PD-AAS-128
ISN 42188

52

6750008
6750089

ANNUAL PROGRESS REPORT

AGRICULTURAL PROJECTS - 1966

Food and Agriculture Division,

U.S. Agency for International Development

Conakry, Republic of Guinea.

675

000094

1

6750008
6750039

ANNUAL PROGRESS REPORT

AGRICULTURAL PROJECTS - 1966

This is the third consecutive and final annual report of progress covering the Agricultural Resources Development and Riceland Rehabilitation projects which the USAID has had in cooperation with the Government of Guinea. Agricultural assistance to Guinea was first negotiated in 1962. Field activities commenced the following year. A third project proposal, Riceland Reclamation (Kakossa Loan), had not yet been agreed to when the USG requested in November 1966 that a moratorium, later in December 1966 termination, be called on all further cooperation with the GOG in agriculture in view of the expulsion of the Peace Corps Volunteers from Guinea.

Seven USAID direct hire personnel, one contract technician and one local-hire secretary were variously engaged during 1966 in fulfilling the objectives of the agricultural projects mentioned above. Status of employment and duties of the personnel assigned to these USAID project activities during 1966 are listed at the end of this section. Individual progress reports for the different sub-activities were completed by the respective technician or technicians immediately assigned to the work.

Peace Corps support in 1966 to the Agricultural Resources Development and Riceland Rehabilitation Projects continued to be about equal in scope as in previous years. There were nine Volunteers assigned to the National Professional School of Agriculture at Tolo (5 teachers, two construction workers, and one each as secretary and mechanic), two to Fouleya Research Institute at Kindia (construction work and agricultural chemist), and one part-time Volunteer each at Conakry (procurement and dispatching of commodities), Koba (rice trials) and Kabak (rice trials). Plans for 1967 which had been approved by the GOG would have more than doubled the number of volunteers assigned to these projects and would have expanded the support to include civil engineers, agriculture extension workers and more mechanics.

Additional agricultural projects which were newly added to the responsibility of the Food and Agriculture Division some time during 1966 included the Self-Help Project, the Regional Rinderpest Program and the Palm Oil Project (following 1 July 1966). The latter had been under contract to Checchi and Co. until the Project Leader returned to the U.S. in July and the Industrial Advisor in September. Following departure of the last of the Checchi Contract employees a Peace Corps Volunteer continued to provide support to the Micros Palm Oil Center at Kagbale. Actual work of the Self-Help Project Activities (Beekeeping and Community Action Subactivities) was done almost entirely by the Peace Corps Volunteers following approval of the proposal by the USAID Director and the Food and Agriculture Officer. Direction of the Self-Help Project Activities were through the Food and Agriculture Division because almost all of the activities sponsored were related directly or indirectly to agricultural development. Support to the Regional Rinderpest Control Program was mostly that of providing counterpart financing and mechanics support by the Peace Corps

Volunteers. At the time of the requested departure of the Peace Corps Volunteers by the Guinean Government there were twelve Volunteers supporting the nine different on-going sub-activities of the Self-Help Project, one at the Micros Palm Oil Center at Kagbale, and two at the proposed Regional Rinderpest Control Program. A brief progress report of each of the three new project activities will be included in this agricultural report.

FOOD AND AGRICULTURE DIVISION STAFF

Direct Hire:

S.C. Litzenberger, Food and Agriculture Officer; Chief of Division; Monitor, Self-Help Project (Beekeeping and Community Action); Monitor, Palm Oil Project beginning 1 August 1966; Liaison Officer for Regional Rinderpest Control Program. Duty began Feb. 1964.

W.M. Shimasaki, Agricultural Engineer Advisor; Monitor Riceland Rehabilitation Project. Duty began Oct. 1964.

R.K. Schwanke, Research Advisor; Monitor, Research sub-activity of the Agricultural Resources Development Project. Duty began Feb. 1966.

W.G. Rockwood, Extension Advisor; Monitor, Extension sub-activity of the Agricultural Resources Development Project. Duty began Mar. 1966.

J.T. Jackson, Agronomy Adviser; In Charge Corn Improvement activity of the Agricultural Resources Development Project. Duty began Oct. 1963.

R.G. Lortscher, Provincial Extension Advisor; Extension sub-activity of the Agricultural Resources Development Project. Duty began Oct. 1965.

Shirley Paulson, Secretary. Duty began Feb. 1965.

Contract Hire:

R.E. Wilson, Agricultural Education Advisor; Monitor, Education sub-activity of the Agricultural Resources Development Project (Tolo) Duty began Oct. 1965.

Helena Bangoura, Secretary (Conakry). Duty began Dec. 1964.

Robert Manly, Agricultural Industrial Advisor (Checchi Contract) assisted on a part-time basis during 1966 in supervising the penela sugar mill installation at Foulaya and the Micros palm oil training program at Kagbale.

Riceland Rehabilitation Project (William M. Shimasaki)

This project was initiated in 1962 to rehabilitate four existing riceland projects, namely: Kabak, Soulemanya sector of Kakossa, the Rio Soumba Project near Dubreka and the Koba Station.

The scope of the project was slightly enlarged upon request of the GOG in 1965 and some limited work was performed in the Fouta Region in the Interior of Guinea. The project was held in suspense because of the elimination of the Peace Corps in November and finally cancelled in December. Effective 1 July 1966 all USAID riceland support was to be confined to the Coastal Region with the center at Koba. Accordingly, rehabilitation in 1966-1967 was to have been confined to Kabak, Koba and Bintimodia, with Peace Corps support provided as civil engineers and mechanics. However, with the GOG not being able to provide topographers the Bintimodia location had to be eliminated.

Cooperation given to the Wansan project by the local government officials has been excellent in the Dalaba Region. At Siguiton, the Governor of the Pita Region did not implement his part of the work arrangement and consequently, although the physical work for the construction was accomplished, no rice was planted during this season. At Kabak, officials have been very willing to listen and offer help when discussions have been held, but implementation had been extremely meager.

The Ministry of Rural Economy had furnished one Tatra truck to transport the HD6B tractor but only on a "when available" basis. This resulted in the loss of approximately one and a half months of work time while the tractor was waiting for the truck to be made available. In the FY 67 program provisions were made to include the purchase of one equipment trailer to be towed by the dump truck.

Although most local commodities were obtainable when in supply, there was considerable difficulty in obtaining both form lumber and lumber for making the gates. About two months after placing an order for gate lumber, we were told that payment in advance would have to be made for any large lumber order. The payment was made as requested, but up to the time of the beginning of the rainy season less than 2 cubic meters of lumber had been received. Consequently, the gates at Kabak, Koba and Siguiton could not be completed by the beginning of the rainy season.

The following major commodities were received from the U.S. during the year: one HD6B Allis Chalmers tractor with bulldozer blade, one vibrating tamper (ordered in FY 64 and finally received 16 November 1966), one 2½-ton Dodge dump truck from the Palm Oil project, two Wagoneers, and two 2½-ton Dodge flatbed trucks.

Some progress in training of operational and management personnel for the rehabilitation effort was made during the year. A Guinean tractor operator, a mechanic and three construction foremen were assigned as full-time employees to work directly with the USAID engineer in the performance of their regular duties throughout the season. The UNSF further supported the riceland effort by providing on-the-job training for operational and management personnel at Kabak and Koba. Eventually UNSF-trained crews as a MERA responsibility would provide operational and management needs for the larger government riceland projects such as Kabak and Koba.

Two candidates had been nominated by the MERA to study rural engineering in the U.S. Only the President's signature stood in the way of their departure at the time of the termination of this project in December. This was in sharp contrast to not having had a single candidate nominated before this time.

Field Activities

Kabak: Despite insistence that the success of the Kabak Island project was very intimately tied up with the dependable operation of the ferry, and despite the Governor's assurances that the ferry would be in good mechanical condition, the ferry was operative only about thirty-five percent of the time. Much time was lost due to the inability to transport needed supplies to the worksite on time. Other projects also suffered as the truck would often be "trapped" on the Island and supplies could not be delivered to the other worksites as required.

Commencement of work at Kabak was delayed until 1 March pending repairs to the road from Mafrenya to Touguiire. When work did start, a labor supply problem was encountered as the UNSF had also started a project where over 100 laborers were needed, thereby creating a labor shortage. The laborers began to leave the job starting about 15 May to work in their own rice fields. From then on to the middle of August when the work was finally stopped, lack of workers was the major problem encountered.

The following work remains to be done at the Kenende structure:

a. Make and install wooden flap gates,

b. Install wooden stop planks.

c. Remove present Armco gates for salvage.

d. Break out old concrete to create three clear openings 2 meters x 2 meters.

e. Remove all shoring under roof of culvert.

f. Complete fill to former level and configuration.

g. Block out the five unused culverts that are now leaking badly.

The following work had been planned for completion in 1966 at the Youlayen structure: Repair the culverts that had dropped down at the junction of the old structure and the new construction. This has been contemplated as a purely Guinean venture with the USAID engineer serving only in an advisory capacity. As the foreman Mr. Cisse Fode has worked on the same type of work for the last three seasons, this project should be continued under his supervision.

Since the ferry had been grounded in the Morebaya River for about two months towards the end of the rainy season two reconnaissance trips were made to investigate the possibilities for making a road link from the mainland to Kabak Island.

The following work could be continued for making the road link to the Island:

a. Brush out preliminary alignment.

b. Run route survey and make profile map.

c. Compute quantities.

d. Make line adjustments as required.

e. Implement the work either through the Public Works or the Guinean Army. Earlier it had been considered as a Self-Help supported activity.

Koba: It was decided to reactivate structure No. 3 and the actual work was started on the first of April. Excavations proceeded slowly due to difficulties encountered in removing the 1.80-meter pipe found in place.

Due to lack of experienced local personnel, the work progressed slowly and it was often substandard. Some portions had to be re-done. The bridge section was poured, thereby completing the structure, on 7 July. As of 22 July all work except the gate work was stopped at the structure due to heavy rains.

The gates were to be constructed and installed as soon the lumber could be obtained. Enough lumber became available on 5 August and the construction of the gates begun immediately.

The gates were hung during the absence of the engineer who was on R & R leave and they did not fit properly. This will have to be remedied.

At the beginning of the month of September, one of the slide gates in structure 4 broke in two and temporary repairs were made.

Several reconnaissance trips were made during the year to examine the proposed "Koba Extension" rehabilitation, an area 500 hectares in size located generally to the west of the station.

Plans had been made and work had just begun on the rehabilitation of the shops and the residences of the Koba Experiment Station when on 12 October it was learned that the GOG planned to utilize a part of the station as a school. All rehabilitation plans were held in abeyance pending clarification of the situation.

The following work remains to be done at Koba:

a. Repair wooden flap gate to fit structure No. 3.

b. Install stop planks in structure No. 3.

c. Build two flap gates for structure No. 4 and install after the existing slice gates have been removed.

d. Remove super structure of structure No. 4 and construct bridge spanning both gate openings.

Plans for 1966 included $ 4,000 to buy repair parts for two D4 tractors at Koba. These tractors are old models but almost new in usage, one tractor having less then 200 hours of use. A Peace Corps mechanic and three Guinean mechanics were sent up to Koba with a mobile shop unit to take one tractor apart and to make a list of parts necessary to put the tractor in first class operating condition. The second tractor had been returned to Conakry where the same process was applied to determine the parts necessary to repair the tractor. The list of parts for the tractor was not completed when the Peace Corps was ejected from the country. No further action is contemplated in this activity. The completed parts list was given to the GOG for their implementation.

Siguiton Project: In this project a cooperative agreement was made whereby the USAID would furnish supervision, transportation, a crawler tractor for dike construction and supplies not available to the Pita Regional forces for the rehabilitation of the Siguiton Plains. The Region would furnish all the labor, local supervision and semi-skilled men to work with our technicians to learn construction and surveying methods and procedures. The Region also agreed to furnish a tractor and a plow and to prepare the land for cultivation.

The construction work proceeded on schedule although difficulty was experienced from the very beginning of the work in obtaining workers and tools. This may have been largely due to the liaison man who was assigned to the project against his will.

A concrete structure of five bays, two meters wide by one and one half meters high topped by a two-foot walkway was constructed. This structure was connected to the adjacent high lands by an earth fill barrage which was built by the HD6B tractor. Rip rap protection was placed on the downstream face of the earth portion of the barrage. On the left bank an outlet structure with a 30 centimeter pipe was built for irrigating the fields during the dry season.

A peripheral protection dike, approximately two kilometers in length and a drainage channel approximately one kilometer long, was also built.

No gates could be constructed or installed as lumber was not available. This yet remains to be done. In addition to this a water-control structure at the outlet of the drainage channel must be constructed.

Wangan: The work planned and implemented in 1966 on this activity was as follows:

a. Build a protection dike (also used as a road) approximately one kilometer long.

b. Build a short cut-off dike between the cuvette and the river for better water level control.

c. Make a topographic survey in preparation to making contour dikes during the second year of the "three year development program".

d. A small warehouse to store project materials.

The actual tractor work was begun at the beginning of the year and progressed smoothly as scheduled. Both the tractor driver and the mechanic proved to be willing learners and quite adept. The Controller d'Agriculture, Mr. Diallo Mamadou readily learned to do simple surveying work and also to do grade checking for making the fills. About one month's working time for the tractor was lost due to the inability to obtain timely transportation to move the tractor.

This project was by far the most successful of all the work undertaken this year. This probably was due mostly to the fact that help for this project was requested from the Dalaba Region itself and not from the GOG in Conakry as is usually the case.

Further implementation of this work has now been stopped by the GOG decree that no further work will be done in Interior Guinea by the USAID.

Riceland Reclamation (Kakossa Loan Project)

Plans for the two-stage pilot riceland reclamation project involving approximately 2,500 hectares of Kakossa Island as developed with and approved by AID/W in 1965 had not been completely resolved by 31 October 1966, the latest deadline set for signing the Loan Agreement. All areas of agreement had been reached on this date except on a section which dealt with plans for subsequent development of the reclaimed land. The GOG had requested that details relating to this phase should be handled in an exchange of letters. There had been such an exchange of letters, but the GOG version had not yet come up to the expected requirements of the USG before signing could be effected. Similarly, there had not yet been an agreement reached between the Harza Engineering Company and the GOG with respect to the details of the contract to make the required engineering studies for the reclamation of Kakossa Island. Once the engineering studies were to have been completed a decision would be made as to whether the second phase or the construction phase would be undertaken and if so, how and at what cost. The negotiations on the Harza contract had reached the final stages. Existing minor differences had been referred to the Harza Engineering Company for consideration at the time that the decision was made by the USG to terminate further negotiations on this activity, the major determining factor was the expulsion of the Peace Corps Volunteers.

The critical problem of a ferry to the Kakossa Island had been resolved with MEPA. It had been agreed that once a ferry was made available to this project by the GOG it was to have been utilized only for the project and

Previous Page Blank

Agricultural Resources Development Project

This project was initiated in 1965 and greatly increased in 1966. Its major aim was to perform exactly as title the large and specific task of agricultural resources development in Guinea. With the cooperative efforts of the Guinean Government through the Ministries of Rural Economy and National Education effective steps were taken through this Project to continue to develop the country's agricultural resources: infrastruture, manpower and natural resources while at the same time actually increasing agricultural commodities.

It is quite apparent that the stage of complete preparation and adjustment of this Project to the Guinean agriculture environment had been reached in 1966 with the point of maximum effective contribution and service to Guinea agricultural production near at hand. Unfortunately with the projects being terminated, this will not be accomplished with this program. There is little question but what the program as developed with the GOG was on the right track. Every effort was bearing fruit although in some cases somewhat belatedly. Progress had been generally favorable.

To develop Guinean agriculture resources, this project administered technical assistance and training as well as provided essential supplies and equipment in order to establish an effective on-going educational-extension-experiment station system of agricultural development. The basic functioning units or sub-activities of this project were agriculture research, extension and education. Each of these activities' aims and resulting progress in 1966 are subsequently discussed under separate headings.

kept in repair by the USAID. If need be, the Self-Help Project was to have considered the rehabilitation of the existing ferry with the Peace Corps Volunteers.

A land route to Kabak was to have been undertaken as a Self-Help activity early in 1967. This would have eliminated the necessity for ferry service to Kabak. As for a land route to Kakosse this too was to have received further attention through subsequent studies by the Ficeland Rehabilitation project.

Research and extension efforts were in cooperation with the Ministry of Rural Economy and agricultural education was with the Ministry of National Education.

There had been essentially no participant training support by the GOG until mid 1966 except for the Director General of Agriculture attending the 1965 International Extension Seminar in the U.S. This year the GOG had requested USAID assistance to train seventeen agricultural technicians in support of this project in the U.S. Breakdown by subjects to be studied was as follows: Agronomy 5, Extension 2, Education 3, Forestry 3, Horticulture 2 and Cooperatives 2. Five of the candidates, all functionaires of the MERA, had already been processed to the point that all they needed was President Toure's signature for departure.

Research Sub-activity

The primary purpose of the research sub-activity in cooperation with the Ministry of Rural Economy and its supporting services was to increase production in the basic crops of rice, corn, vegetables, and sugarcane for panela. To assure realization of these objectives the USAID continued to support the development of three governmental experimental stations or research centers; namely, Fouleya Research Institute near Kindia, Koba Rice Station located north of Conakry on the coastal lowlands, and Bordo Agricultural Station near Kankan. In further support of the increased rice effort in 1966 on the lowlands Kabak Island was also included in the locations where research was to be supported. At these four locations extensive demonstrations and investigations were conducted. Cultural practices, varieties and soil fertility amendments were to be compared for the crops mentioned above with ultimate release of findings of practical applications to the Extension Service. Multiplication of seed of improved varieties found especially suited to Guinean conditions was intensified this year in order to satisfy increasing demands of farmers for better seeds.

Through this sub-activity on-the-job training for GOG personnel was provided as possible at the four locations mentioned above through the Cooperation of the MERA. Essential equipment and supplies were provided as programed. Some had arrived too late to be of value yet this season. Important soil and plant laboratory analysis were performed in 1966 at the Fouleya Research Institute by some of the better trained laboratory technicians in Guinea using high quality equipment. Research on sugar content, quality of juice, etc., on samples obtained from the fertility, date of planting, and variety trials were correlated with production of cane and subsequent panela sugar produced from the newly constructed panela mill. The value of this mill to increase Guinea's agricultural potential has not been fully appreciated as yet, and unless conditions change they may never be able to demonstrate it.

The RG through the Economic Commission had decided early in 1966 to eventually restrict USAID agricultural research assistance to the Coastal Region with riceland research centered at Koba. Support was to be continued at Foulaya as in the past. Assistance at the Bordo and Seredou Station and other outlying tests in Interior Guinea would be terminated following completion of trials conducted during the 1966 rainy season. This suggested change offered no particular problems as it was relatively easy to re-consolidate. This was not the case with the change which was effected at the Koba Station by the Minister Delegate of Base Guinea. Without consulting USAID the GOG had occupied part of the Koba buildings for a normal school under the direction of the Ministry of National Education. The situation had not been entirely resolved at the time of termination of this project, although consideration had been given to the possibility of Self-Help assistance to the construction of needed buildings at another site to satisfy the needs of the new agricultural school. The Peace Corps was to have supplied the service of an architect. Building facilities presently in existence at Koba were only adequate for the research and extension activities.

<u>Corn Improvement</u> (R.K. Schwanke and J.T. Jackson)

The 1966 wet season corn investigations included uniform variety trials, a program of synthetic development with local and introduced varieties, fertilizer trials, plant population trials, foundation seed maintenance and pure seed multiplication.

Since 1964, corn research has been regularly conducted in most of these areas with much success. Interesting results and ways of increasing production in Guinea have been found through these experiments. Further investigations were initiated this year to determine the optimum plant population required for maximum yields under Guinean conditions and synthetic improvement of the newly recommended Perta variety. It was desired that the 1966 experiments would fulfill the following objectives:

1. To determine general NPK fertilizer recommendations for various Guinean soils for maximum grain yields.
2. To obtain performance information on new and previously tested varieties under Guinean conditions.
3. To assist in development of an improved synthetic corn variety adapted to Guinean soil and climatic conditions.
4. To investigate the effect of plant population on grain yield using the newly released Perta variety.

The 1966 corn trials were conducted at the Foulaya Research Institute at Kindia, Bordo Agriculture Research Station at Kankan, and at the Seredou Station near Macenta as noted in Table 1. Soil preparation, fertilization, planting techniques and other cultural practices were similar at the three locations. Fertilization on all corn planting trials, except the fertilizer trials, consisted of applying complete analysis fertilizer (15-15-15) at the rate of 320 kilograms per hectare and triple superphosphate at 500 kilograms per hectare. These fertilizers were applied by hand and disked or plowed into the soil several days before planting. Side dressings of the corn trials at Kindia were applied when the plants reached a height of 50 centimeters and again when they reached a height of one meter. The urea side dressing was applied at the rate of 300 kilograms per hectare and the 2:2:1 mixture of urea, 15-15-15, and Es-min-el minor element fertilizer which was used for the second side dressing application was applied at the rate of 100 kilograms per hectare to correct mineral deficiency symtoms observed on plantings other than fertilizer tests. All side dressing applications were made by hand to the center of the corn row. Border strips that were not side dressed attested to the need of the treatment. Side dressings of the corn trials at Seredou and Kankan were not necessary as the soil was adequately fertile.

Soil fertility was observed to be variable at all locations. Soil acidity with pH values as low as 4.5 were encountered in the sandy soils at Kindia. At this low pH, toxicity of aluminum and iron and unavailability of essential elements were probably prevalent. Application of hydrated lime at the rate of 0.75 tons per hectare had no effect in correcting this low acidity or low exchange-capacity. Soil types varied between and within each location. Predominate surface soil types were sand to sandy loam at Kindia, silt loam at Kankan, and clay loam at Seredou. Drainage problems were encountered in the trial areas at Kindia and Kankan caused by rolling topography and soil impermability.

The corn planting technique was similar in all trials except for the population trial. Four seeds were sown by hand in each hill spaced 45 centimeters apart within the row. Row widths were constant at 90 centimeters in all trials. Plants were thinned to two per hill when they were 15 to 20 centimeters tall resulting in a plant population of 49,383 plants per hectare. Because of poor communications thinning was not performed at Seredou for any of the trials as originally planned. As noted in Table 1, planting of the various experiments commenced in May at the initiation of the rainy season. Weed control was very good at all locations. Only after corn pollination did insects cause damage on some trials. The primary insect was the corn borer. Late-maturing varieties such as Sataba were infested more with corn borer larva than early maturing varieties. Corn ear worm also was a common insect in some of the varieties.

Data and observational notes were obtained especially on the varieties included in the yield trials during the growing season where principal monitors were in immediate charge of the experiments. At harvest, all plots were picked by hand, weighed and sampled for moisture percentage. Where time and facilities permitted, the ear samples were shelled prior to weighing. Bulk Perta ear corn resulting from border rows at Kindia was dried in a hand constructed dryer and stored in a newly constructed metal crib at a moisture content of 20 percent. All grain yields were calculated from ear weights using an estimated shelling percentage value of 83 percent. This percentage is the standard value always used in converting ear corn to shelled corn. All corn yields in the following tables are given in tons per hectare of No. 2 grade shelled corn at 15.5 percent moisture.

Uniform Variety Trial: Twenty-four varieties were compared in replicated trials at three locations. These varieties consisted of previously-grown promising varieties and new introductions from various sources, Table 2. In the case of GS-1 and Mexican 17 varieties from Ghana the seed received of each was a mixture of yellow and white. Lack of uniformity in germination and plant size was noted for both varieties. Also, differences in seed stocks and variety performance, especially germination and seedling vigor, were noted between 1965 and this year in varieties E.B.S., SAS, and Cuyuta 63. Age of seed and poor shipping are beleived to have been primarily responsible for these differences.

There were distinct differences in variety yields among the three locations, Tables 3,4,5 and 6. The highest yields for most varieties were recorded at Kankan, while the lowest yields were recorded at Seredou. The highest yielding varieties were different at each location. Hybrid Poey T-62, open-pollinated Freetown, and synthetic VB-3 were the highest yielding varieties at Kindia, Seredou and Kankan, respectively. Over the three locations Poey-T-62 and Rockefeller 361 averaged the highest production of shelled grain per hectare, 3.70 tons. At all three locations the lowest yielding varieties were the same. These were Satabe, a local late maturing variety and three East German introductions, Siloma, Wir 25 and M 55, which due to photoperiod differences flowered 52 days after planting. As a standard for comparison, Perta was used this year because of the very poor performance of the Guinean variety, Sataba, and the national acceptance and interest of Perta by the Guinean farmers and Government agricultural officials. Yields of Perta were lower than most varieties at Kindia and Seredou, while at Kankan it was the highest.

In Table 7 are presented a summary of yields for the varieties that were included in 1966 as well as in prior years to 1963. When Mexican 17 was used as a standard of comparison for the four-year average a constant unit of measurement could be used to determine the yielding capability of each variety. This measurement is shown as percent superior (+) or inferior (-) compared to Mexican 17. As shown in Table 7, the best performing varieties were SAS and Compuesto Amarillo which yielded 10 and 8 percent more than Mexican 17, respectively. Unfortunately, poor quality of SAS seed was obtained from Trinidad in 1966 which resulted in a lower stand level and subsequent reduction in yield compared to years 1964 and 1965. The most inferior varieties were those introduced by the MERA from East Germany and those of local origins. From the investigational results obtained during the past four years, at least three open-pollinated corn varieties have been isolated as being superior for Guinea - Perta, SAS and Compuesto Amarillo. Several hybrid varieties from Mexico have been outstanding, but they present a problem of seed production at this time.

In addition to grain yields phenologic data were recorded for the variety trials at Kindia and Kankan, Tables 8 and 9. Differences between locations were quite great for each character. In general, ear weights for most varieties were correlated with yields. The maximum ear weight at both locations was about 150 grams. This ear weight was always correlated with yields of above 4.25 tons per hectare. In general most varieties produced larger ears at Kankan than Kindia. This no doubt was related to an existing soil fertility factor. Lodged plants were more prevalent at Kankan than Kindia. This difference in all liklihood was due to increased soil fertility, taller plants, larger ears and soil and climatic conditions. Due to heavy rainfall during the season, lodging resistance (stalk strength) was an important physiological character. Once the stalk has lodged, the ear becomes immediately vulnerable to being destroyed by rot or animals. Varieties Perta, Freetown and Mexican 17 were the least susceptible to lodging at the two locations. There was no particular variety outstandingly poor for disease in 1966. All new introductions have inherited resistance to the Helminthosporium leaf blights or they were sufficiently early to escape the infection. Except for Sataba, Wir 25, M 55 and Silema, most varieties were ordinary in plant and ear height.

__NPK Fertilizer Trial__: In order to obtain information on the optimum amounts of nitrogen (N), phosphorous (P), and potassium (K) fertilizers to apply on Guinea soils for optimum production, a replicated 3 by 3 factorial trial was conducted with the Perta variety at Kindia, Kankan and Seredou. The fertility trial at Seredou was incorrectly harvested and the data could not be used. Due to the very sandy soil and low pH of the fertilizer trial area at Kindia, the amounts applied of N, P and K were insufficient to obtain maximum corn yields as noted in Table 10 with all treatments having greater than 50 percent barrens and ear weights of less than 30 grams. Even though this was the case at Kindia, shelled corn yields of the various treatments present interesting information and trends. Yields and ear weights were much higher at Kankan than Kindia for each of the fertilizer treatments, Table 11.

In order to evaluate response of the main effects of N, P and K, a summary table was constructed for each location to show the percent increase in yield over the check for each fertilizer element. First and second order interactions even though apparent, were not considered in the summary Table. It can be seen that as rates of N, P and K increased, there was a greater positive linear response with N than with P and K. In most cases, a curvilinear response was present with increases of P and K. First order interactions are apparent at both locations at the 0 level of each element. The greatest interaction response was with N and P at both sites. The interaction of P and K was the least effective in raising yields at Kankan and actually reduced yield by 7 percent. Grain yields were increased 150 percent at Kindia and 5 percent at Kankan with the use of N, P and K fertilizers. It is interesting to note that the level of response was the same for each element.

At present the main fertilizer recommended for corn in Guinea has been a complete analysis fertilizer. Therefore, it was of value to test equal levels of N, P and K at 0,22.5, 45.0, 67.0 and 90.0 kilograms per hectare. In general, there was a positive linear yield response to increasing fertilizer rates, maximum yields being obtained at the highest rates of fertilization tried at both location. However, the most economic rate of fertilizing for Guinea to obtain maximum return per unit invested, probably because of the heavy rains, seems to be somewhere near the lowest rate of 22.5 kilograms per hectare of each of the active fertilizer elements. Response to compost treatments at the two locations tested appears to indicate that more than 5 tons per hectare would be necessary for real benefits. There is little question as to the value of it in increasing grain yields but higher rates would have to be applied.

Response of soils at Kindia and Kankan to fertilizer treatments seems to indicate that nitrogen is the most limiting element with phosphate very close to it. A good response may be expected from applications of N and P in combinaison under most conditions. Perhaps, the most economical fertilization program for these two locations would be a complete analysis fertilizer applied at the rate of 22.5 kilograms per hectare. For maximum corn yields, rates of greater than 90.0 kilograms per hectare each of N, P and K must be applied to these soils.

Soil samples were taken at each location and have been analyzed for N and P at the Fouleya Research Institute. This information which is now unavailable for this report would have been useful for interpreting these fertilizer responses.

Normal Population Trial: Since there was no available information on the proper plant spacing and density for maximum corn production on the newly released Perta variety a replicated split-plot population trial was planted at Kindia and Seredou, population levels from 12,000 to 148,000 were obtained by keeping rows spacings a constant 90 centimeters apart and varying hill spacings within the row to 45 and 90 centimeters. One, two and three plants per hill were employed as the density variables. Unfortunately, the trial at Seredou was not thinned to these originally planned densities.

As can be noted in Table 12 highest grain yields at both locations were obtained with a plant population per hectare of approximately 49,383, i.e., 2 plants per hill with the hills spaced 45 centimeters apart, as presently recommended to the Guinean farmers. Populations higher or lower than this produced progressively less grain per hectare. Apparently the 49,000 population value is about optimum for the soil and climatic conditions existing in Guinea.

Ear weight and number of double ears per plant were reduced linearly as population increased. The maximum yield of 5.42 tons per hectare was produced with ears weighing 156 grams. It is interesting to note the effect of closer hill spacing on the percentage of barrens and lodged plants per plot. Because of the greater stress for essential growing factors at the maximum density of 74,000 plants per hectare there was a fourfold increase of barren plants when area per plant was reduced by half. Number of lodged plants were reduced 50 percent or more when hill spacing was widened to 90 centimeters. This would lead to the conclusion that slightly wider row spacings should be attempted, still retaining the near 49,383 plant population found optimum for yield in this test.

<u>Bordo Synthetic</u>: During the past three years some corn breeding and selecting have been done on a local Kankan strain known as Bordo. The final step to producing the synthetic variety was taken this year when the nine best

individual lines were selected for polycrossing. Their retention was based on top-cross yield tests, plant, ear and other phenotypic characters. Original seed from these nine lines was mixed and planted in an isolated area at Foulaya. The entire plot was harvested and the yield calculated on the basis of tons shelled corn per hectare at 15.5 percent moisture. The yield of this plot was 3.13 tons shelled corn per hectare. Ear weight was 115.4 grams. The Bordo synthetic seed produced from this plot was to have been evaluated this next planting season against a random sample of original Bordo seed in order to measure the efficiency and effectiveness of selection, top-crossing, and general combining of the individual lines which comprised the final synthetic.

To develop a possible superior variety by combining the resistance to Helminthosporium of the Perta variety with the yielding capacity of the Bordo variety original seed of the same nine lines which comprised the Bordo synthetic was planted in a crossing block with Perta. Yield and other data are given in Table 13 for the nine Bordo lines and Perta. Due to the great soil fertility differences, all Bordo lines did not grow to their maximum capacity. In comparison to the Perta lines only Bordo lines 3 and 24 yielded greater than the adjoining Perta plot. The Perta variety had less barrens than any Bordo line.

Before pollination, all Bordo lines were detasseled. The seed produced by each Bordo line was planned to be evaluated for combining ability of the varieties this dry season by using original Perta seed for a standard of comparison. It was hoped that the cross between Bordo and Perta would have produced a superior single-cross hybrid variety worthy of further seed increase and investigation.

Pure Seed Multiplication: In order to maintain seed stocks of the better corn varieties and eliminate acquiring seed each year from various foreign countries a small plot was planted to each of the following varieties: GS-1, Mexican 17, Compuesto Amarillo, Compuesto 1, Compuesto 2, VS-2, VS-3, Cuyuta 63, Perta, Metro and SAS. Thirty to forty plants of each variety were hand pollinated. It was found that large scale corn breeding work is difficult to perform at Kindia during the rainy season. With the high frequency of rainfall during the day it was often impossible to do a satisfactory job of collecting pollen, bagging and pollinating ears. Both rain and wind made hand pollination a difficult task at this time of the year. It was decided that future breeding work would have to be performed during the dry season.

Perta seed continued to be increased throughout Guinea in 1966 at Government Experiment Stations and Regional Farms as well as by individual farmers. The quality of seed has been excellent. Controlled pollination of multiplication fields in the Regions of Mamou, Kindia, Kankan and Macenta has been nearly perfect since the greatest part of the seed has been produced during the dry season under irrigation. The continued excellent performance of this variety throughout Guinea (See Table 14 from yield performance since 1963) has made it possible for the country to expand its acreage rapidly to satisfy its increased needs for poultry and human food needs.

Compared with local varieties normally grown in tests conducted to date since 1963 throughout Guinea Perta has yielded 2½ times more grain. For the four years, 1963-1966, it has averaged 3.0 tons of grain per hectare whereas the local checks have yielded only 1.3 tons. One hundred pounds of SAS seed had been obtained from Trinidad for multiplication at Kindia in December 1966 with irrigation. This variety has been one of the most outstanding yielders to date with excellent ear and plant characteristics. It had promise of ultimately replacing Perta even though the latter at present is satisfying the local need most satisfactorily.

Perta Synthetic Development: Due to the variation and degradation of the existing Perta grown at Kindia and the surrounding area of Guinea, it was proposed to commence improvement of this variety by careful selection on yield, plant and ear characters. Seed from 126 selected ears of Perta grown in 1965 at Kindia was planted in individual plots. These plants served as the female parents while seed from a random sample of Perta was used for the male tester lines. Unfortunately, the trial site lacked uniformity in soil fertility. Therefore, evaluation during the growing season of such phenotypic characters as plant vigor, height, lodging and disease and insect resistance were biased in favor of the female lines growing on more fertile soil.

Of the original 126 lines, 70 lines were selected for harvest. The remaining 56 lines were discarded because of purple plant color, susceptibility to leaf diseases and insects, poor standability, poor seedling vigor, low germination and shortness of plant. Yield results of the selected

70 lines and 16 male testers are given in Table 15. Male testers in adjoining plots to the harvested female lines were harvested so that a comparison of grain yields between female lines and male testers could be made. These results are presented in Table 18. Twenty-nine lines were discarded because of their lower yields compared to the adjoining male tester. Of the remaining 41 lines, three lines were discarded because of high susceptibility to leaf diseases, one line due to greater than 10 percent dropped ears and one line due to more than 10 percent barren plants. Unfortunately, there was insufficient time to acquire other phenotypic characters such as ear length, cob color and kernel shape, size and color, and agronomic factors such as shelling percent and test weight. These additional characters would have probably lead to a further elimination of a number of the lines selected for the following top-cross yield test. It was planned to have the improved Perta synthetic completed by the end of 1967 through the use of irrigation during each dry season.

Rockefeller Variety Observation Trial: Seed of 16 corn varieties was received from the Rockefeller Foundation in India to be planted in a yield trial in Guinea. Results of this trial, presented in Table 16, indicate that low yields for most varieties were due to poor soil fertility and/or lack of maturity at harvest. As noted in Table 1, this trial was harvested 32 days after pollination. Most varieties yielded greater than the adjoining Perta variety even though no particular yields were high. A high percentage of barren plants indicates that soil fertility in this trial may have been a limiting factor for full expression of the yielding capabilities of each variety. From general observation no particular Rockefeller variety was highly susceptible to various leaf diseases and insect attacks.

Rice Improvement (R.K. Schwanke)

Rice is the most important dietic food in Guinea. Much research work had been completed on this crop in Guinea by the French prior to Independence and by USAID since 1963. Location of trials for this year's wet season included the Coastal Plains and the uplands of Interior Guinea.

A list of the rice trials conducted at the four locations are presented in Table 17. The major emphasis in both upland and lowland growing environments was placed on rice variety and fertility experiments and in seed multiplication. In the latter case increased quantity of seed were necessary to satisfy Guinean farmers needs for Radin China 4, Anethoda, Tikiri Samba and Fossa. These new varieties had been observed to be superior in yield to locally grown types in controlled tests.

The primary reasons for conducting these trials were as follows:

1. To obtain information concerning the adaptation capabilities of introduced varieties to Guinea soil and climatic environmental conditions.
2. To determine the proper general fertilizer recommendations for maximum rice production on both lowland and upland soils.
3. To increase the availability of seed of new improved varieties found superior for distribution to Guinea rice growers.

Rice trial locations were the same as in 1965. Lowland sites were the Koba Rice Research Station and Kabak Island while the upland locations were the Foulaya Research Institute near Kindia and the Bordo Agriculture Station at Kankan. All of these locations are in the major rice producing areas of the country and, consequently, experimental results may have a greater and more rapid influence to increase rice production.

Cultural practices employed at the two locations in each area were the same. Upland rice trial sites were disked and/or plowed after hand application of a complete analysis fertilizer such as 15-15-15 at the rate of 320 kilograms per hectare and treble superphosphate at 200 kilograms per hectare. Fertilizer plots at each location were individually treated after plowing with the proper weighed quantity of urea, treble superphosphate, and muriate of potash fertilizers.

On the lowland rice trials, complete analysis fertilizer of a 13-13-13 formulation was applied at the rate of 500 kilograms per hectare to each nursery site and 300 kilograms per hectare to the main field. Prior to transplanting rice in the main field, 100 kilograms per hectare of treble superphosphate and 45 kilograms per hectare of muriate of potash were applied to all trials except the NPK fertilizer experiment. After the fertilizer was applied, soils were dug and puddled by hand. All variety trials at both upland and lowland sites were side-dressed with ammonium-sulfate at the rate of 95 kilograms per hectare prior to heading.

There was a large difference in soil types within and between the upland and lowland regions. A better soil type and more fertility were present at Kindia than at Kankan. Less organic matter, poorer structure and permability were evident in soils at Kankan than at Kindia. Surface soil types were a coarse sandy loam at Kankan and a loam or sandy loam at Kindia. The latter soil was derived from alluvial parent material while the former soil originated from weathered red-brown latosols. Soils within each lowland trial area were quite uniform in texture, structure and type. Soil type at the Koba trial site, according to Harza Engineering Company Reports was a clay. At Kabak Island it appeared to be also the same. Both soils were generally impermable which necessitated water removal to be done by surface drainage. Water control on the trial sites during the rainy season was poor at both locations. This presented problems in land preparation, fertilization and weed control. Soil fertility was greater at Koba than at Kabak. Soil mineral toxicity and soil acidity problems appeared to be somewhat less of a problem at Kabak. At both locations large quantities of oxidized iron were evident at 25-30 centimeters depths.

Upland fertilizer and variety trials were planted by hand in rows spaced 25 centimeters apart. Seed multiplication plots at Kankan were broadcast because of the large area involved and somewhat poor soil preparation. In the lowlands, rice seed was broadcast on raised beds, each variety being planted in separate beds. This technique gave good results to control rats and weeds and facilitated transplanting the more than 20 varieties. All lowland experiments except the spacing experiment were transplanted to the main field using a 25 by 25 centimeters hill spacing with an average of 3 plants per hill. Seeding rates were 80 kilograms per hectare for upland trials and 90 kilograms per hectare for lowland nurseries. The proportion of nursery or seedbed area to main field area was 500 square meters to 1 hectare.

Weed control varied with location and the capability of the personnel in charge of the projects. At Kankan, poor land preparation and timeliness of cultivation caused poor growth of the rice fertility trial and the seed multiplication trial of Tikiri Samba. The furrow method of planting was very advantageous for weeding compared to the broadcast system since wheel hoes could be employed. Weed control of all trials at Koba and Kindia was good. Because of poor digging, prior weed growth, and lack of readily available labor, the fertilizer trial at Kabak had a high percentage of weeds. This trial had been recently cleaned, but the early competition probably would have reduced yield. In addition to increased tillering and reduced lodging of the rice plant, a great advantage of transplanting was good weed control. A small non-replicated trial at Koba using Radin China 4 was designed to evaluate the differences in yield, tillering and lodging, between local and spaced methods of transplanting under weeded and non-weeded conditions. The chemical herbicide STAM-F-34 was compared at a low and medium rate in rice trials at Kindia. Best results were obtained with the medium rates. Two major problems encountered with the use of this chemical in upland rice this past season were the frequency of rains during the critical rice seedling stage and timeliness of application for good "kills" of weeds at all growth stages. Applications on rice of this same weedicide at the ENPA at Tolo were equally promising. Further investigations should be conducted in 1967 since weed control is one of the most limiting factors in producing rice.

The new insecticide Sevin effectively controlled stem borers, thrips and webworm which were problems at times in the rice trials at all locations during the season. Rat damage in the nursery and trial areas was reduced this year by the use of two rodenticides: Red Squill and Zinc Phosphide. The latter was found to be most effective because of the small quantity required in the bait and the ease with which it could be mixed with the bait.

Variety Trial: Seed of the seven upland rice varieties were obtained from local sources or from the Rokupr Rice Research Station in Sierra Leone. Unfortunately, a limited quantity of seed of four varieties was received from Rokupr so that a smaller than desired plot size had to be employed. Yields of paddy rice reported in Table 18 are unquestionably low because of the delay in harvest at both locations. This caused an unnecessary loss of grain by shattering. Data for the growth replication from Kankan is unavailable. Tikiri Samba was the highest yielding variety for the two locations. This yield of 3,08 tons per hectare was about 0,5 tons per hectare higher than that in 1965 and nearly double the yield of 1964. At Foulaya, this variety produced 3,34 tons per hectare in 1965. Anethoda was the highest producer at Kankan, but at Kindia primarily due to poor standability, it was the poorest. Of the new varieties introduced this year, Asucena by Faya Selection 57 was the highest producing variety with a yield of 2,84 tons paddy per hectare.

The agronomic character of the upland rice varieties are presented in Table 19. To make comparisons between locations for certain characters is difficult because of the different times that data were acquired. The small yields of Asucena by Faya 28 and 48 at Kankan may have been due to the high stem borer infestation during the heading stage. Fossa at both locations was an exceptionally good variety for resistance to lodging. Under high soil fertility at Kindia, this variety performed very well even though it is one of the tallest.

Small differences among the varieties were noted in reaction to Piricularia oryzae, seedling vigor and plant height. It is unfortunate that more harvest data (milling and cooking qualities) could not have been obtained for selection of the best varieties in this trial.

Due to the incompleteness of the lowland rice variety trials, only phenological data are reported for the Koba and Kabak locations, Table 20. Unlike the upland rice trials, the last observations made at both lowland stations were made within the same week. Comparisons between locations in such cases are possible. Twenty-one of the most promising varieties from Sierra Leone for lowland conditions were acquired from the Rokupr Rice Research Station. Due to the difference in availability of the main field space only 22 varieties were transplanted in the replicated variety trial at Kabak while 27 varieties were employed at Koba. As feasible the most popular local varieties were placed in the experiment to serve as standards for comparison. It was found especially for Koba that many of the local varieties such as Farkomen and Mamousou had been developed by the French prior to their departure. Varieties of early and late maturities were sown in the experimental trial. Varieties AIA-J, B 4 D-A, B 5 D-A, H-6, Faya, B 4 D-A 23, SR 26 and Molikounkoudi were early maturing varieties.

Based on results recorded in Table 20, all varieties grew about 10 to 20 centimeters taller at Koba than at Kabak. Because of the small number of plants sampled and the somewhat unsatisfactory criteria employed to measure plant height, there was a large height variation for the same variety at the different locations. Taller plants at Koba than at Kabak for each variety may have been due to higher soil fertility at Koba than Kabak especially in relation to varieties AA 10, H-6, B C 12, Cadung Phen and MAS 2401 which were growing in several replications at Kabak in poor soil with expressive weed competition. Leaves were wider for most varieties at Koba than Kabak with no specific variety being consisently wider. Leaf widths were not correlated to plant height.

Except for local varieties all varieties had a higher rate of germination at Kabak than Koba. Cultural factors may have been responsible for this difference. At Koba nurseries were dry and very cloddy which probably caused poorer seed contact with the soil and consequently drier conditions for poor germination even though pre-soaked seeds were sown. Bird damage to the nursery sites was small. The poorer germination of all six local varieties emphasizes a basic difficulty encountered by many lowland Guinea farmers. Poor germination, use of high seeding rates, and lack of transplanting material are circumstances which can be directly related to low seed viability and, subsequently poor seedling vigor of many local varieties.

Variety differences were apparent for seedling vigor while growing in nurseries. Varieties B C 8 and Bong Sen Den had the largest and most vigorous plants at both locations. No distinct difference were observed between varieties in rate of tillering although, in general, more tillers were present at Koba than Kabak. This difference was probably caused by better water level control, weed control, soil fertility and/or better transplanting at Koba. Blast disease caused by Piricularia oryzae and insect infestation did not seem to create a basic problem with any particular variety or at any location; however, local varieties seemed more resistant to attacks than introduced varieties.

In summary of the upland varieties, Tikiri Samba, Anethoda, and Azucena by Faya 57 were the highest yielding. As for seed quality none of them are entirely acceptable.

All introduced lowland varieties had better germination and seedling vigor than did local varieties. Local varieties at 130 days after planting seemed more resistant to insect and plant disease attacks and to the existing local soil environment which for many introduced varieties seemed to reduce growth. Unfortunately, without yield, seed, milling and more plant measurements no final evaluation is possible for any variety at this time. Planting plans were recently provided the UN Special Fund Rice Project of the MERA. Their agronomist has indicated interest in providing guidance and assistance as required in seeing the lowland harvested.

NPK Fertility Trials: With the acquisition of previous years variety trial results, better rice varieties were available for use in lowland and upland rice fertility trials, Previous years results showed some trends, but this seemed to vary due to year, location and variety variables. More information as to the optimum fertilizer treatment for future fertilizer recommendations in both regions made it necessary to enlarge this year trials.

A replicated 3 by 3 factorial design was planted at the two upland locations. Amethode was used in each trial. Yield results are only available for Kindia and are shown in Table 21. These must be interpreted in the light that cutting of the trials had been delayed by nearly a month. This undoubtedly resulted in severe shattering of most plots. Some differential shattering could have occurred as it is known that phosphate could encourage earliness while nitrogen might have the opposite effect. Shattering under such conditions might be correlated. A summary table showing main effects of NPK indicates that no particular trends are present. The largest increase in yield above the check was found with the P and K first order interaction especially at P_1 and K_2 levels. There seemed to be small response differences at any level of N P or K. The best complete analysis fertilizer for rice at Kindia was found to be the rate of 90,0 kilograms per hectare which produced a yield indrease of 6 percent.

As seen in Table 21, the number of tillers per plant was increased more by N applications at both levels of 45 and 9o kilograms per hectare than by either P or K. Unfortunately, this tiller count was not directly related to yield responses of N and, also, probably not to the number of panicle producing tillers.

Lowland fertility trials included treatments used in previous years. It was especially desirable to obtain more information on the application of complete analysis fertilizers at the rates of 0,22.5, 45,67.5 and 90 kilograms per hectare to lowland soils. Twelve different treatments applied in a replicated design at Kobe and Kabak are presented in Table 22. Only three agronomic characters are compared for the variety Kadin

China 4 planted in this trial. No apparent relationships appear to exist between plant color, tillering and the various fertilizer treatments. There was a positive linear relationship between increased amounts of complete analysis fertilizer and the increase in plant height above the check treatment. From data presented 10 tons of the type of compost used per hectare seems insufficient to greatly increase plant growth and tillering. Perhaps, this may be due to the immobilization or usage of the available N by soil micro-organisms in their decomposition of this material.

No specific conclusion may be drawn from only one fertilizer experiment in each region even though the treatments were replicated. Results of the upland rice trials at Kindia seem to indicate that yield increases may be expected with a complete analysis fertilizer applied at the rate of 90.0 kilograms per hectare. Applications of N at both rates stimulated tillering.

With the use of transplanted Radin China 4 on clay soils such as those at Koba a linear increase in plant height may be realized when from 0 to 90.0 kilograms of NPK complete analysis fertilizer is applied.

Hill Spacing Trial: It has been noted in the Coastal lowlands that distance between rice transplants varies from region to region, and from farm to farm. Specific reasons for this are probably numerous. However, there is a lack of information in Guinea in this area, especially in view of the release of the new Radin China 4 variety to farmers for growing in the Coastal lowlands.

In order to obtain data on the effect of spacing on rice yields in lower Guinea a replicated split-plot experiment was planted at the two lowland stations. One local variety and Radin China 4 were transplanted at three spacings, 20 by 20, 25 by 25 and 30 by 30 centimeters, and plants per hill remaining constant. The trial has not been harvested but available agronomic data are presented in Table 23. Both varieties had taller plants at Koba than Kabak primarily due to better soil fertility. No consistent trends in plant height were caused by different spacings. It would be expected that as plants are moved closer together, they would have become taller. At both stations local varieties were taller and greener in color than Radin China 4. Better adaptation by the local variety to the environmental conditions over a longer period of time may be a reason for this superior response of the local varieties. Unfortunately, with the data present, no specific spacing conclusions can be drawn at this time.

<u>Lime-Minor Element Fertilizer Trial</u>: In previous years, lowland soil conditions especially at Koba have caused an adverse growing environment, especially during the months of October and November. Later the plants appear to recover and grow normally. Rice plants reacted physiologically to these conditions, causing death of leaf tissue and secondary root system.

Affected areas of plants are often small and scattered. This year at the time of the last field observation younger leaf tips and many old leaves of plants were dead regardless of the soil treatment or water level. Usually local varieties have been more resistant to this condition than the introduced varieties. Most affected plants seem to recover and grow normally by flowering.

In order to obtain information on possible correction of the soil factor or factors which are causing this condition, it was planned to raise the soil pH which in the clay soils ranged from 4.5 - 5.0 and to supply a source of minor elements which may be lacking or are in an unavailable form at these low pH's. An equivalent of one, two and four tons of lime were applied per hectare with and without minor elements at Kabak and Koba. Radin China 4 was sown in each trial. Results presented in Table 24 show that plant heights do not seem to be greatly affected by these treatments. The tallest plants were measured at 130 days after planting in the highest lime application of four ton per hectare with minor elements. No apparent differences were noted in plant color.

Blast Disease Trial: As in previous years, a rice blast disease trial was conducted in cooperation with the International Rice Research Institute, Philippines. This year, 259 rice varieties listed in Table 25 were sent by the Institute to Guinea to be evaluated for resistance to the local strain or strains of *Piricularia oryzae*. Other varieties presented in Table 26 were planted in 1965 and 1966 trials in Guinea. This trial was planted at the Foulaya Research Institute at Kindia according to the Institute's design. Fossa of local origin and introduced Anethoda varieties were used as the susceptible and resistant checks, respectively. Failure of Fossa to be a good source for inoculum resulted in an uneven infection of the test varieties. This difference may be seen in the much lower values (more resistant) given to varieties 126 to 170 and varieties 231 to 270 than from the higher values recorded for the remaining varieties. Infections were read 33 days after planting by two individuals.

Pure Seed Multiplication: Similary to the corn improvement project, there was an intensive seed multiplication program of improved varieties conducted at each location. The primary purpose of this program was to make available to the Guinea farmer a source of better, improved rice seed which would produce higher yields than the present varieties now grown with and without the use of fertilizer. The main source of pure seed for these multiplication efforts was the Rokupr Rice Research Station in Sierra Leone.

At Kindia, about two kilograms of pure Anethode was sown in an isolation block. Due to heavy fertilization, some lodging occurred. Tillering was good. A yield of harvested panicle of 2.31 tons per hectare was calculated from an actual weight of 70.9 kilograms of rice and straw.

Four varieties, Anethoda, Fossa, Tikiri Sambe and Indo-Chine Blanc, were sown in fertilized plots at Kankan. All varieties were introduced to the station except Fossa which is an exceptionally popular local variety. One kilogram of pure Indo-Chine Blanc, a floating rice variety, was acquired from Rokupr and planted in rows on the lowland area along the Milo River. This variety performed exceptionally well in water depths greater than 60 centimeters. The increase of this variety would have been very important in three lowland areas where great water depths are a problem. Seedling rates of 80 kilograms per hectare were used to plant 28, 50 and 63 kilograms of Anethoda, Fossa and Tikiri Samba seed, respectively. Due to poor seed bed preparation and weed control most of the Tikiri Samba planting was lost. Yields of 1.00 and 1.71 tons per hectare of paddy rice were reported for Fossa and Anethoda, respectively.

In the Two coastal locations, the rice variety of Radin China 4 which had yielded well and resisted the blast disease in previous trials was selected for seed increase through the research and extension programs. In addition to this variety being sown and transplanted in the fertility, lime-miner element and spacing trials at both locations, a one-half hectare plot was transplanted at Koba for seed multiplication near the rice trial area and at Kabak away from the trial area by a local farmer. Both locations were fertilized and transplanted by the local method of random hill spacing. These seed multiplication plots had been planned to be used for small plot investigations of weed contrbl, N side dressings and random verses hill spaced transplanting methods.

At each of the above locations, rice seed of the four varieties used in the seed production research program was planned to have been used in succeeding years as sources of pure seed stocks for research trials and distribution to the GOG.

One ton of Radin China 4 was purchased at Rokupr Rice Station for distribution by the extension service to Guinea farmers at Koba and Kabak for seed increase purposes. Forty-five kilograms of seed were given to each of ten farmers. Each farmer also received 100 kilograms triple superphosphate, and 200 kilograms of 15-15-15 complete analysis fertilizer. This was adequate to fertilizer one hectare of Radin China 4. Good local acceptance was expected in both lowland areas because of the better seed, plant, milling, cooking and yielding qualities compared to the local varieties.

During the growing season, about 40 water control boxes were installed in the selected farmers' fields; advice was given on better rice production practices; materials such as insecticides and rodenticides were distributed; direct assistance in planting, fertilizing and transplanting were demonstrated by the extension staff.

<u>Sugarcane Improvement</u> (PCV-Gene Tuma, PCV-Mark Carson and USAID-R.K. Schwenke)

The sugarcane improvement activity at Foulaya Research Institute was continued in the same areas as were initiated in 1964, namely: fertility, variety and date of planting studies. Harvesting of the fertility and variety trials was conducted this year with about three hectares of the best adapted and productive varieties being planted for seed increase and panela production.

The panela mill construction was complete in September and about 200 kilograms of panela was produced during initial operations. Interest and project direction were given to the sugar cane trials upon the initial production of panela. An agreement was initiated between the Ministry of Rural Economy and the owner of Tankara, a sugarcane plantation about five kilometers from Foulaya, for his cane to be used in panela production at the Institute. With this added cane and increased plantings on the Institute grounds, it would have been possible to operate the mill during the entire year.

Peace Corps Volunteers, Mark Carson and Gene Tuma, stationed at Foulaya, supervised the cane harvest, laboratory and field analyses, construction of the panela mill, and production of panela. With their expulsion, well trained Guinea personnel were qualified to carry on with the mill operation and sugarcane field and laboratory analysis at the station. Laboratory supplies and equipment for sugar and soil analyses were installed during the year and put into rapid and effective operation by the trained Peace Corps Volunteer, Mark Carson.

In addition to the yield date acquired from the variety and fertility trials, field analyses were conducted on the March and July date of plantings trial. Due to the failure of planting the March date of planting trials in 1965, this trial was planted this year on May 9.

Sugarcane Variety Trial: A sugarcane variety trial was established at the Fruit Research Institute (Foulaya Station) in Guinea to obtain information on six varieties. It was expected that this trial would assist in selection of the better-producing varieties for future large-scale plantings. Information on yield of cane and sugar per hectare for each of the six varieties was to be ascertained.

The sugarcane variety trial was planted near Kindia on 9 January, 1965. Land preparation, fertilizing, plot design and planting of the cane were immediately supervised by Dr. Rene Steib of Checchi and Company. Five varieties introduced from the United States in 1964, plus one local variety, were used in establishing the yield trial. They are B 41-227, B 4362, POJ 2878, NCO 310, CO 419 and Conakry. A completely randomized block design was used in planting with four replications. Each plot consisted of four rows 11 meters in length and 1.4 meters between rows.

The trial site had been previously used for pineapple production by the Institute. The soil on the trial site was a sandy loam. Soils in the trial area tested medium in organic matter, nitrogen and phosphorus, and low in potassium. Soil acidity on this soil was pH 4.8 at the 0-60 cm. level and 4.5 at the 60-90 cm. depth.

Land preparation consisted of removal of old pineapple stubble and grass, plowing and disking twice. Furrows were made with a two-row furrow opener mounted on a tool bar of a Massey-Ferguson tractor. Furrow depth was about 18 inches. Fertilizers at the rate of 100 kilograms per hectare each of urea and treble superphosphate and 225 kilograms per hectare of muriate of potash were applied in the furrows by hand prior to planting. Each furrow was sprayed with one percent dieldrin insecticide solution prior to planting. Forty 3-eye pieces were placed in each 11-meter row. Seed was covered with three inches of soil. Within 24 hours of planting, the cane was irrigated by furrow irrigation. The entire trial area was bordered by at least three meters of the same six varieties in addition to F.E. 975, L 60-14 and B 43-337.

The harvest of the initial crop from the trial was completed 19 July, 1966. Both mature (flowered) and immature (non-flowered) canes were harvested. No distinction was made in harvest of these two types of plants. All six varieties had flowered in October and November of 1965. All cane was cut by hand. Prior to harvest of the two center rows of each plot all border rows in each plot were cut and removed from the plot area. The cane from the two center rows of each plot was cleaned, laid across each plot, labeled, and stalks counted. Weighing was performed the following day (20 July) by means of a specially constructed automatic dial scale mounted on a Massey-Ferguson 65 tractor. All weights were recorded to the nearest 0.5 kilogram. After weighing, a 20-stalk sample was removed from each plot of the first two replications for a milling test. The following day 17 stalks from the 20-stalk samples were weighed , milled, juice collected and weighed, and sampled for laboratory determinations of percent pol, brix, and purity. Also, a 100-gram sample of bagasse was taken for moisture determination. Each sample was passed through the mill once at normal speed. Three stalks of each sample preceded the main sample in order to clean the mill and have less mixing of the juice between samples. All stalk and juice weights were made to the nearest 0.00 kilogram.

Results of the sugarcane variety trial are presented in Table 27. As can be noted in Table 28, highly significant differences were obtained in yields between the six varieties included in this trial. These differences are especially pronounced between the three highest yielding varieties - CO 419, Conakry and B 41-227, which yielded significantly more than the remaining three varieties. The difference between these two yielding groups is less in stalk number and weight per stalk than cane yield, although yield in tons of cane per hectare was better correlated with stalk weight than stalk number for each variety. CO 419 averaged 79.55 tons of cane per hectare and Conakry 72.37 tons per hectare. The lowest yielding variety was POJ 2878. This variety also had the least number of harvested stalks and only an 849-gram stalk weight. During harvest of this trial, stalk weight seemed better related to the length of the stalk than to its diameter. Both CO 419 and Conakry had similar stalk lengths and diameters. Variety NCO 310 produced the most stalks per plot. However, due to the extended period before the harvest of this trial, this variety may have had greater number of developed tillers than the other varieties. No distinction was made between well developed tillers and the plants which were more than one year in age.

Based on the 17-stalk sample which was pressed through the mill, all varieties yielded approximately the same amount of juice extracted. The greatest quantity of juice, 47.35 percent, was obtained from the variety Conakry. Even though variety B 41-227 was the third highest yielding variety, it produced one of the lowest amounts of juice, 42.81 percent. One reason for this relatively low amount of juice is obviously because the cane was passed only once through the mill. More juice would have been extracted from each variety with subsequent pressings. However, this is not normal with mills of this type.

From the yield and juice extraction results of the trial, CO 419 and Conakry were among the best in this trial. Because of their higher cane-yielding capacity and a higher percent of extractable juice, these two varieties appear to be the most promising for multiplication and release for commercial production in Guinea. Yields of all varieties were more effected by weight of stalks than by number of stalks produced. Average stalk weight varied from 0.730 to 1.265 kilograms. Only 42.6 to 47.4 percent of the stalks of the six varieties was juice when a single milling was used. It is expectetd that the quality of juice (pol, brix, and purity) will probably vary among these varieties. These laboratory tests were made, but data are not available for this special report.

<u>Observational Variety Trials</u>: Observational variety trials were planted in December 1965, at Kissidougou, Gueckedou, and Seredou. These trials as

well as those established earlier in 1965 at Telimele and Mamou consisted of six cane varieties previously included in the advanced yield trial at Foulaya (POJ 2878, MCO 310, CO 419, Conakry and B 41-227). Three-eye seed pieces were planted in 1 row plots 10 meters long. After initial spraying with dieldrin, each trial area was fertilized with 3 kilograms of 15-15-15 complete fertilizer and 1.8 kilograms of potassium sulfate.

Observation of the forest region trials were made periodically during the year. Harvest of the Kissidougou trial was performed on August 25, 1966, about 80 days before the flowering of any of the varieties. Results of this trial are presented in Table 29. As in the variety trial at Kindia, Table 29, Conakry, CO 419 and B41227 varieties produced the highest yields per hectare of cane and the most stalks per hectare. Variety CO 419 was the most productive at both locations. After harvest, seed pieces were cut from all varieties and planted in a half hectare field for future cane production.

During November final observations were made of each of the trials in the forest region. The sugarcane trials at Seredou and Gueckedou were being prepared harvested, even though they had flowered. At Kissidougou, the newly planted field was about 1 meter in height and in good growth.

Sugarcane Fertility Trial: A sugarcane fertilizer trial was established in 1965, by the USAID in cooperation with the Ministries of Rural Economy and Economic Development, at the Foulaya Research Institute at Kindia. This trial was planted with two varieties beleived to be well adapted to Guinean soils and climatic conditions, with the object of obtaining previously unavailable information on the fertilization requirements of the cane plant

The fertilizer trial was planted under the immediate supervision of Dr. Rene Steib of Checchi and Company during the dry season, with irrigation, the exact date being January 14, 1965. A split plot statistical design was used to obtain information on the effects of ten fertilizer levels of nitrogen (N), phosphorus (P) and potassium (K) on cane yields. Varieties B 41-227 and B 4362 constituted the main plots and the ten fertilizer treatments were sub-plots. There were two replications used in this experiment. The levels of N, P and K fertilizers applied are listed in Table 30.

Each fertilizer treatment consisted of a four-row plot 11 meters long with spacing between rows of 1.4 meters. Each row was planted to 40 three-eye seed pieces. The center two rows of each plot were harvested to obtain yield data while the two outside rows, in addition to border plots around the entire field, were harvested but not weighed or stalks counted.

The site of the fertilizer trial was selected in view of similar soil to be used for future plantings. The surface soil on the trial site is a sandy clay testing medium for organic matter, nitrogen and phosphorus contents and low for potassium content. The pH of the soil was quite high for both the surface and subsurface soils. The surface soil is underlain with a sandy soil with lower organic matter content.

The harvest of the trial began 15 June, 1966, and was completed in two days. Both mature (flowered) and immature (non-flowered) canes were harvested. No distinction was made in harvest of these two types of plants. Extensive flowering for both varieties was observed during October, 1965. All stalks were cut by hand. Harvesting was carefully supervised to prevent mixtures between plots or varieties. The canes from the two center rows of each plot were cleaned of trash and stacked across the two plot rows in readiness for weighing. There was no simultaneous harvest of adjoining plots to prevent mixing of plots. All cane stalks were cut near the soil surface and the top trimmed to the lowest lala. Because of heavy flowering in October, 1965, lala growth was heavy on both varieties. These young shoot growths were not included in the weighed samples.

Weights of the harvested plots were effected on 18 June, 1966. It was found advantageous to place 40 to 50 stalks in separate bundles to facilitate weighing. A specially-built Thomson hydraulic forklift mounted on a Massey-Fergusson 65 tractor was used for weighing. All weights were recorded to the nearest 0.5 kilogram. After weighing, all harvested cane was used to plant about two hectares of cane at the Institute. This increase will be used for future panela mill operations. Earlier, it had been planned to harvest the crop long before the beginning of the rainy season in May, preferably during December or January, but this was not possible because of one unexpected delay after another in getting project commodities to Guinea, and getting them ready for use.

A total yield of 6.424 tons of cane was obtained from the plots harvested for yield. This would equal 52.14 tons of cane per hectare. Of the two varieties used in this trial, B 41-227 produced 44 percent more cane than variety B 4362, the former having averaged 61.67 tons per hectare and the latter 42.63 (see Table 30). This difference in favor of B 41-227 is noted in both more and heavier stalks. It produced 11 percent more stalks which weighed 12 percent more per stalk than did those of B 4362. This difference was noted at harvest to be due to greater length of stalks in B 41-227 than B 4362. Statistically, there was no significant difference between the two varieties for these factors as shown in the analysis of variance (see Table 33). One reason for this may be due to the small number of replications and subsequent large amount of variability (52 percent) between the two varieties.

As expected, yields of both varieties were better correlated with weight per stalk than stalk number. Of the two varieties, B 4362 seemed to have a better correlation of yield to stalk weight than did variety B 41-227, Figure 1. It is also noted in Figure 1 that a possible optimum stalk weight of 1.2 kilograms per stalk was reached for at least variety B 41-227 in this trial. This may be a point for further investigation even though optimum stalk weight will vary with fertility and variety.

There was a greater response to all levels of fertilizers from B 41-227 than from B 4362, Table 30. Variety B 41-227 gave an average increase of 18 percent in tons of cane per hectare due to fertilizers, while variety B 4362 responded negatively to most treatments. Both varieties gave the best response to K alone at 45 kgs. per hectare and the formulation of 90-90-270, the respective number of kilos of N, P_2O_5 and K_2O per hectare. Soil tests, as noted earlier, would have indicated a better response to all fertilizers with both varieties, but this was not the case under the conditions of this test. The very large negative response of 20 percent to N,P,K_3 of variety B 4362 is difficult to explain, especially in relation to the good response of K alone at 45 kilograms per hectare. It can be seen in Figure 2 that for most fertilizer treatments there was a difference greater than the five percent level between the responses of the two varieties. Response to fertilizers for both varieties was expressed mainly in a greater stalk weight rather than an increase in stalk number. There was no consistant response to fertilizers for either variety in producing more harvested stalks. Only in variety B 41-227 was there a greater positive response beyond the 5 percent level between the control and fertilized plots.

Table 31 and Figure 3 show that there was an overall positive response to fertilizer of 7.4 percent. There was no significant difference among fertilizer treatments either when a split-plot analysis was employed, Table 33, or when varieties were disregarded and the experiment was made a completelyrandomized block design with four replications, Table 34. The variability in both analyses for fertilizer treatments was about 14 percent. Potassium alone at the rate of 45 kilograms per hectare and in combination with N and P at the highest levels produced the highest cane yields per hectare. Again, this response was primarly due to an increase in stalk weight rather than stalk number. Potassium alone or in combination with N did produce the greatest number of stalks. There seemed to be very little benefit from any of the two-element treatments, $N_1P_1K_0$, $N_1P_0K_1$, or $N_0P_1K_1$.

The above analyses are presented in the light of actual results obtained. It is known, however, that normal harvesting of the crop should have been effected before the beginning of the rainy season, the time when the lalas begin to develop rapidly. The optimum time for harvest would have been before the lalas develop, as they utilize some of the nutrients already stored up from the fertilizer elements added earlier. It is not unreasonable to suspect - although no such weights were taken to verify such an observation - that the most prolific stalks produced the most and heaviest lala growths. These, in turn, were trimmed off and not included in the yield determination. It thus becomes apparent that the results obtained are not a true index of what actually resulted from the addition of fertilizers up to the time of flowering and subsequent lala growth. Lala growths utilize existing nutrients, but they are unproductive as far as actual sugar production is concerned.

Normal harvest, i.e., December-January, was not made as originally planned because the special weighing device being made in the U.S. for the project was not received in time. It turned out that the manufacturer failed to supply the special scale until the rainy season started, and too, it was hoped that the harvested crop could have been milled. Unfortunately, the mill construction was also delayed so that the harvested crop had to be utilized for planting stock.

It is anticipated that the first ratoon crop from this test, which will have received the same fertilizer amendments as originally applied, will not have been complicated by the lala factor.

This being the first cane harvest at Foulaya, it was beleived important to acquire for future reference data pertaining to the labor and costs incurred in harvesting this trial. Man-hours spent on each operation were recorded during the harvest and, in this case, subsequent planting. Total man-hours and costs were calculated on the basis of the trial area, tons of cane and hectares planted as shown in Table 32.

To harvest the fertilizer trial and plant the estimated 20 tons of cane took a total of 3558 man-hours or 444 man-days. Excluding the planting operation, the cutting of the trial and border plots was the most costly and longest operation. A total of 90.5 man-days' equivalent was required to harvest one hectare of cane. Of course, under non-trial and more experienced conditions, this figure would be expected to be decreased considerably. On the acre basis, a total of 37.7 man-days was spent in cutting one acre of cane. This figure is 17 days greater than that reported last year in Liberia. In further calculations, it required only 0.086 man-days to cut a ton of cane at Foulaya compared to 1.21 man-days in Liberia. It must be stated that the total tons of cane harvested at Foulaya was estimated on the proportional basis with the weighed cane produced on the plots. The value of 13.65 tons of cane produced by the border plots may be too high a value.

Loading and hauling of the cane will vary in time due to distance from the field to the mill and also less care required to handle the cane. On the basis of the standard wage of 275 GF per man per day, labor costs to cut a hectare of cane would cost 24,900 GF. Loading and hauling of the cane to the field for planting cost 12,400 GF per hectare. No costs were allowed for truck or tractor use in this operation. To harvest and haul a hectare of cane producing 52 tons of cane would take 135 man-days and cost 37,000 GF. These figures will vary with hauling distance to the mill and in preparation of cane for harvest such as stripping leaves, removal of trash, etc.

A large expense of 2,339 GF was incurred for individual weighing of plots and wrapping of the cane in bundles to facilitate weighing. These operations would not be necessary in cane harvest for full-scale mill operations.

Planting of the cane from this trial was a costly, long process taking 15.8 man-hours or nearly 2 man-days and costing 544 GF to plant a ton of cane. This process should become easier and more rapid with better equipment and more experience.

Results of this variety-fertilizer experiment at Foulaya seem to indicate that different responses to N, P and K fertilizers may be expected among varieties. Even though there was no statistical significance among varieties or fertilizer treatments employed in this trial, certain trends are evident.

Applying of potassium at 45 kilograms per hectare gave good response in both varieties. This response should be expected on most soils at Foulaya, due to the high requirement of the cane plant for potassium and the low potassium soil test found in these soils. A twenty-seven percent increase in yield of cane was obtained when the maximum rates of N, P and K were applied. It may be beneficial in future trials to apply larger amounts of each element in order to obtain more information about the response to higher levels of N, P and K on this soil. Also, the fact that this trial was harvested a year and a half after planting instead of ten to eleven months as originally planned in order to eliminate the flowering-lala production condition may have complicated the results that could be normally expected from different varietal response to fertilizer. It may be possible to conclude that the fertility of these soils with their rather low exchange capacity and organic matter content were affected by the heavy rainfall during the 18 months of the trial, thus leading to a poor response to the N and P at the lower rates of 45 kilograms. per hectare. It is interesting to note that with no fertilizer applications, nearly 50 tons of cane per hectare were produced.

Of the two varieties planted in this trial, B 41-227 responded better to all fertilizer treatments than did variety B 4362. Variety B 41-227 produced more stalks and heavier than did variety B 4362. For both varieties, increased yields were more nearly related to stalk weight than to the number of stalks. Both varieties produced their highest yields with potassium at 45 kilograms or K_2O per hectare. (B 41-227 averaged 73.22 tons compared to the untreated check with 52.27 tons per hectare, while B 4362 averaged 48.15 tons when fertilized with the untreated check yielding only 44.90 tons per hectare) and secondly, with nitrogen, phosphorus and potassium at the highest levels of 90, 90 and 270 kilograms per hectare respectively of N, P_2O_5 and K_2O. (B 41-227 and B 4362 respectively averaged 66.40 and 57.40 tons per hectare on the treated plots.) Fertilizer seemed to affect stalk weight in both varieties more than number of stalks harvested.

Of all the operations connected with harvest and planting of the cane from this trial, the latter operation was the most costly. To plant a ton of cane, it was found to require 15.8 man-hours and cost 544 GF. Cutting the estimated 20 tons of cane from the fertilizer trial was the next most costly operation, requiring 13.9 man-hours per ton of cane. Cutting a hectare of cane on the basis of this experimental fertilizer trial would cost about 25,000 GF and take 90.5 man-days. However, commercial planting would not be expected to be so costly. Hauling and loading of the cane to the field for planting was found to require half of this quantity of labor and time. In view of this trial being the first to be harvested at Foulaya, it can be assumed that these costs and labor estimates are high, but they should prove useful in future harvests.

Date of planting trial: Date of sugarcane planting trials were begun as proposed in 1964, at Kindia on January 9, 1965 and repeated every two months thereafter in 1965 except for the May 9 trial which was omitted due to lack of supervision for the planting operations. This trial was presented in the 1965 report. Field data on each variety in the March 9 and July 9 plantings are presented in Tables 35, 36 and 37. Similar recordings were taken for the September planting trial but were unavailable.

The different results with the same varieties for the two dates may be due to the fact that in October 1965 only cane planted in March flowered. It was found this October that all varieties in the July, September abd November planting trials flowered. All varieties in the May 9th date of planting trial that was planted this year also began to flower in October even though the plants were short and only six months of age. The fertilizer trial which was harvested on June 15 also flowered in October. As discussed in last years report, the flowering mechanism in sugarcane in Guinea must be trigged by the change in day length during late September and October. From the flowering patterns of the May 5 planting trial and fertilizer trial regrowth it seems that a plant may be as young as four months and become responsive to the small photoperiod change required for flowering. Certainly further investigations in this area would have been very profitably utilised for planting and harvesting schedules for the panela mill.

Stalk lengths and weights are presented in Table 35 for each variety planted in the two trials. Stalks were 50 or more centimeters longer in the March than July Trials for most varieties at similar dates. By the sixth or seventh month after planting, March plantings had flowered. After the plants flowered and were not harvested surplus photosynthate was channeled into the nearest axillary buds to develop lalas. Stalk lengths measured to the lowest lala subsequently decreased for most varieties linearly with time. Because varieties in the July planting did not flower in October, the stalk length followed a curvilinear pattern with time. The peak of the curve occured at 9 or 10 months after planting. This type of response may have been caused the higher soil moisture levels due to the initiation of the rainy season in May. The varieties with the longest stalk in the March planting trials were B 4362 and B 43337 at 270 centimeters and L 6014 and B 42231 in the July planting at 3 meters. The small four plant sample seems to be one reason for the large amount of variance between sampling dates for some varieties.

As noted in the same table, stalk weights and lengths showed some correlation for most varieties. In the March planting trial no specific trends of stalk weights were evident. Either curvilinear or linear reductions in weight with the time were common for most varieties. High stalk weights at flowering (6-7 months) seem to be related to the longer stalks at this time. Similar curvilinear responses of stalk weight and length are found in the 10 and 11th months after flowering for the most varieties in the July planting. This response again seems related to the rainy season. In the March planting Conakry produced the heaviest stalks while in the July planting varieties PR 1016, NCO 376 and B 42231 produced the heaviest. There seems to be greater variation in stalk weights than their lengths.

Degrees brix readings and pithiness determinations are presented in Tables 36 and 37 for the March and July plantings trial respectively. Degrees brix is a measure of the soluble solids contained in the juice. It usually is related but not equivalent to the percent sucrose in the juice. Pithiness is a physiological standard to determine the amount of concentration of sugars in the pith of the stalk. It should be noted that only averages of the top, middle and base brix readings are given. Of the three, the brix at the top of the plant varied the most. Brix readings for all varieties were much higher in the March than July planting trials. This may be because flowering had occurred in the March trial at the time of the first sampling on November 15, 1965. It is interesting to note that in the March trial nearly all the varieties gave positive linear brix readings with time. The highest brix for most varieties was recorded on the last sampling date. One may hypothesize that this may be causedby a steady accumulation of soluble solids in the stalk the longer after flowering that samples were taken.

In some varieties such as L 6014, NCO 376, B 46367 and N 328560, two maximum points were obtained one in November, the other in April. Average brix readings for the entire sampling period were highest for NCO 310 with 21,5 and L 6014 with 21,9 and lowest for NCO 376 and CO 331 at 16,4 and 17,0 respectively.

Pithiness was quite constant for most readings regardless of location. There was an increase in pithiness in each variety as the height of sampling increased up the plant. The effect of flowering on pithiness readings can be seen by comparing readings for the same varieties planted in the two planting trials. In the March planting trial the pithiness at the upper most internode seems to increase as the plant nears and passes flowering. The great variation in pithiness readings in the July planting trial may be true or it may be due to experimental error in the readings. Due to the rapid expulsion of the responsible Peace Corps Volunteer, Marck Carson, there was no discussion with him as to the exact reason for this variation.

In summary, distinct differences in trends of brix and pithiness were produced between the two planting dates mainly because of the influence of flowering and rainfall. Varietal differences within each trial were not as large as between planting trials.

The effect of flowering increased the pithiness of all varieties by 50 to 75 percent in the top most internode. Brix readings were lower by 2 to 3 points for most varieties due to a lack of flowering and poor moisture conditions. As moisture conditions became better, brix readings for most varieties responded directly and positively. After flowering, stalks which were not harvested gradually increased in brix readings by 3 to 4 points over a period of six months.

Stalk lengths and weights were also strongly affected by flowering (March trial) and moisture (July trial). As time increased from flowering, length of stalk decreased for most varieties because of the initiation of lalas. Greatest length was recorded at flowering or directly after flowering in the March trials. Weights of stalks were somewhat correlated to length. Where flowering did not take place as in the July trial, stalk length and weights increased with time for all varieties and especially responded well to the increased moisture conditions at the initiation of the rainy season. For most varieties stalk length responded better to this condition than stalk weight, although both were somewhat correlated.

Panela mill operation: Through the direct supervision of Dr. S.C. Litzenberger, Mr. Robert Manley, and PCV Gene Tuma, construction of the mill was completed by September 1, 1966. Minor jobs around the mill remained such as acquisition of wood fuel, pouring of cement and construction of ustensils to be used in panela production.

The first attempt to produce panela was on October 1 and failed. Some reasons for this initial failure may have been (1) too much heat used in the early boiling stages of the juice, (2) insufficient lime added to the cooled juice causing inversion of the sugars, (3) large quantities of foreign material deposited in the syrup, (4) "carmel point" obtained by the texture instead of temperature method, and (5) milling of an unmature cane variety.

The second attempt to produce panela was made about one and half weeks later. With better controlled procedures 21 kilograms of panela were produced from 85 gallons of juice. The quality of this panela was dark brown in color, high in sucrose crystallization and good in taste. Percentage of sucrose in the panela found by laboratory determination was 76,2 which is a very high quality product. After several more successful trials, a basic procedural outline was formulated for production at Foulaya.

Important points in this outline were (1) mill cane the same day as panela is made, (2) apply even heat by use of mixture of wood and dry bagasse in a one: two ratio, (3) move juice from kettle to kettle about every 1 hour, producing a patch of panela every hour after the first four hours (use of fifth kettle is optional) (4) add lime only if juice is below pH 7 (5) skim juice only in early boiling stages, (6) remove panela from the kettle when its temperature reaches 115 to 120° C. (the higher the temperature the less chance "wepty" panela), (7) beat the panela continuously to insure good crystallization and (8) store panela in a cool, dry place especially during the rainy season.

About 180 kilograms of panela were produced during the remaining time before the expulsion of the Peace Corps. During this time it was found that about 30-35 kilograms of panela had been produced from 1 ton of cane or a volume of 150-175 gallons of juice. This figure is comparable to 37 to 40 kilograms per ton cane received in Guatemala. A seven men team was trained by Volunteer Gene Tuma in the operation of the mill for panela production. These people were successfully operating the mill prior to the expulsion of the Peace Corps. The point had been reached to commence marketing panela either to Kindia or Conakry. It was decided that the price should be 100 francs per kilogram which was compared to the white sugar price of 125-140 francs per kilogram. Packaging of the panela in plastic bags especially during the rainy season, was to have been initiated by USAID on a trial basis.

The general response to panela by people around the Institute was quite favorable. The workers and administrative personnel seemed to like the taste of the product even though the dark color, unlike refined sugar, was distracting and required explanation. Demonstrations, concerning various uses of panela in the daily diet, were planned to accompany the first marketing of it. There is no doubt that the mill will be operated once a market for the product is initiated.

This optimism is present because, one, there is sufficient cane at the Institute and nearby Tankara farms to keep the mill operational 10 to 12 months at year, and secondly, the price differential between panela and imported refined sugar seems to be favorable for high sales volume of panela and a good profit margin.

Vegetable and Miscellaneous Crop Improvement (R.G. Lortcher and R.K.Schwanke)

It was desired in this sub-research activity to continue to fulfill one major objective of the vegetable program initiated last year, that is, investigation and seed production of the major improved varieties adapted to Guinea conditions. Increased amounts, over 1965, of seeds, fertilizers and insecticides were received to Conakry and distributed for the establishment and continuation of trial gardens and vegetable variety studies conducted by the Peace Corps and GOG agriculture officials throughout Guinea. The vegetable program emphasized through its garden plots, the adaptability of specific vegetable to environmental conditions and objectively measured the general acceptance or preference of these varieties by the people throughout Guinea. Much progress had been made in conjunction with Guinean agricultural and Peace Corps personnel and with the creation of a National Agricultural Extension Service, was expected to increase in this area. Seed multiplication of selected adapted varieties was planned during the dry season under irrigation at Foulaya Research Institute.

Variety trials were conducted at two locations, Foulaya Research Institute at Kindia and Koba Rice Research Station, in sweet corn, grain and sweet sorghum, legumes and peanuts. Most of the varieties of each crop had been improved in the United States, but many did not adapt well to the Guinean soil and moisture conditions. The primary objective of these trials was to investigate the different possible crop potentials for diversification of cropping system in Guinea agriculture and also for additional sources of food and feedstuffs for both human and livestock consumption.

Seed multiplication of the better crop varieties had been planned for next year in addition to conducting more trials on diversified crops. With an increase of adopted seed stock varieties, both vegetable and miscellaneous crops plans were being made to assist the GOG through the extension service in seed distribution throughout Guinea

Vegetable Trials: USAID's work with vegetable was guided by three principle objectives; 1) To develope highly preferred varieties. 2) To develope disease resistant varieties. 3) To develope varieties which are adaptable to the various environments within Guinea. To complete these objectives, twenty types of vegetables (more than forty varieties) were distributed to Peace Corps Volunteers and Guinean Agriculture Personnel to be planted in cooperation with local schools and Regional Agricultural Divisions. The gardens varied in areas from small ten to twenty square meter plots to areas of more than one hectare. These gardens were located in more than twelve regions including the Forest, the Coastal and the Fouta Djallon Regions.

Due to varied procedures utilized, the ensuing discussion should be regarded more as preliminary research instead of results obtained from extensive and controlled research techniques. Table No 38 indicates the type of vegetable or agricultural product variety, extent of preference, resistance to diseases, adaptability to environment and observations.

The three headings, extent of preference, resistance to disease and adaptability to environment will, for the purpose of this report, be rated as follows: 1, 2, 3 and 4 for excellent, good, fair and poor respectively.

Extent of preference is defined as the extent to which a given vegetable or product is desired by the populace for growing, selling and/or consumption purposes. Resistance to disease in the ability of a certain variety to withstand the various diseases in any given region. Adaptability to environment is the ability of a given vegetable to adapt to such factors as soil, photoperiodism, rainfall and heat.

Sweet Corn Trial: Sweet corn varieties obtained in 1965 from various U.S. sources were planted in a yield and observation trial at Kindia. The yield results are given in Table 17. All yields were quite low due mainly to poor soil fertility and lateness in planting. The highest yielding variety was Hawaiian Sugar which has been regularly recommended in the past for Guinea. Variety USDA 34 produced the second largest grain yield of 0.3 tons of shelled grain at 15.5 percent moisture. Future plans were proposed to multiply the quantity of Hawaiian Sugar variety for farmer distribution.

Peanut Variety Trial: With the large consumption of peanuts in Guinea, a peanut variety trial was initiated to test four variety introductions from the USDA and University of Florida. The primary purpose of this observation trial was to obtain information on the adaptability of these varieties to Guinean soil and climatic conditions for future seed multiplication and distribution.

This trial was conducted at the Foulaya Research Station, near Kindia. Soil type was a sandy loam of medium fertility. During seed bed preparation complete analysis fertilizer of 15-15-15 at the rate of 320 kilograms per hectare was applied and plowed into the soil. Four varieties were planted namely, Starr, Tennessee Red, Dixie Runner and Early Runner, in 45 centimeters rows widths. The first two varieties were planted in June two months before Dixie and Early Runner varieties. During the season, infestations of webworms were a continual problem. These were controlled by dieldrin. Also, all four varieties were infected with a leaf spot organism which caused early death of many plants. Four months later planting Starr and Tennessee Red were harvested and yielded 1.726 and 1.473 tons per hectare of unshelled peanuts. Peanuts were in the process of being shelled to obtain a shelling percentage for each variety. The major contributing factors for the low yields were probably due to large row spacing and the leaf spot infection. Certainly, the susceptibility of each variety to this organism would hinder their further multiplication and investigation. However, due to the fact this may be a soil borne organism, a change of experimental locations should have been beneficial.

Sorghum Variety Trial: Since 1964, 17 varieties of sweet and grain sorghum have been received from Pakistan, Egypt and the United States for evaluation in variety trials in Guinea. This year 8 grain sorghums and 4 sweet sorghums were selected and planted in a variety trial at Foulaya Research Institute near Kindia. The basis for the selection of these 12 varieties was the presence of greater than 60 percent seed germination in a germination test and an absence of seed fungus diseases due to the long period of storage.

The trial was conducted at Foulaya Research Institute on the same soil type, sandy loam, as the rice and peanut trials. After application of

15-15-15 complete analysis fertilizer at the rate of 320 kilograms per hectare, the trial site was plowed and planted. Germination was good for most of the varieties. However, as the plants reached the height of 5 to 10 centimeters, the leaves became yellowish-green and the roots dark red in color. The entire plant eventually died. The plant symptoms showed that a diseased root system was the cause of death. Most varieties were completely killed. This may have been caused by either a soil organism or excess levels of minerals in the soil to the point of toxicity for the sorghum plants. Those plants which survived were markedly reduced in growth. At harvest, only 41 small grain heads were harvested from the variety Brawley sweet sorghum. Plant and root samples were taken for future identification at USDA Plant Pathology laboratory. Future trials of sorghum varieties should have considered the soil factor as a point of investigation.

Legume Variety Trial: A study of various legume crops were conducted at the Koba Rice Research Station during the dry season of 1966. The main purpose of this variety trial was to obtain information on the adaptibility of various soybean, guar and pea varieties which had been acquired from the U.S. Seed of the most successful varieties of each legume was planned to be increased and distributed to local farmers for the introduction into their cropping systems in the dry season.

Due to the heavy clay soils at Koba the surface soil of the seed-bed was quite cloddy even though moisture was adequate at a lower depth. The trial area was fertilized with complete analysis fertilizers of 15-15-15 and treble superphosphate at the rates of 250 kilograms per hectare. Half of each plot was limed at the rate of one half metric ton per hectare. Inoculated and non-inoculated seed of each variety was planted on two planting dates of January 29 and March 5, 1966.

Dates of planting, emergence, flowering, maturity and harvest were recorded. Also, observation notes on seedling vigor, disease, insect attack and yield of seed harvested were obtained for each variety.

Of the six soybean varieties planted Improved Pelican variety, received from a private seed company, gave the greatest promise for future use. It was the only variety that gave satisfactory germination of near 95 percent although subsequent growth and seed crop were unsatisfactory. This high germination was acquired with the January 29 planting date. All other soybean varieties gave very poor germination, and plant growth for both planting dates. No beneficial effect of liming seemed to be apparent for any variety.

All three guar varieties, Brooks, Grochler and Tehsel, gave poor germination, vigor, insect and disease resistance and seed production for the soil and seed treatments.

The effect of lime increased the number of the Brabham cowpeas produced by about four-fold. This response was more effective in the January 29 than March 5 planting. At both planting dates lime produced better growth than the control. Inoculation, as expected, had no effect on growth as it was soybean inoculum.

Velvet bean varieties were similar in germination and seed production at both planting dates. Kaki Pigeonpeas at both planting dates germinated in an uniform manner at a low but promising level. There was 1.25 meters of green growth produced on both lime and inoculated treatments.

Even though results seem poor, several of the legume varieties such as Improved Pellican Soybeans, Brabham cowpeas, Velvet beans, and Kaki pigeonpeas gave promising results and merit more investigations.

<u>Extension Sub-activity</u> (Walter G. Rockwood and R. Gary Lortscher)

The Extension sub-activity as outlined in the Project Agreement between the United States and Guinean Governments, and finally signed on 30 June 1966 was basically designed to advise and assist the GOG in the planning and organization of an agricultural extension service. The service was to be national in scope with activities carried from the highest to the lowest level of government and it was to have as its basic aim the placing of useful and practical information pertaining to agriculture in the hands of Guinean farmers and encouraging of the use of the same.

A. <u>Background</u>

The USAID Extension Advisor arrived at post in March of 1966 and took home leave from 29 June - 11 Sept. 1966. At the time of arrival in March the following situation existed:

1. Basic discussions had been held with officials of the Ministry of Rural Economy on the needs and advantages of an extension activity. These officials were conversant with the subject when raised but were in no way enthusiastic. As a matter of fact, one of the first officials met, the Acting Director General of Agriculture, Mr. Tchame Oumar, was markedly reserved and non-commital in initial discussions.

2. A department, or service, within the Ministry of Rural Economy had been created, the Agricultural Education, Research and Extension Service and a Chief of the Service appointed Mr. Bah Mamadou Ouri who was to serve

as counterpart to those USAID technicians involved at a national level. Mr. Bah had had no previous experience and lacked training in particular for extension work.

3. The project agreement defining the extension activity had not been signed.

4. Prior to the arrival of the Extension Advisor attempts had been made by the Provincial Extension Advisor initiating various projects at the Regional level. It was hoped that these projects could serve as pilot projects once the agricultural extension service was organized at the national level. It might be added that as long as the regional projects could be associated with the research sub-activity or some on-going project, they were functional, but a purely extension project was non-functional. For example, contact had been made with one village in an up-country region (Kindia) but the following week no contact was permitted due to the Regional Government Official not having received instruction from his government. In another and similar instance, contact was made with a cooperative in one of the coastal region (Boffa). Further contacts were limited and ensuing discussions were limited to a Radin China 4 pure seed multiplication project.

B. Accomplishments

In view of existing circumstances of this particular activity it might be stated that little of permanence was accomplished. On the other hand, in spite of hindrances, difficulties and final termination of the project, some small day to day accomplishments were made. These were :

1. Contact with the Ministry of Rural Economy by the Extension Advisor and the establishing of a good working relationship with Mr. Bah, the counter-part for extension work.

2. Visits to the Regions of Boffa, Kindia, Dubreka, Forecariah and Kankan. During these visits discussions were held with regional officials on the possibilities for extension work and in general agreement was reached on the needs for such a service and the degree of cooperation to be expected. Of the regions visited the most progress was made toward actual organisation in Kindia. Rounds of other visits and conferences in the other regions were planned for November but were never carried through because of the suspension of activities caused by the October incident at Accra.

3. Draft project plans were drawn up for activities in poultry, rice and vegetables gardening and discussed with Mr. Bah for the purpose of familiarizing him with the need for a planned approach to even the smallest project.

4. In the absence of a signed project agreement and also of a counterpart (Mr. Bah was removed from this job for assignment to a rice promotion project in early April) a stop-gap program for the multiplication of pure seed stocks of Radin China-4 rice was drawn up. This program for pure rice seed in the hands of individual farmers for multiplication, with the understanding that seed harvested would be sold to other farmers and/or the GOG, with USAID to recover an amount of seed equal to that given each grower.

Twelve individual farmers and one rice grower cooperative participated in this program. USAID furnished fertilizer, insecticides and fungicides and water control boxes in addition to pure seed. A plan of procedure was prepared for the program which received the approval of the Ministry of Rural Economy but there was no participation of Ministry extension personnel.

This rice seed multiplication program demonstrated two important points; (1) that farmers are eager to cooperate in any program that offers improvement of their existing conditions and (2) that any program of this sort needs to be carried out by extension personnel, well organized, well qualified, and well in touch with the farmer. The farmer is substantiated by the response to the program and the latter by the problems of control which were encountered by USAID personnel in trying to control the program from Conakry without benefit of local agents.

5. Within the field crops area, a simple corn brochure was prepared. This was illustrated with descriptive hand-drawn pictures on the cultural practices to be followed in planting "Perta" corn an Indonesian open-pollinated variety which the USAID Research sub-activity had proven to be suitable for Guinea. These brochures were to have been distributed along with the corn seed.

6. Poultry and rabbit (Animal Husbandry) projects, in conjunction with the Peace Corps, were initiated at regional levels. These were designed to distribute chickens and rabbits to the local farmers so they could in turn utilize them to maintain a sufficient number for market and consumption purposes. Another project, (rooster-exchange) was conceived, but due to time

and other limitations did not completely materialize. The proposed project was to import a tried strain of rooster and exchange them for the local roosters in order to improve their flocks.

7. Another area in which extension had initiated work was in the domaine of vegetables gardening. A leaflet, simply written and illustrated, was prepared for distribution. This along with seeds and fertilizer was to be used among local farmers who wished to cooperate in a demonstration garden program. In several regions of Guinea vegetables had been grown in conjunction with various school and regional farm projects. A total of 100 kilograms of 80 assorted vegetable seeds were distributed to more than 30 locations and/or cooperators.

8. Preparation of an organigram and an outline paper on organization of an extension service which was presented to and discussed with Mr. Bah as a basis for concrete action on organization and planning of his extension branch. Several form agreements were reached in the area of organization, chief of which was the need for control of the extension organization by extension personnel from top to bottom.

C. Observation and Evaluation.

The Guineans both in the Ministry of Rural Economy and at the regional level still do not have a clear idea of what was being talked about when extension and extension service was discussed. They still cling to the word vulgarisateur and to them everybody and anybody in any service can be a vulgarisateur. This was to have been a major hurdle in getting them properly organized, in that they felt a national extension service could be organized and have all the extension work done by personnel actually assigned to other services. In the final days it was felt that Mr. Bah was beginning to understand where the other services (Soil Conservation, Animal Husbandry, Poultry, etc.) left off and where extension should take over.

Personnel, however, was to be the problem at the start as well as a problem likely to continue for many years. This observation is based on the fact that personnel with necessary backgrounds were not available and would become available at a much slower rate than that required by a fast developing need. Even in preliminary discussions and plans the propensity for spreading themselves too thin was a constant threat.

A need exists for an extension type organization in Guinea agriculture. It could make a tremendous impression on agricultural development using only the knowledge currently available to be placed in the farmers hands. The keys to success in fulfilling this need are: creation of the organization, training of personnel (in-service training) and finally the solid application to the tried and proven extension methods; the farm visit, the general meeting, the result demonstration, and the method demonstration.

The final factor is the desire on the part of those in decision making positions with the GOG to see such a program in action. In all of the contacts made at this level by the Extension Adviser the feeling of "being wanted" never existed. It was always a case of pushing and sometimes nearly forcing advice and programs on them.

<u>Agricultural Education Sub-activity</u> (R. E. Wilson)

The Agricultural Education Advisor's arrived in Conakry with his family 3 October 1965 and was moved to Mamou 26 January 1966. There he and his family occupied an old plantation house owned by the Region of Mamou which was beautifully renovated and furnished by USAID. Running water and electricity were available. The first week of the Educational Adviser was spent in Conakry in a program of orientation. He made his first trip to the Tolo National Professional Agricultural School on 17 October, accompanied by Mr. Curtis Campaigne, USAID Director, and Dr. S.C. Litzenberger, Food and Agriculture Officer. Between October 1965 and January 1966 when he took up residence in Mamou he made five field trips to Tolo. At times, he remained at Tolo for more than a week at a time and participated in all activities of the school.

When he arrived at Tolo in October 1965 there were thirty-one students enrolled and the staff constituted a Guinean School Director, a Guinean bookkeeper, and seven Peace Corps Volunteers. One volunteer performed the duties of secretary while the other volunteers were responsible for teaching and field, building, and machinery maintenance work. The Agricultural Education Adviser had to teach three hours a week of horticulture and three hours a week of livestock production. Since the School Director was not trained in agriculture, the field work turned out to be the responsibility of the USAID Education Advisor.

The Education Adviser lived about four miles from the school and had access to lands on which he grew bananas, sweet potatoes, rice and vegetables. It is interesting to note that on his arrival at Tolo the School Director blocked his efforts to begin the cultivation of bananas and sweet potatoes on the school farm. In plans for the 1967 planting season he had agreed to include the cultivation of one hectare each of bananas and sweet potatoes on the school farm.

Supervision: Establishment of the National Professional School of Agriculture at Tolo under the Ministry of National Education was an agricultural education activity of the Agricultural Resources Development project. Direct supervision of the program was by Dr. S.C. Litzenberger, Food and Agriculture Officer USAID who made monthly inspection trips to the agricultural school. Mr. Henry Norman, Peace Corps Director, Guinea and his Associate Directors Paul Marke and Sam Longsworth also made periodic visits. The Peace Corps volunteers were immediately responsible to the Peace Corps Director through the School Director. The Education Advisor was directly responsible to the Food and Agriculture Officer for the performance of his official duties.

Contacts With Guinean Officials: The Education Adviser had two meetings during 1966 with the Minister of National Education, Dr. Conte Saidou. On both occasions he found him direct and outspoken in his ideas for the development of the Tolo School. The Minister was at all times cooperative. The two Governors with whom he had worked at Mamou had only high praise for the work and achievements at Tolo.

Personnel: Relationships with Guinean, Peace Corps and USAID personnel by the Education Advisor were always cordial. This was, to say the least, quite an achievement.

Participant Training Program: Two nominees to study and gain practical training in Agricultural Education in the U.S. had been approved. Only the signature of President Toure stood in the way of their departure. Signature had been momentarily expected at the time of the Accra incident which finally resulted in stoppage of USAID cooperation at Tolo.

Construction: Over 3000 Ram-O-Vac blocks were made for needed construction and renovation of buildings. The blocks were made of a 1-2-2-4 mixture of cement, sand, gravel and soil. Tests made at the Guinean Polytechnic Institute at Conakry have shown that quality of the bricks was quite good. The two new buildings (poultry house and refectory) completed with the locally-made bricks have resulted in an excellent presentation. Existing buildings at the school included: 2 classroom buildings, 2 hangers for machinery, 2 storerooms, 4 houses, 1 office building and 1 dormitory. The extensive job of renovation and repairs of these buildings included plumbing, masonry repairs, painting, electrical wiring and building of a toolroom.

A Peace Corps Volunteer Architect prepared extensive plans for the school, including a grounds plan of existing and proposed buildings.

The latter buildings for completion in 1966 were a poultry house, a hog unit, a refectory, and a duplex apartment for teachers.

To facilitate the construction effort two volunteers came to Tolo in January 1966. In April 1966, however, they were returned to Conakry by the Director, because they did not have an official Ordre de Mission. An Ordre de Mission was finally obtained for them and they returned in September 1966. During their absence construction had to be held up.

Under the supervision of Mr. W.M. Shimasaki, USAID Agricultural Engineer, a rather extensive but very satisfactory water system was installed. The system consists of two pumps, three large concrete reservoirs, one of which is a filter basin, and two metal tanks on the plateau. Plans were underway to increase the efficiency of this system by installing a diesel pump to replace one of the gasoline operated ones which was being over-taxed.

Several factors hindered progress of construction, especially in the early stages. Among them were:

1. Difficulty in obtaining building materials locally. Roofing, nails, pipe, fittings and paint came from Freetown. Lumber had to be brought from 300 kilometers away. Transportation had to be by truck over some of the worst roads of Guinea. In recent months this difficulty had been mostly overcome.
2. Lack of transportation. Trucks from GOG Army and Obetail, other agricultural projects, Peace Corps and private hire in Conakry and Mamou had to be utilized to get needed supplies and equipment to Tolo. The first USAID truck for Tolo was received in September 1966.

3. Lack of steady construction crew. The two volunteers assigned to construction were returned to Conakry from April until September because of assignment technicality mentioned above.
4. Difficulty of obtaining funds for construction. In the beginning the School Director refused to meet construction costs from counterpart funds deposited at the Bank in Kamou for operational needs. To overcome this shortcoming the Education Advisor was advanced trust fund money from USAID Conakry, to pay labor costs and transportation of materials.

Classroom and Farm Training: A very complete program of instruction including the course outlines was worked out and implemented. Classroom instruction included courses in: Agronomy, Horticulture, Animal Husbandry, Poultry Husbandry, Farm Mechanics, Rural Engineering, Bio-Science, French, Mathematics and Physics. On completion of the three-year program at the Tolo Agricultural School the graduated students would be qualified to work as extension agents, agricultural teachers, farmers, or to further their studies in agriculture.

The Peace Corps volunteers did a very commendable job in the classroom. The rapport between students and teachers were at all times good. Field work was performed with objectivity of implementing classroom work, and furthering the educational process by observation, and learning by doing. Shop work in masonry, carpentry, and forgery (black-smith) was performed.

During the 1965-66 growing season varietal and fertilizer experimental trials with rice and corn were conducted in cooperation with the USAID and the Ministry of Rural Economy. There was also an extensive program of Perta corn seed multiplication. In March 1966 the Ministry of Rural Economy turned over the farm to the school. Subsequent arrangements for conducting trials and seed production had not yet been worked out since such activities were regularly the responsibility of the Ministry of Rural Economy and the School Farm was now under another ministry.

During 1966, 2 tons of rice, 1 ton of peanuts, 2 tons of corn, 2 tons of tomatoes and about one ton of diverse vegetables were produced and used for feeding the students. Twenty-seven Rhode-Island Red Pullets and two cocks were received in September 1966. These pullets had begun laying. There were 150 chicks ready for delivery to the school on 30 October from Telemele. There was also an order for fifty pullets with the poultry farm at Mamou. A bred Large White sow was received in September. She farrowed a litter of eleven. Seventeen head of cattle were bought from the Mamou Region when the farm was turned over to the school. These were to serve as a nucleus for an improved strain of N'Dama breed.

Thirty-one second year students and thirty-four first year students were enrolled for the 1966-67 school term . All had finished at least nine years of primary school education. The students were selected by the Ministry of National Education. The Ministry had planned to enroll this year about sixty first-year students. This could not be accepted on the grounds that school facilities were set up to accommodate a maximum of forty new students.

The students are very conscientious, and have made strenuous efforts to learn and to meet our expectations. Given the chance these students would be a credit to the school and an asset to their country.

Commodities: The USAID provided an ample dollar budget for the purchase of needed commodities. A complete list of the inventory of supplies currently at Tolo has been prepared and is on file at Conakry and Washington, D.C. A number of supplies and items of equipment had been on order or had been ready for shipment to Tolo at the time of the Accra affair, but these were retained at Conakry or the orders cancelled.

Detention, Expulsion and Evacuation: During 1-5 November the Peace Corps volunteers and the Education Advisor were placed under house detention. They did not have guards, but their activities were closely watched and controlled by the School Director. On the morning of 9 November, the Mamou Regional Commissioner of Police came to the school and informed them that the Peace Corps volunteers had forty-eight hours to leave the Region. This was in keeping with the decision of President Toure to expel Peace Corps volunteers from Guinea. The instructions of the Police Commissioner were later confirmed in a letter from the Mamou Regional Governor. The nine Peace Corps volunteers assigned to the Tolo School left

Mamou for Conakry on the morning of 10 November. The Agricultural Education Adviser and his family were instructed by USAID and the U.S. Embassy to leave Mamou, and did so the morning of 13 November.

With the departure of the Education Adviser the educational program at Tolo as planned in cooperation with the GOG came to an abrupt halt. The Director, the Field Foreman and the Accountant were left to carry on with the students as they could.

The School Director and the students were genuinely sorry to see the American personnel leave Tolo. The Education Adviser could have remained at Tolo and helped to keep things going until certain definite decisions had been reached. He was never in any immediate danger, and all people of the Region had expressed hope that he would have remained to work with them.

Observations and Recommendations: The 1965 achievements at Tolo as well as those referred to in this brief report were made under extremely difficult conditions. At the Ministry of National Education level the agricultural education sub-activity was seen from a different point of view by different people. The Minister of National Education fully appreciated our effort. However, there were others in important positions who did not give needed support and cooperation as programmed.

The Director of the school did not always perform his duties as an impartial civil servant. He tried to interpret the wishes of his immediate supervisors. Since these supervisors were not always consistent in their demands the collaboration of the School Director could not always be depended upon. It took some time and effort to win the confidence of the Peace Corps volunteers and their Director. However, when this was accomplished working relationships were excellent.

At the beginning of the 1965-66 school year over thirty million Guinean francs were released by USAID from counterpart funds and deposited at the Bank at Mamou for the operation of the school. This gave the School Director too much control and power over finances. This was to a large extent responsible for his lack of cooperation at times. Had the system of teacher training (homologs) been implemented at the very beginning at the agricultural school the abrupt departure of the Peace Corps and USAID from Tolo would not have disrupted the operation of the school to the extent that it did. However, this was not possible under existing conditions, there being such a deficiency of teachers and/or technical personnel.

Because of the great potential of the agricultural school it is strongly recommended that if possibilities arose every effort should be made to continue some form of help to the school. This help could be in the form of:

1. Three or four American teachers trained and experienced in agricultural education and tropical agricultural production.
2. An operational budget supplied on a month to month basis based on actual expenditure.
3. No capital expenses for construction etc. until such time as there is clear indication of more amicable relations.

4. Insistence on training of counterpart teachers at the agricultural school.

5. Limited dollar purchase of commodities and access to materials and supplies already in Guinea for Agricultural Resources Development.

6. A local currency budget to develop the farm at the school. There are twenty hectares (50 acres) of cultivable land at Tolo. With appropriate fertilizers, seed, insecticides and weed control materials this land could be made to produce a large part of the food needs for the students and supply a major part of the feed needed for a lucrative livestock program. This would put Tolo on the road to self-sufficiency. This is a natural goal for schools of this type in developing countries.

<u>Self-Help Community Action</u> (Dr. S.C. Litzenberger)

The Beekeeping and Community Action activities comprised the Self-Help Project in 1966. Monitoring of the Project was delegated to the Food and Agriculture Officer by the USAID Director since most of the related activities were to indirectly support the Agricultural Resources and Riceland Rehabilitation Projects. Limited commodities and use of construction tools were supplied by USAID while the GOG supplied labor and locally available materials. Direct field supervision and realization of approved projects was by Peace Corps Volunteers assigned to the various Administrative Regions. At the time of the expulsion of the Peace Corps Volunteers by Guinea in early November the project status was as follows:

Beekeeping - <u>Labe and Pita Regions</u>: All U.S. commodities had been received and installed with training of five trainees at each of the two locations being conducted at the Regional Apiary Centers. Extension programs with farmers were successful in immediately increasing honey production which had dropped to zero prior to USAID-PC cooperation.

Community Action - <u>Gueckedou Region</u>: Construction of a hog run ($ 20 and 47,000 GF) and a rural agricultural school building plus dormitory for 32 students ($ 60 and 250,000 GF). The hog run was 90 % completed and the school construction was yet to start.

<u>Labe Region</u>: Construction of poultry complex of four units ($ 65 and 300,000 GF). The unit was 50 % completed.

- Telimele Region: Expansion of existing poultry project by constructing two additional poultry units 50 x 10 meters in size with capacity for 3,500 chickens at an estimated cost of $ 25 and 1,020,000 GF. Construction begun 22 September and was about 10 % completed. This on-going project was considered one of the most successful. This activity was being used as a training center for a 4-year rural agricultural school.

- Dubreka Region: One school building was renovated ($ 45 and 25,000 GF) to serve as a rural agricultural school while a new primary school ($ 75 and 110,000 GF) was being constructed at kilometer 36 on the Conakry-Kindia road near the Complex Textile where no such school facility existed. The school will be 8 x 12 meters in size to take care of an enrollment of 45-50 students. Work on both projects started 30 September with respective completion dates estimated at 30 October and 15 November.

- Conakry Capital: Two projects were in process of realization at the Transport Urbain de Conakry (TUC), one a mechanics and apprentice school for 50 students ($ 58 and 37,000 GF) and the other a servicing center for the students in training ($ 86 and 80,125 GF). They were respectively started on 22 September and 17 October, and were 80 and 5 % completed.

- Kissidougou Region: Rehabilitation of an irrigation dam ($ 3.00 and 89,000 GF) which would supply water to a palm oil and coffee nursery. The project had just commenced.

Commodities on loan and at the project sites were left when the Peace Corps Volunteers were requested to return to Conakry for departure from Guinea within a week. Commodities at Conakry were immediately inventoried for immediate close-out action. A list of the commodities was filed with AID/W and with USAID/Guinea.

Micros Palm Oil Center (Dr. S.C. Litzenberger)

Following the decision to terminate the Palm Oil Project (Checchi Contract) at the end of June 1966 it had been agreed to continue the services of the Industrial Officer to conduct a training program for a Micros Palm Oil press installed at Kagbale. A Peace Corps Volunteer also assisted in this effort. A GOG working team was to be trained so they could manage the mill alone. The mill was to be turned over to the Guinea team for operation at the end of the brief training period of about one month.

The Industrial Officer together with the Peace Corps Volunteer performed an excellent task in training a two-man crew to operate the Micros mill. Necessary adjustements were made to orient the Micros plant into a commercial operation. Arrangements were made regularly to procure palm oil kernels and find a steady buyer of the oil and cake as both items were new to the Guinean economy. Both were done. The oil was to be marketed to the local soap factory and the cake was to be sold to a local livestock producer. The prices received for the new materials were such that a net profit of about 30 percent to the enterprise could be realized.

Training of the manager and his associate was relatively easy since they were formely employed with the Palm Oil Project. Since the training operation has been terminated and the Peace Corps Volunteer who were working with the Kagbale plant has left upon the government's decision to remove all Peace Corps Volunteers, the manager and his associate have done a reliable job in continuing the operation. Some of the labor needs have been remedied and the plant has been producing oil and subsequent sales have been made. One truck has been left with the project to provide transport for oil to the buyer and to bring in nuts from the interior. One 2-CV vehicle has been left with the manager to provide transport to and from Conakry.

Prior to the departure of the Peace Corps Volunteers, the management had decided to continue the Palm Oil Project. This decision had primarily been made in consideration of the work of the Micros Training operation and combining the fruit gathering operations of the two projects. However, the suggested method of fruit collection seem to be too expensive for the low value commodity. The USC was to have provided a Peace Corps Volunteer who after completing his tour as a Volunteer which was to be early in 1967 was to have continued under contract.

Rinderpest Control Program (S.C. Litzenberger)

As originally agreed the USG proceeded to activate with the GOG (elevage Service of MERA with Dr. N. Keita as the Guinean Director) Phase III of the Rinderpest Control Program for West Africa. Phase III included cleaning up Rinderpest by administering several million doses of vaccine in Guinea over a three-year period. The program was to have gotten underway in October 1966. USAID Guinea was to have primarily assisted in administering local currency financy. A ProAg providing for this support has been prepared and submitted to the GOG for signing. It is expected that the required signature will be forthcoming soon. As soon as appropriate veterinary support can be provided to Guinean and needed supplies arrive vaccination is expected to start.

Some difficulty has been encountered in obtaining donor veterinians to assist Guinea with the program. Originally it was expected that Canada would provide three French-speaking veterinians to the program but this has not materialized. The only real prospect for the three veterinarians for Guinea up until now has been the German Federal Republic. If provided, the GFR would probably not be able to get anyone to Guinea until some time in 1967.

Prior to the expulsion of the Peace Corps Volunteers from Guinea, they had agreed to provide mechanical assistance to this Regional project for the three years that it was expected to be working in Guinea. The three PC mechanics were to also set up a training school in conjunction with serviing the 17 vehicles and other equipment assigned to this project. With the departure of the Peace Corps it was necessary to consider an alternative method of mechanics support. It now appears that the local General Motors representative will be able to handle it, especially since AID/Lagos will be able to supply needed spare parts.

TABLE I.

General information relating to Corn trials conducted in Guinea, 1966.

Locations	Type of Experiment	DATES			
		Planted	Emerged	Poll-ination	Harvest-ed.
KINDIA	Variety	May 21	May 27	July 16	Sept.22
	Fertility	May 19	May 25	July 18	Sept.21
	Ferta x Bordo Cross	May 21	May 28	July 17	Sept.20
	Bordo Synthetic	June 10	June 17	Aug. 22	Sept.26
	Population	May 20	May 26	July 16	Sept.23
	Ferta Top Cross	May 21	May 27	July 15	Sept.19
	Pure Seed Multiplication	June 9	June 16	Aug. 22	Sept.25
	Rockefeller Variety observation	June 10	June 16	Aug. 21	Sept.23
	Sweet Corn	June 9	June 16	Aug. 22	Sept.27
KANKAN	Variety	May 30	June 6	July 30	Sept.29
	Fertility	May 28	June 3	July 18	Oct. 3
SERADOU	Variety	June 6	June 13	July 28	Sept.20
	Fertility	June 5	June 13	July 27	Sept.26
	Population	June 5	June 12	July 26	Oct. 5

TABLE 2.

Pedigree and Seed information on Corn Varieties planted in uniform variety trials, in Guinea, 1 9 6 6.

Variety	Seed[1] color	Origin	Pedigree
Cornell 54	Y	U.S.A.	Hybrid
Poey T-62	Y	U.S.A.	"
Poey T-66	Y	Nicaragua	"
GS-1	W+Y	Ghana	Synthetic
Mexican 17	W+Y	Ghana	"
Compuesto Amarillo	Y	El Salvador	"
Compuesto 1	W	El Salvador	"
Compuesto 2	W	El Salvador	"
VS-2	Y	Ecuador	"
VS-3	Y	Ecuador	"
Cuyuta 63	W	Guatemala	Open
Freetown	Y	Sierra-Leone	"
Sataba	Y	Guinea	"
Parta	Y	Indonesia	"
E.B.S.	Y	Trinidad	"
S.A.S.	Y	Trinidad	"
Silona	Y	Germany	Hybrid
Wir-25	W	Germany	"
M 55	Y	Germany	"
Rockefeller 360	Y	Mexico	Synthetic
Rockefeller 361	Y	Mexico	Hybrid
Rockefeller 362	Y	Mexico	"
Tiquisate	Y	Guatemala	Open
Nicarillo	Y	Nicaragua	"

1) Y = yellow and W = white.

TABLE 3.

Grain yields of Corn Varieties grown in variety trial
at Foulaya Research Institute, KINDIA, R.G., 1 9 6 6.

Variety	Shelled corn in tons per ha.				Average	% of Perta
	Rep.I	Rep.II	Rep.III	Rep.IV		
Cornell 54	3.55	5.66	2.77	4.61	4.15	197
Poey T-62	2.98	8.70	2.26	6.00	4.99	237
Poey T-66	2.60	2.37	1.74	3.12	2.46	117
OS-1	2.99	5.31	2.05	3.14	3.37	160
Mex.17	2.41	5.00	2.82	2.95	3.30	156
Comp. Amarillo	2.18	2.67	[illegible]	3.06	2.65	126
Compuesto 1	3.31	1.66	2.97	2.83	2.69	128
Compuesto 2	2.98	3.51	0.86	1.98	2.33	110
VS-2	1.32	3.78	4.40	2.20	2.93	139
VS-3	1.96	2.79	1.46	1.29	1.88	89
Guyata	3.22	3.18	2.58	1.72	2.68	127
Freetown	3.18	2.05	2.37	3.27	2.72	129
Sataba	0.66	0.39	0.25	0.24	0.39	19
Perta	2.38	3.24	1.51	2.32	2.11	100
K.B.S.	3.58	3.94	2.03	3.51	4.28	203
S.A.S.	2.74	3.17	3.04	4.58	3.38	160
Siloma	0.07	0.40	0.21	0.17	0.21	10
Wir 25	0.06	1.23	0.67	0.07	0.51	24
M 55	0.61	1.52	1.21	1.05	1.10	52
Rockefeller 360	3.31	3.66	3.34	2.68	3.25	154
Rockefeller 361	2.68	4.90	3.12	3.48	3.55	168
Rockefeller 362	2.93	2.58	3.55	3.21	3.07	146
Tiquisate	3.54	4.14	1.37	1.73	2.70	128
Amarillo	1.96	2.30	2.38	4.69	2.83	134

TABLE 4.

Grain yields of Corn Varieties grown in a variety trial at SEMEDOU, R.O., 1 9 6 6.

Variety	Shelled Corn in tons/ha.				Average	% of Perta
	Rep.I	Rep.II	Rep.III	Rep.IV		
Cornell 54	2.30	3.00	5.40	1.70	3.05	219
Posy T-62	3.46	0.86	1.91	2.22	2.11	152
Posy T-66	1.79	1.30	3.76	1.36	2.05	148
GS-I	3.09	1.23	4.38	2.41	2.78	200
Mexican 17	4.63	1.60	0.68	3.64	2.64	190
Compuesto Amarillo	3.27	3.89	2.47	3.39	3.26	235
Compuesto 1	1.17	3.46	4.75	2.96	3.09	222
Compuesto 2	1.73	0.62	5.68	4.00	3.23	232
VS-2	4.81	1.98	4.63	1.67	3.27	235
Cuyuta 63	0.99	2.41	1.91	3.70	2.25	162
Freetown	1.73	5.37	4.38	2.35	3.46	249
Sataba	0.31	0.19	1.48	0.74	0.68	49
Perta	1.05	1.30	1.85	1.36	1.39	100
E.B.S.	0.86	2.22	4.44	1.79	2.33	168
S.A.S.	2.28	2.59	1.36	1.54	1.94	140
Siloma	0.62	1.17	1.60	1.79	1.30	94
Wir 25	0.93	0.62	1.54	0.31	0.85	61
H 55	1.30	1.17	0.62	0.62	0.93	67
Rockefeller 360	2.28	2.96	3.02	3.47	2.93	211
Rockefeller 361	4.01	3.27	4.94	1.48	3.43	247
Rockefeller 362	4.07	1.54	2.53	1.91	2.51	181
Tiquisate	1.17	0.62	3.33	2.53	1.91	137
Nicarillo	1.60	2.22	3.64	3.15	2.65	191

TABLE 5.

Grain yields of Corn Varieties grown in a variety trial at Bordo Research Station, KANKAN, R.G. 1960.

Variety	Shelled corn in tons/ha.				Average	% of Perta
	Rep.I	Rep.II	Rep.III	Rep.IV		
Cornell 54	3.65	3.82	3.58	2.03	3.27	57
Poey T-62	5.15	3.77	4.74	2.16	3.96	69
Poey T-66	3.22	1.96	2.29	2.51	2.50	43
OS-I	4.97	4.88	4.04	3.74	4.41	77
Mexican 17	5.32	5.81	3.49	4.04	4.67	81
Compuesto Amarillo	5.09	3.60	4.05	3.41	4.04	70
Compuesto 1	4.09	5.24	3.93	4.63	4.47	78
Compuesto 2	4.35	4.31	4.64	3.38	4.17	72
VS-2	5.0[illegible]	3.07	4.55	3.41	4.02	70
VS-3	5.44	3.55	4.32	1.71	3.76	65
Cuyuta 63	3.92	2.30	3.46	1.90	2.90	50
Freetown	5.26	5.10	2.94	4.48	4.45	77
Mataba	0.77	0.62	1.24	1.03	0.92	16
Perta	6.51	6.56	4.63	5.33	5.76	100
E.B.S.	1.56	1.87	1.96	2.13	1.88	33
S.A.S.	2.9[illegible]	2.51	1.67	3.88	2.76	48
Silona	0.68	0.38	0.68	0.57	0.58	10
Mir 25	0.[illegible]	0.96	1.58	1.37	1.19	21
M 55	1.64	2.12	1.34	1.43	1.63	28
Rockefeller 360	4.73	3.34	3.97	2.52	3.65	63
Rockefeller 361	4.29	4.98	2.56	4.88	4.18	73
Rockefeller 362	4.63	5.68	3.11	3.46	4.22	73
Tiquisate	4.74	2.73	4.57	4.19	4.06	71
Hicarillo	4.27	3.68	3.18	3.05	3.55	62

TABLE 6.

Grain yields of Corn Varieties grown at three locations in Guinea, 1966.

Variety	KINDIA		SEREDOU		KANKAN		Average 3 locations		
	Shelled Corn tons/ha	% of Perta	Shelled Corn tons/ha	% of Perta	Shelled Corn tons/ha	% of Perta	Shelled Corn tons/ha	% of Perta	% of Mex. 17
Cornell 54	4.15	197	3.05	219	3.27	57	3.49	113	99
Poey T-62	4.99	237	2.11	152	3.96	69	3.69	119	104
Poey T-66	2.46	117	2.05	148	2.50	43	2.34	76	66
GB-I	3.37	160	2.78	200	4.41	77	3.52	114	99
Mexican 17	3.30	156	2.64	190	4.67	81	3.54	115	100
Compuesto Amarill.	2.65	126	3.26	235	4.04	70	3.32	107	94
Compuesto 1	2.69	128	3.09	222	4.47	78	3.42	111	97
Compuesto 2	2.33	110	3.23	232	4.17	72	3.24	105	92
VS-2	2.93	139	3.27	235	4.02	70	3.41	110	96
VS-3	1.88	89	(1)	(1)	3.76	65	2.82	93+	71+
Cuyuta 63	2.68	127	2.25	162	2.90	50	2.61	84	74
Freetown	2.72	129	3.46	249	4.45	77	3.54	115	100
Satake	0.39	19	0.68	48	0.92	16	0.66	21	19
Perta	2.11	100	1.39	100	5.76	100	3.09	100	87
K.B.S.	4.28	203	2.33	168	1.88	33	2.83	92	79
S.A.S.	3.38	160	1.94	140	2.76	48	2.69	87	76
Silome	0.21	10	1.30	94	0.58	10	0.70	23	20
Mir 25	0.51	24	0.85	61	1.19	21	0.85	28	24
M 55	1.10	52	0.93	67	1.63	28	1.22	39	34
Rockefeller 360	3.25	155	2.93	211	3.65	63	3.28	106	93
Rockefeller 361	3.55	168	3.43	247	4.18	73	3.72	120	105
Rockefeller 362	3.07	146	2.51	181	4.22	73	3.27	106	92
Tiquisate	2.70	128	1.91	137	4.06	71	2.89	94	82
Amarillo	2.83	134	2.65	191	3.55	62	3.01	97	85

1) Seeds were lost.

+) Calculation compared two comparable replications for standard for comparison.

TABLE 7.

Summary grain yields of Corn Varieties grown in yield trials during 1963-1966, Rep. of Guinea.

Variety	1963		1964		1965		1966		Avg. for years compared	Avg. of Mex.17 same years	% Sup.(+) or Inf(-) of Mex.17 for same years
	% of Cornell 54	No. of comparisons	% of Harapan	No. of comparisons	% of Mex.17	No. of comparisons	% of Mex.17	No. of comparisons			
Cornell 54	100	6	53	4	-	-	99	3	84	109	-25
Mex. 17	131	6	95	6	100	4	100	3	107	107	0
58-I	120	5	88	6	112	4	99	3	105	107	- 2
Compuesto Amarill.	-	-	119	4	107	4	94	3	107	98	+ 9
Compuesto 1	-	-	117	1	95	4	97	3	103	98	+ 5
RAS [illegible]	-	-	117	4	132	4	76	3	108	98	+10
RAS	88	1	117	6	111	4	79	3	99	107	- 8
Cuyuta 63	-	-	121	6	91	4	74	3	95	98	- 3
VS-2	69	4	77	5	93	4	96	3	84	107	-23
VS-3	75	5	112	5	93	4	71	3	88	107	-19
Compuesto 2	-	-	132	1	87	4	92	3	104	98	+ 6
Perta	81	4	123	6	96	4	87	3	97	107	-10
Sataba	-	-	-	-	66	4	19	3	38	110	-72
Frectown	-	-	-	-	85	4	100	3	93	100	- 7
Poey T-62	75	6	-	-	-	-	104	3	91	116	-25
Poey T-66	-	-	-	-	-	-	66	3	66	100	-34
Siloma	-	-	-	-	-	-	20	3	20	100	-80
Mir 25	-	-	-	-	-	-	24	3	24	100	-76
M 55	-	-	-	-	-	-	34	3	34	100	-66
Rockefeller 360	-	-	-	-	-	-	93	3	93	100	- 7
Rockefeller 361	-	-	-	-	-	-	105	3	105	100	+ 5
Rockefeller 362	-	-	-	-	-	-	92	3	92	100	- 8
Tiquisate	-	-	-	-	-	-	82	3	82	100	-18
Nicarillo	-	-	-	-	-	-	85	3	85	100	-15

TABLE 6.

Phenologic data obtained with Corn Varieties included in yield trials at Foulaya Research Institute, KINDIA, R.G., 1966.

Variety	Ear wt. gms.	% moisture at harvest	Percent of plants: Double ears	Barrens	Lodged	Seedling vigor (2)	Reaction to: Insect (2)	Disease (2)	Plant Ht. (meter)	Ear Ht. (meter)
Cornell 54	140	24.4	0.4	12	14	1-2	2-3	1	1.69	0.93
Posy T-62	137	24.0	0.0	9	10	1-2	2-3	1-2	1.92	1.16
Posy T-66	124	27.0	1.1	14	27	3	3	2	1.39	0.60
CS-1	107	27.2	0.7	9	24	1	3	1-2	1.23	0.96
Mexican 17	111	27.9	0.9	14	6	1	2	2	1.81	0.90
Compuesto Amarillo	90	24.1	0.8	9	29	1-2	3	2	1.54	0.75
Compuesto 1	66	24.0	1.1	8	25	1-2	3	2	1.61	0.73
Compuesto 2	79	23.4	0.6	14	23	2	3	1-2	1.51	0.60
VS-2	114	27.8	1.0	22	14	2	3	2	1.58	0.72
VS-3	74	25.4	0.0	12	13	2	2-3	2	1.34	0.60
Cuyuta 63	109	38.9	0.8	18	22	2	3	2	1.63	0.78
Freetown	92	25.7	0.3	8	12	2	2-3	2	1.34	0.52
Sataba	79	36.1	0.0	78	35	2	4	3	2.13	1.45
Perta	78	26.5	0.7	10	32	2	3	1	1.37	0.56
K.B.S.	144	28.9	6.3	14	20	2	3	2	1.73	1.00
S.A.S.	130	27.9	2.2	13	23	2	3	2	1.79	1.01
Siloma	14	9.3(3)	-	20	-	2-3	3	3	-	-
Mir 25	19	9.5(3)	-	13	-	2	3	3	1.18	0.24
M 55	30	10.0(3)	-	7	-	1-2	3	2	1.18	0.40
Rockefeller 360	100	27.2	1.0	4	13	1-2	2	1-2	1.41	0.64
Rockefeller 361	106	25.6	0.4	9	12	1-2	2	1-2	1.50	0.72
Rockefeller 362	107	28.8	0.0	12	17	1	3	2	1.80	0.88
Tiquisate	84	24.2	0.0	13	14	2	2-3	1-2	1.31	0.95
Nicarillo	100	26.7	0.0	12	12	2	2	2	1.31	0.67

1) Numbers indicate - 1:excellent, 2:good, and 3:fair.
2) " " - 1:highly resistant, 2:resistant, 3:moderately resistant, 4: moderately susceptible and 5 completely susceptible
3) Not comparable - oven dried values.

TABLE 9.

Phenologic data obtained with Corn Variety trial
at Bordo Research Station, KANKAN, 1966.

Variety	Ear wt. (Gms.)	% plants lodged	Seedling vigor(1)	Disease re-action (2)	Plant Ht.in meters	Ear Ht. in meters
Cornell 54	151	52	1	1	2.47	1.55
Poey T-62	136	23	1	1-2	2.62	1.67
Poey T-66	133	33	2	1	2.35	1.38
GS-I	143	30	1	1	2.84	1.79
Mexican 17	154	46	1	1-2	3.04	1.03
Compuesto Amarillo	136	40	1	1-2	2.79	1.65
Compuesto 1	143	29	1	1	2.71	1.68
Compuesto 2	138	29	1	1	2.64	1.51
VS-2	145	30	1	1-2	2.03	1.74
VS-3	109	18	1	1	2.49	1.40
Cuyuta 63	119	43	1-2	1	2.70	1.69
Freetown	139	14	1	1-2	2.67	1.56
Sataba	97	33	1	2-3	3.49	2.45
Perta	153	10	1	1-2	2.88	1.71
A.B.S.	131	22	2-3	1-2	2.61	1.73
S.A.S.	153	25	2	1-2	2.98	1.96
Silona	42	28	1	1-2	1.52	0.49
Wir 25	52	48	1-2	1	1.58	0.62
K 55	58	47	1	1	1.68	0.68
Rockefeller 360	116	19	1	1	2.53	1.56
Rockefeller 361	131	14	1	1	2.76	1.67
Rockefeller 362	137	19	1-2	1	2.86	1.80
Tiquisate	134	11	1	1	2.63	1.51
Nicarillo	124	25	1	1	2.70	1.51

1) Numbers indicate = 1:excellent, 2:good and 3:fair.
2) " " = 1: highly resistant, 2:resistant,
3: moderately resistant, 4:moderately susceptible
and 5: completely susceptible.

TABLE 10.

Agronomic and grain yields obtained with Perta Corn
in a fertilizer trial at Foulaya Research Institute, KINDIA
R.G., 1 9 6 6.

(1) Treatment	Shelled corn in tons/ha. Rep.I	Rep.II	Rep.III	Average	% of check	Ear wt. Gms.	Barren plants %
$N_2P_0K_0$	0.232	0.092	0.085	0.136	179	14	78
$N_0P_2K_0$	0.120	0.188	0.152	0.153	207	17	67
$N_0P_0K_2$	0.064	0.045	0.056	0.055	72	11	53
$N_2P_2K_0$	0.293	0.106	0.279	0.226	297	18	61
$N_2P_2K_2$	0.242	0.168	0.302	0.237	312	20	62
$N_2P_2K_4$	0.375	0.030	0.087	0.164	216	13	70
$N_2P_4K_0$	0.151	0.110	0.132	0.131	172	15	63
$N_2P_4K_2$	0.120	0.030	0.358	0.169	222	16	77
$N_2P_4K_4$	0.088	0.206	0.273	0.189	249	18	74
$N_4P_0K_0$	0.190	0.138	0.145	0.158	208	20	63
$N_0P_4K_0$	0.111	0.182	0.101	0.131	172	14	65
$N_0P_0K_4$	0.107	0.048	0.170	0.108	142	29	76
$N_4P_2K_0$	0.350	0.789	0.128	0.422	555	22	47
$N_4P_2K_2$	0.248	0.180	0.154	0.194	255	22	69
$N_4P_2K_4$	0.269	0.263	0.292	0.274	361	23	64
$N_4P_4K_0$	0.563	0.307	0.305	0.392	516	25	51
$N_4P_4K_2$	0.475	0.239	0.342	0.352	463	22	59
$N_4P_4K_4$	0.425	0.178	0.227	0.310	408	20	63
$N_0P_2K_2$	0.143	0.056	0.227	0.142	187	14	66
$N_0P_2K_4$	0.100	0.150	0.182	0.133	175	15	67
$N_0P_4K_2$	0.080	0.061	0.101	0.081	107	11	76
$N_0P_4K_4$	0.137	0.077	0.121	0.110	145	11	75
$N_2P_0K_2$	0.256	0.205	0.052	0.171	225	22	73
$N_2P_0K_4$	0.154	0.093	0.102	0.116	153	15	73
$N_4P_0K_2$	0.168	0.069	0.174	0.137	180	18	70
$N_4P_0K_4$	0.160	0.355	0.285	0.267	351	21	61
$N_1P_1K_1$	0.102	0.300	0.141	0.181	238	17	75
$N_3P_3K_3$	0.140	0.268	0.155	0.188	247	18	70
Compost(2)	0.134	0.088	0.111	0.111	146	13	66
$N_0P_0K_0$	0.131	0.085	0.003	0.076	100	14	74

Summary of Elemental effects on grain yield

Complete

Level	Grain yield (% of check)
$N_0P_0K_0$	100
$N_1P_1K_1$	238
$N_2P_2K_2$	312
$N_3P_3K_3$	247
$N_4P_4K_4$	408

Nitrogen(3)

Level	Grain yield (% of check)
N_0--	145
N_2--	225
N_4--	366
Avg.	245

Phosphate(3)

Level	Grain yield (% of check)
-P_0-	179
-P_2-	285
-P_4-	273
Avg.	246

Potassium(3)

Level	Grain yield (% of check)
--K_0	267
--K_2	225
--K_4	244
Avg.	245

1)Sub-numbers 0,1,2,3 and 4 indicate 0,22.5,45.0,67.5 and 90.0 kgs per ha. of N, P2O5 and K2O, respectively.
2)Compost rate applied - 5 tons/hectare.
3)Average of 27 individual treatments.

TABLE 11.

Grain yield and Agronomic data obtained with fertilizer trial using Parta Variety, Bordo Research Station, KANKAN, R.G., 1966.

Treatment(1)	Shelled corn in tons/ha. Rep. I	Rep. II	Rep. III	Average	% of check	Ear wt. (Gms)
$N_2P_0K_0$	5.07	4.77	4.87	4.90	109	157.0
$N_0P_2K_0$	3.13	3.39	2.87	3.13	69	101.0
$N_0P_0K_2$	4.21	5.06	3.21	4.16	92	121.0
$N_2P_2K_0$	5.56	5.33	6.08	5.66	126	170.0
$N_2P_2K_2$	5.24	5.18	2.94	4.45	99	133.0
$N_2P_2K_4$	5.70	5.03	3.95	4.89	108	155.0
$N_2P_4K_0$	5.01	5.53	5.58	5.37	119	163.0
$N_2P_4K_2$	5.88	5.88	3.75	4.97	110	157.0
$N_2P_4K_4$	3.76	4.34	5.53	4.54	101	144.0
$N_4P_0K_0$	5.07	4.41	4.22	4.57	101	149.0
$N_0P_4K_0$	4.84	4.56	4.28	4.56	101	155.0
$N_0P_0K_4$	5.53	4.76	3.61	4.63	103	149.0
$N_4P_2K_0$	5.24	4.74	4.80	4.93	109	171.0
$N_4P_2K_2$	4.38	5.08	4.82	4.76	106	181.0
$N_4P_2K_4$	6.11	6.35	4.38	5.61	124	146.0
$N_4P_4K_0$	5.93	5.99	4.82	5.58	124	168.0
$N_4P_4K_2$	6.11	4.41	4.88	5.13	114	148.0
$N_4P_4K_4$	5.53	6.15	4.63	5.44	121	167.0
$N_0P_2K_2$	4.68	3.49	4.28	4.15	92	151.0
$N_0P_2K_4$	5.22	5.69	4.11	5.01	111	160.0
$N_0P_4K_2$	5.24	4.61	3.25	4.37	97	149.0
$N_0P_4K_4$	3.25	4.10	2.55	3.30	73	115.0
$N_2P_0K_2$	4.85	4.75	3.86	4.49	100	174.0
$N_2P_0K_4$	5.10	6.36	2.93	4.80	106	149.0
$N_4P_0K_2$	4.66	4.70	4.18	4.52	100	153.0
$N_4P_0K_4$	5.02	6.01	5.08	5.37	119	169.0
$N_1P_1K_1$	4.91	5.91	4.55	5.12	114	158.0
$N_3P_3K_3$	5.13	5.53	5.40	5.35	119	157.0
Compost(2)	4.34	3.92	4.23	4.16	92	126.0
$N_0P_0K_0$	3.85	4.59	5.09	4.51	100	141.0

Summary of elemental effects on grain yield

Complete

level	Grain yield (% of check)
$N_0P_0K_0$	100
$N_1P_1K_1$	114
$N_2P_2K_2$	99
$N_3P_3K_3$	119
$N_4P_4K_4$	121

Nitrogen(3)

level	Grain yield (% of check)
N_0—	93
N_2—	109
N_4—	113
Avg.	105

Phosphate(3)

Level	Grain yield (% of check)
-P_0-	103
-P_2-	105
-P_4-	107
Avg.	105

Potassium(3)

Level	Grain yield (% of check)
—K_0	106
—K_2	101
—K_4	107
Avg.	105

1) Sub-numbers 0,1,2,3 and 4 indicate 0,22.5,45.0,67.5 and 90.0 kgs. per hectare of N,P2O5 and K2O, respectively.
2) Compost rate applied = 5 tons per hectare.
3) Average of 27 individual treatments.

TABLE 12.

Grain yields and Agronomic Results obtained with a corn population trial using the Perta variety Foulaya Research Institute, KINDIA and SEREDOU, R.G., 1966.

Row width cm.	Plants per hill	Area/ plant square meters	Plants per hect.	Shelled corn in tons/ha.				Average.	Ear weight Gms.	Percent plants		
				Rep. I	Rep.II	Rep.III	Rep.IV			Double ears	Barren	Lodged
						FOULAYA Station						
45	1	0.405	24,691	4.30	1.86	3.33	4.14	3.41	178	8.4	2.6	9.3
	2	0.203	49,383	6.72	4.42	5.13	5.41	5.42	157	2.4	3.9	22.5
	3	0.135	74,074	7.47	2.73	5.11	4.84	5.04	123	0.3	16.5	21.3
90	1	0.810	12,346	2.74	3.02	2.57	2.44	2.69	221	32.9	2.6	3.4
	2	0.405	24,691	4.65	4.44	3.56	2.81	3.87	191	8.7	2.1	10.0
	3	0.270	37,037	6.50	4.22	3.82	2.37	4.23	162	3.4	2.9	10.8
						SEREDOU Station						
45	2(1)	0.203	49,383(2)	2.96	2.07	4.08	2.67	2.95				
	4(1)	0.102	98,039(2)	3.83	[illegible]	2.09	3.29	2.86				
	6(1)	0.068	148,146(2)	2.67	2.12	3.73	1.68	2.55				
90	2(1)	0.405	24,691(2)	1.51	1.38	4.64	3.51	2.76				
	4(1)	0.203	49,383(2)	2.40	1.78	6.25	2.20	3.16				
	6(1)	0.135	14,074(2)	1.75	1.51	5.04	3.09	2.85				

(1) Number of seeds planted per hill. Plants were not thinned to 1,2, and 3 plants per hill.

(2) Actual seeds sown per hectare.

TABLE 13.

Grain yields and Agronomic Results obtained with Perta and Bordo Corn lines grown in a crossing block trial at Foulaya Research Institute, KINDIA, R.G. 1966

Line No.	Shelled corn - Tons/ha.	Shelled corn - % of Perta	Ear wt. Gm.	Percent of Plants Barrens	Percent of Plants Lodged
Bordo 81A(1)	3.48	92	121	18.7	31.3
Perta	3.79	100	111	5.2	15.6
Bordo 3	3.85	102	124	9.3	48.0
Perta	3.42	100	104	15.2	12.3
Bordo 104	1.78	52	67	21.3	10.6
Perta	2.15	100	67	5.4	25.7
Bordo 53	0.60	36	38	46.7	25.3
Perta	0.83	100	28	12.0	24.0
Bordo 24	1.04	125	37	5.6	22.6
Bordo 88	1.68	72	75	29.3	36.0
Perta	2.32	100	77	12.8	19.2
Bordo 44	1.36	59	52	22.6	18.3
Perta	1.48	100	54	8.3	34.7
Bordo 50	0.35	24	27	48.0	5.3
Perta	1.26	100	49	11.1	27.8
Bordo 76	0.58	46	23	28.7	28.7
Perta	0.91	100	31	9.2	40.7
Bordo 81B(1)	0.77	85	46	48.7	25.7

(1) Bordo 81 A + B are same line.

TABLE 14.

Summary grain yields obtained with the improved Perta Variety and local Varieties in yield tests conducted in Guinea, 1963-1966.

Year	Variety compared	Grain yields in tons per hectare.								
		Boffa	Kindia	Mamou	Kankan	Siguiri	Beyla	Macenta	Avg.	% of check
1963	Perta	(1.9) (2)	3.1	1.9	-	-	-	3.5	2.8	187
	Local (1) (4)	-	1.0	1.3	-	-	-	2.1	1.5	100
1964	Perta	0.2	1.2	0.7	6.2	2.8	3.4	-	2.4	400
	Local (1) (4)	0.1	0.5	0.0	0.7	0.6	0.0	-	0.6	100
1965	Perta	-	5.1	3.7	2.7	-	-	3.3	3.7	148
	Local (1) (2)	-	3.3	1.8	2.6	-	-	2.2	2.2	100
1966	Perta	-	2.1	-	5.8	-	-	1.4	3.1	443
	Local (1) check (1)	-	0.4	-	0.9	-	-	0.7	0.7	100
63-66	PERTA								3.0	231
	LOCAL CHECK								1.3	100

(1) Numbers in parenthesis refer to the number of named local strains included in the trials.

(2) Not included in average since no local check was planted for comparison.

TABLE 15.

Grain yield and phenologic results obtained from selected Perta lines in a top-cross yield trial grown at Foulaya Research Institute, Kindia, R.G., 1966

Line and Male tester	Shelled corn tons/ ha.	% Yield of Mt.	Ear wt. gms	% moisture at harvest	Percent Plants: Double ears	Percent Plants: Barrens	Percent Plants: Lodged	% drop ears	Plant Ht. (M)	Ear Ht. (M)	(1) Husk cover	Seedling (2) vigor	Reaction: (3) Disease	Reaction: (3) Insect	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
L 1	6.72	85	177	27.4	7.5	0.0	12.5	0.0	1.79	1.03	1	1	2	2	Discard
L 2	6.39	81	195	27.1	0.0	4.8	19.5	4.8	2.94	1.89	1	1	2	2	Discard
L 3	8.58	108	197	26.8	20.0	0.0	5.0	0.0	2.50	1.35	1	1	1	1	
MT 2	7.93	100	219	27.1	5.0	0.0	12.5	2.5	-	-	-	-	-	-	
L 4	7.33	92	162	27.9	15.0	0.0	7.5	0.0	2.25	1.26	1	1	2	1	Discard
L 6	7.54	106	221	26.1	2.6	2.6	23.1	2.6	2.25	1.17	1	1	2	2	
MT 3	7.01	100	203	28.8	2.5	0.0	20.0	2.5	-	-	-	-	-	-	
L 8	5.28	75	146	25.7	2.5	2.5	0.0	0.0	1.93	0.90	1	2	3	1	Discard
L 9	4.05	58	120	30.5	0.0	0.0	7.5	0.0	1.85	0.84	2	2	3	1	Discard
L 14	3.91	104	125	28.7	0.0	7.8	20.8	0.0	1.50	0.74	1	2	2	1	
L 15	3.31	86	114	31.5	0.0	12.2	18.2	0.0	1.46	0.73	1	2	2	2	Discard
MT 6	3.75	100	117	30.5	2.8	0.0	32.4	0.0	-	-	-	-	-	-	
L 16	5.22	139	162	28.3	0.0	5.2	18.2	2.6	1.73	1.01	2	2	2	2	
L 17	4.88	130	140	28.0	2.6	0.0	20.8	0.0	1.66	0.91	1	2	2	2	
L 18	5.81	155	173	27.1	2.6	5.2	10.4	2.6	1.48	0.84	2	2	2	2	
L 19	8.24	117	223	25.7	5.0	2.5	0.0	0.0	2.35	1.19	1	1	2	1	
L 20	7.19	102	211	28.0	2.5	5.0	10.0	0.0	2.42	1.48	1	1	2	1	
MT 9	7.02	100	212	28.0	0.0	5.0	2.5	0.0	-	-	-	-	-	-	
L 22	6.81	97	193	27.3	2.6	0.0	0.0	0.0	2.10	1.19	1	1	3	1	Discard
L 23	7.03	100	196	27.8	2.5	0.0	17.5	0.0	2.35	1.08	1	1	2	3	
L 24	6.66	95	173	27.1	12.5	0.0	22.5	0.0	2.23	1.24	1	1	2	2	Discard
L 26	8.64	159	225	28.0	10.0	0.0	10.0	0.0	2.32	1.26	2	1	2	1	
L 27	6.89	127	207	29.5	0.0	2.6	13.0	0.0	2.05	1.03	1	2	1	1	
MT 11	5.44	100	157	26.6	0.0	0.0	15.6	0.0	-	-	-	-	-	-	
L 28	5.74	100	176	27.5	0.0	7.5	22.5	0.0	1.70	0.86	1	2	1	3	
L 32	4.53	73	159	27.4	0.0	7.5	7.5	0.0	1.65	0.83	1	2	3	1	Discard

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
L 33	4.84	78	165	26.8	0.0	5.0	17.5	2.5	1.74	0.88	1	2	3	2	Discard
MT 13	6.20	100	187	28.0	0.0	2.5	22.5	2.5	-	-	-	-	-	-	
L 34	5.64	91	204	30.9	0.0	10.8	18.9	0.0	2.14	1.05	1	2	2	1	
L 35	7.93	128	222	28.1	2.5	0.0	12.5	0.0	2.16	1.20	1	1	2	1	
L 36	7.34	118	220	25.6	5.6	2.8	8.3	0.0	2.50	1.45	1	1	3	1	
L 37	5.96	98	169	27.4	0.0	0.0	2.5	0.0	2.01	1.14	1	1	3	1	Discard
L 38	6.21	103	186	27.6	0.0	5.0	10.0	0.0	1.91	0.98	1	1	2	1	
L 39	5.50	91	161	29.4	2.5	2.5	20.0	0.0	1.75	0.80	1	2	3	1	Discard
MT 16	6.06	100	181	29.3	0.0	0.0	10.0	2.5	-	-	-	-	-	-	
L 40	5.76	95	180	30.6	0.0	0.0	2.6	0.0	2.09	1.08	1	2	2	1	Discard
L 41	5.86	97	178	30.2	0.0	2.6	20.8	0.0	2.05	1.14	1	2	3	1	Discard
L 42	5.78	92	162	26.6	0.0	2.4	2.4	2.4	2.[illegible]	1.38	1	2	3	1	Discard
MT 17	6.26	100	192	29.1	0.0	5.0	5.0	0.0	-	-	-	-	-	-	
L 43	7.66	122	207	27.5	7.8	0.0	5.2	0.0	2.07	1.06	2	1	2	1	
L 44	5.64	90	178	29.4	0.0	0.0	13.0	5.2	2.06	1.13	1	1	3	2	Discard
L 45	5.75	138	152	25.6	10.0	0.0	10.0	0.0	1.91	1.06	1	2	4	1	Discard-Disease
MT 18	4.16	100	139	27.7	0.0	15.0	30.0	0.0	-	-	-	-	-	-	
L 46	5.71	137	164	26.5	2.5	0.0	7.5	0.0	1.88	0.85	3	2	3	1	
L 47	5.68	137	175	29.7	0.0	5.0	17.5	0.0	1.95	0.96	1	2	2	2	
L 49	5.24	126	169	27.1	2.7	0.0	18.4	10.5	1.63	0.78	2	2	3	2	Discard-drop ears
L 55	3.82	79	112	29.3	0.0	2.4	0.0	0.0	1.63	0.88	1	2	3	1	Discard
L 56	4.55	94	131	28.4	0.0	0.0	0.0	0.0	1.54	0.80	2	2	3	1	Discard
L 57	4.69	97	128	26.4	0.0	0.0	22.0	0.0	1.75	0.86	1	2	3	3	Discard
MT 23	4.65	100	143	30.1	0.0	0.0	15.0	0.0	-	-	-	-	-	-	
L 58	4.23	87	140	29.0	2.8	5.6	19.6	0.0	1.71	0.83	1	2	3	2	Discard
L 59	5.20	107	171	26.3	0.0	2.7	13.5	5.4	1.90	0.86	1	2	3	2	
L 60	4.32	123	122	27.0	2.5	0.0	17.5	2.5	1.51	0.64	1	2	2	2	
MT 24	3.52	100	140	28.6	3.7	0.0	7.4	3.7	-	-	-	-	-	-	
L 61	4.97	141	141	29.1	0.0	2.4	9.6	0.0	1.68	0.75	1	2	3	1	
L 62	5.42	154	150	28.9	2.4	0.0	7.2	0.0	2.05	0.78	1	2	3	1	
L 63	4.64	139	136	28.0	0.0	2.5	5.0	0.0	1.54	0.79	2	2	2	1	
MT 25	3.33	100	116	30.1	0.0	2.9	11.6	0.0	-	-	-	-	-	-	

TABLE 15. (cont.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
L 64	4.83	145	159	30.4	0.0	2.5	22.5	7.5	1.80	0.95	1	2	3	2	
L 65	5.10	153	163	28.5	0.0	7.5	17.5	2.5	1.89	1.08	2	2	3	2	
L 66	5.64	169	156	29.1	7.8	0.0	23.4	0.0	1.95	1.15	1	2	3	3	
L 72	5.73	108	182	26.0	0.0	2.6	26.0	7.8	2.14	1.14	3	1	3	3	
L 73	6.44	122	184	31.4	5.0	0.0	10.0	[illegible]	[illegible]	1.13	1	1	2	2	
L 74	6.23	118	171	26.9	5.2	0.0	13.0	0.0	1.80	0.84	1	2	2	1	
L 75	5.05	96	150	26.9	2.5	5.0	25.0	2.5	1.91	0.89	1	2	3	3	Discard
L 77	4.31	82	132	29.3	2.6	5.2	15.6	0.0	1.64	0.79	2	2	3	2	Discard
L 83	4.88	92	149	26.9	0.0	0.0	16.2	2.7	1.65	0.88	2	2	2	2	Discard
L 84	5.32	100	170	28.4	2.5	10.0	20.0	2.5	1.93	0.99	3	2	4	3	Discard-barrans
MT 33	5.28	100	154	25.7	0.0	5.0	22.5	0.0	-	-	-	-	-	-	
L 85	5.84	111	170	27.3	2.6	0.0	7.8	2.6	2.04	1.13	1	1	3	1	
L 86	5.96	80	160	25.3	2.6	0.0	10.0	0.0	1.76	0.86	2	1	3	2	Discard
MT 34	7.41	100	206	24.1	2.5	2.5	7.5	2.5	-	-	-	-	-	-	
L 88	6.76	91	195	26.7	0.0	0.0	10.0	2.5	1.83	1.09	1	1	2	1	Discard
L 89	6.43	87	194	28.1	0.0	5.0	10.0	0.0	1.96	1.06	2	1	2	2	Discard
L 103	3.47	96	142	27.9	2.8	16.8	5.6	8.4	1.63	0.91	2	2	3	1	Discard
L 104	3.70	103	122	28.3	0.0	5.2	2.6	5.2	1.53	0.69	2	2	2	1	
L 105	6.08	169	181	30.5	0.0	0.0	7.5	0.0	1.85	0.76	1	2	3	1	
MT 41	3.60	100	120	29.2	0.0	10.0	17.5	2.5	-	-	-	-	-	-	
L 106	4.45	124	141	29.8	0.0	5.0	15.0	2.5	1.70	0.80	1	2	4	2	Discard-disease
L 107	5.01	139	146	29.1	2.5	0.0	12.5	2.5	1.70	0.85	3	2	4	1	Discard .-"-
L 108	5.73	159	179	28.7	0.0	5.0	22.5	2.5	1.89	0.98	3	1	3	3	
L 109	5.79	161	164	29.0	0.0	0.0	10.0	0.0	1.84	0.95	1	2	3	1	
L 116	4.76	128	142	29.1	2.5	5.0	10.0	0.0	1.78	0.63	2	2	2	1	
MT 48	3.73	100	117	29.0	0.0	2.7	27.0	0.0	-	-	-	-	-	-	
L 125	4.00	107	134	31.8	0.0	5.4	10.8	0.0	1.56	0.71	1	2	3	2	
L 126	3.51	94	120	31.3	0.0	10.4	22.8	0.0	1.70	0.71	1	2	2	1	Discard

(1) Numbers indicate : 1 - good enclosure of ear, 2 - fair ear enclosure, 3 - poor ear enclosure.
(2) " " : 1 - excellent, 2 - Good, 3 - poor.
(3) " " : 1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4 - moderately susceptible and 5 - completely susceptible.

115

TABLE 16.

Grain yield and Agronomic results obtained with Rockefeller corn varieties grown in an observational trial at Foulaya Research Institute, KINDIA, R.G. 1 9 6 6.

Variety name and No.	Yield shelled corn (tons/ha).	% Yield of Perta.	Ear wt. grams.	Percent moisture	Percent of Plants		Seedling Vigor(1)
					Barren	Lodged	
(Antigua 40 x Antigua 50) x (Guatemalan) - 7007	2.44	154	107	33.1	13	13	3
Kotro 1592	2.17	137	96	35.0	22	9	2
USA 342 x Antigua 2-7205	2.01	127	76	32.1	4	26	2
Perta 1590	1.58	100	94	38.3	34	19	2
Guatemalan 63 x Antigua 2-7087	1.48	94	105	35.1	34	10	4
Guatemalan 77x Antigua 2-7084	0.89	56	61	33.7	27	17	1
Aegrew	0.06	33	16	20.5	84	43	5
Perta 1590	0.18	100	29	45.4	66	10	5
C.Rica 20 A x Antigua 2 - 7079	0.20	111	37	45.2	70	10	2
Guadalupe1x Antigua 2-7121	1.19	661	53	32.6	11	7	3
Puerto Rico 1 and 2 - 7432	0.48	267	41	34.2	40	24	4
Iowatigua x Guatemalan - 7046	2.33	95	90	38.7	6	9	1
Sotaba	0.19	8	10	32.7	93	12	2
Cuba 24 V x Antigua 2 - 7182	1.96	80	112	35.4	24	13	1
Perta 1590	2.46	100	120	34.4	32	8	3
C. Rica 47 x Antigua 2- 7067	2.29	93	104	31.0	25	7	2
Martinique 1 x Guatemalan - 7039	1.46	59	71	31.9	25	6	3
St.Vicente 3 D x Guatemalan- 7020	1.36	324	57	34.9	10	15	5
Perta 1590	0.42	100	41	43.3	49	4	1
(Guadalupe 6 D x Guadalupe 1 D) x Guatemalan - 7012	0.61	145	35	32.6	37	10	3
Tep 63-64(2)	1.34	319	84	37.8	41	6	3
Guatemalan 1 70 x Antigua 2 - 7080	1.93	460	95	37.9	23	13	4

(1) Numbers indicate - 1 excellant vigor, 2 - good, 3 - fair, 4- poor, 5 - very poor

(2) Received in 1964 from Mexico.

118

TABLE 17.

General information relating to Rice trials conducted in Guinea, 1 9 6 6.

Location	Type of experiment	Dates				
		Planted	Emerged	Transplanted	Flowered	Harvested
KINDIA-Upland	Variety	June 10	June 16	-	Sept.25	Nov. 8
	Fertility	June 13	June 19	-	Sept.27	" 9
	Blast disease	Aug.24	Aug. 29	-	-	-
	Seed multiplication.	June 11	June 18	-	Sept.26	" 8
KANKAN-Upland	Variety	June 1	June 6	-	Sept.16	Oct.24
	Fertility	May 31	June 5	-	Sept.12	Oct.26
	Seed multiplication.	June 2	June 8	-	Sept.20	Oct.31
KOBA-Lowland	Variety	July 8	July 13	Aug.18		
	Fertility	"	"	" 19		
	Lime-minor element.	"	"	" 23		
	Spacing	"	"	" 22		
	Seed multiplication.	"	"	" 26, Sept 27		
KABAK ISLAND-Lowland	Variety	July 6	July 12	Aug.12		
	Fertility	"	"	"		
	Lime-minor-element.	"	"	"		
	Spacing	"	"	"		
	Seed multiplication.	"	"	"		

TABLE 16.

Paddy yields of upland Rice Varieties in Variety trials grown at Foulaya Research Institute, KINDIA, and Bordo Research Station, KANKAN, R.G., 1966.

Variety	KINDIA Paddy rice (tons/hectare)				KINDIA	KANKAN Paddy rice (tons/hectare)			KANKAN	Average of two locations
	Rep.I	Rep.II	Rep.III	Rep.IV	Average Tons/ha.	Rep.I	Rep.II	Rep.III	Average Tons/ha.	tons/ha.
Fosaq	1.60	0.74	2.96	2.96	2.12	2.59	2.13	2.96	2.56	2.[illegible]
Anethoda	1.48	1.85	1.11	1.85	1.57	3.70	1.80	5.19	3.56	2.57
Tikiri Samba	3.33	3.70	2.96	2.96	3.23	4.63	1.85	2.31	2.93	3.08
A x F 28 (1)	2.59	2.22	1.48	1.85	2.04	0.93	0.93	2.41	1.42	1.73
A x F 49 (1)	1.48	1.85	2.59	3.33	2.31	0.65	0.93	1.11	0.90	1.61
A x F 50 (1)	2.59	2.96	2.22	2.22	2.50	2.59	2.69	1.94	2.41	2.46
A x F 57 (1)	2.22	2.22	2.59	2.22	2.31	3.98	3.89	2.22	3.36	2.84

(1) A x F = Asucena x Faya; seed obtained from Rokupr Rice Station, Sierra Leone.

128

TABLE 19.

Agronomic characters of upland rice Varieties grown in Variety trials at Foulaya Research Institute, Kindia, and Bordo Agriculture Station, Kankan, R.G., R.G., 1966.

Variety	Days from planting to flowering	Seedling vigor(1)		Plant height in meters		Tillers per plant		Blast disease(6)		Insect reaction(7)	Lodging(8)	
		Kindia	Kankan	Kindia (2)	Kankan (3)	Kindia (4)	Kankan (5)	Kindia	Kankan	Kankan	Kindia	Kankan
Fossa	106	2-3	2	0.68	0.89	2.7	1.1	3	2	1-2	1	1
Anethoda	103	1-2	1	0.68	0.75	5.1	2.0	2	2	1	4	1
Tikiri Samba	105	2-3	1-2	0.66	0.74	6.0	2.2	3	2	1	3	1
A x F 28(9)	104	2	2	0.60	0.82	4.6	2.7	3	3	3	3	1-2
A x F 49(9)	103	2-3	1-2	0.64	0.79	6.1	2.7	3	2	4-5	2	1
A x F 50(9)	104	2-3	1	0.72	0.80	6.5	1.8	4	4	1	2	1
A x F 57(9)	104	2	1	0.66	0.77	6.8	1.5	4	2	1-2	2	1

(1) Numbers indicate : 1 - excellant, 2 - good, 3 - fair, 4 - poor, and 5 - very poor.
(2) Average of 8 plants. Readings taken 36 days after planting. Height taken to tip of extended leaf
(3) Average of 10 plants. " " 130 " " " . " " " base of panicle.
(4) Average of 10 plants. " " 36 " " " .
(5) Average of 10 plants, " " 130 " " " . Only grain producing tillers counted.
(6) Numbers indicate degree of infection of *Piricularia Oryzae*: 1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4 - moderately susceptible, 5 - susceptible, 6 - very susceptible, and 7 - completely susceptible (death of plant).
(7) Numbers indicate: 1 - highly resistant, 2 - Resistant, 3 - moderately resistant, 4 moderately susceptible, 5 - highly susceptible.
(8) Numbers indicate: 1 - 0 to 20% lodged, 2 - 21 to 40%, 3 - 41 to 60%, 4 - 61 - 80%, and 5 - 81 - 100%.
(9) A x F = Azucena x Faya.

121

TABLE 20.

Phenological data obtained from lowland rice variety trials grown at Koba Rice Research Station and Kabak Island, R.G. 1966.

Variety	Plant height (1)		Leaf width (cm)		Percent Germination		Seedling vigor (2)		Plant color (3)		tillering (2)		Insect (4) reaction		Blast (5) disease		Percent flowering	
	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak	Koba	Kabak
AIA-J	1.15	0.93	1.17	0.86	85	95	2	1	2	2	1-2	2	1-.	3	1	1	1%	
B40-A	1.05	1.00	1.09	0.94	85	95	2	1	2	2	1-2	2-3	1	1	3	1-2	2%	70%
B50-A	1.28	1.00	1.17	1.02	70	95	2	2	3	3	2	2-3	1	1	2-3	1		6%
AD 9	1.06	1.00	0.94	0.78	70	90	4	3	2	2	2	2	3	1	1	1		
BA 6	1.18	0.96	1.09	1.09	80	90	2	3	2	1	2-3	2	3	1	1-2	1		
BC 7	1.16	0.97	1.17	0.94	75	90	4	4	1	2	2	2	1	1	1	1		
BC 8	1.25	0.94	1.33	0.94	75	95	1	1	2	2	2	2-3	1	1	3	3		
BC 12	1.09	0.82	1.09	0.94	90	90	3	3	2	2	1-2	2	2	3	1	1		
AB 3	1.04	0.74	1.09	0.94	85	90	2	4	3	2	2	2	1	1	1-2	1-2		
AC 16	1.0[illegible]	0.71	1.01	1.02	80	80	3	4	1	2	1-2	1-2	1	1	2	1		
AA 10	1.16	0.65	1.01	0.76	75	90	3	3	2	2	1	2	1	1	1	1		
PA Bunch 2	0.98	0.60	1.01	0.86	75	80	3	3	1	1	1-2	1	1	2	2-3	1		
H 6	1.00	0.74	0.94	0.76	90	95	4	2	1	2	1	2	1	1	1	1		
Nam Gasik Hai	1.04	0.79	1.09	0.75	80	85	3	2	2	2	2-3	2	2	3	2	1-2		
Gantang	1.24	0.88	1.09	0.94	80	90	4	1	3	2	.-2	1-2	1	1	1-2	1		
Cadung Phen	1.06	0.75	1.01	0.94	75	90	3	1	2	2	1-2	2	1	1	1-2	1-2		
Faya	1.05	0.90	1.09	0.94	70	85	3	2	3	1	2-3	1-2	1	1	3	1		
Bong Sen Fen 2 F10	1.06	0.82	0.94	0.86	75	95	1	1	2	2	1-2	2-3	2	3	1	1		
Kracheck Chap	1.05	0.94	1.09	0.78	70	75	4	4	1	1	1-2	2	3	3	2	1		
MAS 2401	1.13	0.76	1.01	0.70	75	85	3	3	1	1	1-2	2	1	2	1-2	1		
B 4D-A23	1.12	0.90	1.01	0.94	75	90	2	2	1	2	3	2	1	1	1-2	1		
Koba / Kabak																		
Local-Farkuman / Nan	0.96	0.80	1.01	0.86	55	15	5	5	2	1	2	2	3	2	1	1		
" -Nasousou / Harsan	1.15	0.80 (7)	1.25	0.76 (7)	60	15	5	5	2	2	2	2	1	1	1	1		
" -Sisbindji / Mimikoi	1.00	0.80 (7)	1.01	0.78 (7)	70	3	4	5	1	2	2	2	1	1	2	1		
" -Molikounkoud	1.07		1.01	-	-		-		1		2		1		1			
SR 26	1.14		1.25	-	-		-		3		2		1		1			
Radin China 4	1.04		1.17	-	-		-		2		2-3		1		2-3		45	

(1), (2), (3) and (4)(5) : Page 2 of table.20

TABLE 20 (Cont.)

(1) Height taken to tip of longest extended leaf, 132 days after planting at Koba and 133 days at Kabak. Four plant average.

(2) Numbers indicate: 1 - excellent, 2 - good, 3 - fair, 4 - poor and 5 - very poor.

(3) " " : 1 - dark green, 2 - light green and 3 - yellowish - green

(4) " " : 1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4 - susceptible, 5 - highly susceptible.

(5) Numbers indicate degree of infection of Piricularia Oryzae: 1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4-moderately susceptible, 5 - susceptible, 6 - very susceptible, and 7 - completely susceptible (death of plant).

TABLE 21.

Yield of panicles and Agronomic characters of upland Rice fertility trial planted to Variety Anethoda at Foulaya Research Institute, Kindia, R.G., 1966.

Treatment	Paddy rice (Tons/ha)			Average tons/ha.	% of check	Plant Ht.(2) (meters)	Tillers (3) per plant	Average straw yield tons/ha.
	Rep. I	Rep. II	Rep. III					
$N_1P_0K_0$ (1)	2.0	2.0	2.8	2.27	90	0.61	8.4	4.90
$N_0P_1K_0$	2.0	3.2	2.4	2.53	100	0.53	3.7	4.27
$N_0P_0K_1$	3.2	2.0	2.8	2.67	106	0.64	4.4	5.07
$N_1P_1K_0$	1.6	2.8	2.4	2.27	90	0.59	4.7	2.93
$N_1P_1K_1$	2.8	2.0	1.6	2.13	84	0.74	5.7	5.60
$N_1P_1K_2$	2.8	2.8	2.4	2.67	106	0.75	4.1	5.20
$N_1P_2K_0$	2.8	2.0	1.6	2.13	84	0.65	3.4	4.67
$N_1P_2K_1$	2.4	2.8	2.8	2.67	106	0.76	4.8	5.20
$N_1P_2K_2$	2.0	2.0	2.4	2.13	84	0.75	5.4	5.07
$N_2P_0K_0$	2.0	3.6	2.4	2.67	106	0.63	3.7	4.40
$N_0P_2K_0$	2.8	2.4	4.0	3.07	121	0.56	4.3	3.60
$N_0P_0K_2$	4.0	2.8	2.8	3.20	126	0.48	2.0	4.13
$N_2P_1K_0$	3.6	2.0	3.2	3.29	130	0.63	4.3	5.30
$N_2P_1K_1$	2.8	2.4	1.2	2.10	83	0.74	4.7	4.80
$N_2P_1K_2$	2.8	3.2	2.4	2.80	111	0.71	4.6	3.48
$N_2P_2K_0$	2.4	3.2	2.0	2.53	100	0.72	3.9	4.27
$N_2P_2K_1$	3.2	2.8	2.8	2.93	116	0.73	6.2	3.49
$N_2P_2K_2$	2.8	2.8	2.4	2.67	106	0.81	6.3	4.13
$N_0P_1K_1$	2.8	2.8	2.0	2.53	100	0.51	3.5	3.33
$N_0P_1K_2$	2.4	3.2	2.4	3.27	129	0.55	3.1	4.53
$N_0P_2K_1$	2.8	2.8	2.4	2.67	106	0.53	2.1	4.93
$N_0P_2K_2$	2.0	2.4	3.2	2.53	100	0.51	3.4	6.27
$N_1P_0K_1$	2.8	2.8	3.6	3.07	121	0.68	5.5	4.53
$N_1P_0K_2$	2.8	2.8	2.4	2.67	106	0.69	3.7	4.66
$N_2P_0K_1$	2.0	2.8	1.6	2.13	84	0.68	6.5	3.47
$N_2P_0K_2$	1.6	2.0	3.2	2.27	90	0.71	6.7	4.93
$N_0P_0K_0$	2.4	2.8	2.4	2.53	100	0.40	1.6	5.87

Summary of effect of single element fertilizer on yield.

Complete element	% of check	Element	% of check	Element	% of check	Element	% of check
$N_0P_0K_0$	100	N_0--	109.7	-P_0-	103.2	--K_0	102.3
$N_1P_1K_1$	84	N_1--	96.7	-P_1-	103.6	--K_1	100.6
$N_2P_2K_2$	106	N_2--	102.8	-P_2-	102.5	--K_2	106.4
Mean	96.6		103.0		103.1		103.1

1) Sub numbers o,1, and 2 indicate 0, 45.0 and 90.0 kgs per hectare of N, P_2O_5 and K_2O, respectively.
2) Average of five plants. Data taken on July 17.
3) " " ten " " " " " 17.

TABLE 22.

Agronomic results obtained from a lowland Rice fertility trial planted to RADIN CHINA-4 at the Koba Rice Research Station, R.G., 1966

Treatment	Plant height (meters)(1)	Plant color(2)	Tillering(3)
$N_0P_0K_0$ (4)	0.96	3	2
$N_2P_0K_0$	1.16	1	2
$N_0P_2K_0$	0.91	2	3
$N_0P_0K_2$	1.08	2	2
$N_2P_2K_0$	1.08	1	2
$N_0P_2K_2$	1.06	2	3
$N_2P_0K_2$	1.08	2	2
$N_1P_1K_1$	1.03	2	1
$N_2P_2K_2$	1.17	1	2
$N_3P_3K_3$	1.15	1	2
$N_4P_4K_4$	1.23	1	1
Compost (5)	1.00	2	3

(1) Height taken to tip of longest extended leaf, 132 days after planting.

(2) Numbers indicate : 1 - dark green, 2 - light green, 3 - yellowish green.

(3) Numbers indicate : 1 - excellent, 2 - good, 3 - fair, 4 - poor and 5 - very poor.

(4) Sub-numbers 0,1,2,3 and 4 indicate 0, 22.5, 45.0, 67.5 and 90 kg. per hectare of N, P_2O_5 and K_2O.

(5) Compost at 10 tons per hectare.

TABLE 23.

Agronomics results obtained from lowland Rice spacing trials performed at Koba Rice Research Station and Kabak Island, R.G., 1966.

Variety (1) and hill spacing	Plant height (meters)(2)		Plant color(3)	
	Koba	Kabak	Koba	Kabak
Local - 20 x 20 cm.	1.08	0.96	2	1
25 x 25 cm.	1.58	0.88	3	1
30 x 30 cm.	1.21	0.94	2	1
Radin China 4 -				
20 x 20 cm.	1.03	0.83	2	2
25 x 25 cm.	1.13	0.65	3	2
30 x 30 cm.	1.21	0.84	3	2

1) Local varieties employed - Koba - Farkomen
Kabak - Wan.

2) Height taken to tip of longest extended leaf, 132 and 133 days after planting for Koba and Kabak, respectively.

3) Numbers indicate: 1 - dark green, 2 - light green, and 3 - yellowish green.

TABLE 24.

Agronomic results obtained from lowland Rice lime - minor element trials using variety Radin China 4 performed at Koba Rice Research Station and Kabak Island, R.O., 1966.

Treatment	Plant height (meters)(1)		Plant color (2)	
	Koba	Kabak	Koba	Kabak
L_0 ME (3)	1.05	0.88	1	2
L_1 ME	1.04	0.81	2	2
L_2 ME	1.06	0.89	2	2
L_4 ME	1.18	0.94	2	2
L_0	1.07	0.79	2	3
L_1	1.06	0.94	2	2
L_2	1.12	0.90	2	2
L_4	1.08	0.89	2	2

1) Height taken to tip of longest extended leaf, 132 and 133 days after planting for Koba and Kabak, Respectively average of five plants.

2) Numbers indicate: 1 - Dark green, 2 - light green, 3 - yellowish green.

3) Sub numbers 0,1,2,4 indicate 0,1,2, and 4 tons (metric) of lime($CaCO_3$) per hectare.

ME = minor element (eminal) applied at rate of 60 kilograms per hectare.

TABLE 25.

Results of a study of Rice Variety resistance to Piricularia Oryzae (Blast Disease) in a nursery grown at Foulaya Research Institute, KINDIA, R.G.
1 9 6 6.

Nursery planted August 24.   Observations made Sept.27

No.	Variety	Origin		Blast Reaction (1)	Remarks
1	CI 7787	American differentials		2	
2	CI 8985	"	"	6	
3	CI 1561-1	"	"	7	
4	CI 8970 (purple)	"	"	7	
5	CI 8970 (Straw)	"	"	7	
6	CI 5309	"	"	7	
7	PI 180061	"	"	7	
8	PI 201902	"	"	7	
9	PI 231128	"	"	2	
10	PI 231129	"	"	2	
	Anethoda - Reaction for whole nursery, resistant check Average to be			2-3	
11	Te-tep	Japanese differentials		2	
12	Tadukan	"	"	2	
13	Usen	"	"	4	
14	Chokoto	"	"	4	
15	Yakeiko	"	"	7	
16	Kanto 51	"	"	7	
17	Ishikari Shiroke	"	"	6	
18	Homare Nishiki	"	"	6	
19	Ginga	"	"	5	
20	Norin 22	"	"	5	
	Anethoda -			2-3	

128

No.	Variety	Origin	Blast Reaction (1)	Remarks
21	Aichi Asahi	Japanese differentials	7	
22	Norin 20	" "	7	
23	Taichung 65	Taiwan differentials	7	
24	Taichung 171	" "	7	
25	Chianung 280	" "	7	
26	Chianung 242	" "	7	
27	Kwang-fu 1	" "	6	
28	Pai-kan-tao	" "	5	
29	Taichung line 3	" "	7	
30	Kao-chio-liu-chou	" "	7	
Anethoda -			2-3	
31	Kaohsiung Ta-li-chen-yu	Taiwan differ.	7	
32	Taichung Ti-chie-wu-chien	" "	7	
33	Custagalcula	" "	7	
34	Matala	" "	7	
35	Kanto 51	" "	7	
36	Hung-lin 21	" "	6	
37	Senshu	" "	5	
38	Kung-shan wu-shen-ken	" "	7	
39	A 36-3	FAO (Burma)	7	
40	A 56-11	" "	7	
Anethoda -			2-3	
41	B 35-2	" "	5	
42	B 401	" "	7	
43	B 404	" "	4	
44	C 33-18	" "	5	
45	C 46-15	Burma	4	
46	D 25-4	"	2	

129

No.	Variety	Origin	Blast Reaction (1)	Remarks
47	Podiwi A-8	Ceylon	7	
48	Ptb 16	Ceylon	4	
49	H-302	Ceylon	4	
50	H-4	FAO (Ceylon)	5	
Anethoda -			2-3	
51	H-5	FAO (Ceylon)	3	
52	H-6	Ceylon	4	
53	H-105	FAO (Ceylon)	2	
54	H-501	FAO (Ceylon)	5	
55	59 325 (B-11 x Mas)	Ceylon)	3	
56	59-334 (B-11 x Mas)	Ceylon	4	
57	59-760 (Pandurisi xMas)	"	6	
58	59-811 (MasxPtb-16)	"	4	
59	Murungakayan 302	FAO (Ceylon)	3	
60	Cesariot	FAO (France)	7	
Anethoda -			2-3	
61	Fanny	FAO (France)	7	
62	Arlesienne	FAO (France)	7	
63	Cigalon	FAO (France)	7	
64	Fa Yin Tsai	FAO (Hongkong)	3	
65	Kam Ben Ngan	FAO (Hongkong)	5	
66	Le Shu Ngar	FAO (Hongkong	4	
67	Pak Muk Chai Mei	FAO (Hongkong)	7	
68	Sukhwel 20	India	6	
69	SLO 15 (from 61A)	"	3	
70	T 141	"	4	
Anethoda -			2-3	
71	PTB 10	"	4	
72	Chinsurah 35	"	7	
73	Kolamba 42	"	7	
74	T 21	"	6	

No.	Variety	Origin	Blast Reaction(1)	Remarks
75	Ram Tulasi (Sal)	India	2	
76	Nepali Tulasi(Sal)	"	3	
77	Mhta-6	"	3	
78	M.T.U. 3	"	4	
79	M.T.U. 15	"	6	
80	CO 25	"	-	
Anethoda -			2-3	
81	CO 29	"	6	
82	CO 30	"	7	
83	T.K.M. 6	"	7	
84	ADT-3	"	7	
85	ASD-1	"	7	
86	B.J. 1	"	4	
87	G.S. 336	"	6	
88	B.K.24	"	5	
89	No.10022(a)	"	5	
90	No.10022(b)	"	6	
Anethoda -			2-3	
91	No. K-60	"	4	
92	Hinidhan	FAO (India)	5	
93	A.C. 2250	FAO (India)	-	
94	Hybrid I	FAO (India)	6	
95	Hybrid II	FAO (India)	6	
96	S. 67	FAO (India)	5	
97	CO 4	FAO (India)	-	
98	221/BCIV/I/178/6	Indonesia	3	
99	221/BCIV/I/178/9	"	2	
100	221/BCIV/I/45/8	"	3	
Anethoda -			2-3	

131

No.	Variety	Origin	Blast Reaction(1)	Remarks
101	221/BCIV/I/178/11	Indonesia	3	
102	221/BCIV/I/178/13	"	3	
103	221/BCIV/I/178/3	"	3	
104	221/BCIV/I/45/8	"	4	
105	Zuiho	Japan	5	
106	Kanto 53	"	3	
107	Ginmasari	"	5	
108	Norin 18	"	5	
109	Fujisaka 5	"	5	
110	Hakkoda	"	3	
Anethoda -			2-3	
111	Aimasari	"	5	
112	Kinmaze	"	5	
113	Sasashigure	"	5	
114	Norin 29	"	5	
115	Norin 22	"	4	
116	Koshiji wase	"	4	
117	Norin 17	FAO(Japan)	3	
118	Norin 41	Japan	3	
119	Akebono	"	4	
120	Matsu-nishiki	"	4	
Anethoda -			2-3	
121	Mibe-nishiki	"	4	
122	Tosan 38	"	5	
123	Norin 25	"	5	
124	Norin 1	FAO (Japan)	5	
125	Konge (Hr. No.1)	FAO (Japan)	-	
126	Jae Keun(Suwon No.152)	FAO (Korea)	2	
127	Jin Heung (Suwon No.158)	"	3	
128	Radin Ebos	FAO (Malaya)	2	

132

No.	Variety	Origin	Blast Reaction (1)	Remarks
129	Machang	Malaya	3	
130	Acheh	"	2	
Anethoda -			2-3	
131	Serendah Kuning 11	"	2	
132	Radin China 4	"	2	
133	Lembu Basah	"	1	
134	Serang 50	"	3	
135	Subang Intan 16	FAO (Malaya)	2	
136	Subang Intan 117	" "	3	
137	Mayang Sagumpal	" "	3	
138	Haji Harun	Malaya	3	
139	Engkatek	"	2	
140	Padang Trengganu 22	FAO (Malaya)	2	
Anethoda -				
141	Morak Sepilai Kechil	" "	3	
142	Radin Kuning	Malaya	3	
143	Dular	FAO (Pakistan)	4	
144	Dharial	" "	4	
145	Hashikalmi	" "	4	
146	Kataktara	" "	4	
147	K.P.F. 6	" "	3	
148	Marichbeti	" "	4	
149	Panbira	Pakistan	4	
150	Latisail	"	3	
Anethoda -			2-3	
151	Patnai-23	"	2	
152	Tilok-Katchary	"	4	
153	Da-31	Pakistan	4	
154	Anbar Bau	FAO (Papua & New Guinea)	2	

No.	Variety	Origin	Blast Reaction	Remarks
155	Blue Bonnet	FAO (Papua & New Guinea)	2	
156	K1	- ditto -	2	
157	K1	- ditto -	2	
158	Makeo White	- ditto -	3	
159	Madang	- ditto -	-	
160	TP 1252	- ditto -	-	
Anethoda -			2-3	
161	Tesntoeng	- ditto -	2	
162	52/16-0-2	- ditto -	3	
163	Bengawan	Philippines	2	
164	Tjere Mas	"	2	
165	Peta	FAO (Philippines)	2	
166	FB 121	Philippines	3	
167	B-E-3	"	2	
168	BPI -76	FAO (Philippines)	3	
169	Raminad Str.3	- ditto -	2	
170	E-436	Philippines	5	
Anethoda -			2-3	
171	Dud Kuning	"	4	
172	C. Benton (b)	"	5	
173	FB-86	"	3	
174	Milbuen 5 (3)	"	5	
175	C 22	"	3	
176	Nang Thay	"	6	
177	KK 165	"	3	
178	R 67	FAO (Senegal)	2	
179	R 75	FAO (Senegal)	1	
180	Ignape Catelo	FAO (Senegal)	2	
Anethoda -			2-3	
181	Jappeni Tunkungo	- do -	5	
182	E-425	- do -	2	

No.	Variety	Origin	Blast Reaction	Remarks
183	BT 1095-326	FAO (Senegal)	2	
184	Taipei 127	Taiwan	7	
185	Taipei 306	"	5	
186	Taichung 65	"	4	
187	Taichung 150	"	2	
188	Taichung 155	"	2	
189	Taichung 181	"	4	
190	Chianung 242	"	5	
Anethoda -			2-3	
191	Chianung Yu 280	"	2	
192	Chianan 2	"	2	
193	Tainan 3	"	3	
194	Kaohsiung 24	"	3	
195	Kaohsiung 64	"	4	
196	Taichung 170	"	3	
197	Taichung (Native) 1	FAO (Taiwan)	2	
198	Kaohsiung Ta-Li-Chin-Yu	Taiwan	4	
199	Taipei Woo-co	"	4	
200	I-Kung-Pao	"	3	
Anethoda -			2-3	
201	Taitung Woo-Tsan	"	2	
202	Tsai-Yuan-Chon	"	2	
203	Woo-Gen	"	3	
204	Leuang Awn 29	Thailand	6	
205	Leuang Yai 34	"	-	
206	Leuang Rahaeng 8		-	
207	Nahng Mon S-4	"	2	
208	Puang Nahk 16	"	4	
209	Khao Tah Haeng 17	"	5	
210	Pah Leuad 29-8-11	"	2	
Anethoda -			2-3	

No.	Variety	Origin	Blast Reaction	Remarks
211	Muey Nawng 62	Thailand	2	
212	Sapan Kwai 3	"	2	
213	SM 8	"	4	
214	Lenang Tsang	"	5	
215	Gem Pai 30-12-15	"	1	
216	Leuang 28-1-14	"	1	
217	Colusa	U.S.A.	-	
218	Zenith	"	2	
219	Gulfrose	"	2	
220	Century Patna 231	"	5	
Anethoda -			2-3	
221	C.I. 9402	"	5	
222	Sunbonnet	"	5	
223	Bluebonnet 50	"	4	
224	Fortuna	"	3	
225	Lacrosse	"	5	
226	Rexoro	"	4	
227	Texas Patna	"	4	
228	Calrose	"	4	
229	Caloro	"	6	
230	Bluerose	"	5	
Anethoda -			2-3	
231	Tam chet cuc	Vietnam	3	
232	Mo Nha c	"	-	
233	Nang chet cuc	"	1	
234	Trang Cut.L.11	"	2	
235	Doc Phung	"	2	
236	Nang Tra.	"	2	
237	Nang Quot	"	2	
238	Nang Koh	"	1	

No.	Variety	Origin	Blast Reaction	Remarks
239	Tam Vuot	Vietnam	2	
240	O Tre	"	2	
Anethoda -			2-3	
241	Trang Lon	"	2	
242	Samo Nan	"	1	
243	Puang Ngoon	"	1	
244	Samo Trang	"	2	
245	Tat No	"	4	
246	Nang Quot (Floating)	"	2	
247	Doc Phung Lun A	"	2	
248	Nang Koi	"	-	
249	Nang Chel	"	2	
250	Nang tay C(Floating)	"	2	
Anethoda -			2-3	
251	Nang dum to (Floating)	"	2	
252	CP231 x HO12		4	
253	K10B-28-1		2	
254	Remadja		1	
255	Sigadis		1	
256	Ta-poo-cho-2		1	
257	Pah-Leuad 111		1	
258	Mo-R-500 x Nato		1	

(1) Numbers indicate degree of infection of Piricularia Oryzae: 1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4 - moderately susceptible, 5 - susceptible, 6 - very susceptible, and 7 - very susceptible (death of plant).

137

TABLE 26.

Results of Rice variety resistance to Piricularia Oryzae (blast disease) in a nursery study consisting of varieties planted in Guinea 1965 and 1966.

No.		Variety	Origin	Blast reaction (1)	Remarks
259	(1965)	Babilla 17	Morocco	7	
260	"	BPI 76	Philippines	3	
Anethoda -				2-3	
261	(1965)	BPI 121	Philippines	2	
262	"	Nichin Ii	Sierra Leone	3	
263	"	Radin Siak 34	" "	2	
264	"	Azucena	Philippines	3	
265	"	Raminard Strain 3	"	2	
266	"	Peta	"	3	
267	"	Tikiri Samba	Sierra Leone	2	
268	"	Bong Sen Den 2810	" "	3	
269	"	Bergman	Philippines	2	
270	"	BG 6044	British Guinean	4	
Anethoda				2-3	
271	(1965)	Nam Dawk Mai	Sierra Leone	4	
272	"	Precoz Blanco	Costa Rica	5	
273	"	Dima	" "	3	
274	"	Tjermas	Philippines	3	
275	"	Milpal 4	"	3	
276	"	Basmatic Rice No.370	Pakistan	5	
277	"	Texas Patena	U.S.A.	5	
278	"	Blue Bonnet 50	U.S.A.	5	
279	"	BE-3	Philippines	4	
280	"	MAS 2401	Sierra Leone	4	
Anethoda				2-3	
281	(1965)	Socotera	Sierra Leone	2	
282	"	Anethoda	" "	3	
283	"	MAS 2501	" "	3	
284	"	BG No.79	British Guiana	5	
285	"	Surinam	Surinam	4	
286	"	Ecombouca	Sierra Leone	5	
287	"	P.G. 60281	British Guinean	-	
288	"	Ac 440 (DM260)		5	
289	"	Pala Wan		3	
290	"	Dinalaga		5	

No.		Variety	Origin	Blast reaction (1)	Remarks
Anethoda				2-3	
291	(1966)	Radin China 4	Sierra Leone	1	
292	"	Tikiri Samba	Guinea	3	
293	(1965)	Vicco		-	
294	(1966)	Fossa	Guinea	3	
295	"	Impert	Mali	7	
296	"	Azucena x Faya 28	Sierra Leone	3	
297	"	" " 50	" "	4	
298	"	" " 57	" "	4	
299		Cadung Phan	" "	3	
300		BC 7	" "	1	
Anethoda				2-3	
301		M6	Sierra Leone	2	
302		BC 12	" "	1	
303		AB 3	" "	1	
304		Gantang	" "	2	
305		AIA-J	" "	3	
306		Krachek Chap	" "	5	
307		PA Bunch	" "	2	
308		AC 16	" "	2	
309		Medli Male	" "	4	
310		B 40A	" "	4	
Anethoda				2-3	
311		MTLC x VI 283	" "	3	
312		BC 8	" "	3	
313		AD 19	" "	2	
314		A-A 10	" "	2	
315		Faya	" "	2	
316		Bong Sen Den	" "	3	
317		BA 6	" "	3	
318		B5 DA	" "	5	

(1) Numbers indicate degree of infection of *Piricularia Oryzae* ,1 - highly resistant, 2 - resistant, 3 - moderately resistant, 4 - moderately susceptible, 5 - susceptible, 6 - very susceptible, and 7 - completely susceptible (death of plant).

TABLE 27.

Effect of variety on stalk number, yield of cane (tons per hectare) and per cent juice extracted.

Variety	Total stalks per plot(1)	Kg. cane per plot	Tons cane per ha.	WT. per stalk (kg)	Mill extraction(2)		
					WT. of sample (kg)	WT. of juice (kg)	% juice extracted
Conakry	187.00	222.90	72.37	1.209	21.38	10.13	47.35
BCO 310	221.75	162.50	52.76	0.730	14.15	6.13	43.22
B 4362	179.00	178.88	58.08	1.002	16.45	7.03	42.59
POJ 2878	171.75	148.88	48.34	0.849	15.08	6.53	43.25
CO 419	196.75	245.00	79.55	1.265	18.94	8.60	45.39
B41-227	198.25	206.75	67.13	1.053	17.70	7.58	42.81

1) Average of four replications

2) 17 stalk sample passed through mill one time.
LSD (5% level) : 13.64 tons per hectare.

TABLE 28.

Analysis of variance for variety trials at Foulaya using tons of sugar cane per hectare.

Source of variance	d.f.	Mean Squares	F
Replications	3	68.82	
Varieties	5	578.02	6.90++
Error	15	83.82	
Total	23		

Coefficient of variability : 14.44 %

++ Significant at the 0.01 level.

TABLE 29.

Results of Sugarcane Observational Trial at Kissidougou, R.G.

Planted December 8, 1965 - Harvested August 25, 1966

Varieties	Stalks Harvested	Stalks* Missing	Weight per Plot	Yield per Hectare**
	(No)	(No.)	(Kgs.)	(Tons)
POJ 2878	72	8	121.650	67.6
B 4362	67	20	87.150	48.4
NCO 310	67	31	57.325	31.8
CO 419	110	20	198.635	109.2
Conakry	79	18	162.910	90.6
B 41227	87	22	196.775	108.2

* Stalks missing apparently removed by thiervery; however, not compensated for in yield determination.

** Yield per hectare calculated on the basis of single plot 10 x 1.8 meters in size.

TABLE 30.

Effect of Variety and Fertilizer on Stalk Number
and Yield of Sugar Cane at Foulaya, 1966

Variety	Treatment(1)	Total Stalks per plot	kg. Cane per plot	Tons Cane per (ha)	WT.per Stalks(kg)	Tons Cane /ha. % of Check
B 41-227	NoPoKo	175	161.0	52.27	0.920	100.0
	N1PoKo	214	185.3	60.16	0.866	115.1
	NoP1Ko	179	186.0	60.39	1.039	115.5
	NoPoK1	201	225.5	73.22	1.122	140.1
	N1P1Ko	203	197.5	64.12	0.973	122.7
	NoP1K1	199	194.5	63.15	0.977	120.8
	N1PoK1	211	196.3	63.73	0.930	121.9
	N1P1K1	175	174.5	56.66	0.997	108.4
	N1P1K3	182	174.3	56.59	0.958	108.3
	N2P2K6	196	204.5	66.40	1.043	127.0
Total		1935	1899.4	616.70	9.825	
Mean		193.5	189.9	61.67	0.983	118.0
B 4362	NoPoKo	171	138.3	44.90	0.809	100.0
	N1PoKo	166	124.8	40.52	0.752	90.2
	NoP1Ko	168	143.3	46.53	0.853	103.7
	NoPoK1	177	148.3	48.15	0.838	107.2
	N1P1Ko	153	107.8	35.00	0.705	78.0
	NoP1K1	153	109.3	35.49	0.714	79.0
	N1PoK1	167	113.5	36.85	0.680	82.1
	N1P1K1	151	140.0	45.46	0.927	101.3
	N1P1K3	138	111.0	36.04	0.804	80.3
	N2P2K6	160	176.8	57.40	1.098	127.8
Total		1604	1313.1	426.34	8.186	
Mean		160.4	131.3	42.63	0.819	95.0

(1) Sub Numbers 0,1,2,3 and 6 represent 0,45,90,135 and 270 kgs. of N, P2O5 and K2O per hectare.

LSD'S (5% level) - Varieties - 8.5 Tons
- Between Varieties for same fertility Treatment - 10.7 tons
- Between fertilizer treatments for same Variety - 6.9 tons.

TABLE 31.

Effect of Fertilizer on Stalk Number and Yield of Sugar Cane at Feulaya, 1966

Treatment(1)	No.Stalks per plot	Kg.Cane per plot	Tons Cane/ha.	WT. per Stalk (kg)	Tons Cane/ha. % of Check
NoPoKo	172.50	149.63	48.57	0.866	100.0
N1PoKo	189.50	155.00	50.33	0.818	103.6
NoP1Ko	173.00	164.63	53.45	0.952	110.0
NoPoK1	188.75	186.88	60.68	0.990	124.9
N1P1Ko	177.75	152.63	49.56	0.859	102.0
NoP1K1	175.50	151.88	49.31	0.865	101.5
N1PoK1	188.75	154.88	50.28	0.821	103.5
N1P1K1	165.25	157.25	51.06	0.952	105.1
N1P1K3	159.75	142.63	46.31	0.892	95.4
N2P2K6	178.25	190.63	61.89	1.069	127.4
Total	1769.00	1606.04	521.44	9.084	
Mean	176.90	160.6	52.14	0.908	107.4

(1). Sub Numbers 0,1,2,3 and 6 represent 0,45,90,135 and 270 kgs of N, P2O5 and K2O per hectare.

LSD, (5 %) - 4.9 tons cane/hectare.

TABLE 32.

Estimation of Labor and Costs for Harvest Operations of Fertiliser Trials and Subsequent Planting of Cane At Feulaya, 1966

Item	Fertiliser Trial		Per ton of Cane (1)		Per hectare		
	Total man hrs	Cost(2)	Total man hrs	Cost	Total man hrs	Cost	Total man days
Cutting Cane(3)	280.0	9,632	13.9	478	724.0	24,906	90.50
Hauling Cane(3) to field.	140.0	4,816	7.0	239	362.0	12,453	45.25
Weighing and(4) wrapping Cane	68.0	2,339	10.6	364	552.2	18,994	69.03
Cutting seed pieces	231.0	7,946	(5)	(5)	(6)	(6)	(6)
Planting Cane	319.0	0,973	15.8	544	(6)	(6)	(6)
Total	3558	35,706	47.3	1625	1638.2	56,353	204.78

(1) Total cane harvested from plots - 6.424 tons
Estimated " " border strips - 13.648 tons
Total Cane - 20.072 tons.

(2) Calculated on basis of 275 CF/person/8 hour day which equals 34.4 CF per hour. No overtime pay calculated.

(3) Includes both plots and border strips or whole trial area of 0.3864 ha.

(4) Performed only on plots equaling 0.1232 hectares.

(5) Not all cane was cut.

(6) Total area of plots unknown.

TABLE 33.

Analysis of variance for Sugarcane fertility trial at Foulaya using tons of Sugar Cane per hectare.

Source of Variance	d.f.	Mean Squares	F
Main Plot			
Replications	1	313.40	
Variety	1	3626.36	4.97
Error (a)	1	729.52	
Split Plot			
Fertility	9	106.19	2.21(1)
Variety x Fertility	9	66.80	1.39
Error (b)	18	48.07	
Total	39		

Coefficient of variability : variety - 51.95 %, Fertility - 13.29 %

(1) Significant at 10 percent level.

TABLE 34.

Analysis of variance for Sugarcane fertility trial at Foulaya using tons of Sugar Cane per hectare and treating fertility as main plots.

Source of variance	d.f.	Mean Squares	F
Replications	3	1556.43	
Fertility	9	106.19	1.95(1)
Error	27	54.32	
Total	39		

Coefficient of variability : 14.00 %

(1) Significant at 10 percent level.

TABLE 35.

Length and weight of stalks of Sugar Cane varieties planted on March 9 and July 9, 1965, at Foulaya Research Institute, K i n d i a,(R. G.).

Variety	Month after planting	March 9 planting		July 9 planting	
		Average stalk a) length (cm)	Average stalk a) weight(gm)	Average stalk a) length(cm)	Average stalk a) weight(gm)
(1)	(2)	(3)	(4)	(5)	(6)
POJ 2878	6	230	1225	123	960
	7	175	925	140	710
	8	178	875	155	1103
	9	195	937	167	685
	10	172	925	204	1398
	11	[illegible]	1189	170	1222
	12	176	705	162	744
FR 1013	6	238	700	135	925
	7	225	875	155	950
	8	150	550	181	1220
	9	204	513	204	1053
	10	159	625	234	1388
	11	177	633	199	690
	12	[illegible]	713	171	1000
B 41-227	6	203	1050	143	1025
	7	218	1375	177	1188
	8	146	625	203	1493
	9	[illegible]	925	217	1456
	10	[illegible]	713	196	1563
	11	177	783	173	1288
	12	237	1250	189	625
FR 1028	6	252	925	125	575
	7	204	1325	124	420
	8	158	675	156	678
	9	205	788	143	323
	10	-	-	160	580
	11	159	653	183	1062
	12	189	668	187	1288

Table 35 (CONT.)

(1)	(2)	(3)	(4)	(5)	(6)
H 328560	6	256	1375	159	1000
	7	259	775	200	1088
	8	200	1350	227	1413
	9	223	1363	226	860
	10	193	1325	216	1523
	11	249	1465	193	653
	12	259	1275	145	806
Ebene	6	226	1125	124	638
	7	221	650	109	258
	8	161	800	90	208
	9	215	1250	-	-
	10	-	-	-	-
	11	-	-	-	-
	12	-	-	184	900
B 34104	6	199	750		
	7	295	650		
	8	122	550		(b)
	9	184	675		
	10	157	588		
	11	186	701		
	12	222	750		
FR 975	6	196	700	133	713
	7	256	300	158	1075
	8	160	425	210	1345
	9	159	518	168	765
	10	131	500	155	1063
	11	150	425	165	988
	12	190	668	206	1531
CONAKRY	6	265	1625	146	950
	7	262	750	206	830
	8	146	550	206	1288
	9	198	850	177	823
	10	163	875	180	1333
	11	212	1183	186	1460
	12	222	1115	143	588
MCO 293	6	195	600	113	625
	7	188	500	161	975
	8	146	450	154	968
	9	160	585	173	625
	10	126	500	149	1005
	11	146	565	141	868
	12	149	453	167	813

TABLE 25. (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
M 13432	6	198	1050	118	650
	7	238	825	143	725
	8	153	675	150	730
	9	190	963	196	630
	10	160	713	235	855
	11	169	820	185	970
	12	215	1015	191	1194
B 37172	6	193	925	135	788
	7	248	750	154	840
	8	168	725	194	1210
	9	206	1063	186	708
	10	255	938	201	1235
	11	226	1275	176	1083
	12	158	475	165	1094
B 46367	6	225	1050		
	7	214	675		
	8	133	675		
	9	209	1178		(b)
	10	237	1025		
	11	214	938		
	12	236	925		
B 43337	6	274	875	153	900
	7	215	750	195	960
	8	183	800	188	1093
	9	215	825	221	1043
	10	167	663	223	1105
	11	218	1020	215	1323
	12	239	738	173	975
MCO 310	6	213	875	124	650
	7	188	675	163	840
	8	113	875	194	1103
	9	181	550	205	960
	10	149	600	186	1266
	11	207	663	185	1100
	12	181	580	204	1688
PINDAR	6	171	825	111	688
	7	229	825	159	1200
	8	158	550	175	1025
	9	230	778	183	1128
	10	-	-	176	1098
	11	229	743	173	1093
	12	232	855	175	1131

TABLE 35 (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
PR 1016	6	228	850	111	600
	7	230	550	163	875
	8	152	725	174	1021
	9	197	1025	181	910
	10	161	775	235	1840
	11	219	843	170	558
	12	201	840	168	775
B 4362	6	189	775	132	1028
	7	278	1200	163	1088
	8	166	925	191	1488
	9	233	1075	195	1473
	10	159	713	180	1343
	11	183	783	164	593
	12	220	913	163	1113
B 3710	6	255	1425		
	7	223	825		
	8	154	875		(b)
	9	221	1425		
	10	177	963		
	11	-	-		
	12	-	-		
B 4744	6	238	875		
	7	254	725		(b)
	8	136	650		
	9	170	758		
	10	165	763		
	11	173	780		
	12	175	763		
PR 980	6	225	900	143	775
	7	222	800	190	693
	8	165	-	189	958
	9	203	638	228	1240
	10	183	988	185	1195
	11	237	950	186	1393
	12	151	853	170	1194
NCO 376	6	239	1025	146	725
	7	179	725	185	975
	8	179	575	210	1138
	9	180	535	233	713
	10	149	588	260	1515
	11	146	400	205	1053
	12	145	342	175	1181

TABLE 35 (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
CO 331	6	212	750	139	575
	7	245	825	174	788
	8	138	525	209	995
	9	209	1050	198	628
	10	148	525	228	1098
	11	167	505	184	943
	12	160	525	171	913
POJ 3016	6	238	1425	146	950
	7	245	1400	170	1245
	8	131	625	222	1893
	9	201	1190	203	1478
	10	158	925	195	1350
	11	164	775	210	1985
	12	166	838	173	1238
L 6014	6	223	825	173	1050
	7	225	1000	190	1100
	8	147	525	246	1253
	9	209	700	303	1643
	10	156	638	246	1568
	11	175	1013	194	1153
	12	164	600	206	1806
CO 419	6	214	1225		
	7	264	1475		
	8	169	900		
	9	186	1050	(b)	
	10	159	775		
	11	160	965		
	12	159	590		
CP 5263	6			99	663
	7			120	889
	8	(b)		160	1203
	9			155	943
	10			176	1475
	11			180	675
	12			165	625
CL 41223	6			83	775
	7			109	803
	8	(b)		129	1173
	9			134	1015
	10			178	1568
	11			181	1050
	12			132	844

TABLE 25. (Cont.)

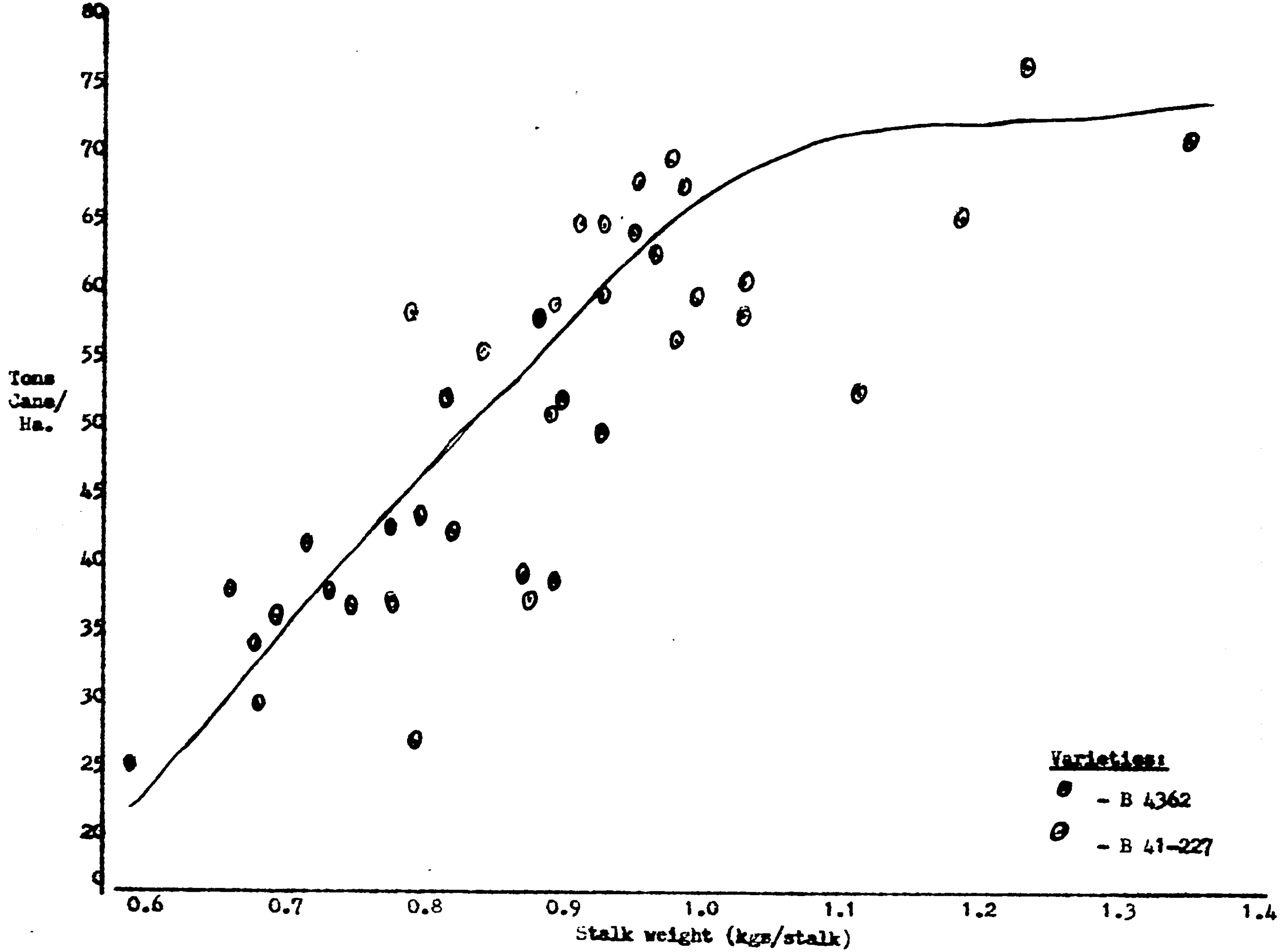
(1)	(2)	(3)	(4)	(5)	(6)
PEPE CUCA	6			94	350
	7			115	440
	8	(b)		144	793
	9			153	448
	10			1[illegible]	1140
	11			181	1215
	12			200	1213
PR 1048	6			124	838
	7			155	683
	8	(b)		154	940
	9			164	730
	10			134	1080
	11			179	1275
	12			196	956
B 42231	6			189	1400
	7			215	1360
	8	(b)		249	1740
	9			203	978
	10			304	2158
	11			199	1433
	12			189	1031

a) Average length and weight per stalk from four stalk sample per sampling

b) Not planted in this trial.

FIGURE I.

Effect of Stalk Weight on Yield (Tons per Hectare) of Sugar Cane at Foulaya, 1966.



152

FIGURE 3. EFFECTS OF FERTILIZER TREATMENTS ON

YIELD OF SUGAR CANE (TONS PER HECTARE)

AT FOULAYA, 1966.

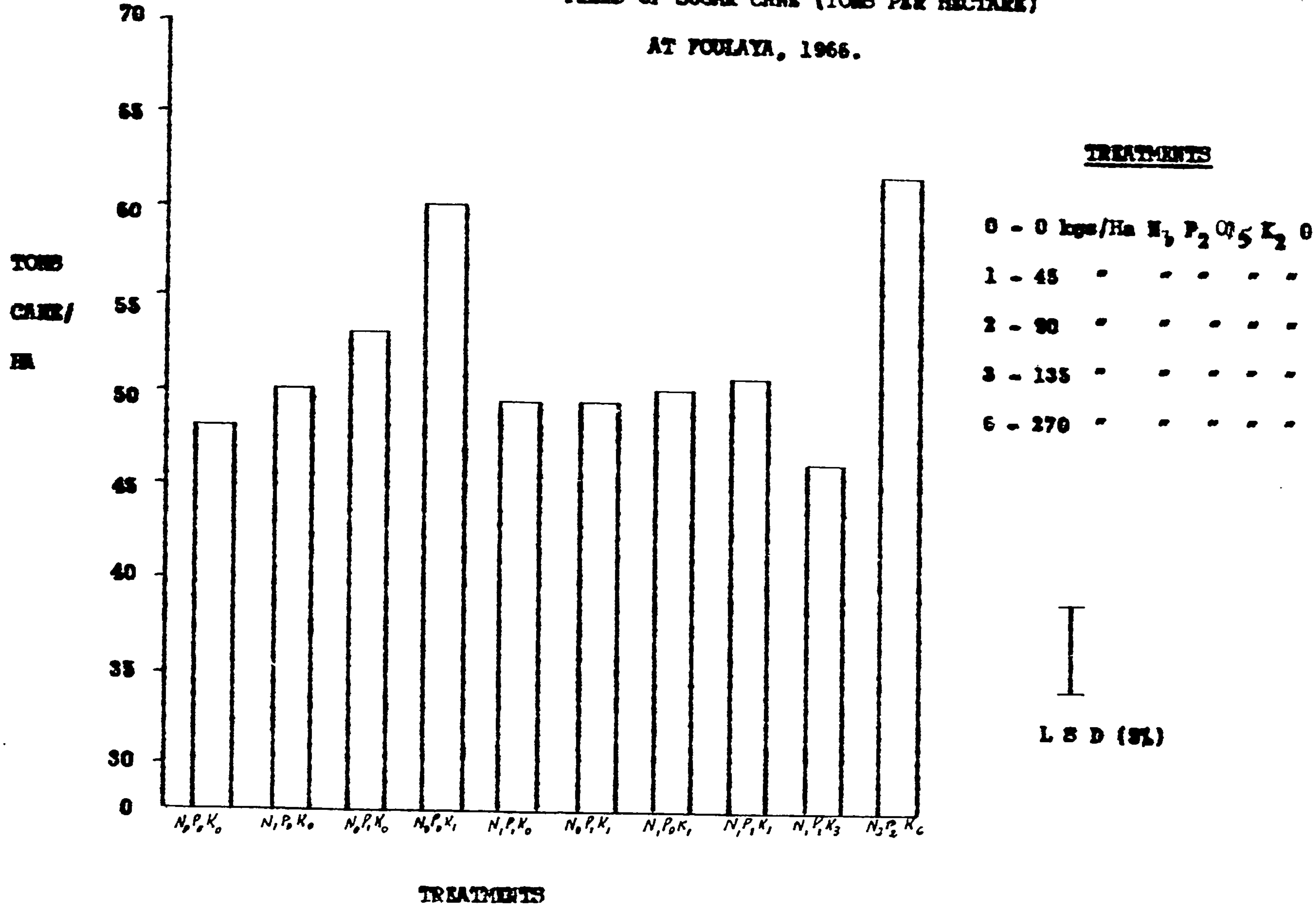


FIGURE 2. EFFECTS OF VARIETY AND FERTILIZER TREATMENTS ON YIELD OF SUGAR CANE (TONS PER HECTARE) AT FOULAYA, 1966.

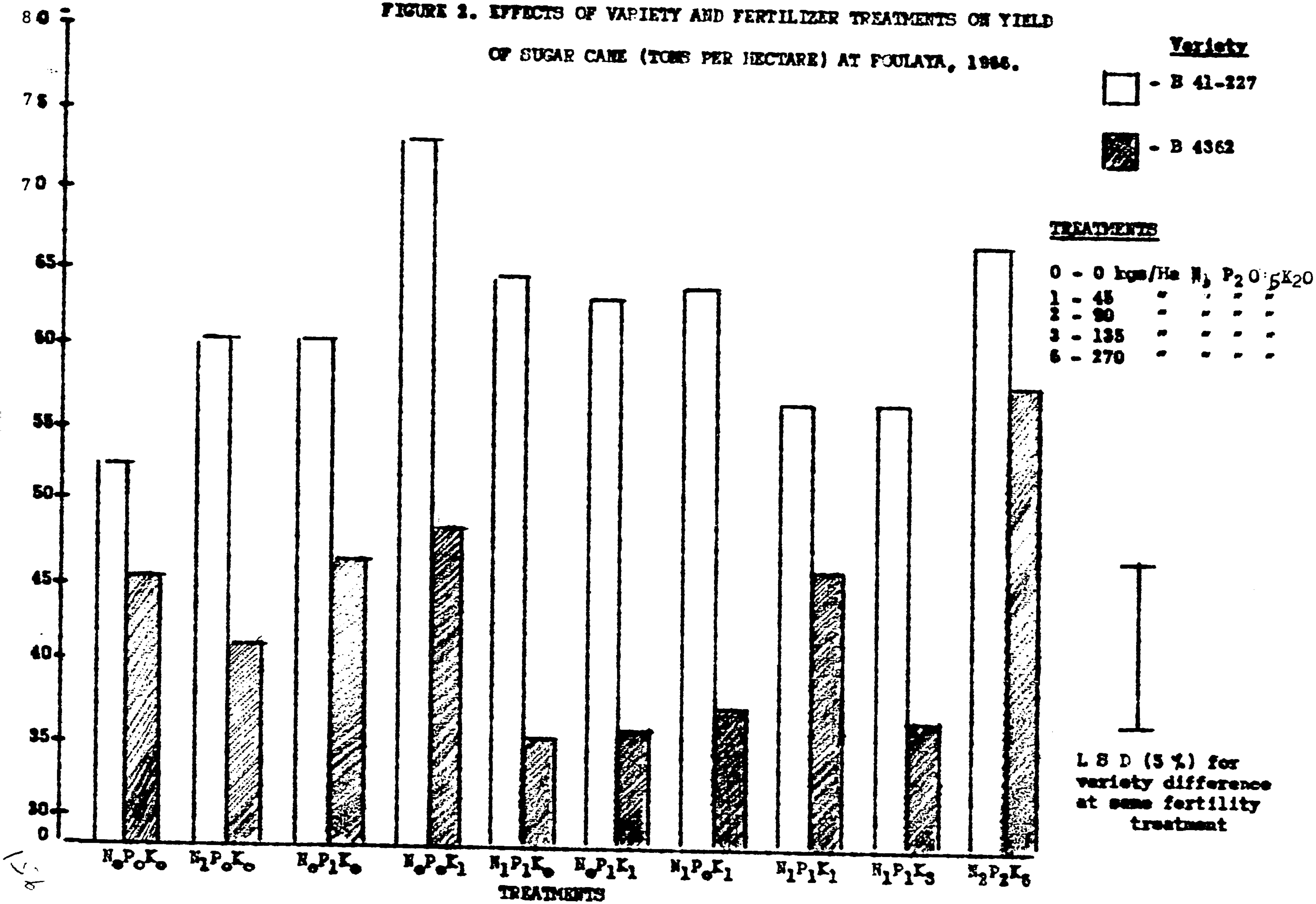


TABLE 36.

Brix reading and degree of Pithiness of 26 Sugarcane varieties planted on March 9, 1965 at Foulaya Research Institute, Kindia, 1966.

Variety (1)	Date (2)	°Brix of juice Average(a)	Degree of pithiness (b) of flowered stalk sampled at Top height	Mid Height	Near ground level
CoJ 2878	11-15-65	16.9	5	2	1
	12-1-65	17.2	5	1	1
	12-15-65	16.9	5	2	1
	1-6-66	14.0	5	2	1
	1-21-66	18.2	5	3	1
	2-9-66	19.6	5	3	1
	3-17-66	22.1	5	2	1
	4-7-66	19.7	5	2	1
	Average	18.1	5.0	2.1	1.0
PR 1013	11-15-65	18.1	5	2	1
	12-1-65	18.6	4	2	1
	12-15-65	19.2	5	2	1
	1-6-66	18.9	5		1
	1-21-66	19.0	5	1	1
	2-9-66	20.6	4	1	1
	3-17-66	22.1	5	1	1
	4-17-66	23.0	5	1	1
	Average	19.9	4.7	1.5	1.0
B 41-227	11-15-65	17.0	5	2	1
	12-1-65	19.3	5	1	1
	12-15-65	18.0	5	1	1
	1-6-66	18.3	5	3	1
	1-21-66	13.2	5	1	1
	2-9-66	21.4	4	1	1
	3-17-66	19.1	5	2	1
	4-17-66	22.6	5	2	1
	Average	18.6	4.9	1.6	1.0
PR 1028	11-15-65	18.5	5	1	1
	12-1-65	19.3	5	1	1
	12-15-65	19.9	5	2	1
	1-6-66	18.6	5	3	1
	1-21-66	17.0	5	4	1
	2-9-66	-	-	-	-
	3-17-66	21.5	5	2	1
	4-17-66	23.2	5	3	1
	Average	19.7	5.0	2.3	1.0

TABLE 36 (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
M 328560	11-15-65	20.5	4	1	1
	12-1-65	21.6	4	1	1
	12-15-65	19.1	5	3	1
	1-6-66	18.7	5	1	1
	1-21-66	19.1	5	1	1
	2-9-66	20.4	4	1	1
	3-17-66	22.3	5	1	1
	4-17-66	22.4	5	2	1
	Average	20.5	4.6	1.2	1.0
Kbene	11-15-65	17.8	5	1	1
	12-1-65	19.0	5	1	1
	12-15-65	18.4	5	1	1
	1-6-66	18.6	5	1	1
	1-21-66	18.2	5	1	1
	2-9-66	-	-	-	-
	3-17-66	-	-	-	-
	4-7-66	-	-	-	-
	Average	18.4	5.0	1.0	1.0
B 34104	11-15-65	17.9	5	1	1
	12-1-65	15.3	4	1	1
	12-15-65	19.1	4	2	1
	1-6-66	14.8	4	1	1
	1-21-66	17.3	2	1	1
	2-9-66	18.4	3	1	1
	3-17-66	18.6	5	2	1
	4-7-66	22.0	5	1	1
	Average	17.9	4.0	1.2	1.0
PR 975	11-15-65	19.6	3	1	1
	12-1-65	19.3	5	1	1
	12-15-65	21.3	3	1	1
	1-6-66	18.7	3	1	1
	1-21-66	18.5	5	1	1
	2-9-66	19.9	3	1	1
	3-17-66	22.6	5	1	1
	4-7-66	23.0	5	2	1
	Average	20.4	4.0	1.1	1.0
Conakry	11-15-65	[illegible]	4	1	1
	12-1-65	19.2	5	1	1
	12-15-65	18.9	4	1	1
	1-6-66	19.1	4	2	1
	1-21-66	18.8	5	1	1
	2-9-66	21.5	5	1	1
	3-17-66	20.5	5	1	1
	4-7-66	23.2	5	1	1
	Average	20.0	4.6	1.1	1.0

Table (Cont.)no.36

(1)	(2)	(3)	(4)	(5)	(6)
MCO 293	11-15-65	18.4	5	2	1
	12-1-65	17.7	5	2	1
	12-15-65	19.1	5	2	1
	1-6-66	18.4	4	4	1
	1-21-66	18.5	5	3	1
	2-9-66	18.5	5	3	1
	3-17-66	20.2	5	3	1
	4-7-66	21.6	5	2	1
	Average	19.1	4.9	2.6	1.0
M 13432	11-15-65	15.1	5	2	1
	12.1.65	17.7	5	1	1
	12-15-65	16.9	5	2	1
	1-6-66	18.3	5	1	1
	1-21-66	17.4	5	1	1
	2-9-66	19.4	5	2	1
	3-17-66	16.1	5	3	1
	4-7-66	20.2	5	2	1
		17.6	5	1.8	1.0
B 37172	11-15-65	16.1	1	1	1
	12-1-65	18.8	3	1	1
	12-15-65	19.6	4	2	1
	1-6-66	17.3	5	1	1
	1-21-66	16.4	1	1	1
	2-9-66	20.9	5	1	1
	3-17-66	21.2	5	1	1
	4-7-66	20.6	5	2	1
		18.9	3.6	1.2	1.0
B 46367	11-15-65	19.0	5	1	1
	12-1-65	19.7	4	1	1
	12-15-65	15.7	1	1	1
	1-6-66	15.5	1	1	1
	1-21-66	17.7	1	1	1
	2-9-66	18.3	5	1	1
	3-17-66	20.5	2	1	1
	4-7-66	22.7	4	1	1
		18.6	2.9	1	1
B 43337	11-15-65	16.7	1	1	1
	12-1-65	17.0	5	2	1
	12-15-65	19.2	2	1	1
	1-6-66	13.7	5	1	1
	1-21-66	16.4	5	3	1
	2-9-66	17.2	5	1	1
	3-17-66	16.1	5	2	1
	4-7-66	21.4	5	2	1
		17.2	4.1	1.6	1

(1)	(2)	(3)	(4)	(5)	(6)
MCO 310	11-15-65	21.6	5	1	1
	12-1-65	22.5	4	1	1
	12-15-65	21.5	5	3	1
	1-6-66	17.9	5	2	2
	1-21-66	19.0	5	2	1
	2-9-66	22.2	4	1	1
	3-17-66	23.0	5	2	1
	4-7-66	24.5	5	1	1
		21.5	4.8	1.6	1
PINDAR	11-15-65	18.8	5	3	1
	12-1-65	20.1	5	2	1
	12-15-65	14.4	1	1	1
	1-6-66	20.4	5	4	2
	1-21-66	18.1	5	4	1
	2-9-66	-	5	2	1
	3-17-66	21.4	5	3	1
	4-7-66	22.4	5	3	1
		19.4	4.5	2.8	1
PR 1016	11-15-65	18.2	5	3	1
	12-1-65	20.6	5	1	1
	12-15-65	20.8	5	4	1
	1-6-66	20.8	5	4	1
	1-21-66	19.0	5	4	1
	2-9-66	20.3	5	3	1
	3-17-66	22.3	5	1	1
	4-7-66	21.4	5	3	1
		20.4	5	2.9	1
B 4362	11-15-65	20.1	5	2	1
	12-1-65	20.6	4	1	1
	12-15-65	20.9	5	2	1
	1-6-66	19.5	5	2	1
	1-21-66	18.5	-	-	-
	2-9-66	20.1	5	3	1
	3-17-66	23.2	5	1	2
	4-7-66	22.8	4	3	1
		20.7	4.7	2	1
B 37101	11-15-65	19.8	4	1	1
	12-1-65	20.9	4	1	1
	12-15-65	19.5	5	3	1
	1-6-66	16.5	5	2	1
	1-21-66	18.8	5	1	1
	2-9-66	20.5	5	2	1
	3-17-66	-	-	-	-
	4-7-66	-	-	-	-
		19.3	4.7	1.7	1

TABLE 36 (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
Bk744	11-15-65	16.8	5	2	1
	12-1-65	18.4	5	1	1
	12-15-65	19.5	5	2	1
	1-6-66	16.3	5	3	1
	1-21-66	19.3	5	2	1
	2-9-66	20.5	5	2	1
	3-17-66	19.1	5	2	1
	4-7-66	21.5	5	2	1
		18.9	5	2	1
PM 980	11-15-65	14.5	4	1	1
	12-1-65	15.6	3	1	1
	12-15-65	15.9	1	1	1
	1-6-66	16.5	5	1	1
	1-21-66	18.6	4	1	1
	2-9-66	17.8	4	1	1
	2-17-66	17.2	2	1	1
	4-7-66	22.7	3	1	1
		17.4	3.3	1	1
MCO 376	11-15-65	19.2	5	1	1
	12-1-65	18.1	5	2	1
	12-15-65	15.7	1	1	1
	1-6-66	17.3	5	4	1
	1-21-66	17.5	5	2	1
	2-9-66	18.1	5	2	1
	3-17-66	5.9	5	3	1
	4-7-66	19.7	5	2	1
		16.4	4.5	2.1	1
CO 331	11-15-65	12.9	5	4	1
	12-1-65	17.9	5	1	1
	12-15-65	16.0	5	3	1
	1-6-66	15.9	5	4	2
	1-21-66	15.9	5	4	1
	2-9-66	16.2	5	4	2
	3-17-66	20.5	5	3	2
	4-7-66	20.5	5	5	1
		17.0	5	3.5	1.4
POJ 3076	11-15-65	17.8	5	2	1
	12-1-65	16.3	1	1	1
	12-15-65	18.9	5	2	1
	1-6-66	18.3	5	3	1
	1-21-66	19.2	5	1	1
	2-9-66	20.5	5	2	1
	3-17-66	24.8	5	2	1
	4-7-66	23.9	5	3	1
		20.0	4.5	2	1

TABLE 36 (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
L 6014	11-15-65	22.2	5	1	1
	12-1-65	21.1	4	1	1
	12-15-65	19.2	5	4	1
	1-6-66	21.8	5	3	2
	1-21-66	21.8	5	2	1
	2-9-66	22.4	5	2	1
	3-17-66	21.8	5	2	1
	4-7-66	25.0	5	2	1
		21.9	4.9	2.1	1.1
CO 419	11-15-65	20.3	5	1	1
	12-1-65	19.8	5	1	1
	12-15-65	22.3	5	2	1
	1-6-66	16.6	5	3	1
	1-21-66	13.9	5	4	1
	2-9-66	21.5	5	1	1
	3-17-66	21.9	5	2	1
	4-7-66	21.8	5	3	1
		19.8	5	2.1	1

a.) Average of 3 readings taken at upper most height, mid-height, near ground level from 4 stalks per plot.

b.) Degree of pithiness from 4 stalks.

5 - 76 - 100 % pithiness
4 - 51 - 75 % "
3 - 26 - 50 % "
2 - 1 - 25 % "
1 - No. "

TABLE 37.

Brix readings and degree of pithiness of 26 Sugarcane varieties planted on July 9, 1965 at Foulaya Research Institute, Kindia, Republic of Guinea, 1 9 6 6.

Variety	Date	(a) °Brix Average	Degree of pithiness(b) of stalks sampled at: Top height	Middle
(1)	(2)	(3)	(4)	(5)
H-328560	1-8-66	11.9	1	1
	3-16-66	13.8	1	2
	5-11-66	15.6	4	3
	5-24-66	15.1	1	2
	6-8-66	8.1	1	1
	7-12-66	17.3	1	1
	8-11-66	15.1	1	1
	Average	13.8	1.4	1.6
MI3432	1-8-66	10.5	1	1
	3-16-66	11.9	1	2
	5-11-66	13.8	1	1
	5-24-66	18.1	1	2
	6-8-66	14.6	2	2
	7-12-66	17.6	3	2
	8-11-66	17.1	2	2
		14.4	1.6	1.6
PR 1016	1-8-66	11.1	3	3
	3-16-66	15.2	4	4
	5-11-66	11.2	1	3
	5-24-66	13.6	4	3
	6-8-66	15.1	4	3
	7-12-66	15.1	4	3
	8-11-66	14.8	1	1
		13.7	3.	2.9
CP 5263	1-8-66	12.3	1	1
	3-16-66	15.4	2	1
	5-11-66	12.8	1	2
	5-24-66	16.4	2	2
	6-8-66	20.4	2	2
	7-12-66	14.5	3	2
	8-11-66	13.7	1	1
		15.1	1.7	1.6
B 4362	1-8-66	11.5	1	1
	3-16-66	18.3	2	2
	5-11-66	13.1	1	1
	5-24-66	16.8	1	1
	6-8-66	16.9	1	1
	7-12-66	13.2	1	1
	8-11-66	-	1	1
		15.0	1.1	1.1

TABLE 37. (Cont.)

(1)	(2)	(3)	(4)	(5)
FR 1013	1-8-66	11.8	1	1
	3-16-66	13.3	1	1
	5-11-66	15.3	4	2
	5-24-66	18.0	1	1
	6-8-66	14.3	1	1
	7-12-66	16.8	1	1
	8-11-66	14.0	1	1
		14.8	1.6	1.1
GI 41223	1-8-66	8.8	1	1
	3-16-66	17.5	1	1
	5-11-66	14.2	2	2
	5-24-66	18.1	1	1
	6-8-66	14.5	1	1
	7-12-66	20.8	1	1
	8-11-66	10.1	1	1
		14.9	1.1	1.1
FR 1028	1-8-66	10.4	1	1
	3-16-66	17.3	3	1
	5-11-66	13.8	4	3
	5-24-66	18.9	1	2
	6-8-66	16.8	1	1
	7-12-66	20.7	4	2
	8-11-66	17.4	1	1
		16.5	2.3	1.6
B-37272	1-8-66	10.9	1	1
	3-16-66	17.1	8	1
	5-11-66	12.6	5	2
	5-24-66	14.5	1	2
	6-8-66	17.4	1	2
	7-12-66	10.8	1	1
	8-11-66	14.4	1	1
		14.0	1.7	1.4
POJ 2678	1-8-66	8.5	1	1
	3-16-66	14.5	2	1
	5-11-66	15.5	5	3
	5-24-66	14.9	1	1
	6-8-66	16.4	1	2
	7-12-66	12.8	1	1
	8-11-66	14.0	1	1
		13.8	1.7	1.4

TABLE 37 (Cont.)

(1)	(2)	(3)	(4)	(5)
CONAKRY	1-8-66	10.3	1	1
	3-16-66	14.8	3	2
	5-11-66	14.4	5	3
	5-24-66	15.2	2	2
	6-8-66	7.7	1	2
	7-12-66	12.9	1	1
	8-11-66	18.3	1	1
		13.4	2	1.7
PEPE CUCA	1-8-66	10.7	1	1
	3-16-66	17.0	1	1
	5-11-66	12.4	5	3
	5-24-66	16.2	1	1
	6-8-66	17.1	1	1
	7-12-66	18.0	3	2
	8-11-66	16.0	1	1
		15.3	1.9	1.4
PR 1048	1-8-66	11.2	1	1
	3-16-66	13.4	4	2
	5-11-66	13.6	3	2
	5-24-66	17.6	2	2
	6-8-66	15.0	2	2
	7-12-66	19.4	2	1
	8-11-66	15.4	1	1
		15.1	2.1	1.6
PR 980	1-8-66	13.1	1	1
	3-16-66	16.8	1	1
	5-11-66	14.6	1	4
	5-24-66	18.1	2	1
	6-8-66	10.1	2	1
	7-12-66	19.7	4	3
	8-11-66	19.0	2	1
		15.9	1.9	1.7
B 43331	1-8-66	11.1	2	1
	3-16-66	15.1	3	1
	5-11-66	16.0	2	2
	5-24-66	17.3	3	1
	6-8-66	17.7	3	3
	7-12-66	8.0	2	1
	8-11-66	16.2	1	1
		14.5	2.3	1.4

TABLE 37. (Cont.)

(1)	(2)	(3)	(4)	(5)
PR 975	1-8-66	12.9	1	1
	3-16-66	17.2	2	1
	5-11-66	14.2	1	2
	5-24-66	17.1	1	1
	6-8-66	8.4	1	1
	7-12-66	16.5	2	2
	8-11-66	18.9	1	1
		15.0	1.3	1.3
MCO 293	1-8-66	10.8	1	1
	3-16-66	16.7	2	1
	5-11-66	14.6	1	2
	5-24-66	14.7	1	1
	6-8-66	14.3	1	1
	7-12-66	8.5	1	2
	8-11-66	15.0	3	1
		13.5	1.4	1.3
PINDAR	1-8-66	11.0	1	1
	3-16-66	17.3	3	2
	5-11-66	13.8	1	2
	5-24-66	13.9	1	3
	6-8-66	13.3	1	2
	7-12-66	10.0	1	1
	8-11-66	14.4	1	1
		13.4	1.3	1.7
B 41227	1-8-66	12.2	1	1
	3-16-66	14.1	1	1
	5-11-66	14.3	3	1
	5-24-66	18.0	1	1
	6-8-66	17.5	2	2
	7-12-66	14.3	5	3
	8-11-66	16.7	1	1
		15.3	2	1.4
[illegible]	1-8-66	8.0	1	1
	3-16-66	14.2	2	1
	5-11-66	-	-	-
	5-24-66	15.0	5	3
	6-8-66	-	-	-
	7-12-66	-	-	-
	8-11-66	15.4	1	1
		13.2	2.3	1.5

TABLE 37 (Cont.)

(1)	(2)	(3)	(4)	(5)
CO 331	1-8-66	10.4	2	1
	3-16-66	13.6	4	3
	5-11-66	12.8	3	3
	5-24-66	15.0	2	3
	6-8-66	15.6	3	3
	7-12-66	18.2	1	1
	8-11-66	13.9	2	1
		14.2	2.4	2.1
NCO 376	1-8-66	11.7	1	1
	3-16-66	17.2	1	1
	5-11-66	13.6	2	3
	5-24-66	17.4	1	1
	6-8-66	17.3	2	1
	7-12-66	16.4	1	1
	8-11-66	10.8	3	2
		14.9	1.6	1.4
POJ 3016	1-8-66	9.2	1	1
	3-16-66	16.8	1	1
	5-11-66	15.4	4	4
	5-24-66	18.4	1	1
	6-8-66	15.7	3	1
	7-12-66	17.3	1	1
	8-11-66	12.8	1	1
		15.1	1.7	1.4
L 6014	1-8-66	12.3	1	1
	3-16-66	20.3	1	1
	5-11-66	14.5	5	3
	5-24-66	23.9	1	1
	6-8-66	25.2	1	1
	7-12-66	19.0	3	2
	8-11-66	13.0	2	1
		18.3	2.	1.4
B 42231	1-8-66	13.4	2	2
	3-16-66	18.0	2	2
	5-11-66	20.1	5	2
	5-24-66	21.3	1	4
	6-8-66	21.4	3	2
	7-12-66	18.8	2	2
	8-11-66	6.6	2	1
		17.1	2.4	2.1

TABLE 37. (Cont.)

(1)	(2)	(3)	(4)	(5)
NCO-310	1-8-66	11.1	1	1
	3-16-66	17.5	[illegible]	1
	5-11-66	18.7	4	3
	5-24-66	20.6	1	1
	6-8-66	19.7	1	1
	7-12-66	17.1	1	1
	8-11-66	14.9	1	1
		17.1	1.4	1.3

a) Average of 3 readings taken at upper most height, mid-height, near ground level from 4 stalks

b) Degree of pithiness from 4 stalks.

5-76-100 % pithiness
4-51-75 % "
3-26-50 % "
2-1-25 % "
1-0 % "

TABLE 38.

Vegetable Information for 1 9 6 6.

Vegetable or Agricultural Product.	Variety	Extent of preference	Resistance to diseases	Adaptability to Environment	Observations
(1)	(2)	(3)	(4)	(5)	(6)
Bush Bean	Harvester	1	2	2	Less work than climbing beans. Beans are uniform and tender . (See Note 1).
Climbing Bean	Kentucky Wonder	1	1	2	In one area, Kouroussa, this variety flowered but did not set pods. (See Note 2).
Beet	Detroit Dark Red	3	2	3	Better success at higher elevations.
Cabbage	Copenhagen Market Early	2	1	3	Long maturation time
"	Marion Market	2	1	3	Long maturation time
Cantaloup	Charentais Edisto, and No. 45-SJ	3	3	3	15 day interval treatment with insecticide. (See note 3)
Carrot	Chantenay Red cored	2	2	3	High fertility and thinning required (See note 6)
Cowpea	Brabham	4	2	2	Good green cover crop
Cowpea	California Blackeye	4	1	1	Good green cover crop, pods are edible if eaten at early stage.
Cowpea	Velvet	4	1	1	Fast vigorous growth, good green cover crop.

TABLE 38. (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
Collard	Georgia Southern	4	1	1	Excellent growth, edible, especially in early stages (Note 4)
Cucumber	Palmetta	1	2	3	Fruits appear to be slightly bitter
Cucumber	Palomar	2	2	2	Fruit rots easily due to humidity (See note 5)
Cucumber	Ashley	1	2	2	Seems to be more tolerant to humidity.
Eggplant	Florida high Bush, Florida Market	2	3	3	Susceptible to a combination of *Fusarium* wilt and root knot nematodes! (See note 7).
Lettuce	Hanson	1	1	1	(See note 6)
Lettuce	Batavia Blonde de Paris Great Lakes Merveille des 4 Saisons Reine de Juillet	2	2	2	-ditto-
Lettuce	Reine de Mai Romaine Blonde Maraîchère	2	2	2	-ditto-
Lettuce	Parris Island	3	2	2	-ditto-
Okra	Perkins Mammoth	2	2	3	Seems susceptible to humidity Insects attack readily
Onion	Excel Texas Early Grano	1	2	3	High fertility, well drained area required.

170

TABLE 30. (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)
Pea	Little Marvel	3	2	2	
Hot Pepper	Hungarian Yellow Wax	4	2	2	This variety is not as hot as the local variety.
Sweet Pepper	Yolo Wonder	2	3	2	Dark brown spots occur on fruit, indicates anthracnose (See note 8).
Pop corn	Dynamite	4	2	2	
Radish	Early Scarlet	1	1	2	High fertility, sandy soil required
Radish	Icicle	3	1	1	-ditto-
Squash	Table Queen	2			
Sweet corn	Hawaiian	1	1	2	When left to mature beyond wilt stage, the palatability and sweetness decreases.
Tomato	Manalucia Pearsons Improved	1	4	2	Susceptible to a combination of <u>Fusarium</u> wilt and root knot nematodes (See note 9).
Watermelon	Baby Sugar	2	2	2	See Cantaloup
Watermelon	Charleston Gray Hope Diamond	2	3	2	See Cantaloup

NOTES:

1) Many farmers prefer a bush bean due to the labor and time involved in securing materials and construction of a trellis for a climbing bean.

2) A possible explanation was the addition of nitrogen three days after flowering thus reverting plants to vegetative growth.

171

TABLE 36. (Cont.)

3) A certain species of fly deposit eggs in the soft skinned young, fruits, which later rot internally. Alternate insecticide treatments at intervals of 15 days, prevents the mature insects from depositing eggs in the young fruits; thus decreasing the loss of fruits.

4) Collard leaves are utilised in many countries in several manners, one being in a sauce. The leaves to be utilized are usually are cut at an early age for two reason, to assure more production and to obtain a more palatable leaf.

5) If the soil is constantly damp, a simple trellis or support prevents excessive rotting of fruits.

6) Mulching the nursery beds will usually produce a higher germination than non-mulched beds; however, care must be taken not to leave the beds mulched for an extended period of time. The reason being that the weak plants may become stunted or die when exposed to direct sunlight after having been covered for an extended period of time.

7) Four controls are: 1) plant on virgin soil - 2) plant in rotation with other vegetables - 3) plant on ridges or well drained areas - 4) plant resistant varieties.

8) Plant clean seed. Use zineb or equivalent spray treatment.

9)(See note 7). Purée type such as "Roma" appear to be more resistant.

TABLE 39.

Grain yields of sweet corn varieties grown in a variety trial at Foulaya Research Institute Kindia, R.G. 1966.

Guinean accession No.	Variety	Shelled corn (tons/ha.)
365	Line 10 (1)	0.022
367	" 22 (1)	0.021
366	" 44 (1)	0.032
363	" 90 (1)	0.014
364	" 91 (1)	0.079
134	Hawaiian Sugar	0.419
212	Pajimaca	0.091
337	USDA 34	0.311

(1) Hybrids obtained from Louisiana State University.

TABLE OF CONTENTS

	Page No
Introduction	1
Personnel or Staff	4
Riceland Rehabilitation Project	5
Riceland Reclamation (Kakossa Loan)	14
Agriculture Resources Development Project	16
Research sub-activity	19
Corn Improvement	21
Rice Improvement	35
Sugarcane Improvement	50
Vegetable and Miscellaneous Crop Improvement	71
Extension Sub-activity	78
Education Sub-activity	84
Self-Help Community Action	94
Micros Palm Oil Center	97
Rinderpest Control Program	99
Tables	101

* * * * *