on a prior study by Long (8) which isolated differences in production characteristics among these areas.

ground, type of work, and abilities as evaluated by the employer. Characteristics of the farm manager evaluated include age, education, years farmed, average work hours, lives on the farm, and has off-farm job.



Regions and sample counties utilized for dairy labor study.

Multiple regression analysis was utilized to reflect the relationship of these factors to the rate of labor turnover on Alabama dairy farms. These structural parameters were estimated using the following final statistical model:⁴

$$LT = a + b_1L_1 + b_2L_2 + b_3WR + b_4VP + b_5AM + b_6ME + b_7CW + b_8O_1 + b_9O_2 + b_{10}YF + b_{11}RW + b_{12}EA + b_{13}EE + b_{14}H_1 + b_{15}H_2 + b_{16}H_3 + b_{17}BA + b_{18}BE + b_{19}E_1 + b_{20}E_2 + b_{21}DP + b_{22}GC + b_{23}MA + b_{24}CE + b_{25}ED + b_{26}OT + b_{27}PV.$$

where:

LT = rate of labor turnover per farm by individual employee which was calculated as the ratio of the number of full-time employees who left the farm during the last 5 years divided by the present number of full-time employees adjusted for new and terminated positions times 100 to place the figure on a percentage basis.

L_0-L_2 = location of farm (south, north, and central).

WR = hourly wage rate.

VP = monthly value of perquisites which includes payments for social security, housing, milk, utilities, workmen's compensation insurance, hospital insurance, telephone service, food items other than milk, and meals for employees.

AM = age of the farm manager.

ME = education attained by the farm manager.

CW = cows per worker.

O_0-O_2 = type of ownership (proprietorship, corporation, and partnership).

YF = years dairy facility has been in use.

RW = race of the employee (black and white).

EA = age of the employee.

EE = education attained by the employee.

H_0-H_3 = health status of the employee (excellent, good, fair, and poor).

BA = occupational background of the employee (non-agriculture and agriculture).

⁴ Several of the factors hypothesized to influence the rate of labor turnover were deleted from the final statistical model because of multicollinearity. For example, number of cows and number of workers are highly related. Thus, these factors were combined into a variable designated as cows per worker to reflect the composite impact of these factors and avoid the problems created by high correlation of independent variables. Other related factors which were deleted were years farmed by the manager, average work hours of the manager, manager lives on the farm, manager has off-farm job, employee is paid a bonus, and percent of income from dairying.

BE = lifetime background of the employee (non-farm and farm).

E₀-E₂ = job of the employee (milker, milker and general farm hand, and general farm hand).

DP = employee is dependable (no and yes).

GC = employee is good with cows (no and yes).

MA = employee had mechanical ability (no and yes).

CE = employee is careful with equipment (no and yes).

ED = employee can make management decisions (no and yes).

OT = job requires overtime (no and yes).

PV = vacation is provided for employees (no and yes).⁵

Specification of the direction of impact of these factors on labor turnover is fostered by reliance on formulated theory, knowledge of the study area, and previous relevant research. Generally, labor turnover would be expected to vary inversely with changes in hourly wages and the value of perquisites. Also, the hypothesized relationship between labor turnover and the availability of vacation time for the employee would be inverse. Positive variation would be expected between the rate of labor turnover and such factors as cows per worker, years facility has been in use, and whether overtime is required. In these cases, cows per worker and overtime required may reflect the work-load on the employee while the age of the facility may give an indication of working conditions. Inferences relative to the direction of impact of other factors were limited because *a priori* information concerning these relationships was insufficient.

RESULTS

General Characteristics

An analysis of characteristics of dairy farms, dairy farm employees, and dairy farm managers provides a basis for profiling the larger dairy units in Alabama. Dairying contributed 82 percent of the total income generated on the operations studied, Table 1. Average age of dairy facilities on these farms was 16.5 years. Almost 71 percent of these farms were owned individually. The remaining farms were organized as partnerships (20 percent) or corporations (9 percent). Average herd size was 112 cows.

⁵Zero-one dummy variables were utilized to analyze the impact of all factors except hourly wage, value of perquisites, ages of the manager and employee, education levels attained by the manager and employee, cows per worker, and age of the facility. The initial class in each category, as indicated, was excluded to avoid singularity.

TABLE 1. AVERAGES AND STANDARD DEVIATIONS FOR CHARACTERISTICS OF DAIRY FARMS, DAIRY FARM EMPLOYEES, AND DAIRY FARM MANAGERS, ALABAMA, 1971¹

Characteristics	Measurement	Average	Standard deviation
Dairy farms:			
Rate of turnover.....	percent	148.5	218.6
Wage rate.....	\$/hr.	1.50	0.63
Value of perquisites.....	\$/mo.	87.91	52.15
Total cows.....	head	112.0	46.9
Cows per worker.....	head	44.8	22.3
Age of facility.....	years	16.5	11.4
Income from dairying.....	percent of total	81.9	19.2
Employees.....	number	2.5	1.5
Corporation.....	percent	8.6	---
Partnership.....	percent	20.6	---
Overtime required.....	percent	37.3	---
Vacation is provided.....	percent	44.0	---
Bonus paid.....	percent	61.3	---
Job change—other dairy.....	percent	19.0	---
Job change—nonag.....	percent	66.0	---
Job change—ag. nondairy.....	percent	15.0	---
Dairy farm employees:			
Age.....	years	39.0	15.1
Education.....	years	6.5	3.7
Race—white.....	percent	54.7	---
Health—good.....	percent	60.7	---
Health—fair.....	percent	12.7	---
Health—poor.....	percent	4.0	---
Occupational background—farm.....	percent	68.7	---
Lifetime background—farm.....	percent	89.3	---
Milker and general farm hand.....	percent	8.0	---
General farm hand.....	percent	30.7	---
Dependable.....	percent	8.0	---
Good with cows.....	percent	8.0	---
Has mechanical ability.....	percent	44.7	---
Careful with equipment.....	percent	14.7	---
Can make management decisions.....	percent	69.3	---
Dairy farm manager:			
Age.....	years	49.5	10.9
Education.....	years	13.2	2.7
Years farmed.....	years	23.6	10.2
Hours worked.....	per week	56.2	26.4
Lives on farm.....	percent	83.3	---
Has off-farm job.....	percent	25.3	---

¹ Minor discrepancies between averages presented in this table and averages presented in Bulletin 475 resulted from differences in the base for analysis and the resulting weighting factors (7). This study utilized the worker as the unit of analysis while Bulletin 475 used the farm as the unit of analysis.

With this herd average and 2.5 workers per farm, there were 44.8 cows per worker.

Alabama dairy farms experienced an average rate of labor turnover of 148.5 percent over the 5-year period of analysis. That is, the full-time labor force adjusted for new and terminated positions was replaced almost one and one-half times during the 1966-71 period. Given the average full-time hired labor force per

farm of 2.5 workers, this translated into almost four different employees on the farm during this time span. Almost two-thirds of the workers terminating their employment on dairy farms accepted non-agricultural related jobs. About a fifth of the workers changing jobs accepted positions on other dairy farms while 15 percent remained in agriculture but in employment not related to dairying.

Remuneration could be an important factor influencing labor turnover. For the farms analyzed, employees were paid an average hourly wage of \$1.50. They also received perquisites with an average value of \$87.91 per month which amounted to approximately \$.42 per hour for the average worker. Further, employees were provided vacation time on 44 percent of the farms and bonuses on 61 percent of the operations. Thirty-seven percent of the dairy farms had tasks which required overtime.

Employees on the farms studied averaged 39 years of age and had completed 6.5 years of education. Fifty-five percent of these individuals were white. Twenty-two percent were considered to be in excellent health while 61, 13, and 4 percent were in good, fair, and poor health, respectively. Sixty-nine percent of the employees had been previously employed in jobs related to agriculture. Similarly, 89 percent were raised on a farm. The majority of the dairy farm employees were hired as milkers. However, 31 percent were hired as general farm hands and 8 percent performed both tasks.

Employees were evaluated by the dairy farm managers relative to certain personal traits and abilities. Only 8 percent of the employees were judged dependable or good with cows. Similarly, only 15 percent were believed to be careful with equipment. Employees were given more favorable evaluations relative to possession of mechanical ability and ability to make management decisions, 45 and 69 percent, respectively.

Characteristics of the farm manager may also influence labor turnover. Dairy farm managers averaged 49.5 years of age and 13.2 years of formal education. As a group, they averaged almost 24 years experience in farming. Eighty-three percent lived on the farm and 25 percent had off-farm jobs. They also devoted an average of 56.2 hours of work to the farm per week.

Statistical Analysis

The model explaining variations in labor turnover was acceptable considering the use of cross-section data. Variation of the independent factors included in the model explained 53 percent of the variation in full-time labor turnover, Table 2.

Labor turnover differed by the regional location of the farm. Turnover was significantly different between the south and central regions, but was not different between the south and north

TABLE 2. ESTIMATES OF STRUCTURAL COEFFICIENTS FOR FACTORS AFFECTING THE RATE OF LABOR TURNOVER ON DAIRY FARMS, ALABAMA, 1971

Factor	Coefficient	Standard error
Intercept	654.64***	155.58
Location		
South ¹		
North	-63.31	43.21
Central	-89.66*	51.46
Wage rate	-0.43	27.48
Value of perquisites	-0.67**	0.31
Age of manager	-0.35	1.66
Education of manager	-18.84***	6.19
Cows per worker	2.19***	0.80
Type of ownership		
Proprietorship ¹		
Corporation	201.26***	61.57
Partnership	-11.44	37.92
Age of facility	2.84*	1.49
White	49.51	38.92
Age of employee	-0.39	1.17
Education of employee	5.18	4.77
Health status of employee		
Excellent ¹		
Good	-71.76*	40.65
Fair	-46.12	52.86
Poor	-71.42	83.96
Occupational background—farm	70.72*	37.61
Lifetime background—farm	-358.31***	50.56
Job of employee		
Milker ¹		
Milker and general farm hand	65.67	56.45
General farm hand	18.97	35.46
Employee is dependable	96.57*	58.85
Employee is good with cows	-107.62*	60.84
Employee has mechanical ability	-1.23	34.87
Employee is careful with equipment	33.03	47.37
Employee can make management decisions	-18.62	36.06
Job requires overtime	19.27	33.53
Vacation is provided for employee	-27.13	38.50
R ²		.53
F-ratio		5.13

¹ Class omitted to avoid singularity.

* Coefficient is significant at the .10 level.

** Coefficient is significant at the .05 level.

*** Coefficient is significant at the .01 level.

regions.⁶ Dairy farms in the central region experienced labor turnover which was 90 percent less than that noted in the south region.

Factors representing remuneration were inconsistent relative to significance in the model. Contrary to expectations, the hourly wage rate received by the dairy farm worker and the availability of vacation time were not significant contributors to variation in labor turnover. The only remunerative factor judged to be significant was the monthly value of perquisites received by employees. As was expected, an increase in the value of perquisites would tend to decrease labor turnover. However, this response was less than 1 percent per dollar change in monthly perquisites.

An analysis of other characteristics of the farm isolated factors which significantly influenced the rate of labor turnover. Cows per worker, type of ownership, and age of the facility were significant factors in explaining variations in labor turnover while the requirement of overtime work on the farm was not significant. As was expected, labor turnover increased by 2 percent for each cow added per worker and by almost 3 percent for each year of additional age of the facility. The few dairies organized by corporate charter had labor turnover more than twice that noted on dairy farms operated on an individual basis. Differences in labor turnover between dairies operated by individuals and on a partnership basis were not significant.

Various traits and abilities of the employee were identified as being significant contributors to labor turnover. Employees bearing different health characteristics, having an agricultural lifetime background, who were dependable, and who were good with cows experienced significant differences in labor turnover. Employees who were evaluated as being in good health had a rate of turnover which was 70 percent less than that noted for employees designated as being in excellent health.

About a third of the dairy employees had previously worked at nonfarm jobs. Length of employment of these employees was less than for those with only farm work experience. However, employees who had worked at nonfarm jobs had a turnover rate 71 percent less than noted for employees with only agricultural work experience. Apparently, the group with off-farm work experiences

⁶ For this study, the null hypothesis was rejected at the .10 level. However, significance probabilities at the .10, .05, and 0.1 levels were presented in the tables. All references to significance in the text refer to the .10 level or less.

had a better perception of their employment alternatives and were more satisfied with dairy employment.

Approximately 10 percent of the dairy labor force did not "grow-up" on the farm. These individuals were more likely to change employment than workers who had lived their entire life on the farm. The model showed a turnover rate 3.5 times greater for the workers reared off-the-farm than for those with only an agricultural background.

Farm managers viewed dependability and being good with cows as two particularly important characteristics in their employees. Unfortunately, the turnover rate of employees who were evaluated as being dependable was twice the rate for workers not considered dependable. However, the few workers considered to be good in handling cows (only 8 percent) had turnover rates half that of workers not as adept with cows. Other characteristics and traits of the employee such as race, age, education, type of job performed on the dairy, and the manager's evaluation of the employee relative to mechanical ability, care with equipment, and ability to make management decisions were not found to be significantly related to labor turnover at acceptable levels.

Educational attainment of the dairy farm manager had a significant influence on labor turnover, but the age of the manager did not. Labor turnover was reduced by 19 percent for each additional year of education attained by the farm manager.

SUMMARY AND CONCLUSIONS

The labor problem on Alabama dairy farms is complex. Factors inherent to the dairy operation such as characteristics of the farm manager, farm employees, and the farm affect labor turnover. Also, factors outside the realm of agriculture have an important impact. This analysis attempted to explain the impact of agricultural related factors on labor turnover on Alabama dairy farms.

A capsule of the full-time hired labor situation might include the following description. Dairy farm employees had low educational attainment and averaged almost 40 years of age. A relatively large number of the workers were black, particularly in Central Alabama. Most of the workers were "farm-raised" and had little off-farm work experience. Wage rates received by these workers were low when compared to off-farm opportunities. However, perquisites such as housing, food items, utilities, hospital insurance, telephone service, etc. supplemented wage rates. Also,

some workers received bonuses and vacation time. Many dairy farm employees worked overtime which was often vaguely defined by farm managers.

Characteristically, managers of these farms were about 50 years of age, relatively well-educated, and hard working individuals who had many years of experience in agriculture. Most managers lived on the farm but a few had off-farm jobs. Managers were generally not satisfied with the traits and abilities of their employees. On the average, a dairy farm lost one employee per year. This worker generally accepted employment outside agriculture.

Fifty-three percent of the variation in full time hired labor turnover on Alabama dairy farms was explained by farm related factors. Labor turnover increased with increases in the number of cows per worker and age of the facility. Labor turnover was greater for farms organized by corporate charter rather than individually owned. Turnover was greater for employees who had only farm related work experience or who were evaluated by the manager as being dependable. Conversely, labor turnover decreased with increases in the value of perquisites provided employees and educational attainment of the manager. Further, labor turnover was less for dairy farms located in the central rather than the south region, employees in good health rather than excellent health, employees who were "farm reared," and employees evaluated by the manager as being good with cows.

A general statement summarizing the full time hired labor situation on Alabama dairy farms might be that dairy farms attracted workers with skills compatible with the pay offered and workers received pay compatible with their skills. Obviously, there were exceptions to this statement because some workers were skilled and some dairymen did pay competitive wages. However, many dairymen did indicate dissatisfaction with the traits and abilities of their employees. Also, employees did not project an image of overwhelming opportunity; that is, many of the workers were beyond middle-age, had little formal education, and lacked non-farm work experience.

Level of farm wages did not significantly influence labor turnover. However, the disparity between farm and nonfarm wages, or at least some unidentified nonfarm factor, seemed to be attracting farm labor. Two-thirds of the workers leaving dairies accepted nonfarm employment. Dairy farmers must narrow the farm labor-industrial labor wage-benefit gap if they are to attract

qualified workers. Even then, acceptable employees may not be available in certain areas.

Dairy farm managers should exercise caution in evaluating labor relative to wages alone. Employee productivity is also a prime consideration. "Cheap" labor may be costly in terms of efficiency, whereas a higher paid worker may be more productive and thus actually decrease cost per unit of output in the long run. The adage, "You get what you pay for," is often appropriate for dairy farm labor situations.

Effective management decisions relative to the work load and conditions of employment can decrease labor turnover and improve operational efficiency. The effective manager strives for high output per worker without adversely affecting the employer-employee relationship. A high ratio of cows per worker may induce increased turnover, while a low ratio is economically inefficient. Upkeep and modernization of the barn and milking facilities can affect this relationship. Increased automation in the dairy operation means that labor can maintain output with less effort or increase output with the same effort.

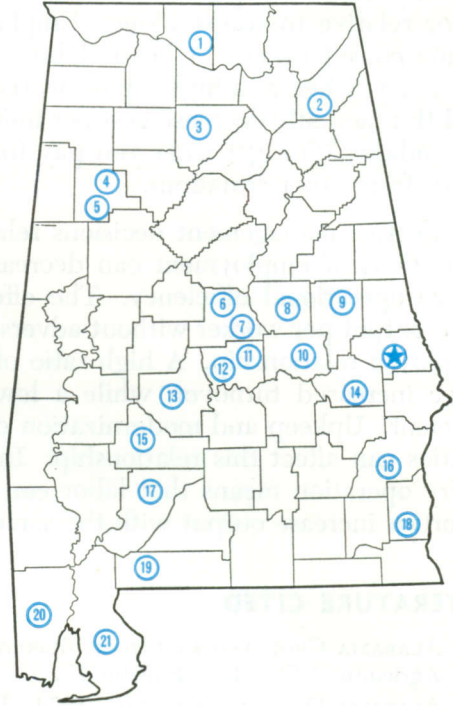
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Alabama's Agricultural Experiment Station System

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With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, live-stock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill.
21. Gulf Coast Substation, Fairhope.