Department of Agronomy
The Ohio State University and
Ohio Agricultural Research and Development Center

Williams Hall, Agronomy Headquarters at OARDC (including proposed addition)

Townsend Hall, Agronomy Headquarters at OSU
Faculty of the Department of Agronomy

Ohio Agricultural Research and Development Center
Wooster, Ohio 44691

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Davis, R. R., Ph.D. (Wooster) Professor and Associate Chairman (Turf)
Anderson, S. R., Ph.D. (Columbus) Professor, Forage Crops
Amsden, T. G., Ph.D. (Columbus) Associate Professor, Tropical Agriculture
Bendixen, L. E., Ph.D. (Columbus) Associate Professor, Plant Physiology (Weeds)
Bone, S. W., M.S. (Columbus) Instructor and Extension Agronomist (Soil Survey)
Clark, R. B., Ph.D. (Wooster) Assistant Professor, Plant Physiology (Corn)
Dollinger, E. J., Ph.D. (Wooster) Professor, Corn Genetics
Danelson, J. R., B.S. (Wooster) Instructor, Cereal Chemistry
Danelson, D. W., M.S. (Wooster) Instructor, Cereal Chemistry
Everett, K. R., Ph.D. (Columbus) Assistant Professor, Polar Soils
Findley, W. R., Jr., Ph.D. (Wooster) Associate Professor, Corn Genetics
Franklin, R. E., Ph.D. (Columbus) Associate Professor, Soil Chemistry
Gist, G. R., Ph.D. (Columbus) Professor and Extension Agronomist, Forage Crops
Hagshiri, F., Ph.D. (Wooster) Associate Professor, Soil Chemistry (Radio Ecology)
Hall, G. F., Ph.D. (Columbus) Assistant Professor, Pedology
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Heizer, H. K., B.S. (Wooster) Assistant Professor, Cereal Chemistry
Herr, D. E., Ph.D. (Columbus) Assistant Professor, Crop Production
Himes, F. L., Ph.D. (Columbus) Associate Professor, Fertility

New Greenhouses games, OARDC
Emeritus Faculty

Dodd, D. R., Ph.D. (Galloway) Professor Emeritus
Lamb, C. A., Ph.D. (Wooster) Professor Emeritus
Sayre, J., D., Ph.D. (Wooster) Professor Emeritus
Slipher, J., A., M.S. (Columbus) Professor Emeritus
Willard, C. J., Ph.D. (Columbus) Professor Emeritus

Other Associated Faculty

Bader, K. L., Ph.D. (Columbus) Associate Professor (Assistant Dean, College of Agriculture and Home Economics)
Bower, L. D., Ph.D. (Columbus) Associate Professor, OSU-USAID India Contract
Becker, R. O., M.S. (Columbus) Consultant (Seed Improvement Association)
Brown, R. S., B.S., B.S. (Columbus) Collaborator in Conservation
Friday, D. T., M.S. (Columbus) Associate Professor (General Manager, Form Science Review)
Katterheinrich, D. L., B.S. (Wooster) Instructor (Superintendent of Outlying Branches)
Miller, M. E., M.S., B.S. (Columbus) Climatologist (Environmental Science Services, U. S. Department of Interior)
Magnave, O. L., Ph.D. (Columbus) Professor (Assistant Director, Extension)
Snyder, G. J., Ph.D. (Columbus) Associate Professor (Extension District Supervisor)

Yoder, R. E., Ph.D. (Wooster) Professor (Assistant Director, ORDC)

*The Ohio State University
*Ohio Agricultural Research and Development Center
**Cooperative Extension Service
On leave
*Crop. USDA
**Crop. Environmental Science Services, U. S. Dept. of Interior

Smith, P. E., Ph.D. (Columbus) Professor, Soybean Genetics
Sneed, E. W., Ph.D. (Columbus) Assistant Professor and Extension Agronomist (Weedicides)
Sutton, P., Ph.D. (Wooster) Associate Professor, Stripmine Reclamation
Taylor, G. S., Ph.D. (Columbus) Professor, Soil Physics
Triplett, G. B., Jr., Ph.D. (Wooster) Associate Professor, Crop Production
Van Doren, D. M., Jr., Ph.D. (Wooster) Professor, Soil Physics
Van Keuren, R. W., Ph.D. (Wooster) Professor, Pastures
Wells, J. D., M.S. (Hillsboro) Area Extension Agronomist
Wilding, C. P., Ph.D. (Columbus) Associate Professor, Soil Mineralogy
Wilson, J. H., B.S. (Wooster) Instructor, Soil Analysis
Yamazaki, W. T., Ph.D. (Wooster) Professor, Biochemistry (Crops)
Research and Teaching Program in Agronomy

SOIL CLASSIFICATION AND SURVEY

Personnel: Arscott, Bone, Everett, Hall, Holloway-

Chair, Winding

Research Projects and Leaders:

State 103 - Ohio Soil Survey (Holloway/Arscott)

State 106 - The Physical and Chemical Properties of Important Ohio Soils (Holloway/Arscott)

State 107 - Mineralogy of Ohio Soils (Winding)

State 101 - Land Use in Southeastern Ohio (Everett)

State Special 135 - Effects of Free Ruts on Hydraulic Conductivity and Fracture of Forest Soils in the Allegheny-Senewic-Plains (Holloway/Arscott)

Courses Offered and Instructor in Charge:

Agron. 563 - Tropical and Subtropical Soils (Arscott)

Agron. 550 - Pedology and Edaphology (Hall)

Agron. 650 - Advanced Soil Classification Morphology and Genesis (Winding)

Agron. 750 - Methods of Soil Mineralogical Investigations (Winding)

Agron. 650 - Soils of the Cold Regions (Everett)

Agron. 850 - Interdepartmental Seminar in Polar and Alpine Studies (Staff)

SOIL CHEMISTRY AND FERTILITY

Personnel: Arscott, Franklin, Haggard, Hoff, Jones, Laville, McLean, Maderka, V. Schmidt, Shoemaker, Sutton, Wilson, Volk

Research Projects and Leaders:

Batch 24 - Factors Affecting the Release of Ex-
changeable and Slowly-Exchangeable Potassium from Soils (McLean)

Batch 165 - Basic Interaction in Soils and in Systems of Plant Roots in Relation to Nutrient Uptake (McLean)

Batch 209 - Balancing Crop Yields with the Sus-
picient Element Status of Ohio Soils (Soil Year Correlation Investigation) (Jones and Hoff)

Batch 210 - Nitrogen Fertilization and Green Manuring Studies with Continuous Corn (Jones and Maderka)

State 234-1 - The Reclamation and Use of Strip-
mined Lands (Subproject 1, Spill Properties and the Establishment of Storage Species (Hoff)

State 237-1 - Fertilization of Perennial Forage with Phosphorus and Potassium (McLean)

State 237-2 - Nitrogen Fertilization and Irrigation of Tobacco (Arscott)

State Special 64 - Detailed Characterization of Soil and Vegetation on Se-
lected Sites to Serve as Basis for Future Evaluations of Effects of Radioactive Contamination (Haggard)

Courses Offered and Instructor in Charge:

Agron. 670 - Soil Fertility (Arscott)

Agron. 672 - Chemistry of Soils and Fertilizers (McLean)

Agron. 706 - Radioactive Tracers in Plant and Soil Research (Franklin)

Agron. 872 - Physical Chemistry of Soils (McLean)

Agron. 861 - Clay Membrane Electrodes - Theory and Application (McLean)

Laboratory studies verify field classification of soils.

400 channel analyzer for measuring radioactive standards in soils and other materials.

Harvesting corn on "hot" plots at AEC site for studying the fate of strontium 90.

Liquid scintillation counter in counting room at OSU.

Auto analyzer used for determining nitrogen in plant samples.

Computer and read-out section of direct reading emission spectrophotograph used for plant analyses.

Land judging team at work.
SOIL PHYSICAL CONDITION AND WATER MANAGEMENT

Personal: Bone, Haft, Enz, D. Schmidt, Taylor, Triplatt, Van Doren

Research Projects and Leaders:
- Hatch 35 - Effects of Soil Physical Conditions on Plant Growth (Van Doren)
- Hatch 30 - Integrated Effects of Soil Structure on Plant Growth (Van Doren and Triplatt)
- Hatch 38 - Tillage Practice in Relation to Soil Till and Crop Response (Van Doren and Triplatt)
- Hatch 32 - Soil Characteristics which Affect Subsurface Drainage (Taylor)
- Hatch 37 - Effects of Soil Management Treatments on Sensitivity and Infiltration Characteristics of Ohio Soils (D. Schmidt)

Courses Offered and Instructor in Charge:
- Agron. 421 - Soil Erosion and Its Control (Enz)
- Agron. 671 - Soil Physics (Taylor)
- Agron. 571 - Advanced Soils Physics (Taylor)

Artificial soil mixtures with additives are studied to determine the influence of soil physical condition on plant development.

Reversiometer enables agronomists to apply artificial rainfall to determine infiltration rates of soils.

An electrical resistance network is used for laboratory studies of water movement in soils.

SOIL BIOCHEMISTRY AND MICROBIOLOGY

Personal: Franklin, Hines, R. M. Miller

Research Projects and Leaders:
- Hatch 77 - Chemical and Physical Properties of Soil Organic Matter (Miller and Hines)
- Hatch 328 - Factors Influencing the Infectiveness and Effectiveness of Mycobacterium tuberculosis on the Soybean Root (Miller)
- State 209 - The Conservation and Improvement of Humus Soils (Miller)
- State Special 133 - Fission Product Soil Organic Matter Complexes (Franklin)

Courses Offered and Instructor in Charge:
- Agron. 660 - Soil Microbiology (Miller)
- Agron. 560 - Chemistry of Soil Organic Matter (Miller)

Organic compounds, including fractions of soil organic matter, can be identified on the infrared spectrophotometer.

CROP PRODUCTION AND CROPPING SYSTEMS

Personal: Arscott, Bandeen, Hodesvik, Bibasas, Bay, Shoemaker, Sheppard, N. Schmidt, Triplatt, Van Doren

Research Projects and Leaders:
- Hatch 35 - Tillage Practice in Relation to Soil Till and Crop Response (Van Doren)
- Hatch 30 - Development of Cropping Systems for Soils in Midwest Chronic Fissility Zones Revisited (Triplatt)
- Hatch 30 - Development of Tillage-Resistant Herbicidal Systems (Triplatt)
- State 282 - Cultural Practices for Sugar Beets (Hodesvik and Triplatt)
- State 437-4 - Continuous Tobacco Culture (Arscott)
- State 400 - Evaluation and Culture of Bird Resistant Grain Sorghum in Ohio (Bibasas)

Courses Offered and Instructor in Charge:
- Agron. 411 - Grain Crops (Bay)
- Agron. 412 - Soil Management (Shoemaker)
- Agron. 510 - Crop Production in Developing Countries (Arscott)
- Agron. 621 - Field Crop Ecology (Bandeen)

The new "no tilling" method of growing corn allows rapid planting and results in yield increases on some soils.
PLANT BREEDING, GENETICS, SEED IMPROVEMENT

Personal: Amott, Becker, Dollinger, Findlay, Lauer, Richard, Ray, Rabon, Smith

Research Projects and Leaders:

- Hatch 20 - Breeding Field Corm for Ohio (Dollinger and Findlay)
- Hatch 36 - oat Breeding and Testing (Hay)
- Hatch 64 - Development and Evaluation of Improved Varieties of Soybeans for Farm and Industrial Utilization (Smith)
- Hatch 215 - Fundamental Research in Corn Breeding including Use of Accessions Leading to Isolation of Superior corn in the Field (Dollinger)
- Hatch 216 - Wheat Breeding and Evaluation (Teder)
- Hatch 305 - The Improvement of Forage and Turf Grasses and the Development of More Efficient Grass Breeding Procedures (Steinhauser)
- Hatch 305 - Corncob and Straw (Findlay)
- State 61 - Vintage Dairy Breeding and Testing (Hay)
- State 337-3 - Heilman Tobacco Variety Test (Amott)
- State Special 12 - Seed Corn Storage Studies (Findlay)
- OH 62 - Corn Production, Breeding, Diseases, and Quantity Investigations (Findlay)

Courses Offered and Instructor in Charge:

- Agron 530 - Field Crop Breeding (Smith)
- Agron 650 - Advanced Field Crop Breeding (Hay)

FORAGE CROPS AND TURFGRASS MANAGEMENT

Personal: Anderson, Davis, Olt, R. W. Miller, Persons, Van Heuren

Research Projects and Leaders:

- Hatch 36 - The Effect of Length of Harvest Period and Seed Period on Yield and Survival of Forage Plants (Van Heuren)
- Hatch 15 - Establishment, Maintenance and Harvesting of High Quality Forages (Persons and Davis)
- Hatch 211 - A Comparison of Two Methods of Grazing and a Stored Food Program for Summer Feeding of Dairy Cows (Van Heuren)
- Hatch 37 - Adaptation, Management, and Utilization of Forage Crops in the Shale (Persons and Davis)
- Hatch 251 - Effect of Companion Grazing and Stocking Pressure on Plant and Animal Response (Van Heuren)
- State 369 - Turf Culture and Pest Control (Davis and Miller)
- State 351 - Evaluation of New and Standard Strains of Forage Crops (Van Heuren and Olt)

Courses Offered and Instructor in Charge:

- Agron 512 - Forage Crops (Anderson)
- Agron 543 - Turfgrass Selection and Management (Miller)
- Agron 612 - Principles of Grassland Management (Anderson)
- Agron 613 - Principles of Turfgrass Management (Miller)

Wheat lines with one or more desirable characteristics are crossed in the greenhouse, an early step for a potential new variety or hybrid.

Crops with a variety improvement program include soybeans, Ohio's No. 2 crop.

Grassing experiments measure animal response to forage species or management practices and the influences of animals on the forage.

Turfgrass research provides information for homeowners and professional turfgrass managers.

Students have opportunities for courses in forage crops and grassland management.
The refrigerated centrifuge is standard equipment in the physiology laboratory.

Environment control chambers are valuable assets in the physiology research program.

Beta ray gauge was developed to monitor the internal water of soybean leaves.

The gas chromatophraph is a useful instrument for studying herbicide residues.

NEEDS AND WEED CONTROL

**Personnel:** Bendirezzi, Herr, R. W. Miller, Strohbe, Tripklet

**Research Projects and Leaders:**

- Hatch 72 - Interaction of Control of Weeds and Other Undesired Plants. 1. The Chemical and Cultural Control of Weeds in Plant Crops (Strohbe)
- Hatch 74 - Weed Control in Crop (Herr)
- Hatch 224 - Basic Physiological and Morphological Responses of Weed Crop Species to Herbicides (Bendirezzi)
- Hatch 234 - Development of Tillage-Deposited Herbicide Systems (Tripklet)

**Courses Offered and Instructors in Charge:**

- Agron. 621 - Physiological Aspects of Crop Management (Herr)
- Agron. 622 - Physiological and Biochemical Aspects of Herbicides (Bendirezzi)
- Agron. 670 - Soil-Plant Relationships (Strohbe)
Ohio's major soil types and climatic conditions are represented at the Research Center's 11 locations. Thus, center scientists can make field tests under conditions similar to those encountered by Ohio farmers.

Research is conducted by 13 departments on more than 6000 acres at Center headquarters in Wooster, nine branches, and The Ohio State University.

Center Headquarters, Wooster, Wayne County: 1918 acres
Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres
Mahoning County Experiment Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres
North Central Branch, Vickery, Erie County: 335 acres
Northwestern Branch, Hoytville, Wood County: 247 acres
Southeastern Branch, Carpenter, Meigs County: 330 acres
Southern Branch, Ripley, Brown County: 275 acres
Vegetable Crops Branch, Marietta, Washington County: 20 acres
Western Branch, South Charleston, Clark County: 428 acres
Grass Roots Lab
Opening At OSU

By Michael B. Lafferty
Associated Press Writer

It's back to the grass roots at Ohio State University where workmen are completing a $50,000 underground laboratory that scientists will use to watch grass grow.

"The most important part of the plant is the root and that's the part we know least about," said OSU agronomist Dr. Keith J. Kernock, who will be in charge of the lab. "Scientists only have a general idea now when and how much to fertilize."

KERNOCK SAID THE lab, called a rhizotron, will be used to learn how much cold, heat, fertilizer, water, mowing and other practices make grass thrive.

The lab, which opens early next month, is Kernock's brainchild. He said its proper name is a rhizotron lysimeter and it is perhaps the only one of its kind in the world because the lab is equipped to accurately measure how much water is being utilized by the plants.

Despite a plethora of pamphlets, gardening books and video advice on how to treat your lawn, Kernock said there is relatively little exact information about how turf grass develops, especially the roots.

KERNOCK SAID MORE detailed growth information is needed by golf course managers and groundskeepers, as well as by a few fanatical homeowners who are all part of Ohio's $300 million turf industry.

Kernock says $15 billion is spent on lawns each year in the United States. He said watering and fertilization can be made to work better by knowing when and how much to put on.

THE RHIZOTRON IS a space-age name, but the idea is simple. Scientists walk underground into a long hallway in the lab and observe the roots of grass growing on the surface in 30 glass-topped compartments. The lab has time-lapse microscopic photography equipment. On the surface is a complete meteorological station used to keep tabs on wind speed, direction, rainfall, humidity and other weather factors.

Kernock said the lab will help homeowners. He said some gardeners overwater their lawns and others overfertilize, especially in August when there isn't enough rainfall to support the extensive leaf growth the fertilization stimulates.

Kernock's lawn fertilization tips: apply nitrogen to your lawn in June and at the end of August at the rate of about three quarters of a pound per 1,000 square feet. Then apply 1½ pounds in October and another 1½ pounds next spring.
Doves found dead in OSU field

By Vivian Stockman

Four mourning doves have been found dead on the same field where 30 to 40 waterfowl died on Oct. 13, said Andrew Pierce of the U.S. Fish and Wildlife Service. The field, adjacent to an agronomy research field, is near the intersection of Lane Avenue and Kenny Road.

Pierce said the cause of the birds' deaths is under investigation. He expected an analysis of the chemicals in the waterfowl's bodies about two weeks ago, but still has not received the report, he said.

Some theories about the deaths are under consideration, but no comment can be made at present, Pierce said.

Originally, some OSU officials reported that corn soaked with Mesurol, a chemical used as an insecticide and bird repellent, was placed on the field to lure crows from the agronomy research field. However, Berlie L. Schmidt, chairman of the Department of Agronomy, said the chemical had been applied last spring, so the cause of death probably was something else. Mesurol usually repels birds and is not toxic.

After the waterfowl were found dead, the U.S. Fish and Wildlife Service plowed the field in an effort to disperse whatever may have caused the problem. However, Pierce said plowing may have aggravated the problem.
Grass is always greener for turf students

Although snow is still on the ground, a few OSU agronomy majors are already worrying about how green the grass will be this spring.

In the Department of Agronomy, about 30 students are studying the specialized area of turf grass management, said Keith J. Karnok, assistant professor of agronomy and adviser for the OSU Turf Club.

"Most of the turf program students do not have farm backgrounds, but come from urban areas. They got involved by a love for the outdoors or golfing. Some are probably frustrated golfers," Karnok said.

"Our students are essentially agronomy majors but have an interest in the crops area, rather than the soil area, of agronomy. They schedule more horticulture classes, but take the same basic agronomy core program," he said.

Upon graduation, turf program students have a wide choice of careers to pursue. "The golf course superintendent position is very attractive, particularly for OSU students, since there are about 750 public and private courses in the state of Ohio," Karnok said.

Fertilizer, pesticide and equipment sales careers also provide job opportunities in the turf grass industry.

"The fastest growing area is working with lawn care companies," Karnok said. "The idea of landscape lawn care originated in Ohio. Two national lawn care companies, ChemLawn and O.M. Scott, have headquarters in the Columbus area."
OSU helps Uganda
revive agriculture

By David Lore
Dispatch Science Reporter

Ohio State University agronomists are directing a $6.9 million program to revive the agriculture of Uganda, a potential breadbasket in the middle of hungry Africa.

Unlike Ethiopia and Chad, its famine-plagued neighbors to the north, Uganda is blessed with rich soil in the "fertile crescent" agricultural belt north of Lake Victoria, and to some degree in the highlands east of Lake Edward, says agronomist Paul R. Henderlong, campus coordinator for the project.

It also has one of the most hospitable climates on the continent, with temperatures averaging in the low 90s in the summer and the mid-60s in the winter, he said.

Politics, however, has been the chill on Uganda's future.

Between 1971 and 1979, the country was terrorized by military dictator Idi Amin, who killed thousands and forced the Asian middle-class to leave the country. Amin was ousted in 1979, but the damage to the nation's agricultural economy remains, Henderlong said.

"The Asians who were expelled were the small businessmen, the skilled craftsmen, the entrepreneurs," he explained. "Amin's friends took over the businesses and sold out the inventories and that was it. There were no parts, no vehicles, the whole economic infrastructure was dismantled. By the time Amin left, the cupboards basically were bare."

OSU, which helped develop graduate programs at Uganda's Makerere University in the early 1970s, was picked by the U.S. Agency for International Development last October to direct a four-year reconstruction of Ugandan agriculture.

OSU agronomist John Parsons, project team leader, moved to Uganda last month and will be joined in March by John Trierweiler from OSU's Agricultural Research and Development Center in Wooster.

Uganda is not starving, said Henderlong, because farmers survived by subsistence farming on their plots of two to five acres.

OSU's JOB is to revive agricultural education at Makerere University, update Ugandan experts who have been largely cut off from the rest of the world since 1971 and re-establish basic institutions for food production, marketing and export.

Small cooperatives, for example, need to be restored to provide farmers with basic goods such as hoes, shovels, fertilizer and seed.

AID is more interested in basic food production than in reviving Uganda's traditional "plantation" crops such as cotton and sugar cane, Henderlong said. An exception, however, is coffee, still a vital export crop.

Converting Uganda into a continental breadbasket depends on political stability and Uganda's willingness to emphasize food production and export, he said.
OSU program to help Uganda

By Brian Bursack
Lantern staff writer 5-9-85

Researchers from Uganda and Ohio State are teaming up to revive Uganda's agricultural industry.

OSU's Office of International Programs in Agriculture and the Department of Agronomy will use a $5.9 million U.S. Agency for International Development grant to work with Ugandan researchers to maximize the country's potential for food production.

The grant money will be used to send U.S. researchers and workers to Uganda, to repair and rebuild agricultural facilities, to provide farmers with needed tools, and to start agricultural research programs in Uganda.

Paul Henderlong, professor of agronomy and campus coordinator of the project, said Uganda's agricultural industry was neglected during the eight years of Idi Amin's government.

"There was a period where very little was done in terms of building maintenance," Henderlong said. He said crops often went unattended and many agricultural facilities were looted during the 1979 coup which overthrew the Amin government.

"We want to renovate the existing agricultural facilities to put them back into productive use," Henderlong said.

Uganda has not had the traditional drought problems of other African countries such as Ethiopia, Henderlong said. "Uganda has a beautiful natural agricultural climate," Henderlong said. "They can grow practically any crop there, whether it is tropical or sub-tropical or temperate."

He said this is because of the climatic influence of Lake Victoria and the country's elevation.

The project will not focus on developing export crops, Henderlong said, but rather will focus on developing staple crops such as corn and millet produced by Uganda's small-scale farmers. He said they also want to develop ways to produce non-food items which are needed in Uganda, like cooking oil.

"It is not just direct food consumption, but it is also some of the by-products that can be used then for the total well-being of the population," Henderlong said.

The project will also work on restructuring agricultural research in Uganda.

Henderlong said Ugandan agricultural researchers and workers are being sent to universities around the world to study new developments in agriculture.

Henderlong said these researchers will then take their knowledge back to Uganda.

Nathan Nangoti, an agricultural researcher from Uganda, will be studying at Ohio State this summer.

"I have come to look into the most recent aspects of agricultural research, because agriculture here is so advanced," Nangoti said. He said he wants to see what aspects of current research can be applied to Uganda's agricultural industries.

"We do not have big farms like here (in the United States)," Nangoti said. "So what we are trying to do is help the small farmer. That way we can help him to produce more from his land."

Nangoti said one major problem that needs to be solved is how to provide small farmers with herbicides, which most cannot afford, so they can control the weeds.

"After sowing the crop the weeds come up so fast, that by the time you weed they have already zapped the nutrients for the crop," Nangoti said. "Next week the same weeds are back up."
New grass strain stands up to drought

By Tim Doulin
Dispatch OSU Reporter
Tall fescue once was considered an eyesore, but during these dry summer months some agronomists are eyeing the grass as an alternative to the Kentucky bluegrass used for lawns by most homeowners in Ohio.

"It is a grass that is more tolerant of the heat and drought, and it doesn't take much maintenance," said John R. Street, professor of agronomy at The Ohio State University.

For years, tall fescue was simply too ugly to use for lawns.

THE GRASS grew in clumps, had a wide blade and an undesirable light green color. It grew in pastures or median strips of highways.

"Tall fescue used to be called the 55-mile-per-hour grass," Street said.

"It looked good when you were driving past it at 55 miles per hour, but when you looked at it up close, it was ugly."

In the last five years, researchers have improved the appearance of tall fescue while preserving its resistance to heat and drought.

The new variety has a finer blade, a richer color and no longer sprouts in clumps, Street said.

"The quality isn't as good as Kentucky bluegrass, but it is more acceptable than it was eight or 10 years ago," Street said.

Although not involved in developing the new blend, OSU researchers have been evaluating tall fescue. The grass has held up well during the drought in central Ohio.

"We have tall fescue which we haven't watered all year, and it is still green. The Kentucky bluegrass is brown and dormant," Street said.

Tall fescue lawns are popular in parts of the South where dry conditions are prevalent. Kentucky bluegrass has flourished in Ohio because of less severe exposure to heat and drought.

AS THE QUALITY of the grass continues to improve, tall fescue might become more popular in Ohio. The grass could be used more for lawns, landscape at commercial sites and athletic facilities.

Street does not believe tall fescue will be used out of necessity, but the grass will offer an alternative to Kentucky bluegrass, which takes more time to maintain.

"The grass is good for a clientele that wants a nice lawn but doesn't want to put a lot of effort and money into it like you do with Kentucky bluegrass," he said.
Grant worms way to Ohio State

Earthworms create turmoil with drainage of pesticide

By Dan Arnold
Lantern staff writer

Earthworms have long been considered friends to the farmer, however the holes they burrow may have an effect on the drainage of pesticides into the earth's groundwater supply.

A grant for more than $152,000 was awarded to the Department of Agronomy to study this potential problem.

Officially, the grant will be used to study water and chemical movement through biologically active surface layers of no-till soils.

Warren Dick, an associate professor in the Department of Agronomy, wrote the proposal for the grant five months ago.

"IN MODERN agriculture there's a large amount of pesticides being used, and we are finding some of these in the groundwater, Dick said.

"When it rains after a pesticide has been applied, some of the pesticide goes into worm holes and is rapidly transmitted to depths of a meter or more."

The fast drainage of the pesticide into the earth does not allow microbes on the topsoil to do their job of degrading the pesticide.

"No-tillage farming is very effective in controlling erosion and is being used more and more because it conserves soil for future generations," Dick said.

A NO-TILL field is not plowed at the end of a growing season. Crop remnants die and form a mulch layer on the ground in which seeds are planted the following year.

The mulch layer controls erosion and contains the microorganisms that degrade pesticides.

"But earthworms grow much more in a no-till soil than in a plowed soil because they are killed by the plow," Dick said. "It destroys their home.

"So in no-till soil you have all these nice earthworm holes that enable pesticides carried by rainwater to bypass the mulch layer."

Bill Edwards, a soil scientist for the U.S. Department of Agriculture, has been working in this field for over 10 years.

EDWARDS INITIALLY thought of the idea for the grant.

"For many years I've been trying to document that water does flow into worm holes when we get thunderstorms. I've wondered what's in that water, because it bypasses the filtering mechanism of conventional topsoil."

Consequently, pesticides are a potential pollutant to the groundwater, Edwards said.

Edwards, a specialist in soil physics, will be working with Dick on the project. They will use radioactive carbon to trace the movement of pesticides through the soil.

The grant, awarded July 14, should help answer three questions, Edwards said.

- "We must find out if these worm holes are important, if water is moving down in them, and if this water is carrying chemicals."

The funds, awarded by the U.S. Geological Survey, will be used from Sept. 1, 1988 to Aug. 31, 1991.
Group gives money for turfgrass

By Tina Lee Straw
Lantern staff writer

Most of us take lawns and golf courses for granted, but for the administrators and 1,500 members of the Ohio Turfgrass Foundation, it’s serious business.
The foundation was started in 1966 to help generate money for turfgrass research and education, according to John Street, executive secretary.

Street says in 1989, the foundation has already given $12,000 in scholarships to students majoring in turf-related fields such as golf course superintendents and lawn care specialization.

Gary Selerter, a senior from Grove City majoring in turf, received a $500 scholarship this year. Selerter attended the conference and show and is a student member of the foundation.

The foundation has also given $120,000 to turfgrass research projects this year. Over $700,000 has been generated by the foundation for similar projects during the past 20 years, Street said.

HE SAID these monies are generated through various projects such as donations, membership, fund-raising activities, such as an annual golf tournament, and the Ohio Turfgrass Conference and Show.

The foundation was also successful in completing an endowment campaign for $1.25 million to establish an endowed research position in the Department of Agronomy, he said.

The foundation promotes turfgrass education through its annual conference and show which features speakers from various areas in the industry, such as lawn care specialists and researchers. The trade show features equipment and products used and needed by professionals in the turf industry, Street said.

The foundation also sponsors an annual Field Day at the Turfgrass Research Center located at OSU’s Waterman Farm Complex at Kenny and Lane Avenues.

"AT OUR annual research Field Day, the Department of Agronomy and the Ohio Turfgrass Foundation display current research studies in addition to chemical product comparisons and grass species trials," said Jill Taylor, agricultural technician and manager of the research center.

These research studies include projects being done on turfgrass, such as the use of pesticides, fertilizer, wetting agents and seed.

Students majoring in turf-related areas receive special consideration from the foundation. They are able to attend the conference and show for free, receive foundation membership at no cost and are eligible for numerous scholarships.

Selerter said he plans to join the foundation as a professional in the field after graduation.

Street said the foundation is now co-funding positions in the Department of Agronomy: the Extension Assistant position with the Plant Pest and Diagnostic Center and the Turfgrass Extension Associate position.

THE NEXT Field Day is scheduled for Sept. 7 and the next conference and show will be held in Columbus Dec. 4-7. Interested students and faculty should call 292-2601 for more information.
Bacteria munch on pollution

Ohio State University researchers have discovered a pollution-munching bacteria they believe could help clean up industrial wastes seeping into drinking water supplies. The Rhodococcus bacteria usually live in soil but "eat" quinoline, a byproduct of oil shale and coal processing.

Gerald Sims, an assistant professor of agronomy, said the research sheds light on how organisms degrade hazardous materials. Bacteria already have been used to help clean up pollution. They were used in an experiment to help clean up oil from a massive spill in the Gulf of Mexico recently.
Bacteria discovered to improve cleanup

By HopeAnn Kauffman
Lantern staff writer

OSU researchers have discovered a pollutant-munching "bug" they think could help clean up industrial wastes seeping into drinking water supplies.

Gerald Sims, assistant professor of agronomy, and his co-workers found a previously unknown type of Rhodococcus bacteria that usually lives in the soil. The organism feeds on the pollutant quinoline.

Quinoline comes from oil and fuel refining procedures, and are components of some pesticides.

Quinoline pollution is not as bad as some environmental problems today, but Sims said it might be a future problem.

The discovery of the bacteria could become an important tool in understanding how organisms degrade hazardous materials. Sims hopes to learn how scientists can step up this process.

Environmental agencies and scientists are trying to find whether a combination of physical cleaning and breaking down of pollutants by organisms can thoroughly clean up polluted areas.

"We hope to use the quinoline work as a model to find out," Sims said.

The ultimate test of the bacteria's capabilities would be the recent catastrophic oil spills in Alaska.

"Human intervention can only do so much," Sims said. "Eventually, we think nature will kick in and clean the stained landscape, but it's hard to say that there won't be long-term effects."

To date, the bacteria's capabilities in cleaning what Sims calls an industrial mess have not been tested.

"We want to know how and why this bug eats quinoline, and what it makes from it," Sims said.

Groundwater is relatively pure, with little carbon for the energy such organisms need, he said. Because chemicals such as quinoline usually are not present in the groundwater in large amounts, researchers have to know whether the organisms will "bother" to degrade them.

Sims has seven graduate students working on different areas of the Rhodococcus bacteria research.

One of Sims' students, Staci Kehr-meyer, who holds a bachelor of science degree from the University of Wisconsin, is currently trying to find a way for the bug to locate the pollutants. Such pollutants are mixed in soil or clay, or on rock surfaces, making them hard to find.

The researchers isolated the Rhodococcus after placing a random sample of Ohio soil and sludge in a flask with no other energy source except a measured amount of quinoline.

Bacteria have been used in the past to help remove dangerous chemical pollutants such as cadmium and mercury from the environment.

In the future, genetically engineered microorganisms might be created to remove certain hazardous wastes, Sims said.

"We may want the engineered organisms to die out once the target chemical is consumed," he said. "Unfortunately, the possibility exists that the organism dies, but its genes are exchanged with another organism. It could be a gene we didn't know was dangerous."

Sims and his co-workers presented this work at a recent meeting of the American Society of Agronomy, Crop Science Society of America and the Soil Science Society of America in Las Vegas.
Clippings should be left alone

By Kim Bates
Lantern staff writer

Yard waste comprises almost one-fourth of the space in landfills and costs as much as $60 per ton for collection, hauling and disposal, an OSU waste management specialist says.

Leaves, grass clippings, brush and trees are items usually bagged and left for pickup in streets around the state. A proposed state bill would limit this process starting in 1993 because of a lack of space in landfills, said Joseph Heimlich, an OSU waste management specialist for the Ohio Cooperative Extension Service.

The service adopted a lawn care plan for Ohio called “Don’t Bag It,” which outlines the process for lawn maintenance without waste. The program is based on materials developed by the Texas Agricultural Extension Service.

The prime way to reduce waste is to leave grass clippings on the lawn, Heimlich said. On a larger scale, the method of backyard composting can be utilized.

“We’ve been trying for years and years to get Ohio State to leave grass clippings on lawns,” Heimlich said. “Now we’re trying to educate homeowners so they know the clippings are good to leave on lawns.”

Heimlich said the benefits of putting grass clippings back on lawns include returning nutrients to the lawns and reducing time, effort, money and materials going to the landfill.

Also, the myth that grass clippings contribute to thatch accumulation is wrong, Heimlich said. Thatch is a layer of living and dead stems, leaves and roots of grass that develops between the grass and soil surface. Clippings and thatch are not related because grass clippings decompose at a faster rate than thatch, he added.

Heimlich has been working on the program with John Street and William Pound, both from the OSU Department of Agronomy.

Pound and Street have specific lawn care plans for homeowners who practice the “Don’t Bag It” method. They recommend applying a moderate amount of nitrogen fertilizer every eight to 10 weeks. They believe a lawn should be watered about once a week, mowed frequently only when the grass is dry, and cut high.

This method is used by golf courses to keep their lawns green, Pound said.

“I think there will be a ban on the use of landfills for yard waste even before 1993,” Pound said. “Therefore, it is important for people to know how to produce less waste and protect their lawn at the same time.”

Backyard composting is the other way for homeowners to reduce their waste, Heimlich said. Composting can be easier and cheaper than bagging wastes, and it also improves the soil and the plants growing in it, he said.
Flood-proof soybean undergoes tests at OSU

Tara VanToai found something Midwest farmers could have used this year.

The plant physiologist, who is based at the Soil Drainage Laboratory at Ohio State University, now is seeking the genes in those soybeans responsible for the flood tolerance.

She searched for the tolerant soybeans in southern China, an area prone to flooding. Most U.S. soybeans' ancestors originate in northern China, a drier region, she said.

China experienced a 100-year flood in 1990, the year VanToai visited China to gather soybean cultivars. "I thought I would have to collect 100 or so cultivars and test them, but because of the flood, I was able to identify some immediately," VanToai said.

Now she's field testing about 20 cultivars, from the United States and China, to see how they perform under floodlike conditions. Some were previously identified as flood tolerant, others as flood susceptible. Continual irrigation keeps the test plots wet.

At the same time, VanToai is studying the DNA of both tolerant and susceptible plants to discover the locations of the genes responsible for the traits.

She expects to find the genes in two to three years. Speeding her work is a new technique called RAPD, or random amplified polymorphic DNA. With the technology, DNA is reproduced quickly. VanToai had expected it to take two years to learn how to apply RAPD to her work, but it only took six months.

"We've had excellent results, very reproducible," VanToai said.

Once identified, plant breeders will be able to place the responsible genes in existing soybean varieties that have other desirable traits. VanToai expects flood tolerant soybeans to be available to farmers in five to eight years.

"It would be real handy for those with low-lying land, river bottom land, or low areas in field where water typically accumulates," said Jim Beuerlein, OSU soybean specialist. "There's a fair number of acres like that in the state, not to mention the rest of the world."

Flood tolerance also would have helped last summer when so much rain fell in July, he said.
THE END, AND A NEW BEGINNING—
DR. FRED MILLER

Since its origins in 1905, this Department has been reorganized, divided, restructured, merged or administratively changed 10 times, the last merger between the OSU and OAES (Ohio Agricultural Experiment Station) departments occurring in 1947. Thus, the most recent Department of Agronomy has lasted longer than any of its nine predecessor configurations. And now, change has been visited upon us once again. The Department of Agronomy was dissolved (effective July 1, 1994) as part of the College of Agriculture restructuring plan. The crop science component was merged with Horticulture to form a new Plant Science Department and the soil science component was merged with the School of Natural Resources to form a new, more comprehensive School.

While recent budgetary restraints provided the immediate impetus to restructure the University's colleges and programs, Dean Moser sees the forces driving the College of Agriculture's restructuring as 1) the enhancement of our ability to attract and serve students, 2) meeting the needs of our external clients better, and 3) positioning the College to flourish in the years ahead.

Today's institutions of higher education are experiencing major external forces driving these institutions to review both their programs and their structure. A consensus as to the nature of these forces has been articulated recently by some 400 senior officers of colleges and universities across the U.S. (Policy Perspectives, 1994). These forces include 1) a focus on "vocationalism" as students and their parents realize the preeminent role a college degree has come to play in providing access to good jobs, thus the fixation upon "relevance" and "market forces"; 2) electronic technology that allows others to transfer information thereby providing cheaper access to "education," thus establishing competition for higher education's student customers; and 3) the trend toward privatization as the public and its legislatures distinguish between private and public goods, thereby allowing markets to supplant institutions as a means of providing public needs (ibid.).

Students and their parents are seeking a higher education "value" that will provide entry to secure and well-paying jobs. Despite rising enrollments, there is increased public willingness to "trust the market" in assessing program and curriculum effectiveness.

While research universities have contributed much to the development of information transfer technologies, they have not considered fully how this technology might apply to the process of teaching and learning. These technologies not only resulted in new products but new markets with new providers. Today's youth are much more accustomed to learning from electronic products than are faculty whose classes they attend (ibid.). Higher education no longer holds the monopoly on information packaging and transfer. What telemarketing and phone banks did for catalog sales, what QVC did for home shopping, what ATM's did for banking, the information highway is about to do for distance learning and higher education (ibid.).

With respect to the public's growing acceptance of market mechanisms as a means for allocating public resources, Ohio's legislature is typical of those who have come to regard higher education as more of a private than a public good, i.e., concluding that a college education contributes more to individual advancement than to the nation's social fabric (ibid.). During the 1991-93 period, the State balanced its revenue shortfall largely (69%) on the back of higher education which accounts for only 13% of the State's budget.

DISTINGUISHED SERVICE AWARD
Dr. Roy M. Kottman

Dr. Roy M. Kottman, Ph.D., age 77, of Columbus, died Saturday, June 4, 1994 at The Friendship Village of Dublin Healthcare Center. He was Vice President for Agricultural Administration and Executive Dean for Agriculture, Home Economics, and Natural Resources at OSU, Emeritus.

The following is a letter from President Gee to Dr. Kottman and to the Chairmen in the College of Agriculture.

Dear Roy:

I am delighted to inform you of an action taken by The Ohio State University Board of Trustees. At their April 8 meeting, the Trustees approved your selection as a recipient of the university’s Distinguished Service Award.

Your years of leadership and service to the College of Agriculture and the entire university have brought lasting changes benefiting all. As an enthusiastic, tireless, and vital supporter of the Ohio State community, you are most deserving of this significant honor.

On behalf of the entire university, congratulations on your selection. We would like to present your award at our Spring Commencement on Friday, June 10, 1994.

Sincerely,

E. Gordon Gee

GAMMA SIGMA DELTA
Outstanding Sophomore
Chad McDowell

This last issue of Newsletter is published by the Ohio State Agronomy Department.

Fred P. Miller ...................... Chairman
Karla Gutheil .............. News Coordinator
THE END—AND A NEW BEGINNING
continued

As most of America's corporate enterprises have rethought their place in the economy and restructured, including downsizing, so too are universities expected to become less insular and more relevant to society's needs. Because universities are people-intensive institutions, salary obligations now consume up to 85–90% or more of our budgets. Thus, we must consider other ways to organize ourselves and to scale back in delivering programs. During the "golden years" (60's into 80's), higher education was characterized by growing budgets and expanded programs. As budgets decline, however, the tendency of higher education to protect personnel has resulted in forfeiture of our capacity to adequately support our faculties, upgrade equipment and adapt new technologies, maintain library acquisitions, maintain buildings and infrastructure, and recruit key personnel.

Something has got to give if we are to serve an expanded clientele base. The point is that today's colleges of agriculture must address a social agenda that is quite different from its production-focused, low-technology counterpart a century ago or even the production efficiency-driven model of 10-20 years ago. Clearly, our paradigm today is to undergird production agriculture with a social objective of sustainability, environmental compatibility and stewardship of the natural resource base upon which both agriculture and our rural-urban society are dependent for their sustenance, economy, and ecological well-being. We should not leave our roots of production agriculture, but we must manage agriculture as a component of the natural-cultural ecosystems in which agriculture occurs. The issue is not whether the Department of Agronomy should be retained or whether the College should have 11 or 5 departments, but whether the expertise and talents of the faculty and the disciplines they represent can be melded in the interest of developing a College and programs that are focused on supporting an agriculture in its broadest sense that is productive, sustainable, ecologically compatible and socially supported.

Whether the proposed College restructuring is the "best" option to consider remains to be seen. It will not be the form of the restructuring that will determine our future, but the substance and focus of program changes that result from this restructuring. Traumatic as this restructuring is, the difficult part is yet to come, namely, what do we keep and refocus and what do we discard? If we do not shift our paradigm to a more ecologically-based agricultural system, we will have merely, to use a trite phrase, "rearranged the chairs on the deck of the Titanic."

For those of us faced with the task of "reading the societal tea leaves" for direction, we might harken back to the words of an agriculturalist of another era, Thomas Jefferson in counseling his fledgling University of Virginia:

"We cannot always do what we think is absolutely best. Those with whom we act, entertaining different views, have the power and the right of carrying them into practice... We must lead where we can, follow where we cannot, and still go with them."


SCIENCE UNDER SIEGE—BALANCING TECHNOLOGY AND THE ENVIRONMENT—DR. WARREN DICK

A book review


One of the most compelling books that I have ever read, this politically incorrect book is sure to spark controversy. Mr. Fumento challenges his readers to reevaluate their assumptions about environmental issues and leaves almost no one unblamed for the lack of public understanding on environmental issues and the way environmental policy is conducted in this country. The book is thoroughly researched, highly documented and extremely readable. It presents with wit, integrity, sound method and logic the way the American public has become misinformed and led down the path of pseudo-science to accomplish goals of dubious return. I had a difficult time putting the book down until I had read it in its entirety.

Current environmental issues are numerous. Macro issues such as acid rain, global warming and the ozone layer spill over borders and generally effect many countries at once. Micro issues may occur throughout the planet, yet are more localized in their effect. This book deals with the micro environmental issues and includes chapters on Alar, the politics of cancer testing, dioxin, Agent Orange, food irradiation, electrical and magnetic fields, video terminal displays and gasohol. Probably the most informative and interesting chapters, however, were those entitled "A Fairly Brief, Nonboring Lesson in the Pitfalls of Amateur Epidemiology," "A Fairly Brief, Nonboring Lesson in Risk Taking," "Prejudice and Logic: How to Spot a Smelly Argument" and "A Closer Look at the Besiegers." Each chapter contains numerous and interesting case studies as well as citing original literature of pertinent studies.

The most important thing about this book, for me, was how it challenged me to think about (1) the ways environmental science is portrayed to the public, (2) the incorrect assumptions that are often made concerning environmental issues, and (3) the role of personal agendas in shaping our environmental policy.

Modern technology has brought us to the point where we are capable of measuring, for some compounds, essentially down to the single molecule level. Does the mere presence of a compound necessarily constitute risk and are movie and television stars really the most creditable witnesses on science (environmental) related issues? Does appealing to the emotions, instead of clearly establishing a scientific link between cause and effect lead to good environmental policy? These are just some of the questions raised by Mr. Fumento when he questions how environmental issues are portrayed to the public?

Assumptions often made and rarely questioned include big is bad, old is good, and the majority position is right. Personal agendas have a role in what assumptions we adopt for our own frame of reference whether we come from big business, a regulatory agency, an environmental advocacy group or a university laboratory.

Who is to blame? Mr. Fumento points a finger at everyone involved in the environmental arena—politicians, bureaucrats, the
SCIENCE UNDER SIEGE

continued

media, big business, scientists, and environmentalists. Especially scorned, however, are the environmental extremists. This book is essentially a plea for a rational public policy that says a life saved is a life saved regardless of whether the threat is environmental or something else. In the competition for public funds Mr. Fumento questions, for example, why a guard rail on a dangerous stretch of a California highway (where fatalities are known to have occurred) costing only a few thousands of dollars is considered too expensive to install while millions or billions of dollars are spent on environmental regulations to save a handful of theoretical lives.

The jacket for this book includes ringing praise from such well known and respected scientists as Dr. Bruce Ames (University of California), Dr. Frederick Seitz (Past President of the National Academy of Sciences) and Dr. Alexander D. Langmuir (Former Chief of Epidemiologists, Centers for Disease Control).

Science Under Siege should be read by everyone concerned with how our resources are allocated. Maybe it will make as great an impact on you as it did on me.

W. A. Dick, The Ohio State University, Wooster, OH 44691.

AGRONOMY—THE WAY WE WERE

THIRTY-THREE YEARS AGO

The following newsletter consisted of faculty and graduate student alumni reviewing the year of 1961.

GREETINGS FROM THE CHAIRMAN

The Department has been busy carrying on the usual work required to maintain top efficiency in our teaching, extension, and research programs. During the past year there have been a number of changes in the department. Dr. Bondarenko went with the Cyanamid Company and he was replaced by Dr. Ed Stroube. Recently, Dr. Bendixen of California, joined the staff to spend full time on weed control problems.

Even though our budgets were quite tight this year, we have been given the go ahead sign to add several staff members. Dr. Bertie Schmidt of Iowa, has been engaged to carry on research and extension in soil and water conservation. We are also looking for a person to carry on soil survey research. This will help Nick Holowaychuk in the very extensive program he is supervising in Ohio. Nick needs the help because he is trying to divide his time between two large A.E.C. projects and the regular survey work. We will probably have a soil scientist employed for this work by the time you receive this letter.

Dr. Gist is in India and we are looking for a temporary replacement to carry on his extension work. We have a very good candidate coming for an interview this weekend, so our hopes are high for ending this search.

The Polar Institute of OSU is interested in employing a scientist to conduct research on polar soils. We are also very interested in this field so a meeting of the minds has resulted in an agreement to find someone who is trained in polar work and who can also help on Ohio soil problems. We have two good candidates in mind.

Since Dr. Davis (Dick) has become associate chairman we must find some way to reduce his load in pasture research. We hope this may result in the quest for another good pasture research specialist.

Our situation with regard to space is far past the critical point as it has been for 20 or 30 years. The outlook for a new building is not good at present and we hope that something will develop in the next 10 or 15 years. This, of course, has been going on for 40 years and it seems that eventually others will be taken care of so that Agronomy may be favored with a nod. I do not expect to have the privilege of working in new quarters but when the opportunity arises we will try to plan well for the next generation. Most of you would not recognize Townshend with all the remodeling that has taken place, the installation of isotope labs, the development of large growth chambers, and the outstanding array of scientific equipment. We sometimes worry about all of this fine equipment in a building that is not fireproof. Keep your fingers crossed.

Hello to everyone and be sure and visit us in both Columbus and Wooster. Our doors are always open.—G. W. Volk

VOLK, Garth W., Chairman of Department, and Alice, Worthington, Ohio. "Same old job as Chairman. Sometimes I feel more like a chief clerk. It keeps one busy trying to keep one's head above water with a young and vigorous staff.

The Year 1961 has been a travel year for me. One trip was made to Jamaica, Puerto Rico, Martinique, Trinidad, Br. Guiana, and Surinam. Another trip around the world with stops in Italy, Greece, Cyprus, Lebanon, Thailand, Philippines, Australia, New Zealand, and Fiji Islands was most pleasant. Still another trip over a weekend to Kingston, Jamaica. The agriculture of each of these countries was studied and I met many old friends in far away places."

STROUBE, Edward W., Assistant Professor, Ph.D. 1961, and Evelyn, Columbus. Their two children are Mark, 6, and Mary Ellen, 4. "I received a Ph.D. in August. Prior to July 1, 1961, I was full time Extension. Then I was split three ways (figuratively and almost physically). My appointment is 1/3 each teaching, research, and Extension, all in the field of weed control. There is a rumor that I will have some help after January! The family is growing in size but not in number. Mark started to kindergarten this year and is quite enthused about this higher education."

TAYLOR, George S., Professor, and Bernice. "Continuing work in soil physics, primarily a study of moisture flow problems with a resistance network analog and the University's electric computer. The soil physics group has been sneered at occasionally because of a new research project in soil clogging by septic tank effluent. In fact, we may lose many of our former visitors! Family status same as previous years: Barry, 13, Ronald, 11, and Jill, 6. My wife (Bernice) and I have names but forgot the ages."
"SOMEHOW I WAS HOPING GENETIC ENGINEERING WOULD TAKE A DIFFERENT TURN."
STAINED GLASS MURAL

The stained glass windows are composed of many sections, and depict three crops and three soil drainage classes. The crops are wheat, corn, and forage. The drainage classes are very poor, moderate, and well drained. The soil colors were selected as the best match between glass and the representative soil colors. The vertical and horizontal lines represent roots and channels. The sky depicts rays of the sun and emphasizes the role of radiant energy in plant growth and food production. Observing the windows as a whole aids the viewer in comprehending agronomy. Just as the artist has aided the viewer in seeing new relationships, the following three faculty members aided students and farmers to see new horizons.
Dr. Musgrave's professional career was in Ohio's Agronomy Extension Service. He was a Specialist in Soil Fertility and Director of the Soil Testing Laboratory. The laboratory evolved into one of the best in the U.S. He developed educational programs that utilized soil test results as a major input of farm management. These programs and the laboratory made the tools of crop production available to every farmer in Ohio in a form that he could understand. Under his direction, the Soil Testing Laboratory tested approximately 100,000 samples annually for several years. Dr. Musgrave advanced administratively in the Ohio Cooperative Extension Service to the position of Associate Director.

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The wheat crop represents the small grains. The improved wheat varieties contributed greatly to the Green Revolution. It is one of the two principal food crops in the world.

The soil profile represents moderately drained soils. The subsoils of these soils are mottled and are represented in the window by the yellow and gray glass. These soils occur on nearly level landscapes. The bottom layer of clear glass symbolizes the limestone bedrock found in western Ohio.

Dr. Volk was a soil scientist and served as chairman of OSU's Agronomy Department for 28 years. His early work involved soil survey and fertility work in Central America. His research in Oklahoma, Alabama, and Ohio concentrated on phosphate fertilization, soil acidity modification, and nitrogen fertilization. His success as chairman of the Department and as advisor of 50 graduate students is attested by the accomplishments of "his" faculty, of "his" advisees, and by being elected a Fellow of ASA. At his retirement all the faculty in the department had been employed during his tenure as chairman. His enthusiasm for soil science was not only contagious to his professional colleagues but also to his two sons.

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Corn is a major cash crop in Ohio. Corn, as well as soybeans, is used for food, feed, and a source of chemicals.

The center window shows a very poorly drained soil profile. These soils are black because of the high concentration of organic matter. The mineral fraction is gray because the iron is in the reduced state. In the corn belt, the very poorly drained soils are very productive after the excess water has been removed by drainage.

Forage crops are important to the livestock industry and for soil conservation. The artist also included weeds and an earthworm. Certain grasses have been modified by plant breeding for use around homes and on golf courses.

The window represents well-drained soils. These soils have a uniform red or yellow coloration in the subsoil because the iron is in its highest state of oxidation. These soils occur on sloping sites.