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PREFATORY NOTE:

RESEARCH FOR RURAL PROGRESS: RATIONALE¹

Joseph Lenwood Edge²

Knowledge of facts does not immediately lead to satisfactory solutions. A case in point is that the disclosure by research that malnutrition plagues all parts of the world has not yet led to satisfactory solutions, largely because the problem is surrounded by a multitude of factors, many of which are "people problems," not just material in nature.

Agricultural research first contributed to improvements in commodity productivity in relation to resources of land area, capital and physical human input. Soon thereafter product quality was improved through research. Present-day researchers must continue these two thrusts just to keep up with expanding population. Very early researchers discovered the difficulties of technology transfer. Much is now known in this area, but, judging from the time lag between knowhow and adoption, there is much for "people" oriented researchers to contribute.

Perhaps not enough attention has been given to appropriate tools, equipment and machines. Use of available electricity can be integrated into fabrication of useful items and the performance of useful tasks in addition to illumination. Ideas from all over the world can be inventoried and those which are applicable can be studied, modified and tried. Success in this area need not displace workers. It may make possible the more efficient use of land and capital and increase employment in the rural areas if adequately integrated with concepts and principles contributed by socio-economic researchers.

The opportunity for researchers for the benefit of the rural constituents of society is ever expanding as we recognize new facets of the concept of "people oriented progress." Each researcher has a place and must accept the challenge to move ahead toward the goal of a better life for all.

¹Excerpts from Foreword in the printed program of the 5th Regional Agricultural Research Symposium, held on Nov. 24-25, 1983 at Central Philippine University.

²Consultant, College of Agriculture, Central Philippine University, Iloilo City.

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STUDY ON THE YIELD RESPONSE OF IR54 AND THE COMPETITIVE ABILITY OF ECHINOCLOA CRUSGALLI AS INFLUENCED BY LEVELS OF NITROGEN

First Place, Crops and Soil Science Section
Student Category, 5th Regional Agricultural Research Symposium

Marietta V. Gadia and Erlinda V. Famoso

This study was conducted from September 16 to December 7, 1982 at the experimental field of the College of Agriculture, Central Philippine University. This aimed to find out (1) the number of *E. crusgalli* which could be tolerated by the IR 54 rice variety at certain level of nitrogen; 2) what level of nitrogen can support both the crop and a certain number of *E. crusgalli* and 3) the yield reduction at different weed density and level of nitrogen.

The experimental treatments were arranged in a split plot in randomized complete block design replicated three times. The main-plots were varying numbers of *E. crusgalli*, namely 0, 3, 6 and 9

planted per square meter. The sub-plots were the levels of nitrogen 0, 60, 90 and 120 kg N/ha.

The different weed population per square meter and nitrogen levels markedly influenced dry matter production such that heavier dry matter weight was obtained on plots with 3 and 6 barnyardgrass per square meter with 120 kg N/ha applied. The decrease in biomass of barnyardgrass at 9 weed population per square meter could be attributed to the competition for nutrients between the crop and the weeds.

Productive tiller production was significantly affected by the varying number of barnyardgrass per square meter and different rates of nitrogen fertilization such that the least

number of productive tillers (10.03) were obtained on plants with 9 barnyardgrass per square meter. The increasing rates of nitrogen increased significantly the number of productive tiller such that the highest number of productive tillers (14.025) was obtained on plants fertilized with 120 kg N/ha.

Rice yield on plots with 3 and 6 barnyardgrass per square meter was comparable with those without weeds. However, in plots with 9 barnyardgrass per square meter grain yield decreased by 8.1 percent. The application of the differ-

ent levels of nitrogen significantly increased grain production. Regression analysis revealed that 25.33 kg of grains was produced for every kilogram of nitrogen added.

Based on the results, IR54 rice variety can tolerate up to 6 barnyardgrass per square meter. If nitrogen is to be applied, 6 *E. crusgalli* must be supplied with 90 kg N/ha to support both the needs of the weeds and the rice crop. With 9 barnyardgrass per square meter, 120 kg N/ha must be applied; however, if supply is limited, 90 kg N/ha may be sufficient.

INITIAL GROWTH OF LEUCAENA LEUCICEPHALA vs. CUNNINGHAM ON ACIDIC INFERTILE UPLAND SOIL AS AFFECTED BY THE APPLICATION OF PHOSPHATE AND LIME

Second Place, Crop and Soil Science Section,
Student Category

Santiago O. Zamora and
Lanwood Edge

This research was conducted in a factorial pot experiment at Central Philippine University from August 11 to November 30, 1982. The purpose was to determine the growth response of *Leucaena leucocephala* cv. *Cunningham* on acidic infertile upland soil treated with lime and phosphate. Initial results of soil analysis were: pH, 5.4; C.M., 3 percent; P, 2 ppm; and K, 100 ppm.

Six plants were established in 30 cm. rubber pots filled with 10 kg. of soil. Experimental treatments were levels of lime (0.2 and 4 tons/ha) and levels of phosphate (0, 45 and 90 kg/ha) applied before planting in all possible combination in a RCB design.

Data show that lime applied at 4 tons/ha resulted in the tallest plants and significantly longer primary

rachises from 4 to 10 and at 8 weeks after thinning (WATh), respectively. Similarly, lime at 4 tons/ha gave significantly higher number of leaflets and secondary rachises throughout the period of study. However, phosphate at 45 kg/ha gave taller plants and significantly longer primary rachises at 2 and 4 WATh, respectively.

Finally, the addition of lime at 4 tons/ha produced the heaviest fresh and dry weight of top growth and also dry weight of roots and the largest diameter of stems at 12 WATh. Phosphate application did not significantly affect the aforementioned yields.

In summary, phosphate was beneficial only during the early stage of growth, for height and number of branches, whereas lime application showed importance to growth components up to 12 WATh.

PERSISTENCE OF DINITRAMINE AND PENDIMETHALIN IN THE SOIL

Second Place, Crop and Soil Science Section,
Professional Category

Belen F. Berayon¹

The effects of different soil types, application rates and moisture levels on persistence of dinitramine and pendimethalin were evaluated in pot experiments under greenhouse conditions.

Higher residue carryover of the herbicides as determined by bioassays was obtained in clay loam soil over clay and fine sandy loam soils at 50 to 110 days because of the lower soil organic matter content in clay loam. Dinitramine was lost faster than pendimethalin at 50 to 80 days after application. However, both herbicides were almost undetectable after three months and could therefore not do serious injury even to sensitive species of crops in the succeeding season.

Higher rates of application consequently gave higher residues in all sampling periods than the recommended rate. Residues were very

negligible at the end of three months when the recommended rate was used. Pendimethalin was more persistent than dinitramine although both were present in very minute amounts after three months, at the lowest rate of application. Under field conditions spray overlaps could result in variation of herbicide electivity and residual phytotoxicity especially on the sensitive crops.

Dissipation of dinitramine and pendimethalin under low soil water levels was very slow. Dinitramine was more readily lost than pendimethalin in frequently wet soil. Leaching is not a principal means of dinitramine or pendimethalin loss in high soil water level with most of the residues still present in the upper 5 cm soil layer even if water was applied at 100% field capacity.

¹ Agronomist I, Visayas Experiment Station, Hamungaya, Jaro, Iloilo City.

LEGUME INOCULATION WITH RHIZOBIA: FIELD TRIALS

Third Place, Crop and Soil Science Section,
Professional Category

Nora T. Armones, Ma. Theresa Flores and
Erlinda S. Paterno¹

This field experiment, a collaborative work of the Philippine Council for Agriculture and Resources Research and Development (PCARRD) and NIFTAL Project of the University of Hawaii, U.S.A., was conducted at the experimental area of the Bureau of Plant Industry, La Granja Experiment Station, La Carlota City to determine the inoculation requirements of soybean, mungbean and peanut and to evaluate the performance of legume inoculants in the field.

Inoculated, uninoculated and uninoculated plus nitrogenous fertilizer treatments were compared at two fertility levels, farm fertility (30-30-30 kg NPK/ha) and maximal fertility (100-100-100 kg NPK/ha) levels.

Legume seeds were inoculated with multi-strain inoculants supplied by the NIFTAL Project at the rate of 100g/kg of soybean and peanut and 90g/kg of mungbean.

Significant influences were detected on bean yield of soybean and mungbean for 2 seasons (1982-83 dry and 1982 wet).

Inoculation-30-30 kg NPK/ha obtained mean yields of 1.48 and 2.27 t/ha for soybean, and 1.31 and 1.76 t/ha for mungbean, respectively, with increases of 180 and 470 kg/ha for soybean and 140 and 110 kg/ha for mungbean over the uninoculated control at farm fertility level.

Significant effects were observed in peanut yield for 3 seasons (1981-82 dry, 1982-83 dry and 1982 wet). Inoculation-30-30 kg NPK/ha with mean yields of 1.68, 1.45 and 2.31 t/ha, respectively, gave increases of 420, 110 and 380 kg/ha over the uninoculated control at farm fertility level.

On soybean, mungbean and peanut, Inoculation 30-30 kg NPK/ha consistently produced the heaviest weight of dry matter and highest number of effective nodules.

These results indicate that yield increases could be achieved by seed Inoculation with P and K fertilization at farm fertility level. Therefore, Rhizobium technology offers an alternative to the increasing cost of nitrogenous fertilizers.

¹ Horticulturist III, Research Assistant, Bureau of Plant Industry, La Granja Experiment Station, La Carlota City and Assistant Professor/Secretary, Graduate School, U.P. at Los Banos College Laguna.

CARBOFURAN IMPROVES UREA UTILIZATION OF SUGARCANE

Third Place, Crop and Soil Science Section,
Professional Category.

R.J. Serra and F.C. Barredo¹

Carbofuran has been reported to have increased the uptake of N, K, Zn and other trace elements in rice and other graminaceous crops. An experiment was conducted to determine its relationship to the amount of sugarcane. The treatments were: T1 (100% of the recommended N w/o carbofuran 3G), T2 (100% N plus carbofuran 3G at 2.0 kg. a.i./ha), T3 (75% N plus carbofuran 3G at 2.0 kg. a.i./ha), T4 (50% n plus carbofuran 3G at 2.0 kg. a.i./ha), T5 (25% N plus carbofuran 3G at 2.0 kg. a.i./ha) and T6 (zero N plus carbofuran 3G at 2.0 kg. a.i./ha). The P_2O_5 and K_2O levels were constant in all

treatments.

It was observed that under T2, T3 and T4 plant heights were the same but were significantly better than under the rest of the treatments. There was no significant differences in tiller population, except during the fifth month. In the tenth month, all the treatments resulted in same tiller population. Tonnage yield was significantly higher in T3, T4 and T5 but in picul sugar yields only T3 and T4 were statistically better than the other treatments. Rendements was not significantly affected, though there was a slight increasing trend as N was reduced.

¹Head, Crop Protection Section and Head, Agronomy/Soils Dept., Agricultural Research & Development Division, VICMICO.

THE EFFECT OF DIFFERENT LEVELS OF SAND AS A DIETARY FEED FILLER ON THE GROWTH OF BROILERS

Second Place, Animal Science Section, Student Category

Regina B. Abonado

This study was conducted at the Iloilo National College of Agriculture, Lambunao, Iloilo from September 16 to October 28, 1983.

Eighty day-old chicks were used in the study. There were five treatments, each replicated four times, namely: Treatment A – pure commercial feed (without sand); Treatment B – 3 percent sand; Treatment C – 6 percent sand; Treatment D – 9 percent sand; and Treatment E – 12 percent sand; in the ration. The experiment made use of the randomized complete block design.

Results showed no significant

differences in the body weight and gain in weight of birds given different treatments. However, it was noted that the feed consumption of the birds given TA (without sand) was significantly reduced by the addition of sand in the ration. Lower feed consumption was observed at higher level of sand in the ration. Moreover, trends show that the feed conversion efficiency of the birds appeared to have been improved by the addition of sand. Among the treatments, 12 percent sand in the rations (Treatment E) gave the highest return.

THE EFFECT OF THE DIFFERENT LEVELS OF SEA CUCUMBER (HOLOTHURIA SPP.) MEAT MEAL ON THE GENERAL PERFORMANCE OF GROWING DUCKS

Third Place, Animal Science Section, Student Category

Benigno V. Madayag and Ricardo C. Sumpay

The study was conducted from September 30 to November 25, 1982 at the Swine Research Project of the College of Agriculture, Central Philippine University, Jaro, Iloilo City. The object of the study was to determine the effect of the different levels of sea cucumber meat meal mixed with home-mixed ration on the feed consumption, liveweight gain, feed efficiency and return over feed cost of the growing ducks.

Sixty one-month old ducklings were divided into four treatments, each one replicated three times and were arranged in a completely randomized design (CRD). The treatments were as follows: (A) 0 or no cucumber meat meal included, (B) 3 percent, (C) 6 percent and (D) 9 percent sea cucumber meat meal

added to the home-mixed ration.

Results of the study revealed that the birds fed with rations containing 3 percent sea cucumber meat meal had the highest average gain in liveweight and feed efficiency compared to the birds given other levels of sea cucumber meat meal in the diet. In terms of feed consumption, the birds fed with pure home-mixed ration consumed more feeds, followed by the birds fed with rations containing 6, 3 and 9 percent sea cucumber meat meal. Ducks given feeds with 9 percent sea cucumber meat meal gave the highest economic returns of P3.034 which was P0.324, P0.684 and P0.584 higher than those obtained from the birds given feed with 3, 0 and 6 percent sea cucumber meat meal, respectively.

THE STUDY ON THE GROWTH PERFORMANCE OF TEGEL BROILERS AS AFFECTED BY DIFFERENT LEVELS OF ALGAE MEAL

First Place, Animal Science Section, Professional Category

Edgardo Bacero Alcazaren and Julie C. Cusa

This study was conducted from August 1 to September 27, 1981 at the Poultry Research Project of the College of Agriculture, Central Philippine University, Iloilo City. The object of the study was to determine the effect of different levels of algae meal on the growth performance of Tegel broilers in terms of liveweight gain, feed consumption, feed efficiency, dressing percentage and return over feed cost.

Four treatments were used, namely: (a) zero percent, (b) 3 percent, (c) 6 percent, and (d) 9 percent algae meal mixed with the home-made basal ration.

Results of the experiment revealed that the birds given ration with 3 percent algae meal consumed the highest amount of feed, while the birds fed with rations containing 9 percent algae meal consumed the least amount. In terms of liveweight gain, the birds given feeds with zero and 3 percent algae meal gained more or less the same liveweight in the eight-week period. The liveweight gains shown

by the first two groups were significantly ($P > .05$) higher than that of the birds given feed containing 9 percent algae meal. Birds fed with rations containing zero, 3 and 6 percent algae meal were equally efficient in converting feeds to produce a kilogram liveweight. The birds fed with rations having 9 percent algae meal were observed to be the poorest converter of feed. In terms of the return over feed cost, the birds fed with rations containing 3 percent algae meal had the highest net return of P6.02, followed by the birds fed with rations containing zero, 6 and 9 percent algae meal, with values of P5.70, P5.38 and P4.63 per bird, respectively.

From the economic point of view, the researcher recommends the use of 3 percent algae meal in home-mixed broiler rations if the supply of algae in a locality is abundant and its cost is relatively cheaper compared to the traditional and conventional but expensive feed ingredients.

EFFECT OF DIFFERENT FEEDING MATERIALS AND FORMULATIONS ON THE REPRODUCTIVE RATE OF EARTHWORM

Second Place, Animal Science Section, Professional Category.

Alma Y.D. Desales, Rosame Buenvenida, and Melanie C. Alba

The study consisted of six treatments replicated three times, in completely randomized design. The different treatments were as follows: Treatment A — Ipil-ipil leaves; Treatment C — chicken manure; Treatment D — Baggasse; Treatment E — Baggasse plus Ipil-ipil leaves; and Treatment F — Baggasse plus chicken manure.

The weight and length of earthworm in the different treatments did not significantly differ.

Treatment D — Baggasse resulted in a reproduction rate significantly higher than that in the other treatments. Baggasse feed is less expensive than other feed materials used in the study.

THE EFFECT OF DIFFERENT LEVELS OF BANANA PEELING MEAL ON THE GENERAL PERFORMANCE OF BOBCOCK LAYERS

Third Place, Animal Science Section, Professional
Category

Cornelio J. Jaranilla, Jr. and Julie C. Cusa

This study was conducted from January 26 to April 20, 1982 at the Poultry Project of the College of Agriculture, Central Philippine University, Jaro, Iloilo City to determine the effects of different levels of banana peeling meal added to B-Meg laying rations on the feed consumption, feed efficiency, total egg production, percent egg production, egg sizes, and return over feed cost of Bobcock layers. There were four treatments, each one replicated three times. Each replication consisted of three birds having a total of 36 birds and arranged in a completely randomized design. The treatments were as follows: (A) control, zero percent, (B) 2 percent, (C) 4 percent, and (D) 6 percent banana peeling meal added to B-Meg laying ration.

Results showed that birds fed with 4 percent banana peeling meal

consumed less amount of feed and required only 1.63 kg. of feed to produce a dozen of eggs followed by the birds fed with 2 percent, 0 percent, and 6 percent banana peeling meal. Layers given the same rations laid more jumbo and extra-large eggs. Likewise, these gave the highest return-over-feed cost of P41.45 for a period of 84 days followed by birds fed with 0, 2, and 6 percent banana peeling meal.

Among the experimental birds, those fed with pure commercial laying ration produced not only the most number of eggs but also the most number of large eggs. The birds fed with 2 percent banana peeling meal gave more medium, small, and peewee eggs.

Statistical analysis showed that there were no significant differences among treatment means for all data, at the 5 percent.

DESIGN, CONSTRUCTION AND PERFORMANCE TEST OF DIRECT HEATING TYPE COPRA DRIER

First Place, Socio-economic and Related Studies Section,
Student Category

Belrose F. Balestramon and Peter V. Cañoso

The direct heating type of copra drier with a drying capacity of 500 nuts was constructed and tested in Banago, Caluya, Antique from April 25 to June 3, 1983, to determine the performance of the drier using coconut shells as fuel. Two sets of tests were conducted. In the first test, fifty split nuts were arranged in the drying chamber with the meat facing upward. In the second test, the same number of split nuts were arranged in the drying chamber with the meat facing sideward. The result of drying fifty split coconut nuts is expected to be the same as drying five hundred split coconut nuts.

The temperature in the drying chamber ranged from 84 to 99°C for the first and 84°C for the second test. The ideal temperature range from 84 to 90°C. The charging of the coconut shells into the heating

chamber was done at same time intervals. Only three coconut shells were used to burn at a time. These were arranged in three different locations. The charging of fuel continued until about 20 hours of drying and the copra were all dried as manifested by the absence of a faint water line in the coconut meat, and a dull snap of the meat when broken.

The temperature variations were 0.034 and 0.045 for the first and second tests, respectively. The coconut piece near the door of the heating chamber had the lowest temperature reading because often they were subjected to air from the outside when the door was opened to charge fuel.

Results of the tests showed that temperature was directly proportional to moisture content reduction. The two samples located near-

est the door which were most often subjected to lower temperature, were the ones that had a slower rate of moisture content reduction.

Based on the results of the study, the researcher recommends that proper care should be taken when drying the coconut by using the direct heating type copra drier during the rainy season. A windbreak should be put up near the door of the drier to minimize the movement of air entering the heating chamber. The researcher recom-

mends the arrangement of coconut halves in the drying chamber with the meat facing sideward because it has faster moisture content reduction per hour. Finally, the researcher also recommends that the coconut being dried be turned over at least once during the drying process. The ones placed on top should be placed at the bottom to ensure proper distribution of temperature. This could be conveniently done after shelling.

DETERMINANTS OF LEVELS OF LIVING: A CASE STUDY OF RURAL FARMING COMMUNITIES IN THE PROVINCE OF ILOILO, PHILIPPINES¹

First Place, Socio-economic and Related Studies Section
Professional Category.

Reynaldo N. Dusanan

Level of living is often held to be an important component of development. Identifying the determinants of levels of living of households was seen as an important step in the design of development programs and projects. Knowledge concerning the determinants of levels of living may be useful in the evaluation of development programs and projects.

This study examined some of the determinants of levels of living among households of the rural farming communities of the Province of Iloilo, Philippines. A total of 977 households were taken as the sample for this study. Hypothesized factors included the policy relevant variables of: household income, occupation and education of the household head, farm size, tenure status; availability of electricity in the barangay, availability of irrigation in the barangay, and distance of the barangay from the city. Household size and marriage duration were considered as "control variables." Level of living was

measured by an unweighted factor-analysis-based score composed of an 11-item index. Multiple Classification Analysis (MCA) was used as the main tool in the analysis.

In the whole sample, household income, education and occupation of the household head, and the availability of electricity in the barangay were found to be significant determinants of levels of living. But among farm households, the level of education of the head, farm size, tenure status and the availability of electricity in the barangay were found to be significant determinants of levels of living.

These findings suggest that increasing the access of rural people to high schools, bringing electricity to rural areas, and fully implementing the land reform, including land redistribution and tenure reform, would likely lead to improvements in levels of living. Further research directed toward the process by which these factors influence level of living is warranted.

¹Abstract of a thesis for Master of Science in Rural Sociology done at the Pennsylvania State University, University Park, Pennsylvania, U.S.A., 1983.

THE IMPACT OF THE USE OF SMALL RICE THRESHERS ON THE PRODUCTION PERFORMANCE OF IRRIGATED RICE FARMS IN THE MUNICIPALITY OF KALIBO, AKLAN

Third Place, Socio-economic and Related Studies Section,
Professional Category

Perla A. Cipriano, Enrique S. Altis and B.S. Garcia

The survey was done from October 25 to December 30, 1982 in order to analyze the impact of the use of small rice threshers on rice production of farmers and to determine the effects of rice threshers on the efficiency of threshing, quality of palay produced, employment and the frequency of cropping and turn-around period between harvesting and the preparation of land for the next cropping.

Results of the data gathered from 45 rice thresher users showed that the average per hectare yield of the respondents slightly increased after the use of threshers. The average increase in production was 3.02 cavans per hectare per cropping or an increase of 3 percent in production.

Efficiency-wise, mechanical threshing was more efficient than manual threshing, whether it be

“hampasan” method or feet trampling. The small rice threshers had an output of 31 or more cavans per hour on the average. The quality of palay threshed manually was the same as that threshed by mechanical threshing.

The majority of the respondents (80%) required 7 to 12 men to thresh their palay manually but needed only 4 to 6 persons for mechanical threshing. Analysis thus showed that 1 to 6 persons were displaced when a farmer uses the small rice thresher instead of manual threshing. Thirteen percent of the respondents reported the retention of the same number of laborers they had when they used manual threshing as when they used mechanical threshing. By doing so they had farm-related activities which before were neglected, attended to.

STUDY OF THE DURATION OF WEED COMPETITION AND TIME OF PLANTING PEANUT INTERCROPPED WITH SUGARCANE

**Third Place, Crop and Soil Science
Section, Student Category**

Zaldy B. Artacho

The research was conducted to determine the (1) best time of planting peanuts relative to the time of planting sugarcane, (2) degree of weed control due to peanut on between sugarcane rows, and (3) critical period of weed competition in peanut, intercropped with sugarcane.

The experimental treatments were laid out in a split plot design, replicated three times with components assigned as for a randomized complete block design. The time of planting peanuts after sugarcane, i.e. 0, 3, 6 and 9 days after planting sugarcane, was the main plots and the duration of weed competition after the peanuts emerged, i.e. 2 and 4 weeks, was the subjects. Weeded and unweeded plots were provided as controls.

The peanut plants in plots planted 3, 6, and 9 days after planting sugarcane were taller than those planted right after cane. On the

other hand, sugarcane plants with intercropped peanuts planted 9 days after planting the sugar were significantly taller than those with intercropped peanuts planted 6, 3 and 0 days after sugarcane planting.

Four weeks after emergence, peanuts on the unweeded plots and those allowed to compete with weeds for 4 weeks after emergence were significantly taller than those on the weed-free plots and those allowed to compete with weeds for 2 weeks after emergence. At harvest peanut plants on the unweeded plots were taller and produced less number of pods.

Planting peanut right after and 3 days after sugarcane yielded more than those planted 6 and 9 days after the planting of sugarcane. The yield of peanuts allowed to compete with weeds for 2 and 4 weeks after emergence was comparable to the yield from the weed-free plots but significantly higher than the yield from the unweeded plots.

IMPACT OF THE KABSAKA PROJECT ON PRODUCTIVITY, EMPLOYMENT, AND INCOME DISTRIBUTION IN ILOILO¹

Ricardo C. Patricio

This study was conducted to find out the economic implications of the KABSAKA technology. Specifically, it aimed to examine the impact of the technology on resource productivity, employment, and income distribution in Sta. Barbara, Iloilo.

The mean levels of resources used, yield, and net income were tested for differences using the t-tests. The response function analysis was used to quantify the yield response to factors of production such as labor, rainfall, fertilizer, weedicide, insecticide, and seeds. The covariance analysis was employed to segregate the effect of membership in KABSAKA from other variables such as yield, education, farming experience, family size, capital stock, operating capital, cropping period, and mechanization. On the other hand, the earner-share and factor-share approaches were used to estimate the benefits that accrue to landlords,

farm operators, and hired laborers, and to land, labor, operator's residual and current inputs, respectively.

Results of the comparative analysis showed that the mean annual yield, current inputs, labor utilization, and net income were significantly higher in post-than in pre- and non-KABSAKA farms. On a per crop basis, however, the covariance analysis illustrated the dramatic decline in pre- and post-harvest labor after the adoption of the technology. Much of this decrease in employment was caused by the transition from transplanting to direct seeding and by the mechanization of land preparation. On the other hand, employment did not markedly vary between post- and non-KABSAKA farms.

The production function analysis yielded quantitative evidence that the pre- and post-KABSAKA farms differed significantly in intercepts while the post and non-KABSAKA

farms differed significantly in both intercepts and slopes of their production functions. These imply higher rice productivity in post- than in pre- and non-KABSAKA farms.

On the shares of farm earnings, results showed that the adoption of the technology conclusively benefited the earner participants and the factors of production through increase in their absolute and relative

shares. In terms of the distribution of benefits to various claimants, however, the operator and his family as well as current inputs gained more than the landlord and hired laborers. Similarly, for the factors of production, operator's residual (return to operator's management and capital) and current inputs gained more than land and labor.

DESIGN, MODIFICATION AND PERFORMANCE TESTING OF THE BATCH TYPE FEED MIXER *

Cherry B. Tanco

The study was conducted at the Machine Shop, Engineering Building and Swine Project area, CPU, Iloilo City from October 17 to 27, 1983. The construction of the feed mixer is an attempt to help the small livestock raisers mix their own feeds at a minimum power requirement for a given uniformity of mixture compared with the conventional manual feed mixing.

The feed mixer consisted of collection bin (GI sheet No. 16), screw conveyor bolted on to a 2.54 cm shaft and protected by a tube (GI sheet No. 16) 100 cm long, mixing paddle (2.54 x 0.635 cm flat bar), gathering paddle bolted on to the screw conveyor, sacking spout with a slide, frame (0.2 x 3.5 x 3.5 cm angle bars), 1/4 hp electric motor and V-belts and pulleys for transmission.

The machine could be operated by one man with a small amount of spillage. The mean mixing time for 25 kg of ingredients for all the

speeds tested was 3.33 minutes at a maximum efficiency measure of 98.4% by weight of feeds. Fifty kilograms of ingredients were mixed for 5.33 minutes with an efficiency of 87.3%. The machine was 4.5 times as efficient as the manual method in terms of mixing time. A minimum feed loss of 6.4% and a maximum of 13% was observed at speeds of 170 rpm and 220 rpm, respectively.

The time needed to mix ingredients manually was 8.95 minutes with an efficiency of 97.6% by weight of feed and required a power of 0.15 man-hr. The least power requirement for the machine was 0.0225 kw-hr at 220 rpm.

The machine can mix thoroughly feed ingredients of different sizes, shapes and densities and carry a maximum load of 50 kg. The machine could be modified using wooden materials for the frame and reduce the size of the collection bin to minimize construction cost.

DIFFERENT LEVELS OF BAT MEAL (Family Rhinolophidae) AS FEED SUPPLEMENT TO BROILERS

Sylvia Mae Gonzales, Victor T. Gonzales and
Margarita C. Linga

Eighty day-old Cobb Broiler chicks were used in the study to determine the effects of bat meal as feed supplement on the growth of broilers. The birds were assigned at random to the treatments and replicated four times with five birds in a replicate. The treatments used were: Treatment A, pure commercial feed; Treatment B, 3% bat meal; Treatment C, 6% bat meal and Treatment D, 9% bat meal.

Statistical analysis showed that there were significant differences between treatment means in the body weight, gain in weight, feed consumption, feed conversion, efficiency and average daily gain. No significant differences were ob-

served in dressing percentage of birds.

Both in terms of body weight and gain in weight, birds given supplements of 3% and 9% bat meal were significantly heavier than those given pure commercial feed and 6% bat meal.

Furthermore, feed consumption of birds fed with ration containing 6% bat meal was also found to be significantly lower than birds fed with pure commercial feeds and also than birds given the ration containing 3 and 9% bat meal.

In terms of feed conversion efficiency, birds given supplements of 9%, 6% and 3% bat meal were better feed converters than birds given pure commercial feeds.

VARYING LEVELS OF COCONUT RESIDUE IN BROILER RATION

Ruperto Loreda Malcon II, Margarita C. Linga
and Victor T. Gonzales

This six-week study on "Varying Levels of Coconut Residue in Broiler Ration" was conducted in the Poultry Project of the Iloilo National College of Agriculture, Lambunao, Iloilo, from November 12 to December 24, 1981.

There were four treatments, each replicated four times. The Completely Randomized Design was used in the study. The treatments were as follows: Treatment A (control), without coconut residue;

Treatment B, with 5 percent coconut residue; Treatment C, with 10 percent coconut residue; and Treatment D, with 15 percent coconut residue added to the ration. Eighty day-old broiler chicks were used in the study.

Statistical analysis revealed no significant differences in the final body weight, weight gain, feed consumption, feed efficiency, and dressing percentage of the birds.

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