TEXAS A&M UNIVERSITY
Research-Extension Centers

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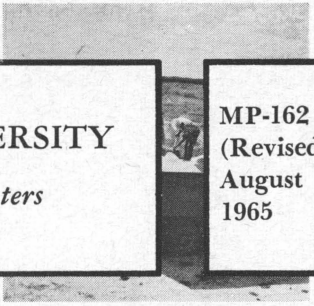
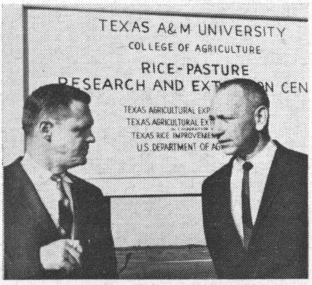
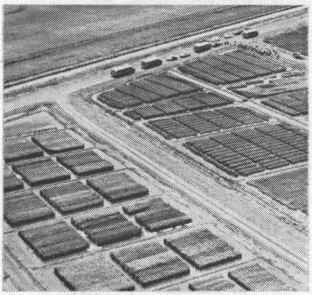






Rice-Pasture Research and Extension Center

BEAUMONT

TEXAS A&M UNIVERSITY
TEXAS AGRICULTURAL EXPERIMENT STATION
R. E. Patterson, Director, College Station, Texas

CONTENTS

TEXAS A&M UNIVERSITY
Research-Extension Centers

Rice-Pasture Research and Extension Center

BEAUMONT

J. P. Craigmiles and Staff

THE RICE PASTURE RESEARCH AND EXTENSION CENTER is the only research station for rice and rice-pasture rotation in Texas. It is located on Imes Road, 10 miles west of Beaumont on U. S. Highway 90.

The station was established in 1909 on a 100-acre tract of land just west of Beaumont. It was relocated in 1945 to its present site under a cooperative agreement among three agencies—the federal government, through the U. S. Department of Agriculture; the state, through the Texas Agricultural Experiment Station; and the Texas Rice Improvement Association, a nonprofit organization of rice farmers and businessmen interested in the improvement of agriculture on the Texas Gulf Coast. Financial sup-

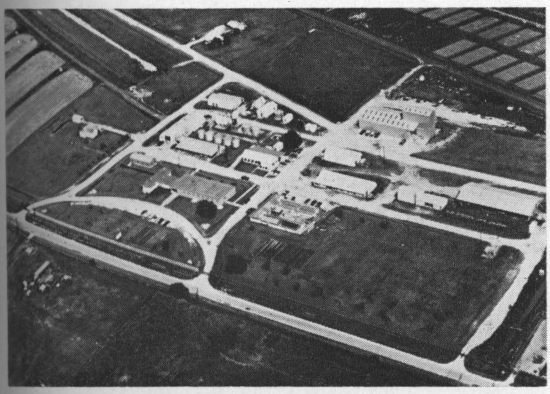
Superintendent J. P. Craigmiles examines an increase block of Bluebelle, released jointly by USDA and TAES in 1965. Station headquarters, pilot drying plant and other facilities can be seen in the background.

port from the association enables the station to broaden and deepen its scope of research. Numerous commercial firms, farm organizations and individual farmers also donate material, service and land to research conducted on the 910 acres of the Rice-Pasture Research and Extension Center. Many offstation tests are conducted on individual farms throughout the Texas rice belt in cooperation with the Texas Agricultural Extension Service.

The Rice-Pasture Research and Extension Center is centrally located in the Gulf Coast rice area at 94° longitude, 30° latitude and 30 feet elevation. The annual precipitation is 55 inches. Records for a 44-year period show an average 271-day growing season with the first killing frost in the fall occurring November 25 and the last frost in the spring on February 27. The average maximum temperature is 79° F., and the average minimum is 58° F. January, the coldest month, has a 53° F. average and July, the hottest month, an 83° F. average.

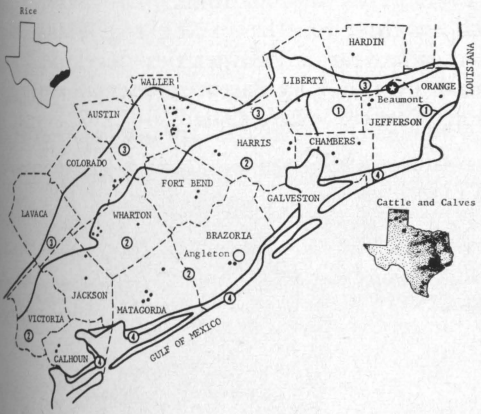
Two field days are held annually—one for rice in July and one for pastures generally in late March. The constant flow of visitors—primarily Texas and Louisiana Gulf Coast area rice farmers, cattlemen and visitors from foreign rice-producing countries — are enthusiastically welcomed. Inquiries concerning rice and forage problems are given prompt attention. The mailing address is Route 5, Box 366, Beaumont, Texas, 77706. The telephone number is REdwood 9-2741.

Outfield rice experiments are conducted in areas away from the Center. Here, agronomist N. S. Evatt cooperates with a county agent studying second crop yields.



Aerial view of headquarters, rice plots and forage experiments.

All phases of rice improvement, production, harvesting, drying, processing and utilization, and studies of forage and pasture production in rotation with rice are included in present research projects. In Texas, rice is the number three cash crop following cotton and grain sor-



RICE-GROWING AREA OF TEXAS

Predominant Rice Soil in each Area

① Beaumont clay and Bernard clay loam

② Lake Charles clay, Bernard clay loam and Edna fine sandy loam

③ Katy, Hockley and Edna fine sandy loam

④ Marsh and Beach sands (not used for rice)

• Location of off-station field experiments during the period 1955-65, inclusive

○ Location of Gulf Coast Pasture-Beef Cattle Research Station, Angleton

◘ Location of Rice-Pasture Research and Extension Center, Beaumont

Where rice and cattle are produced in Texas.

ghum. It is the most important crop of the Gulf Coast.

Texas has a larger acreage planted to long-grain rice varieties than any other state in the United States and is exceeded only by Louisiana in total rice acreage.

Rice is produced and consumed in larger quantities than any other food in the world. The United States is a major rice-producing country, producing enough to supply all domestic requirements and providing for a large export trade, making it the third largest exporter of rice in the world. Rice from the United States, recognized the world over for its superior quality and cleanliness, is shipped to approximately 90 different countries.

In the United States, rice is becoming increasingly popular, and consumption is rising steadily. During 1959-64, the use of rice in this country increased 26 percent.

Varietal Improvement

About three-fourths of the rice planted in Texas each year is of varieties developed and released by the Rice-Pasture Research and Extension Center. Texas had 617,117 acres of

A new rice variety usually has its conception in the greenhouse. Plant breeder John Scott hybridizes two parents in an effort to combine the superior characteristics of each into a single plant.

Building levees prior to seeding rice.

rice in production prior to the establishment of acreage controls in 1955. The principal varieties released since the rice-breeding program was begun in 1931 include Bluebonnet, Bluebonnet 50, Texas Patna, Century Patna 231, Belle Patna and Bluebelle. These varieties also are widely grown in other rice-producing states and in many foreign countries.

Breeders' stocks of varieties developed at the Center are increased for planting the certified seed acreage of the state as well as for seed production for export.

The main objectives of the rice-breeding program are the development of high-yielding varieties with the processing and cooking characteristcs required by the rice trade which are adapted to machine harvest and artificial drying. The breeding program has been concerned primarily with the development of early and midseason varieties of long and medium grain. Other varietial characteristics receiving major attention are:

1. Plant height and other nonlodging characteristics. Rice varieties are being developed to resist lodging and to better utilize high fertilizer rates.

2. Improved milling, processing and cooking characteristics with ideal-shaped grains.

3. Early maturity. Varieties especially suitable for stubble cropping and maturing in

95 to 110 days are being emphasized. An improved plant type with narrow erect leaves for better light penetration also is receiving attention. These erect leaf types reduce the amount of mutual shading, allowing the plant to receive more light and utilize higher nitrogen rates for increased grain yield.

4. Disease resistance. High-yielding varieties resistant to blast, hoja blanca, straighthead, Helminthosporium leaf spot and other diseases are being considered.

5. Salt and alkali tolerance. Tolerance to salt and alkali continue to be sought in the varietal improvement program.

The World Rice Collection is being screened in an effort to add disease resistance and outstanding agronomic characteristics that can be incorporated into present and future rice varieties. Other selections from all the major rice-growing countries are grown in an effort to improve the rice industry.

BREEDING METHODS

Hybridization, the most satisfactory method of breeding to date, is performed by removing the anthers (male) from the flower. Pollen from the anthers is then dusted on the stigma (female) of other emasculated flowers to be crossed. This method has been most successful in getting desirable characteristics from several parents into a single plant as indicated by the large number of high-yielding, high-quality varieties being released to farmers.

New methods and procedures involving ionizing radiation, utilization of male sterility in F_1 hybrids and improved breeding and testing techniques are being investigated by the Center's research workers. These plant types are normally shorter and darker in leaf color.

Erect leaf types reduce the amount of mutual shading, allowing the plant to receive more light. Since the plant can get more light, it can use higher nitrogen levels. Light intensity also influences the amount of nitrogen to be utilized for grain yield.

Genetics and Environment

Of all the factors influencing the growth of the rice plant, environment probably is the

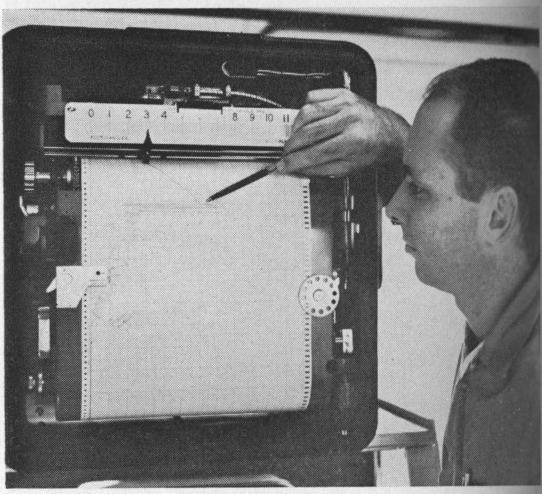
Emasculation is accomplished by removing the stamens (male part) from the flower. This is usually done by clipping the upper part of the floret with scissors.

Remaining immature pollen is removed with tweezers.

Cross fertilization is accomplished by dusting pollen from the male parent onto the emasculated stigma of the female plant. An F_1 hybrid seed is produced.

Plant breeder, C. N. Bollich, examines a field of Bluebelle.

greatest, yet the least understood. Recommendations concerning cultural practices in the past have, by necessity, been generalized to allow for a wide range of environmental conditions. By understanding environmental effects, recommendations for cultural practices could be



Of all the factors influencing the growth of the rice plant, environment is probably the greatest but is the least understood. Instruments to record light, temperature and moisture are used in many experiments in studying the effect of environment upon plant growth.

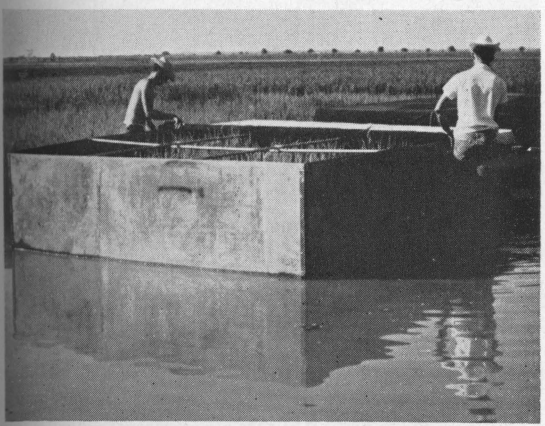
more specific. Also, by defining the environmental influences, the inheritance mechanism may be studied more critically in a specific environment. Studies have been conducted to determine the relationship of heredity and environment on some of the important quality, agronomic and morphologic characteristics of rice.

Differences in environmental temperatures have been found to influence the endosperm characteristics of rice. Cooler environmental temperature increased the amylose content and lowered the gelatinization temperatures of the varieties tested. Both of these endosperm characteristics affect the cooking and processing properties of rice. Gelatinization temperatures were found to be reduced approximately 2.3° C. for every 5° F. reduction in environmental temperatures.

Rice seeded early in the season efficiently utilizes higher levels of nitrogen fertilizer for grain yield. Later seeding dates reduced yield and the amount of nitrogen fertility utilized for yield.

MORPHOLOGY

The amount of light the rice plant receives during certain stages of growth has an effect on the amount of nitrogen fertilizer that can be economically utilized for grain yield. Variety-fertilizer tests have shown that some varieties have the ability to utilize higher rates of nitro-



Technicians give a short-day treatment to day-length sensitive varieties of rice to induce early blooming.

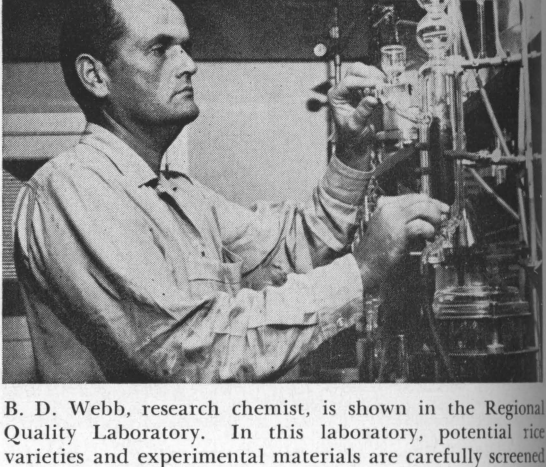
gen than do others. The varieties that utilize high nitrogen levels appear to have leaves which are intermediate to narrow in width and have an erect leaf structure.

Milling and Cooking Quality

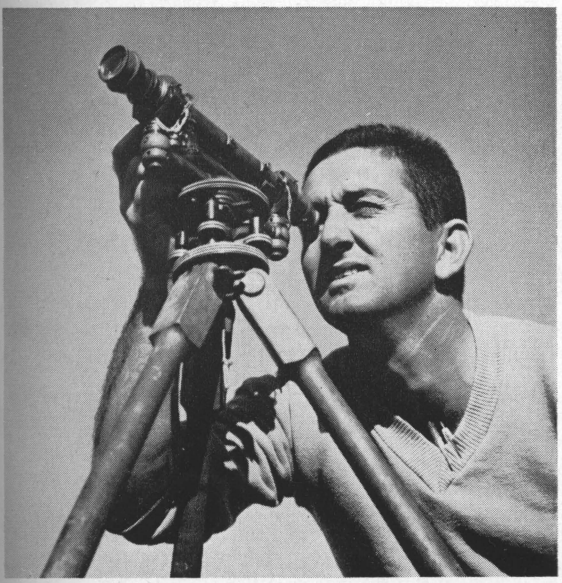
The importance of quality is recognized by all segments of the rice industry. Acceptable quality in each new variety, regardless of type, is a prerequisite before the rice is seriously considered for release. Consequently, the Crops Research Division, Agricultural Research Service, USDA, operates a Regional Rice Quality Laboratory in cooperation with TAES and TRIA which serves the rice breeding programs of the several rice-producing states. Commercial producers and processors of rice and rice-containing foods play a major role in the support of the laboratory through generous grants-in-aid.

Major objectives of the Rice Quality Laboratory are (1) to determine and evaluate the milling, cooking and processing properties of new rice varieties and selections developed by the rice breeders; (2) to develop new tests and improve current ones that will differentiate and characterize rice quality more accurately and (3) to conduct basic investigations on the factors responsible for differences in rice quality.

At the Rice Quality Laboratory, new and potentially new varieties of rice are subjected



B. D. Webb, research chemist, is shown in the Regional Quality Laboratory. In this laboratory, potential rice varieties and experimental materials are carefully screened for cooking quality well in advance of release.



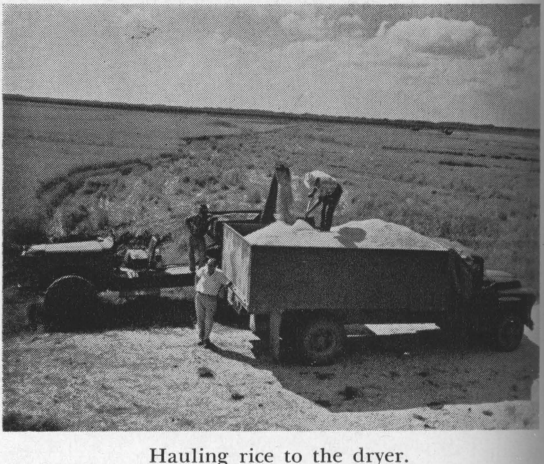
Level land is essential for good rice production. A. W. Bollich, in charge of Foundation Seed production, stakes out a field for levees before seeding rice.

to a series of chemical and physical tests which determine their processing behavior. Routine characterization consists of measurement of amylose content, starch-iodine-blue value, type and extent of disintegration of "head" rice in contact with dilute alkali, amylographic gelatinization and pasting characteristics, water absorbing properties at different temperatures, protein content, cookability of rice with malt enzymes and parboiling, soup-canning characteristics.

In addition to laboratory evaluation, samples of experimental varieties are made available to industry where they are further evaluated. As a result, farmers, millers and processors are aware of the quality characteristics of new and improved rice varieties before their release for commercial production.

Foundation Seed

Foundation seed, the product of the varietal improvement program, are produced at the Center in sufficient quantity to provide high quality seed of superior varieties to certified seed producers. These seed producers further increase the foundation seed under registered



Hauling rice to the dryer.

and certified seed classes so that adequate planting seed are available for farm use.

Foundation seed of Belle Patna, Bluebonnet 50, Bluebelle, Saturn, Nato and CI 9534 are presently being grown for distribution. Foundation seed of Abon Persianclover should be in adequate supply to meet grower needs. Gulf ryegrass and Israel sweetclover foundation seed also are produced. Seed growers interested in obtaining foundation seed of the above varieties should place their seed orders by February 15 of each year.

Station seed are produced on clean land and are rogued carefully, harvested, processed, cleaned and treated under the close supervision of research personnel to meet the rigid specifications required of foundation seed. A new rice seed processing plant was completed and put into use for the first time in 1964.

Rice Diseases

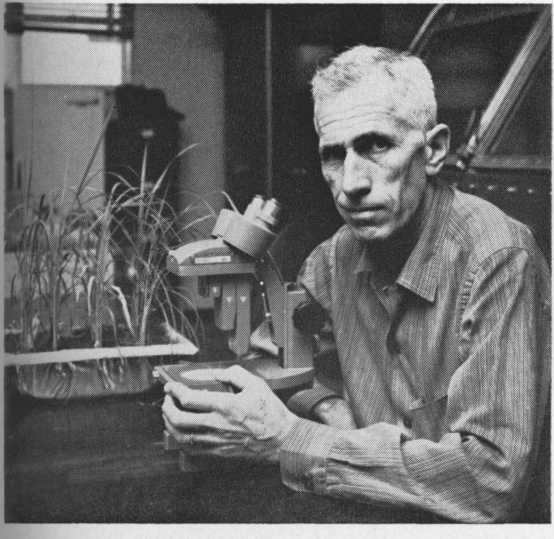
Resistance to many rice diseases has resulted from investigations conducted in the laboratory, greenhouse and field. Control of straighthead and certain races of blast has been obtained through breeding. In the varietal improvement program, major emphasis is being placed on the development of varieties resistant to all important races of the blast fungus in the southern rice area of the United States. The pathology program and the varietal improvement program

are closely coordinated with the pathologist evaluating the breeding lines for reaction to the blast organism. This regional pathology program also is an integral part of a world-wide screening program using differential rice varieties to determine physiologic races of blast fungus. In addition, chemical control measures are being investigated to prevent and restrain blast.

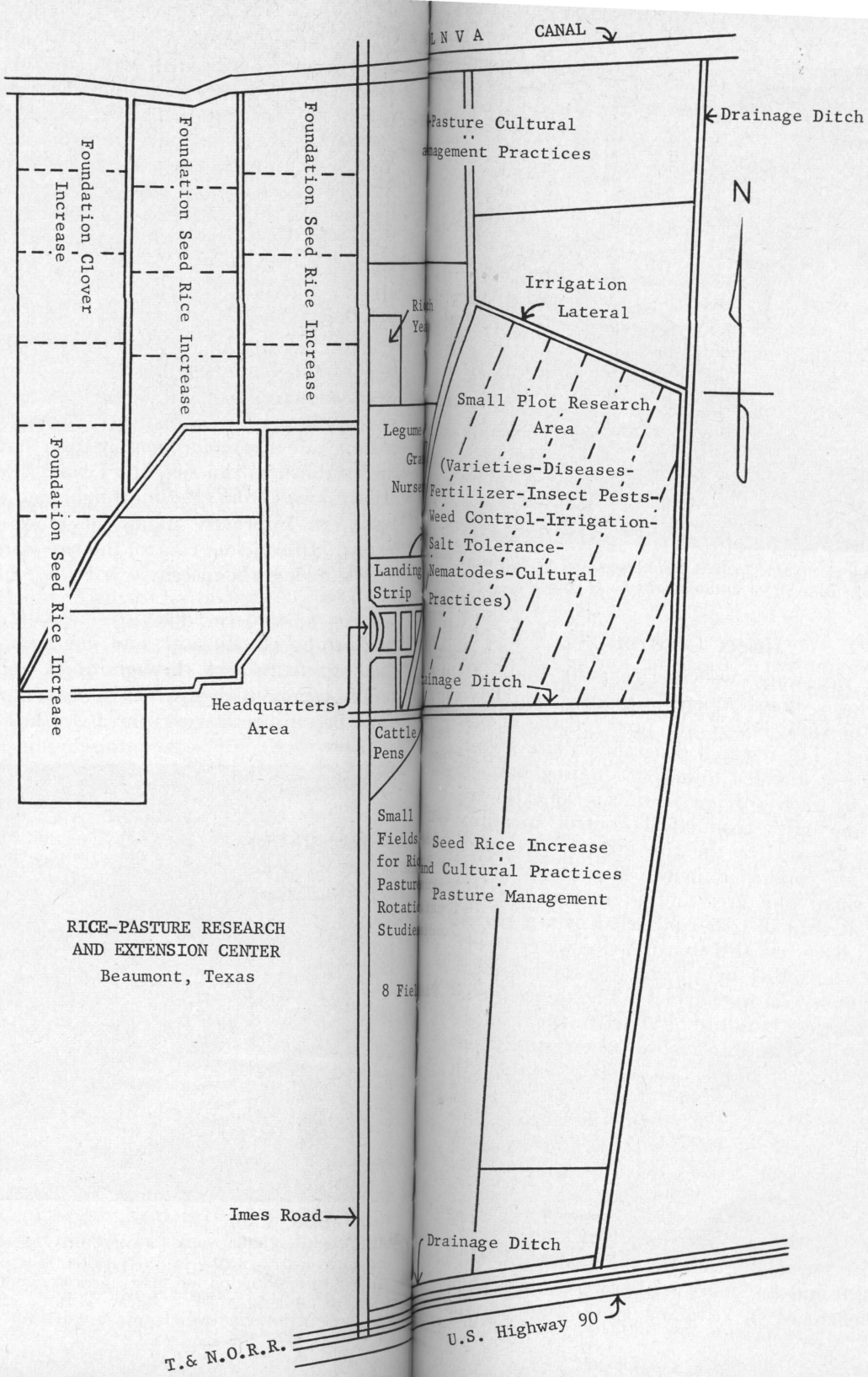
SEED TREATMENT

Seed rice treatment tests have provided rice growers with information on the most effective and economical chemicals and on the method of applying them. Treatment of seed rice with a fungicide-insecticide combination has become an established practice in Texas. Fungicides reduce losses from seedling blight and generally result in improved stands of more vigorous plants. Insecticides control the rice water weevil and stored grain insects.

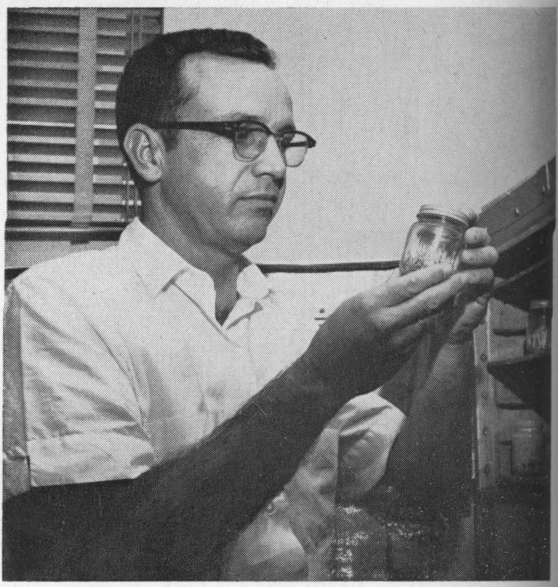
The Center is constantly checking for new or introduced diseases and methods of controlling them, and through quick recognition and isolation, many diseases have been prevented from becoming a serious threat to the rice crop.



J. G. Atkins, USDA pathologist, conducts research on blast disease. This work is concerned primarily with obtaining blast control in this region, but cooperative varietal differentiation of blast races is studied on an international level.



RICE-PASTURE RESEARCH
AND EXTENSION CENTER
Beaumont, Texas



Controlling rice water weevils, stink bugs and armyworms is the main concern of entomologist C. C. Bowling.

Insect Control

The rice water weevil, rice stink bug, fall army worm, grasshopper, leafhopper and two species of stalk borers are pests of the Texas rice crop. The research program on rice insects primarily is directed toward evaluating damage caused by each species of insects and toward developing safe, economical control measures that can be used by the rice grower. Research studies are conducted in the laboratory, greenhouse, small plot area and in commercial rice fields. Results of tests conducted over a period of years have revealed that the rice water weevil can be controlled by spray or granular applications of several insecticides. The same insecticides also were found to be effective when mixed with fertilizer application or when applied to seed before planting. Since seed treatment is the most economical and practical method of controlling the rice water weevil, considerable work is conducted each year to improve this method.

Cage tests have shown that losses in yield, milling quality and grades of rice can result from rice stink bug feeding. Parasites on both the adult and egg stages are known to be present and beneficial in reducing stink bug popula-

tions. Spray application of various insecticides have been evaluated and are recommended when populations reach economic levels.

Spray applications of insecticides to control army worms on rice sometimes are needed at the same time the herbicide propanil is needed for grass control. Tests have shown that certain insecticides interact with propanil resulting in severe leaf burn to the rice. Leaf removal tests have given indications of yield losses that might be expected from army worm feeding.

Rice Soils, Fertilizers and Irrigation

Fertilizer recommendations vary according to soil type, but research conducted on every major rice soil type in the Texas Gulf Coast Prairie indicate that commercial fertilizers applied at proper rates at the correct time and under optimum moisture conditions will increase rice yields 30 to 50 percent.

Although the soil fertility work began in 1909, it was not until 1947 that an intensive study of the different variables associated with rice fertilization began. As a result of the studies since then, general fertilizer recommendations on rates and ratios of nitrogen, phosphorus, and potassium; sources of fertilizer elements; influence of the effects of surface soil moisture on top dressing practices; methods of application; effects of liming; and fertility-irrigation interrelationships have been established for rice varieties in the different maturity groups.

Fertilizer requirements and yield responses of varieties are determined before they are released to commercial growers. This usually is determined in small plot work.

The application of these results are responsible for much of the rice yield increase recently experienced in Texas. General recommendations are 80-40-0 (pounds of available nitrogen, phosphoric acid and potash) per acre for Beaumont clay, Lake Charles clay and Bernard clay loam. The recommendation for Katy fine sandy loam is 60-40-20 and for Edna fine sandy loam and Hockley fine sandy loam, 60-40-0 per acre. These are general recommendations and will not apply to every individual farm. Results from soil tests, previous cropping history, weed and grass problems, time of seeding, variety and the goal of the producer also should be considered.

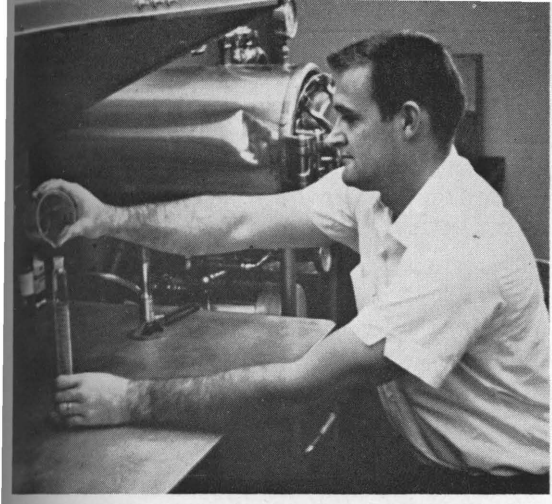
All of the phosphorus and potassium and a portion of the nitrogen should be applied at seeding.

Much of the current research is devoted to variety-fertilizer investigations. Although present rice varieties within the same maturity groups and grain size respond equally to commercial fertilizers, varieties are being developed that show a differential response to nitrogen as indicated by higher yields, less lodging and sterility at high nitrogen rates. Greatly increased yields may be expected when these become available to commercial producers.

Studies with very early maturing varieties (100-day) have enabled farmers to produce two crops of rice a year from one seeding. The second or ratoon crop comes from the regrowth of the stubble. Rough rice yields of 8 to over 12 barrels (1,300 to 2,000 pounds) per acre now are commonplace, particularly where additional nitrogen (40 to 60 pounds per acre) and water have been added. By double cropping, the total yield per acre is increased, thereby decreasing the unit cost of production.

Weed Control

Standard cultural practices have proved inadequate in controlling weeds in rice; consequently, chemical measures are being taken. The Center continually tests materials in the greenhouse and on field plots for their potential use as weed and grass killers. A suitable compound should kill or reduce all grass and weeds and not be harmful to rice or leave a toxic residue. Such a chemical reduces the amount



Weed control is necessary in crop production. Here, W. T. Flinchum perpares chemicals for herbicide tests.

of water used in growing rice and results in higher yields.

Chemicals that will control broadleaf weeds have been available for several years, but not until 1960 was there a material, Propanil, that was effective against grass type weeds. Its use has become a standard practice and has altered the cultural practices of rice farming.

Nonselective sprays are tested for controlling vegetation in drainage ditches. Weed control research will be continued in rice and be expanded into pasture improvement. Studies to determine what effect grass control in rice has on native pasture which follows rice are under way.

Drying and Storage

Rice drying tests are in progress using a continuous-flow, heated-air dryer similar but smaller than commercial dryers. Drying procedures which show promise of reducing dryer operation time and/or increasing the milling yield of dried rice are evaluated. Recent tests show that cooling rice in bins by aeration following passes through the dryer resulted in removing enough moisture so that dryer operation time was reduced about 20 percent compared with tempering rice without cooling between dryer passes. Fast versus slow throughput rates were compared in another series of tests. It was determined that a faster throughput rate along

with an increase in heated air temperature reduced dryer operation time. The heated air temperatures were controlled so that the temperature of the rice leaving the dryer was the same in both cases.

Research on aeration of rice has provided fundamental information about the design and operating procedures of aeration systems when used as a method of maintaining quality of dry rice in commercial storage. A series of tests were completed to determine the length of time undried rice may be held in aerated storage before a reduction in grade from damaged kernels occurs. Rice of four different varieties with initial moisture contents ranging from 18 to 24 percent (wet basis) was aerated at rates ranging from 0.5 to 2.0 cfm per barrel. The safe storage time was reduced as the moisture content of the rice or air temperature increased and such time was extended somewhat by an increase in the rate of airflow.

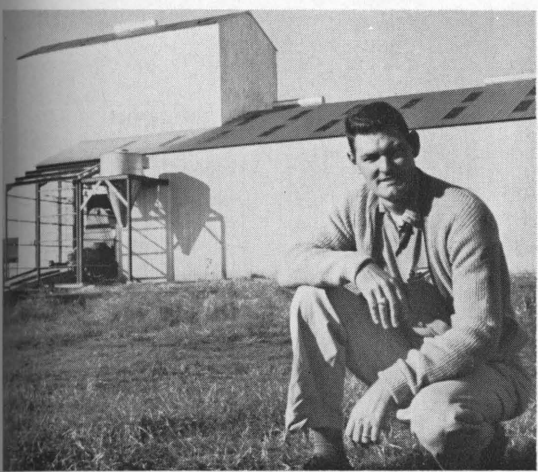
A study of rice handling and operating methods used at selected commercial dryers in Texas and Louisiana is underway. The object of these studies is to evaluate the techniques presently used and to determine how changes

D. L. Calderwood ignites the burner on the experimental rice dryer in studies to determine better procedures for operating commercial rice dryers.

Rice drying and storage is an important research area being investigated. Pilot rice bins are used in studying the effect of drying speed and temperature on rice, and pilot size experimental dryers are used in studying continuous flow, heated air commercial dryers.

in handling and dryer operating methods might increase drying capacity and maintain or improve the quality of the dried rice.

Previous research demonstrated that rice can be dried in storage with unheated air in the



Foris J. Louvier, agricultural engineer, conducts studies on handling rice at commercial dryers.

The Center is concerned with improving pastures in rotation with rice. Here, John Wood determines the relative cold susceptibility of several small grains in a clipping study.

Gulf Coast area of Texas when the following recommendations are followed.

1. Depth of rice should not exceed 8 feet.

2. Moisture content of rice should not exceed 20 percent when stored.

3. Select drying equipment to obtain a uniform airflow rate of not less than 9.0 cubic feet per minute per barrel.

Pasture Management

Improvement of pastures between rice crops has proved profitable in the rice-pasture rotation. In tests involving several rice-pasture rotation systems, it has been found over a period of 15 years that 100 pounds of beef gain were produced annually on first-year improved pasture and 180-270 pounds on second-year or older pastures. Less than 50 pounds per acre were produced annually on unimproved pasture.

Pastures are established by aerial seeding of dallisgrass and clover in rice stubble from mid-October until mid-November. Levees and drains

remain but are reworked to provide a drainage and irrigation system for the improved pasture. Thirty to 60 pounds of available phosphoric acid are broadcast in the fall at seeding and 30 pounds each subsequent fall. Development of these methods reduced establishment costs 50 to 75 percent and greatly increased the assurance of establishment of improved pasture.

Because of the usual lack of rainfall when moisture requirements are high for seed germination and early growth of fall and winter pasture in the Gulf Coast area, it has been found that the application of irrigation water about October 15 aids in early establishment and abundant growth of winter clovers and grasses.

The Rice-Pasture Research and Extension Center maintains a cow herd of all classes, totaling approximately 130 head annually, solely on forage and mineral supplement. This is accomplished through the utilization of summer and winter pastures and silage prepared from flush ryegrass-clover growth in the spring. A mineral supplement is fed free-choice the year around.

Each time cattle change grazing area, they are weighed to determine weight gain or loss. This also is an excellent time for dehorning and spraying.

Forage Plant Improvement

There is a continual worldwide search for better grasses and legumes. Each year, many strains of domestic and foreign grasses and clovers are tested at the Center for adaptability as measured by forage production, disease, heat and insect resistance, cold hardiness and nutritive value. From this program have come several improved forage crops.

GRASSES

The grass testing program to date has shown dallisgrass and bermudagrass to be unusually good pasture grasses. These grasses give excellent forage production in a mixture with whiteclover or persianclover. Also recommend-

Herdsman, Bruce Brown, and "Rusty" stand by to work cattle. The Gulf Coast area has a good year-round grazing climate with white clover, Abon persianclover and Gulf ryegrass providing the principal winter grazing.

ed for the rice belt are annual ryegrass, Angleton bluestem and Bahia grass.

Gulf ryegrass, developed by the Rice-Pasture Research and Extension Center from Estanzuela 284, a selection from Uruguay, is more productive and more rust resistant than other annual ryegrasses. Gulf ryegrass has largely replaced small grains for winter pastures; however, Mustang oats, Alamo oats, Goliad barley and Elbon rye give good forage production.

LEGUMES

White and persian clovers have proved the most productive in the eastern part of the rice belt. Beerseem clover and giant ball clover show promise. Sweetclovers are more productive in the western section.

Abon persianclover, a reseeding annual, was released by the Rice-Pasture Research and Extension Center in the fall of 1963. This improved variety of persianclover was developed from seven strains originating in the Near East. It can be grazed 4 to 8 weeks earlier in the fall and 4 weeks earlier in the spring compared with common persianclover.

Israel sweetclover, also released by the Rice-Pasture Research and Extension Center, has proved superior to other sweetclovers in forage production for the rice belt.

Fence Post Durability

The Center, in cooperation with the Texas Forest Service, has engaged in a state-wide test on fence posts since 1952. After 14 years of service, no cedar, live oak, catalpa, gum or creosoted pine posts have failed because of attack by insects or decay. Post oak posts serviceability is very poor, and the use of untreated post oak posts is not recommended. Insects and decay were present in a large number of posts within each species, but exceptions were found in live oak and creosoted cedar posts. More insects and decay occurred in unpeeled cedar than in peeled cedar posts. On posts treated by an oil solvent preservative, L-shaped, ring-shank staples are superior to conventional staples in holding capacity.

Weather Data

Other activities include maintaining meteorological records of daily readings of rainfall, air and soil temperature, humidity, evaporation and wind movement. Readings of light intensity within the visible spectrum are recorded continuously on a daylight recorder. In addition to recording light intensity on a chart for a permanent record, an integrater device allows computation of accumulated light on a daily basis. Records have been kept since 1945 and are published twice daily in the local papers. These recordings are made in cooperation with the Texas Water Commission.

Improved Varieties Released

Improved varieties of rice and forage crops released by this Center are:

Rice	
Texas Patna	1942
Bluebonnet	1944
TP 49	1949
Bluebonnet 50	1950
Improved Bluebonnet	1951
Century Patna 231	1951
Gulfrose	1960
Belle Patna	1961
Bluebelle	1965
Forage Crops	
Israel sweetclover	1957
Gulf ryegrass	1957
Abon persianclover	1963

Foreign Training Program and Visitors

Although grants or funds are not provided for the Foreign Training Program at the Rice-Pasture Research and Extension Center, over 130 foreign visitors and students, representing some 20 countries, spend from 1 to 90 days studying at the Research Center each year. This training responsibility is absorbed by the local staff member having the same interest as the visitor. The main objectives of the program are to provide the foreign visitor with the opportunity to observe American rice production methods and practices and procedures

Both foreign and U. S. dignitaries, congressmen and specialists visit the Center. Here, members of the rice subcommittee of the House Committee on Agriculture listen to a researcher.

based on research conducted at this research center; to study research techniques and procedures used by our research workers; and to understand the overall rice industry and the role the Center plays in obtaining research data and disseminating the information.

A 5-day rice short course designed for foreign visitors is held whenever required. This course is for participants desiring an intensive study of the research projects being maintained by the staff. It includes rice breeding, genetics and varietal improvement, rice diseases, rice insects, rice fertilization and management, weed control, rice drying and storage, quality testing and pasture and animal production in rotation with

Extension is part of the job of the Rice-Pasture Research and Extension Center. Here the entomologist explains rice insect damage and control to a group of visting farmers.

Visitors are always welcomed at the Center. A group from the Eagle Lake area study the latest research findings.

rice. Participants also will gain an understanding of the whole rice industry. Prior approval is required to attend the short course. Application is made by letter to the superintendent.

Boyt Memorial Fellowship

This fellowship was established in 1950 by the American Rice Growers Association and the Texas Rice Improvement Association in honor of the late Capt. A. H. Boyt, a pioneer leader in the rice industry. The purpose is to train outstanding young men for research or service for improving the rice industry. Four men–L. E. Crane, R. J. Butschek, J. W. Stansel and J. I. DeMont–have received benefits of this grant, and all have made noteworthy contributions to the rice industry. Applications from men of high potential value always are being considered. This fellowship presently amounts to $3,000 annually.

Graduate Student Training

Graduate students enrolled at Texas A&M University who are interested in rice production frequently conduct rice research at the Center. In the past 10 years, 12 students have participated in the research program on the graduate level. Many foreign students not enrolled in a graduate level of study spend time at the Center studying and obtaining practical experience.

The Texas Rice Improvement Association

It is difficult to mention the work of the Center without mentioning the Texas Rice Improvement Association. The TRIA, a nonprofit organization of Texas rice growers and Gulf Coast cattlemen, has been an integral part of the Center for many years. This group of progressive farmers contributes to the budget of the research center, provides facilities and equipment for its operation and stimulates interest in all activites with leadership, imagination and suggestions. This organization makes the Center uniquely a cooperative institution among the Federal government, the State government and the individual grower. The TRIA has a 20-man board of directors, with E. V. Boyt as president.

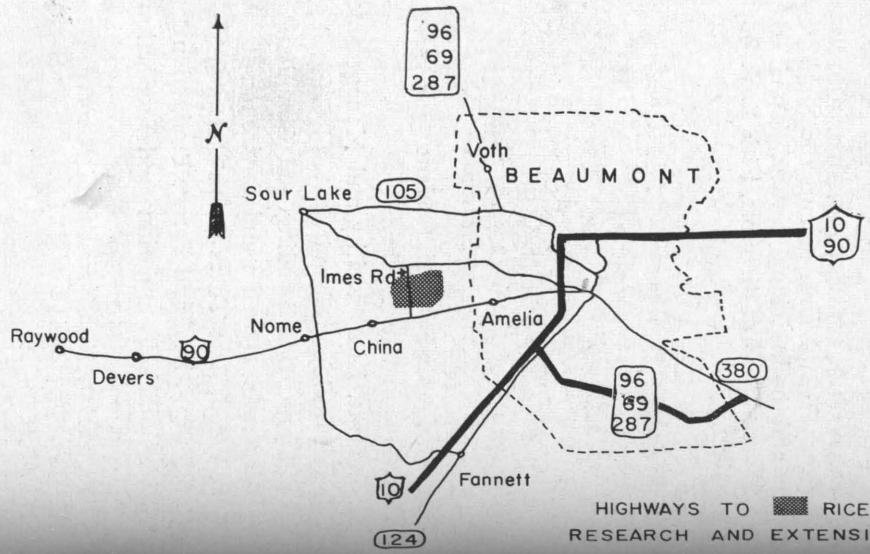
Personnel of the Texas Agricultural Experiment Station

J. P. Craigmiles, Superintendent
C. C. Bowling, Rice Insects
N. S. Evatt, Rice Fertility and Management
W. T. Flinchum, Chemical Weed Control
*J. E. Scott, Rice Breeding and Genetics
J. W. Stansel, Genetics and Environment
J. R. Wood, East Texas Crops Research
C. B. Brown, Beef and Forage Production
*A. W. Bollich, Foundation Seed Production

Personnel of the Agricultural Research Service, USDA

J. G. Atkins, Rice Diseases
C. N. Bollich, Rice Breeding and Genetics
D. L. Calderwood, Rice Drying and Storing
F. J. Louvier, Commercial Drying and Storing
B. D. Webb, Rice Quality

**Work cooperatively with the Texas Rice Improvement Association.*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HIGHWAYS TO
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