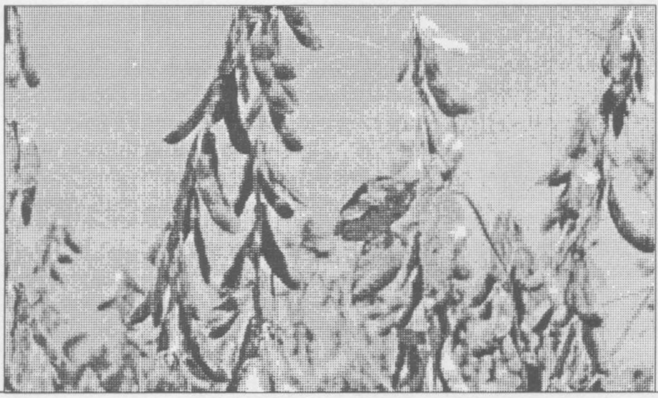

# Research Update 1989

# SOYBEANS

## New Report Inaugurated

**This is the first report in a new research series, called "Research Update," being inaugurated by the Alabama Agricultural Experiment Station (AAES). The new series is meant to promote timely reporting of research results to producers of specific crops or commodities. Each report will be identified with the crop or commodity and year—"Research Update Soybeans 1989" in this case. Others will follow the same pattern.**

**Plans call for annual issues of the Research Update series to assure that latest research information from Auburn is made available to producers. Efforts will be made to maintain up-to-date mailing lists so all Alabama producers will receive the reports.**

**Today's highly competitive conditions make it doubly important that farmers have available the latest scientific information. This new publication series is being produced to help meet that need.**

**Other information about soybean production and latest recommendations are available from each county Extension Service office in Alabama.**

## Mo, Lime Increase Yields

Soybean yields increased with applications of lime, molybdenum (Mo), or both in research on two AAES substations and on farmers' fields where soil pH was low. Response to Mo varied from one field to the next, and use of Mo did not eliminate the need for lime on acid soils. However, cost of a Mo seed treatment that will supply Mo needs was so low that even a 1-bushel per acre soybean yield increase would more than pay it. Therefore, small yield increases were profitable.

Yield responses in plots that had been in long-term fertility studies, summarized below, show the value of lime and Mo in north Alabama:

| Long-term treatment (lime-fertilizer) | Yield per acre, 1985-87, bushels | | | |
|---|---|---|---|---|
| | Tenn. Vall. Sub. | | Sand Mt. Sub. | |
| | No Mo | With Mo | No Mo | With Mo |
| Unlimed-fertilized (pH 4.8-5.4) | 28 | 40 | 18 | 33 |
| Limed-fertilized (pH 5.6-6.0) | 37 | 40 | 32 | 37 |
| Limed-not fertilized (pH 5.0-5.8) | 21 | 31 | 12 | 17 |
| No lime or fertilizer until 1979 (pH 5.8-6.0) | 24 | 32 | 30 | 36 |

Results from an acid Vaiden clay soil in Perry County illustrate value of Mo on fine-textured soils of the Black Belt when lime is not added. At soil pH of 5.0, yields were as follows:

- No lime-no Mo....................19 bu.
- Mo added...........................27 bu.
- Lime added .........................29 bu.
- Lime, Mo added .................29 bu.

Slight yield advantages showed up from both lime and Mo in tests on 15 north Alabama fields, where pH ranged from 4.6 to 5.6, as follows:

- No lime-no Mo....................25 bu.
- Mo added...........................32 bu.
- Lime added .........................34 bu.
- Lime, Mo added...................36 bu.

Because of these results, the Alabama Cooperative Extension Service now recommends Mo for soybeans on all soils of north Alabama and on fine-textured soils in other areas of the State.

**Charles Mitchell and C.H. Burmester**

## Cotton-Soybean Rotations Boost Yields of Both

Recent results from the Brewton Experiment Field strongly indicate that rotating soybeans with cotton can greatly improve yield of both crops without increasing production costs. The beneficial effects of soybeans on cotton were apparent the first year of the rotation and the effects continued through the 4-year test period.

For the 4-year period reported in the table, seed cotton yields averaged about 500 pounds per year higher when soybeans rather than cotton was the previous crop (soybean-cotton rotation). The beneficial effect of cotton on soybean yield was not noticeable until the third year. During the third and fourth years, however, soybean yields averaged 14 and 21 bushels per acre higher when cot-

Alabama Agricultural Experiment Station Auburn University
Lowell T. Frobish, Director Auburn University, Alabama

Effect of Crop Rotations on Soybean and Seed Cotton Yield at the Brewton Experiment Field

| Cropping system | Per acre yield 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|
| Soybean yield, bushels | | | | |
| Following soybeans (continuous) | 41 | 29 | 15 | 11 |
| Following cotton (rotation) | 44 | 30 | 29 | 32 |
| Seed cotton yield, pounds | | | | |
| Following cotton (continuous) | 3,000 | 2,630 | 2,610 | 2,310 |
| Following soybeans (rotation) | 3,300 | 3,370 | 3,010 | 2,950 |

ton rather than soybeans was the previous crop.

Using values of $0.80 per pound for cotton lint and $6.50 per bushel for soybeans, the crop rotation in the fourth year alone would have increased gross income $189 per acre for cotton and $137 per acre for soybeans.

**J. T. Touchton**

## No-till, Strip Till Show Production Advantages

Using conservation tillage instead of conventional tillage in soybean rotations at the Sand Mountain Substation, Crossville, resulted in (1) delayed build-up of crop-damaging cyst nematodes in the soil, and (2) higher soybean yields. This was true with rotations of soybeans-corn and wheat-soybeans-corn. Furthermore, the rotations in most cases increased soybean yields over continuous soybeans.

| Cropping system | Yield, by tillage system Conventional | Strip | No-till |
|---|---|---|---|
| Continuous soybeans | 23 bu. | 30 bu. | 35 bu. |
| Soybeans-corn | 32 bu. | 39 bu. | 39 bu. |
| Wheat-soybeans-corn | 35 bu. | 36 bu. | 31 bu. |

The two conservation tillage systems tested were (1) strip tillage (killing the wheat with herbicides, tillage with a chisel to 12 inches, pulling soil over the chisel area, and planting; and (2) no-tillage (planting in the killed crop residue with a double disk-opener planter). The conventional tillage compared was moldboard plowing the wheat cover in the spring, disk incorporation of herbicide, and planting conventionally on the surface.

Plots with conventional tillage had a quick build-up of cyst nematodes. In contrast, conservation tillage plots had slow population build-up. In fact, the less tillage used, the slower the populations developed. Cyst nematode counts were beginning to pick up at the end of the 4-year test, but strip tillage production continued to show highest yields with Essex variety soybeans. The highest individual average yield was 39 bushels per acre from both no-till and strip-till soybeans rotated with corn. Corn in the rotation averaged about 137 bushels per acre for conservation tillage systems.

Four-year average yields under the three tillage systems are listed below for continuous soybeans and for both rotations.

**D. L. Thurlow**

## Model Based on Weather Assures Fungicide Profits

Midseason diseases of soybeans, including frogeye, anthracnose, and brown spot, reduce yields by up to 20 percent in Alabama. Recent AAES research indicates timely treatment of these diseases with recommended fungicides can provide a big payback for growers.

To provide a guide for growers, a model based on weather factors was developed. Since these midseason diseases affect yield only after flowering (RI) and during podfill (R2-R5), the model is designed to monitor soybeans only during these growth periods.

After the RI stage, records are kept, and when 2 or more days of rain, extended fog, or heavy dew are recorded in a 4-day period, plus 2 more days of precipitation are predicted in the next 5-day period, application of a systemic fungicide, such as Benlate®, is made. If a fungicide is applied at this time, records need not be kept for the next 8 days. After 8 days, record keeping resumes, and if moisture occurs 2 days in a 4-day period and more is predicted for 2 days out of the next 5 days, a second fungicide application is needed. In this manner, up to three fungicide applications may be made during podfill (R2-R5).

The perception by many soybean growers is that fungicide use is only marginally rewarding, and above average prices are necessary to profit from the use of these chemicals. This is not the case. Even at prices of $6.00 per bushel, the predictive spray program repeatedly paid for itself and provided a good profit on investment. Programmed spray schedules, on the other hand, sometimes paid and sometimes didn't, providing a large element of risk for growers.

**Paul Backman**

## Variety, Rotations More Vital than Nematicides

While nematicides are important tools in fighting yield-robbing nematodes, these chemicals can't replace good varietal selection and crop rotation, according to recent AAES results.

Seven of the top soybean varieties grown in Alabama were compared, and each of these varieties was planted in plots treated with 2 pounds per acre active ingredient of Temik® and in untreated plots. Soil in these plots was heavily infested with peanut root-knot and cyst nematodes. These varieties, which differ in nematode resistance, were also planted in plots following 1 year of corn and in a continuous soybean monoculture.

Braxton in nontreated plots following soybeans produced only 23 bushels per acre in 1987. The same variety following soybeans, but with Temik, produced 32 bushels per acre. Braxton beans grown in plots that were planted in corn the previous year, and not treated with Temik, produced 45 bushels per acre. Adding Temik to the corn-soybean rotation increased yields to 53 bushels per acre. The other varieties in the test, Centennial, Forrest, Gordon, Kirby, Leflore, and Ransom, also had higher yields in rotation plots versus nematicide-treated ones. Kirby and Leflore each had about a 5-bushel per acre advantage for the rotation, compared to a 10- to 15-bushel advantage for the other varieties.

Each of the varieties in plots following corn showed a positive response to Temik. Forrest, for example, showed a 12-bushel per acre advantage for treated versus untreated plots planted in rotation with corn. The average response of the seven varieties was about 7 bushels per acre in the plots that followed corn. In the soybean monoculture, the average of the seven varieties also showed a 7-bushel per acre advantage for treated versus untreated plots. The average of all varieties in the soybean monoculture treated with Temik was 36 bushels per acre, compared to 46 bushels per acre for the corn-soybean rotation, without the nematicide.

The top net dollar return among varieties and treatments in the test was from Braxton, treated with Temik and grown in a soybean/corn rotation, see table. This combination produced a net return of $203 per acre. Braxton, Forrest, and Ransom varieties showed negative returns of $39-$93 in plots planted in a soybean monoculture without using a nematicide. Leflore, which is resistant to SCN, but susceptible to root-knot nematodes, showed the smallest return ($72) from rotations.

The average net dollar return on soybeans following soybeans, using no nematicide, was only $3 per acre, compared to $94 per acre using a nematicide and rotating with corn. By rotating with corn, average soybean returns were $157 per acre without nematicides and $164 with nematicides.

R. Rodriguez-Kabana, David B. Weaver, and Emmett L. Carden

Economics of Crop Rotation and Nematicide Use in Nematode-Infested Fields, 1986-87

| Variety & nematicide[1] | Net return/acre[2] Corn -soybeans | Soybeans -soybeans |
|---|---|---|
| | Dollars | Dollars |
| Braxton | | |
| No | 195 | -69 |
| Yes | 203 | 39 |
| Centennial | | |
| No | 189 | 39 |
| Yes | 173 | 129 |
| Forrest | | |
| No | 93 | -39 |
| Yes | 145 | -3 |
| Gordon | | |
| No | 153 | 27 |
| Yes | 143 | 93 |
| Kirby | | |
| No | 165 | 69 |
| Yes | 161 | 162 |
| Leflore | | |
| No | 159 | 87 |
| Yes | 179 | 162 |
| Ransom | | |
| No | 147 | -93 |
| Yes | 143 | 78 |
| All varieties | | |
| No | 157 | 3 |
| Yes | 164 | 94 |

[1] Temik (2 lb. a.i./acre = $40).

[2] 1986 corn total cost (fixed and variable) = $182.00/acre; 1986 soybean total cost (fixed and variable) = $157.00/acre; 1987 soybean total cost (fixed and variable) = $146.00/acre; corn @ $2.30/bu.; soybeans @ $6.00/bu.; 1986 corn = 110 bu./acre.

## Bahiagrass Rotation Ups Soybean Yields

The banning of nematicides containing dibromochloropropene (DCBP) and ethylene dibromide (EDB) by the EPA several years ago left soybean farmers without their most effective and economical means of controlling yield-robbing nematodes. Thus, crop rotation and varietal selection are essential tools to manage nematode problems. Recent AAES research discovered some interactions among these tools that could improve soybean yields and reduce production costs.

Tests were conducted on light sandy soils in southern Baldwin County. Gordon, Centennial, Braxton, Kirby, Leflore, Ransom, and Stonewall soybean varieties were planted in plots that had been in Pensacola bahiagrass the previous 2 years. These were compared to the same varieties planted in plots on which soybeans had been grown the previous 2 years. In each of the two cropping systems, each variety was planted in plots treated with aldicarb (Temik®) and in plots with no nematicide.

As expected, yields of all varieties in the bahiagrass rotation were higher than the same varieties in continuous soybeans. The average yield increase in the bahiagrass rotation plots was 110 percent. However, not all varieties responded the same to the bahiagrass rotation. Braxton, for example, showed a 233 percent yield increase over plots planted continuously in soybeans, but Leflore showed only a 33 percent increase.

Race 4 cyst nematode numbers were lowest in Leflore plots, regardless of cropping system. The nematicide treatment did not increase yields or reduce nematode numbers in the soil, regardless of variety. The highest number of root-knot nematodes was found in Leflore plots grown in the soybean monoculture, while Race 4 cyst nematode numbers were lowest in Leflore plots, regardless of cropping system.

R. Rodriguez-Kabana, David B. Weaver, and Emmett L. Carden

## Varietal Response Varies with Rotation Crops

Pioneer 8222 sorghum, American joint vetch, and hairy indigo were recently tested for use as rotation crops with seven leading soybean varieties in the State. AAES test results indicate that different varieties of soybeans responded differently to the various rotation crops.

Each of these varieties was tested on plots in which aldicarb (Temik®) was used and on plots where no nematicide was used. Each soybean variety was also planted in plots that had a rotation crop before it and on others that were previously planted to soybeans. The test site was near Elberta in Baldwin County in an area heavily infested with root-knot and Race 4 cyst nematodes.

In plots where sorghum was grown the previous year, Temik did not increase yields of any of the seven varieties tested. In the continuous soybean plots, Temik increased yields in Centennial, Kirby, Leflore, and Gordon varieties. Yields in the soybean-sorghum rotation versus continuous soybeans increased by as much as 231 percent for Stonewall and as little as 31 percent for Kirby. The average increase from the sorghum rotation was 85 percent.

In plots where American joint vetch was grown,Temik increased yields in Centennial and Kirby. In continuous soybeans only Braxton yields were improved by using Temik. Yield responses to the joint vetch rotation versus continuous soybeans averaged 46 percent, ranging from a low of 13 percent for Leflore to a high of 105 percent for Stonewall.

In plots where hairy indigo was grown, Temik increased yield in Kirby soybeans, but only in the monoculture system. Yield increases in rotation versus continuous soybean plots ranged from a low of 17 percent for Leflore to a high of 210 percent for Braxton. The average improvement with hairy indigo over continuous soybeans was 55 percent.

In all the plots, Temik was applied at the rate of 2 pounds of active ingredient per acre in an 8-inch band. Included in the test was Stonewall, a new release from the Alabama Agricultural Experiment Station; Braxton; Kirby; Leflore; Gordon; Ransom; and Centennial.

**David B. Weaver, R. Rodriguez-Kabana, and Emmett L. Carden**

## Computerized Pest Control Saves Production Cost

AUSIMM, Auburn University Soybean Integrated Management Model, was developed in the mid-1980s and field tested in 40 grower fields in 1986-87. In about 70 percent of the fields, net profits were increased and risks decreased by using the AAES-developed computer model.

The model begins with a file that contains approximately 120 soybean varieties, ranked by maturity groups, relative productivity, and susceptibility to nematodes and diseases. Potential yields of the various varieties are calculated given the location, soil type, planting date, rotation, and pest histories of the field.

AUSIMM is a menu-driven program written for IBM-PC and compatibles with at least 512K RAM and one floppy disk drive. Since the program is written for use by farmers with little or no experience with computers, it was designed to be menu-driven and difficult to lock up. Data entered into the program by farmers are easily obtainable, requiring little sophisticated equipment.

The model manages nematodes primarily by the recommendation of resistant varieties. Equations relating soybean yield to nematode numbers were developed using data available from nematicide and variety experiments conducted during 1979-84. These equations adjust the yield for the effects of the nematode complex on each of the 120 cultivars. The program then ranks the best cultivars for selection, or on occasion recommends that soybeans not be planted.

AUSIMM also includes a mid-season foliar disease module that helps growers determine whether fungicides are needed, are economically justified, and, if so, which materials to use. Fungicides are cataloged for therapeutic activity, protection period, and application cost. When a decision is made concerning fungicide selection and application, the projected yield and crop values in the core program are updated.

The insect module with AUSIMM calculates the profitability of insecticide applications for one to several soybean insect pests. It includes a soybean plant growth model, along with equations for temperature-dependent development and feeding, sampling information, and insecticide-induced mortality data. The value of the yield projected by each management choice is calculated by subtracting application costs from the market value of the yield projected by that choice. A display comparing pest management decisions allows the user to easily determine which are the most profitable.

Comparisons of management practices recommended by AUSIMM to those actually made by farmers in 40 fields showed that the model saved farmers money or increased profit 71 percent of the time. Net return increases were primarily due to decreased pesticide costs, more timely pesticide applications, and the careful selection of soybean varieties. Extensive field tests in 1987 indicate that the disease, insect, and nematode submodels all had less risk associated with their decisions than the alternative management practices employed for comparison, and that proper use of the program improved soybean profitability and decreased risk.

**Tim Mack, Paul Backman, and R. Rodriguez-Kabana**

## Stunting vs. Killing Cuts Weed Management Costs

Sicklepod is one of the most troublesome weeds for southeastern soybeans. Its tolerance to commonly used herbicides and its adaptability to a wide range of soil fertility and pH conditions have allowed it to spread in the South, particularly in Alabama.

While the cost of weed control has not decreased, AAES research may have identified a way to reduce this expense through herbicide management. A single application of the herbicides Classic® or Scepter® was found to stunt sicklepod and other weeds enough to allow growers to produce good yields at reduced herbicide costs.

Experiments at the Prattville Experiment Field during the 1986 and 1987 growing seasons evaluated the competitiveness of stunted sicklepod with soybeans. Classic and Scepter herbicides were used along with sicklepod densities of 0, 2, 4, 6, and 8 plants per 3 feet of row. Weed densities were established within 4 inches of the drill on the center row of a three-row plot planted on 36-inch row spacings. Classic was applied at 0.008 and Scepter at 0.125 pound of active ingredient per acre 16 days after planting the soybeans. At that time, sicklepod plants were about 1-4 inches tall.

Sickelpod dry weight was affected by densities and herbicides. Classic reduced sicklepod dry weight as much as 81 percent and Scepter reduced it as much as 61 percent. Soybean yield decreased as sicklepod density increased up to six plants per 3 feet of row. In 1986, soybeans in plots treated with Classic yielded 43 percent more than untreated plots and Scepter-treated plots yielded 26 percent more. In 1987, however, Classic improved yields only 15 percent while Scepter increased yields 23 percent.

Results indicated that a single application of Scepter or Classic at the recommended rate sufficiently stunted sicklepod to reduce its competitiveness with soybeans. These single applications also reduced seed pod formation in sicklepod.

Planting soybeans in narrower row spacings may offer chances to further reduce competition of stunted sicklepod and these practices may eliminate the need for a second, expensive herbicide application.

**R. Harold Walker**

## Resistant Soybean Looper Tough to Control

The soybean looper is usually a late season pest of soybeans in Alabama. This insect reduces yield by eating leaves needed to produce the sugars used by the plant to grow seeds. Population outbreaks of this insect can be rapid, because soybean looper adults can migrate into a field and lay a large number of eggs in a short time.

Damaging populations of this insect are usually controlled by the use of insecticides. However, soybean looper larvae that were resistant to commonly used insecticides were reported in 1988 in Louisiana, Mississippi, and Alabama. Ambush® has been considered to be one of the best, if not the best, insecticides to use against this insect. However, it was not effective in reducing the population of resistant soybean looper larvae in 1988 AAES research, see table.

Ambush at twice the normal rate of 0.10 pound active ingredient provided only 1 percent control. The only insecticide that provided more than 60 percent control was Danitol®, which is currently not registered for use in soybeans. The mixture of Dimilin® plus Dipel® was the best treatment that is registered for use, but it provided only 53 percent control.

**Tim Mack**

Mean No. Total Soybean Loopers Per 6 Feet of Row

| Treatment, a.i./acre | Number of loopers | | |
|---|---|---|---|
| | Pretreatment | Day 5 | Day 7 |
| Control | 11.78 | 9.33 | 9.11 |
| Ambush 2E, 0.20 lb. | 10.17 | 8.83 | 9.00 |
| Ambush 2E, 0.25 lb. | 6.89 | 6.67 | 6.00 |
| Ambush 2E, 0.20 lb. + PBO (1:8) | 7.83 | 6.50 | 6.42 |
| Scout Xtra 0.9E, 0.0188 lb. | 10.58 | 6.50 | 9.50 |
| Danitol 2.4EC, 0.30 lb. | 10.75 | 3.08 | 2.58 |
| Karate IE, 0.04 lb. | 7.83 | 7.83 | 7.83 |
| Dimilin 25W, 0.25 lb. | 9.58 | 8.42 | 8.33 |
| Dimilin 25W, 0.25 lb. + Dipel ES, 12 BIU | 9.08 | 3.75 | 4.25 |

## Inoculation Still Important in Some Soybean Fields

In the 1960s and 1970s, when large acreages of soybeans were planted on land that had never grown soybeans before, producers and researchers found that inoculation of soil with *Bradyrhizobium japonicum*, the bacteria that facilitates nitrogen fixation by soybeans, is critical. AAES research suggests that inoculation is still important in land that has never supported soybeans or has not been used for soybean production for several years.

Successful inoculation of soybeans on rhizobia-free land allows the rhizobia to become "naturalized citizens" that will persist for years after the soybeans are harvested. Usually rhizobia survival even 3 to 5 years after soybeans is adequate for replanting without inoculation. In fact, soybeans in soils with "naturalized" rhizobium populations seldom show yield responses to additional inoculation.

Inoculants providing less than 1,000 rhizobia per seed were found to be useless in inoculating soybeans. The best inoculants provided 100,000 to one million rhizobia per seed. Mixing inoculants with seed treatment chemicals such as fungicides or molybdenum salts was found to be incompatible with bacteria survival.

Soil measurements have shown that a million or more rhizobia can be found in a gram of soil taken from the plow layer after soybeans are harvested. Even after a corn-cotton rotation with soybeans, more than 10,000 rhizobia per gram of soil remain into the third year of the rotation.

The only situation that critically reduces rhizobium levels is severe soil acidity (pH 5). Under these conditions, rhizobia are killed to near extinction within a few months after soybean harvest. However, adding adequate lime and a good inoculant with the next planting of soybeans was found to correct this problem.

**Art Hiltbold**

## Improved Varieties from AAES Development

A soybean variety development program was initiated by the AAES in 1981 with the objective of developing superior cultivars suited for Alabama growing conditions. Each year since, thousands of experimental soybean genotypes have been evaluated for yield, pest resistance, and agronomic characteristics at the Plant Breeding Unit in Tallassee. Lines exhibiting superior performance are advanced to statewide tests and those that perform well in the statewide tests are tested through a cooperative USDA testing program throughout the Southeast.

This research yielded its first release in 1988 (Stonewall), a mid-maturity group VII variety that has excellent yielding ability. In 12 Alabama tests during 1985-87, it yielded 11 percent and 14 percent more than Braxton and Centennial, respectively. In the USDA tests at 66 locations across the Southeast from 1986 to 1988, Stonewall yielded 7 percent more than Thomas and 10 percent more than Braxton.

Stonewall is resistant to race 3 of soybean cyst nematode, stem canker, and frogeye leafspot, and tolerant to lance nematodes and Phytophthora root rot. Protein and oil content, seed quality, lodging, plant height, and seed size are equal or superior to other adapted varieties.

Approximately 750 bushels of Stonewall Foundation seed were produced in 1988. Seed should be available on a limited basis for general production by 1990. More promising lines are in various stages of development, with other releases anticipated.

**David B. Weaver and R. Rodriguez-Kabana**

## Applying Paper Mill Sludge Improves Soil Fertility

Applying paper mill sludge to soil increased soil fertility, organic matter, and pH in tests at the Lower Coastal Plain Substation, Camden. However, soybean yields were not affected by the sludge applications during the 3 years of the test. (Yields averaged 32, 26, and 32 bushels per acre in 1986, 1987, and 1988 with or without sludge applications.)

Three application rates were tried: 10, 30, and 60 tons per acre. At the 60-ton rate, the sludge contained 194 pounds of nitrogen, 92 pounds of phosphorus, 218 pounds of potassium, 5,916 pounds of calcium, 271 pounds of magnesium, and the equivalent of 6.7 tons of limestone. Increases in soil fertility after the first year's application are indicated by the soil content figures given in the table for different sludge rates.

These results indicate that paper mill sludge may be an excellent alternative to agricultural limestone on sandy Coastal Plain soils. Furthermore, such use would offer an economical alternative to landfill disposal for the pulp and paper industry.

| Soil factor | Soil content, by sludge rate/acre | | |
|---|---|---|---|
| | None | 30 tons | 60 tons |
| Phosphorus, lb./acre | 87 | 95 | 98 |
| Potassium, lb./acre | 142 | 156 | 158 |
| Calcium, lb./acre | 1,037 | 1,847 | 2,577 |
| Magnesium, lb./acre | 155 | 163 | 182 |
| Organic matter, pct. | 0.8 | 1.0 | 1.2 |
| Soil pH | 6.8 | 7.3 | 7.5 |

G.L. Mullins, J.W. Odom, and D.C. Burrows

# SOYBEAN VARIETIES FOR 1989

Soybean varieties that have performed best in AAES variety tests for 3 years or longer are listed below for each region of Alabama. Varieties are grouped according to maturity, and are listed in alphabetical order. Detailed results of variety performance are reported in the current year's soybean variety report.

## Northern Alabama

**Early**
Asgrow A 5980
Bay
Bedford
Coker 425
Coker 485
Deltapine 105
Deltapine 415
Essex
FFR 561
Hartz H 5164
Hartz H 5171
Hartz H 5370
Pioneer 9591
Terra-Vig 515
Terra-Vig 553

**Full season**
Bradley
Centennial 126
Coker RA 606
Coker 686
Hartz H 6130
Jeff
Leflore
New NK S69-54
Pioneer 9691
Tracy M

**Late**
Braxton
Hartz H 7126
Ransom
Terra-Vig 708

## Central Alabama

**Very early**
Asgrow A 5980
Coker 485
Deltapine 105
Forrest
Hartz H 5370
Terra-Vig 515

**Full season**
Braxton
Coker 6727
FFR 771
GaSoy 17
Hartz H 7126
New NK S72-60
Terra-Vig 708
Terra-Vig 717
Wright

**Early**
Asgrow A 6785
Coker RA 606
Coker RA 680
Davis
FFR 668
Leflore
Pioneer 9691
Tracy M
Young

**Late**
Cobb
Coker 368
Dowling
Foster

## Black Belt (acid soil)

**Very early**
Bay
Deltapine 105
Hartz H 5370
Wilstar 550

**Full season**
Braxton
Deltapine 417
Hartz H 7126
Ransom

**Early**
Centennial
Coker RA 680
Davis
Deltapine 566
Hartz H 6130
Leflore
Tracy M

**Late**
Cobb
Coker 368
Dowling
Johnston*

## Southern Alabama

**Very early**
Deltapine 105
Pioneer 9591*

**Full season**
Braxton
Coker 6727
Coker 6847
Deltapine 417
GaSoy 17
Hartz H 7126
Pioneer 9791
Stonewall
(Au82-204)
Terra-Vig 717

**Early**
Coker RA 606
Coker RA 680
Davis
Jeff
Leflore
New Nk S69-54
Terra-Vig 616
Tracy M

**Late**
Cobb
Coker 368
Coker 6738
Dowling
Johnston
Kirby

## Baldwin-Mobile

**Very early**
Deltapine 105
Forrest

**Full season**
Braxton
Coker 6727
Coker 6847
Hartz H 7126
New NK S72-60
Pioneer 9791
Stonewall
(Au82-204)
Terra-Vig 708
Wright

**Early**
Davis
Hartz H 6130
Jeff
Leflore
New NK S69-54
Twiggs

**Full season, late**
Cobb
Coker 368
Coker 6738
Dowling
Hartz H 8112
Johnston
Kirby

*Based on 2-year data.

*EDITOR'S NOTE.*
*Mention of company or trade names does not indicate endorsement by the Alabama Agricultural Experiment Station or Auburn University of one brand over another. Any mention of non-label uses or applications in excess of labeled rates of pesticides does not constitute a recommendation. Such use in research is simply part of the scientific investigation necessary to fully evaluate materials and treatments.*

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