Annual Report of the Department of Agriculture, Assam, for the year 1940-41

BY

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DIRECTOR OF AGRICULTURE, ASSAM.

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FROM

DR. S. K. MITRA, M.S., PH.D., I.A.S.,
DIRECTOR OF AGRICULTURE, ASSAM,

To

THE DEPUTY SECRETARY TO THE GOVERNMENT OF ASSAM IN THE EDUCATION AND LOCAL SELF-GOVERNMENT DEPARTMENTS, SHILLONG.

Dated Shillong, the 13th December, 1941.

SUBJECT :—ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE, ASSAM.

SIR,

I HAVE the honour to submit herewith the Annual Report of the Department of Agriculture, Assam, for the year 1940-41.

Your obedient servant,

S. K. MITRA,

Director of Agriculture, Assam

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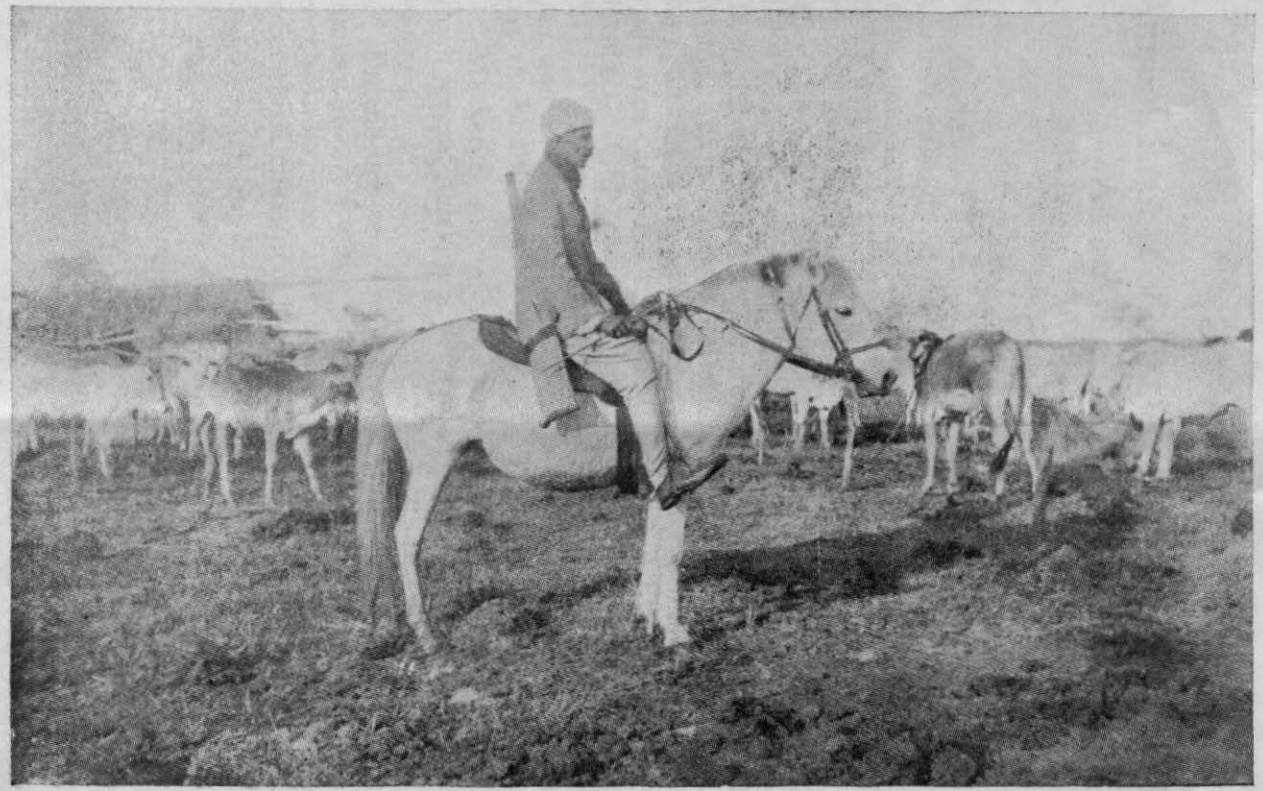


A Grazier Mahajan and one of his herds.—(Photo by R. C. Woodford).

Annual Report of the Department of Agriculture Assam, for the year 1940-41

CHAPTER I

General.—The activities of the Department of Agriculture, Assam, consisted of researches and investigations on various crops, demonstrations—including the cultivation of *boro* paddy under irrigation by power-pumps, seed distribution, improvement of livestock, supervision of co-operative milk unions, and other allied activities. Researches on paddy were continued at the Paddy Experiment Stations at Titabar, Karimganj and Habiganj, and those on sugarcane at the Jorhat Experimental Station. Experiments on deciduous fruits were conducted at the Fruit Experiment Station at Shillong, while those on citrus fruits were carried out at the Citrus Fruit Experiment Station, Burnihat. Our research stations evolved, upto 31st March 1941, 117 improved strains of crops—44 of paddy, 21 of sugarcane and 52 of potato. This is an achievement of which we may reasonably feel proud.

Marketing surveys were completed during the year, during which several marketing development schemes were in operation.

During the year under report, the following five schemes, financed jointly by the Imperial Council of Agricultural Research, India, and the Local Government, were functioning under this Department:—

(*i*) Sugarcane Research Scheme,
(*ii*) Deep Water Paddy Research Scheme,
(*iii*) Agricultural Marketing Survey,
(*iv*) Citrus Fruit Research Scheme, and
(*v*) Animal Nutrition Scheme.

Detailed information about them will be found elsewhere in this report.

Demonstration and propaganda for the improvement of agriculture and animal husbandry were continued as before. As a result of the propaganda carried on by the Department 102,691 acres of land were cultivated with improved strains of paddy, sugarcane, potato and jute, the corresponding acreage for 1939-40 being 100,560.

The Rural Uplift Campaign, launched in 1939-40, was steadily gathering force. During the year under report, the campaign was being conducted at 34 centres—15 in the Surma Valley, 12 in the Lower Assam Valley and 7 in the Upper Assam Valley. A brief account of the activities in these centres will be found in Appendix I of the report. The campaign has by its unqualified success convinced even the sceptic of its utility. A definite awakening of a desire for better living is in evidence and the villagers are gradually realising that by self-help and mutual co-operation alone can they improve their lot. It may be noted in this connexion that 16 more centres are going to be started in 1941-42.

2. *Agricultural Condition of the Year.*—Weather was generally favourable for crops although droughts, insects and shortage of rainfall in certain districts caused some damage to autumn and winter rice crops. For jute and spring rice weather was on the whole favourable. For rabi crops, weather was not quite up to the mark due to drought. Report of some damage by insects was also received from almost all the districts.

Cultivation of rice, jute, sugarcane and tea slightly increased during the year under report, while that of rape and mustard decreased.

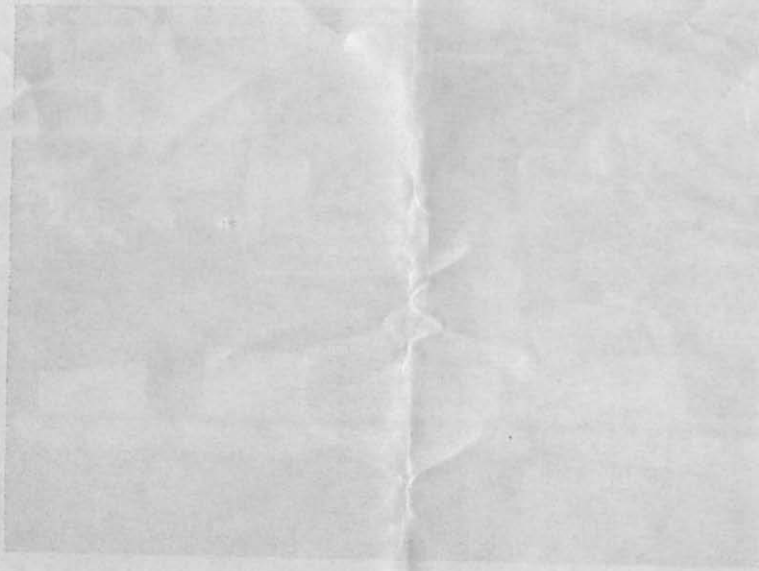
The average yield per acre of all crops showed a slight increase except that of rape and mustard as compared with the outturns of previous year.

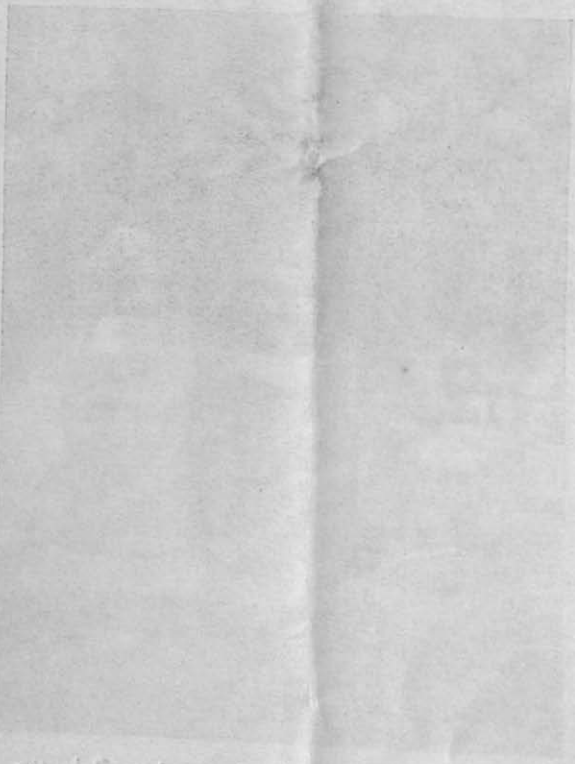
Prices of agricultural produce, except raw sugar (*gur*), showed a tendency to a gradual rise due to war. The statement below shows the wholesale price of rice, raw sugar (*gur*), jute and potato per maund of 40 seers, in the important markets of Assam during the year 1940-41.

Commodities	Karimganj	Goalpara	Gauhati	Dibrugarh	Dhubri	Nowgong	Habiganj	Shillong
	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.
1. Rice—								
Winter rice unhusked.	2 4	2 6	2 5	2 12	..	..	..	..
Winter rice husked.	4 9	4 6	4 5	4 14	..	..	..	..
Autumn rice unhusked.	2 4	2 10	2 9	2 12	..	..	..	..
Autumn rice husked.	4 6	4 4	4 6	4 13	..	..	..	..
2. Raw Sugar— (Gur) ..	5 7	5 12	5 7	6 3	..	..	..	..
3. Jute	..	..	..	..	4 8	3 8	5 0	..
4. Potato ..	..	..	..	..	..	..	..	2 10

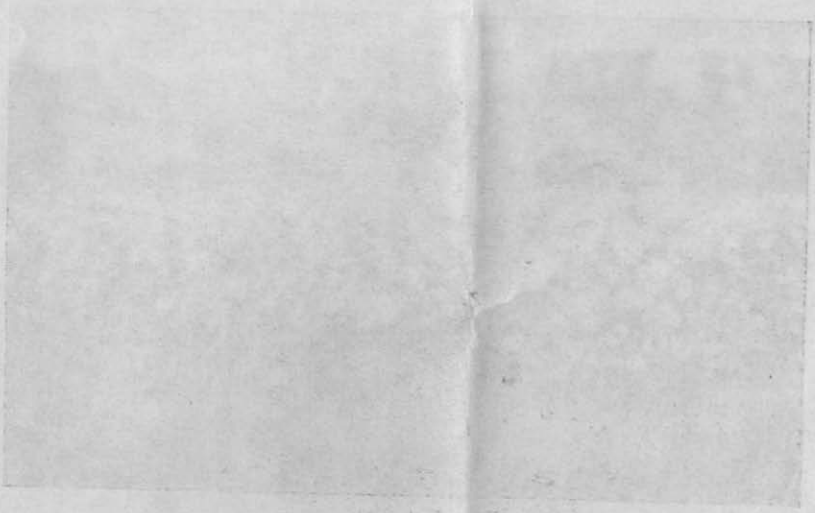
Graded Eggs ready for sale at Burrabazar, Shillong.
Photo by L. K. Handique.

Graded Orange ready for despatch to Calcutta.
Photo by L. K. Handique.





Soya Bean grown at the Sylhet Farm.
(Photo by R. C. Woodford).



CHAPTER II

EXPERIMENTS AND RESEARCHES

3. *Paddy*.—Experiments and researches on paddy were conducted, as before, in the Karimganj, Titabar and Habiganj Farms.

The experimental work on paddy at the Karimganj Farm consisted of (A) pure line selection, (B) cross-breeding, (C) varietal trials, (D) cultural experiments, (E) genetical investigations and (F) miscellaneous experiments.

(A) *Pure-line Selection*.—Besides 8 different types of paddy received during the year, there were 1,033 types under observation.

(B) *Cross Breeding*.—Last year two hybrids, Ar.C.614-25b and S.C. 412-56, were handed over to the farm for field scale trial. Ar. C. 614-25 b gave the best yield amongst the *asra* types this year. Some more hybrids, *viz*., S.C. 40-34, S.C. 1177-36 and S.C. 1177-37, were found to be very promising.

One very early *asra* hybrid, Ar.C. 546-132 a, has been recommended for distribution outside.

(C) (*i*) *Varietal trials*.—There were altogether 85 types under comparison. Some *asra* types, *viz*., Ar. 143-4 and Ar. 127, were found superior to our standard.

(*ii*) *Trial of recommended vs. Local types*.—In *aus*, As. 2 and As. 46 were found significant over the local. In *sail*, S.C. 94-47, S. 22, S. 156 and S.C. 54-60 were found superior to the local. In *asra* all gave identical yields.

(D) *Cultural experiments*.—(*i*) Three factors complex experiment with four dates of planting, four ages of seedlings and 3 numbers of seedlings was conducted for the last three years. Details of the experiment will be found in Appendix II.

(*ii*) *Ploughing experiments*.—All the treatments gave almost identical yields, but it was observed that the yield increased along with the increase in number of ploughings.

(E) *Genetical investigations*.—Inheritance of characters, such as, size of grains, height of plants, number of tillers, length of panicles, colour of plants, colour of apiculus, colour of stigma and aroma, were studied in F_1, F_2 and F_3 generations.

(F) *Miscellaneous experiments*—(*i*) *Seed testing*.—All farm seeds which were to be sent outside were tested and germination percentage was found to be satisfactory.

(*ii*) *Cooking test.*—In the Jorhat Laboratory, cooking tests were done with F_3 generations.

(*iii*) *Quantitative characters.*—Quantitative characters, such as, flowering dates, height of plants, number of tillers, number of false and full grains, weight of grains and length and breadth of grains, of 50 types of *aus* and 60 types of *sail* were recorded according to the suggestion of the Imperial Council of Agricultural Research, India.

The experimental work on paddy was continued in the Titabar Farm mainly under (*a*) pure line selection, (*b*) varital trials, (*c*) cross breeding, (*d*) cultural experiments and (*e*) miscellaneous experiments. The classes of paddy dealt with were *ahu* and *sali*.

(*a*) *Pure-line Selection.*—Besides 78 new types of paddy received during the year, there were 1,012 types under observation.

(*b*) *Varietal Trials.*—There were altogether 146 types under comparison, of which 79 types were in *ahu* and 67 in *sali*. All the comparison experiments in *ahu* were badly damaged by rice bugs and hence no definite conclusions could be drawn from the experiments conducted. All these experiments will be repeated next year. The final varietal trial in *ahu* with 5 types were conducted at the Kokilamukh Farm and from the analysis of the results it was seen that the hybrid A.C. 313-11, a cross between As. 86 Rangaduria and As. Dacca (No.6—type), with white kernel was found to be very promising. This type has been handed over to the farm at Kokilamukh for multiplication of seeds for distribution.

In *sali* the hybrid S.C. 308/372, a cross between Lakhijoha and Latamaguri, which was recommended for field scale trial last year, proved very promising and seeds were distributed in the Assam Valley this year. Two other hybrids of the same parents, namely, S.C.308-51 and S.C. 308-210, were also found to be very promising and they were recommended for field scale trial in the farm.

Trial of Recommended vs. Local Types.—A trial with the best local varieties against 10 recommended varieties was conducted. All the recommended varieties, except two, proved their superiority over the two local types.

(*c*) *Cross-breeding Work.*—There were altogether 229 fixed hybrids under observation and study. Inheritance of characters, such as, hybrid vigour, tillering habit, height of plants, number of grains per panicle, colour of inner-glume, kernel colour and earliness were studied in F_1 and F_2 generations. Some new crosses were also made both in *ahu* and in *sali*.

(*d*) *Cultural Experiments.*—(*i*) A confounded cultural experiment with 3 factors (spacing, seedling number and age of seedlings) was conducted for the third year. Seedlings of 6 weeks age gave higher yield than those of 4 weeks. The highest yield was obtained with closer spacing, namely, 6". Yield of paddy also increased along with increase in number of seedlings. Four seedlings per bunch gave higher outturn than with one or two seedlings per bunch.

(*ii*) A new confounded experiment with three factors (variety, spacing and seedling number) was conducted in the year under report. Out of the three varieties taken, S. L. 70 (*a*) Ahomsali gave the best result and next came S.115 Latamaguri. 4" and 6" spacing gave almost identical yields and 9" spacing gave the poorest outturn. 4 seedlings per bunch gave the best outturn and 2 seedlings gave the worst. 6 seedlings gave intermediate results.

(*iii*) An experiment was conducted to find out the optimum water level required for *sali* paddy during the season. There were two varieties and 4 levels of water, 0", 3", 6" and 9". The average effect of variety B (Bengalijoha) was significantly greater than that of variety A (Ahomsali). Among the levels, the effect of zero level (moist) was found to be significantly greater than that of the rest which did not differ among themselves significantly.

(*iv*) An experiment was conducted to find out the best time of maturity and milling qualities of paddy harvested at four different dates. All the varieties showed poor outturn when harvested at 4 weeks after flowering and the yields gradually increased and gave the highest outturn when harvested at 7 weeks after flowering. The finer varieties had better milling percentage.

(*v*) An experiment was conducted to find out the best seed rate in *sali* paddy which also would prove the effect of weak and strong seedlings. Although no significant difference between the yields from plots grown with different strengths of seedlings or seed rates was obtained, it was found that the seed rate of 4 mds. per acre was better than 6, 8 or 10 mds. seed rate per acre.

(*vi*) An experiment was conducted to find out the effect of shallow and deep ploughing in *sali* paddy. No significant difference between the yields was obtained. The experiment will be repeated next year.

(*vii*) *Late Transplanting in Sali.*—Six recommended types were grown late to study the effect of late transplanting on yield and to find out desirable types which would do moderately

well even when transplanting is done very late by the middle of September. The variety Latisail proved to be the best. Latamaguri, Bengalijoha and Laudumra were almost identical but gave better yields than the rest.

(*e*) *Miscellaneous Experiments.*—(*i*) All farm seeds which were to be sent outside were tested every fortnight and germination percentage was found to be satisfactory.

(*ii*) *Quantitative characters.*—Quantitative characters, such as, flowering dates, height of plants, number of tillers, number of false and full grains, weight of grains and size and shape of grains, etc., of 238 types were recorded according to the Schedule of the Imperial Council of Agricultural Research.

At the Deep Water Paddy Research Station at Habiganj (partly financed by the Imperial Council of Agricultural Research) work is carried on for the improvement of deep water *amon* and *boro* paddies. Three improved strains each of *amon* and *boro* have been given out from this farm and recommendations have also been made regarding cultural problems. These have recently been published in a departmental bulletin for circulation.

During the year under report, qualitative and quantitative characters of 470 cultures in *amon* and 405 in *boro* were studied in the observation plots.

During the year under report, varietal trials included 48 types in *amon* and 58 in *boro*. The results showed that the two recommended types in *amon*, A. 192 Laki and A. 38-13 Gowai, were quite outstanding being not yet surpassed by any other type. It was observed that A. 185 Laki was equal in yield to the recommended Laki with the additional advantage of its being better in quality and flood-resistance. The type A.185 will, therefore, be grown for seed next year and will be passed as Habiganj Aman No. 4. Some more promising types have also been noticed in both *amon* and *boro*, which will be included in the final varietal trials next year.

Eleven cultural experiments were conducted at the Habiganj Farm. The conclusive results obtained from some of them are summarised below :—

(*i*) The best seed rate this year for the dry-sowing of *amon* was 105 lbs. per acre. This indicates that in a year when adequate rainfall does not follow dry-sowing, a seed rate higher than the normal one brings higher yield.

(*ii*) As found in the last year, the seed rate over 60 lbs. per acre could not produce any significant difference in the yield of the wet-sown *amon* crop. This simply justifies the previously recommended dose of 75 lbs. per acre for the wet-sowing of *amon*.

(*iii*) For the dry-sowing of *amon*, four ploughings were statistically as good as eight ploughings although the yield for six ploughings was noticed to be at the top. In the wet-sowing, the number of ploughings beyond six had failed to produce any beneficial effect on the yield.

(*iv*) In the transplantation of *boro*, the ages of seedlings beyond four weeks could not increase the yield.

(*v*) Resting *boro* seedlings for a period of three days could not produce any deleterious effect on the yield.

An experiment to study the behaviour of *amon* plants of an early variety towards different depths and durations of submergence was successfully conducted on the line followed last year. The four-week seedlings proved to be the worst. Thus the result confirmed the previous recommendation of six weeks as the minimum interval between the time of sowing and the advent of flood. Moreover, the submergence under six inches of water was found to be the least injurious for almost all ages. The evils of submergence also manifested in an increasing measure with every increase in its duration from four to twelve days.

Boro paddies of the Surma Valley have been classified into fourteen popular groups and sub-groups on the basis of their important botanical characters. The variability in some of the quantitative characters, such as, length and breadth of paddy and rice, weight per 1000 grains of paddy, height and number of tillers per plant, length and number of grains per panicle and sterility percentage of grains, was also studied for each group and sub-group.

The relationship of height, length of panicle and number of grains per panicle with yield of *boro* paddy was studied in a pure line.

The studies on anthesis were taken up in three *boro* cultures. The blooming of flower buds was noticed to start at 8 A.M. It was most vigorous at 10 or 11 A.M., after which there was a rapid fall. The operation continued even up to 4 P.M. on cloudy or rainy days.

The selection of homozygous types with special attention to quality and yield from seven crosses between *aus* and *boro* in F_4 and F_5 was continued. The crosses between Rata and Prasadbhog and between Rata and Vijoysail were studied in the F_1 generation. Three new crosses have also been made between *boro* and Tupa, *boro* and Bashful and between Tupa and Bashful.

4. *Sugarcane.*—The Sugarcane Research Section of the Jorhat Farm, which is financed partly by the Imperial Council of Agricultural Research, was in its seventh year of working. A detailed account of the co-ordinated research work on sugarcane at the Jorhat Farm will be found in the Annual Report of the Sugarcane Research Station, at Jorhat for 1940-41, which is issued as a separate publication.

The work on sugarcane was mainly under chemical control and consisted of (1) studies of new Coimbatore canes, both in the nursery and observation plots, including periodical analysis of juice, and (2) varietal and manurial experiments, both in plant and ratoon canes.

The total annual rainfall at the station was deficient, being only 67·54″ compared with the normal of 83·62″. The rainfall was only 1·61″ in April as against the normal of 7·12″. This unusually low rainfall affected the germination of cane which had a considerable effect in reducing the average outturn of plant canes.

There were eleven varieties in the nursery plots and 38 varieties (including the standard cane, Poj.2714) in the observation plots. On the basis of the promising behaviour in the observation plots in 1940-41 and also in the previous years, Co.446, Co.449, Co.540, Co.527 and Co.349 have been selected for the semi-final experiment in the next year, 1941-42.

In the final varietal experiment (normal ripening group) in plant canes, Co.419 once again gave the highest yield (34·52 tons per acre) followed by Co.J.1 (31·12 tons per acre). Co.408 and Co.413 also gave satisfactory yields. Co.419 and Co.408 have already been distributed outside where they have been reported to do quite well. In the final varietal experiment in ratoon canes of the same varieties, Co.J.1 was the best (31·46 tons per acre) followed by Co.419. It appears therefore that they are also good ratooners.

Both Co.J.1 and Co.413 have been retained for further study in the final varietal stage in 1941-42.

In the final varietal experiment in plant canes with medium ripening group, yields were not satisfactory. In the final varietal experiment in ratoon canes of the same varieties, Co. 421 was the best. It has already been distributed outside where it has been reported to do quite well. Co.418, Co.355 and Co.356 did not do well and have been retained for further study in the final varietal stage in 1941-42.

In the semi-final varietal experiment in plant canes with eight varieties, including the standard cane Poj.2714, Poj. 2878 × Co.290—Type 4 was the best in yield followed by Poj. 2878 × Co.290—Type 15, Co.331 and Co.439. The ratoon canes of the same varieties in the other semi-final experiment showed that Co.331 was the best in yield followed by Poj. 2878 × Co.290—Type 3 and Type 4. Both Type 4 and Co.439 lodged badly. Co.331 and Type 15 have been selected for the final varietal test in 1941-42.

Green manuring experiment with plant canes did not give encouraging results. The different green manure crops chosen for the experiment were, sunnhemp, *dhaincha* and cowpea. In the second green manuring experiment dealing with the residual effects of the same green manure crops applied to previous plant canes, *dhaincha* gave the best yield followed by sunnhemp. Experiments will be repeated for more confirmatory results in both plant and ratoon canes.

In the complete nutrient experiment in plant canes on the interaction of nitrogen, phosphate and potash at 3 levels each, nitrogen at all the levels gave highly significant increases in yields over no-nitrogen. Potash at all the levels also gave significant increases in yield over no-potash, but phosphate at different levels did not produce any significant difference. The quality of juice was high and almost uniform under all treatments. In the other complete nutrient experiment dealing with the residual effects on ratoon canes of the same nitrogenous phosphatic and potassic manures (at the same three levels each) and their interactions nitrogen at all the levels gave significant increases in yields over no-nitrogen. The increases due to higher levels of potash over no-potash were significant. So also with the higher levels of phosphate. The quality of juice was almost uniform under all conditions. These experiments are being repeated for more confirmatory results.

The manurial experiments in plant canes with organic manures (3 levels), inorganic manures (3 levels) and their combinations, showed that so far as yields of cane were concerned organic manure was significantly better than inorganic manure in the higher dose, but the difference in the lower dose was not

significant. The combination of organic and inorganic manure was not significantly better than either of them applied alone in the lower dose, but in the higher dose the combination was better than the inorganic manure applied alone. The quality of juice was almost the same with all treatments. In the other manurial experiments dealing with the residual effects on ratoon canes of the same manurial treatments applied to plant canes in the previous year, organic manure was significantly superior in yield of canes to inorganic manure both in the higher and the lower dose. In the higher dose, the combination was significantly better than inorganic manure applied alone. In the lower dose, organic manure was significantly superior to the combination. These experiments are being repeated for more confirmatory results.

The Department has been distributing improved varietie of cane which are being increasingly used by the cultivators. They are, however, slow to adopt improved manurial and cultural methods.

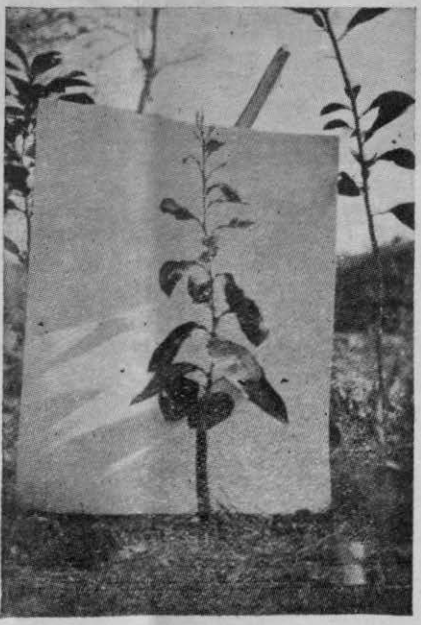
5. *Potato.*—A fresh manurial experiment was taken up at the Upper Shillong Farm to test the effect of oilcake, compost, cowdung and bonemeal. The experiment was conducted in randomised blocks with six replications for each treatment. Although the average yield of the crop was poor, the results were highly satisfactory as they indicated that manuring for Shillong soil had great possibilities. It showed that for growing potato organic manures were essential. It further showed that compost, properly prepared, was of better, or at least of equal value to cowdung. Bonemeal did not appear to be remunerative. Bonemeal with compost, however, gave the best result, but it is doubtful if the combined application would be paying. The experiment will be repeated in 1941-42 for conclusive result.

6. *Fruits.*—Propagation of various acclimatised deciduous fruits was carried on, as usual, at the Fruit Experiment Station, Shillong, and 663 grafts of these fruits were issued from the nursery during the year under report. Grafting of apple was tried on one local stock "Sohshur" (Pyrus Pashia), which is immune from woolly aphis, the main pest of apples in these hills. It proved quite successful. It will, however, take some seasons more to draw any conclusion on the suitability of this stock. If it is a success, it will be a great boon to the apple growers in eliminating the root woolly aphis. During the winter, more than 1,000 grafts were made and it is expected that about 800 will be available for issue in 1941-42.

No. I

Khasi orange budded on a promising stock No. 42 showing remarkable 5'-6" growth within a period of eleven months.

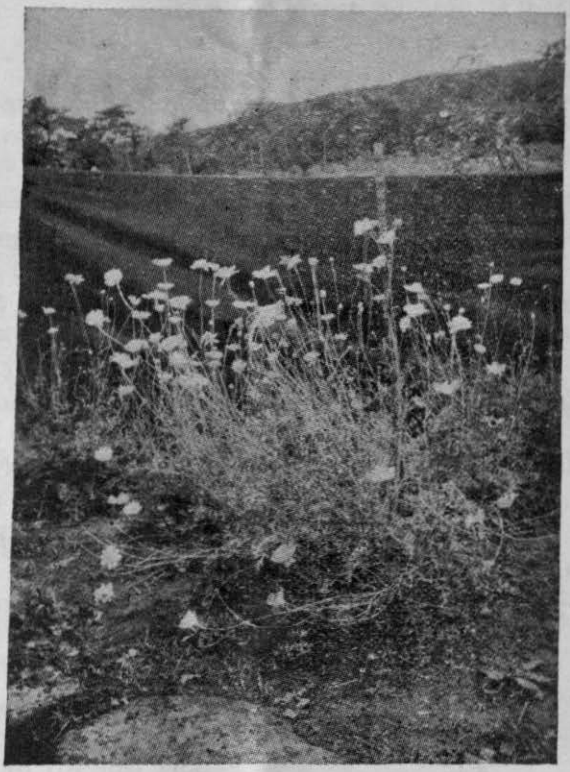
(Photo by S. Dutta, Citrus Station, Burnihat).



No. II

Budded Valencia orange on stock No. 245, attaining a height of 2'-9" in 38 days.

(Photo by S. Bhattacharya, Citrus Station, Burnihat).



Pyrethrum Cinerariaefolium grown at the Fruit Station, Shillong. Each plant has al out 40 well-developed flowers.
(Photo by H. K. Nandi).

Trials on canning and preservation of fruits were continued as before. Both glass jars and tin cans were used as containers. About 100 lbs. of guava jelly was prepared for trial sale to the public.

Cinchona was tried and found to be successful, but it proved to be very sensitive to frost attack. Observation on the growth of this plant will be continued. Pyrethrum (*P. Cineraraefolium*) is growing very successfully here and arrangements are being made for its extension and distribution to the cultivators. *Digitalis purpurea* also is thriving at this station.

The soil of this station is very poor in organic contents, which deficiency is partly supplied by the application of specially prepared compost of pine needles in pits. The quality of this compost has been found to be quite good. More will be prepared next year so that each tree gets a regular application once in two years.

Researches on citrus fruits were being continued at the Citrus Fruit Experiment Station, Burnihat. This station is financed partly by the Imperial Council of Agricultural Research. An account of the progress of work in this station is published separately.

7. *Inseci Pests.*—The results of systematic roguing for the control of sugarcane borer pests were satisfactory, both in the Government agricultural farms as well as in the cultivators, fields.

The paddy hispa pest was controlled successfully in Jorhat and Sibsagar Subdivisions this year too by adopting the same operations as in the last year.

The rice weevil appeared in pretty big number in certain localities. It was ıchecked timely by fumigating, hand-winnowing, sunning and k lling all possible insects.

The citrus borer and the citrus green bug were successfully tackled in various places.

8. *Plant Diseases.*—There was a serious outbreak of foos rot disease of paddy at the Karimganj Farm. This wat controlled by roguing.

Puccinia Maydis appeared at the Upper Shillong Farm, after a very long interval, on maize. The damage was very negligible.

There was a very serious outbreak of *Erysiphe Polygoni* at the Kakilamukh Farm and in some other cultivators' plots on mung. The disease was controlled satisfactorily by spraying the affected crops with 1% Bordeaux mixture.

The season for potato crop was very favourable during this year. The extent of damage was only sporadic and negligible.

There was a heavy loss of mustard crop at Kakilamukh due to blight disease.

Some yellow orange trees were treated with a mixture of zinc sulphate 10 lbs., lime 5 lbs., blood albumen $\frac{1}{4}$ lb. and water 100 gallons. The result was not conclusive.

A new disease of banana was noticed in different parts of the Province. This was under investigation.

Bud rot disease of areca palm seemed to be increasing in many places. Attempt was being made to control them.

A serious outbreak of coffee disease due to rust was reported from Cherrapunjee. The parties were advised on control.

Attempt was also being made to control the betelvine diseases.

Rust disease of wheat was noticed at Kakilamukh causing considerable loss in the cultivators' plots.

One variety of cotton (Cambodia) suffered very badly at Nakatani. The climatic factor seemed to be responsible for this trouble. This was under investigation.

The smut disease of sugarcane was totally controlled during the year.

The percentage of attack due to various diseases was appreciably less than that of last year.

CHAPTER III

DEMONSTRATION

9. *General*.—The main items of demonstration during the year, were :—(*i*) demonstration with improved varieties of paddy, sugarcane, jute and potato, (*ii*) manurial demonstrations with cowdung, oilcake, bonemeal and various chemical fertilizers, (*iii*) introduction of new crops, such as, groundnut, linseed, various *rabi* crops and fodder crops, (*iv*) introduction of better agricultural implements, (*v*) cultivation of *boro* paddy under irrigation by means of power driven pumps and (*vi*) demonstration of control measures for checking insect pests, etc.

A very brief resume of the progress of work during the year under review is given below.

10. *Paddy*.—As usual, the recommended varieties of paddy maintained their superiority over the local types. In the Surma Valley, the best outturns were obtained from Nagrasail, Latisail, Dumai 133/6, Chengri, Murali 36/30, Kaimurali, Sailbadal,

Kerrsail, Dhepisail, Hbj. Amon I and II, Hbj. Boro I. S. C., 671/16, Ausjaria, and Kachalat. Of these, Nagrasail, Kerrsail, Kachalat, Hbj. Amon II and Latisail gave an average increased outturn over the local varieties of 707 lbs., 692 lbs., 538 lbs., 633 lbs. and 479 lbs. respectively per acre. In the Upper Assam Valley, Rangaduria proved to be the best of the recommended *ahu* paddies, while in *sali* Prasadbhog, Laudumra, Kanaimuluk, Badshabhog and Dhusari did quite well. Demonstrations were also conducted in the Upper Assam Valley with a good number of *asra* and *boro* paddies. In the Lower Assam Valley, Kataktara, Rangaduria, Kaimurali and Prasadbhog did very well. Amon crop was not very successful in this valley, but the three Habiganj selections gave better results. During the year under report, improved strains of paddy covered an area of 58,115 acres of land out of the total acreage of 5,425, 943 under paddies of all kinds, that is, about 1·1 per cent. of the total area. The Department is alive to the need for further extension of improved varieties.

11. *Boro Cultivation under Irrigation*.—Demonstrations of the cultivation of *boro* paddy in precarious *amon* paddy land under irrigation by means of power driven pumps were continued during the year under report, during which altogether 17 pumps were employed for the purpose. In the Surma Valley, with 11 pumping setts and at a cost of about Rs.7,593 an area of 782 acres was covered with *boro* paddy from which an yield of about 23,460 maunds of paddy was obtained. In the Lower Assam Valley, with the help of 4 pumps and at a cost of Rs.773 an yield of 1,029 maunds of paddy was obtained from an area of 55 acres, while in the Upper Assam Valley 2 pumps irrigated an area of about 58 acres. In the Upper Assam Valley, the outturn of paddy was very poor as the crop was severely damaged by storm and rain.

12. *Sugarcane*.—During the year under report, 12,965 acres of land were under improved varieties of sugarcane compared to the total sugarcane acreage of 41,131, that is, 31·5 per-cent. of the total area. The usual demonstrations with improved varieties of sugarcane, and improved *gur* and sugar making implements, etc., were continued all over the Province. Improved varieties of cane, such as, Co. 213, Co. 290, Co. 313, Co. 419, Co. 408, Co. 421, Co. 361, Poj. 2878 and Poj. 2714, maintained their superiority over the local varieties. During the year under report, 580,230 improved sugarcane setts were distributed by the demonstration staff for which there was a very widespread demand.

13. *Potato.*—Varietal and manurial demonstrations were conducted with potatoes all over the Province. In South Sylhet and Habiganj, Shillong seeds gave an increased yield of 252 lbs. and 1,890 lbs. respectively per acre over the local seeds, while the Darjeeling variety gave an increased outturn of 655 to 1,580 lbs. per acre. In the manurial demonstrations, preserved cowdung and chemical manures proved their utility. In the Lower Assam Valley and Upper Assam Valley also these demonstrations proved quite successful. The degree of success attained in introducing improved potatoes will be evident from the fact that about 42·2 per cent of the total area under potato in Assam was cultivated with improved strains during 1940-41.

14. *Other Crops.*—The Jute Propaganda Staff, maintained by the Indian Central Jute Committee, continued to carry on development work in the districts of Sylhet, Kamrup, Darrang, Nowgong and Goalpara. They distributed seeds of improved strains of jute and demonstrated the correct methods of extracting and treating jute fibre.

A large number of demonstrations were also carried out with linseed, mustard, pulses, tobacco, groundnut, vegetables, etc.

15. *Fruits.*—Cultivation and marketing of fruits were encouraged, as usual. During the year, a large number of grafts, seedlings, suckers, etc., of pineapple, orange, banana, litchi, papaya, etc., were issued to the cultivators by the demonstration staff, who also conducted a good number of demonstrations of grafting and pruning of fruit trees. Pineapple growers of the province are being helped to a considerable extent by the reduction of freight over railways and steamer services obtained for pineapple. With a view to increase the facilities for marketing Assam pineapples and oranges in Calcutta, a marketing agency of this Department was established there in 1938-39 which continued to help the growers in disposing of their produce without the intervention of middlemen. Grading of fruits was also done in this connection. During the year, fruits worth Rs.22,960-10-9 (gross) were disposed of through this agency.

16. *Manures.*—Quite a good number of demonstrations were conducted during the year with such fertilizers as oilcake, bonemeal, niciphos, ammophos, ammonium sulphate and sodium nitrate. Demonstrations were also carried out for the preservation of cowdung, and preparation of compost and water-hyacinth ash. During the year, 976 manure pits were dug as scompared to 693 of the previous year. A number of demonrations were also conducted on green manuring with *dhaincha,* cowpea, sunnhemp, etc.

17. *Implements.*—The usual demonstrations with improved implements and appliances, such as, Meston plough, Planet Junior hand hoe, power driven irrigation pump and sugarcane crusher, *gur* boiling pan, three roller sugarcane mill, McGlashan furnace, etc., were continued. For the first time in the history of the Department, improved agricultural tools were made in Sylhet by a private individual with help from us.

18. *Hills.*—The activities of the Department of Agriculture in the hills consisted of terraced rice cultivation, making of dry terraces for other crops, improvement of *jhums*, extension of fruit and potato cultivation, introduction of new crops, etc. Efforts were also made to introduce some practical methods for the prevention of soil erosion.

CHAPTER IV

SUPPLY OF SEEDS, PLANTS AND MANURES

19. *Supply of Seeds, etc.*—The Seed Depots at Jorhat, Gauhati and Sylhet continued to function during the year under report. Seeds, plants, manures, etc., were issued from the Depots for demonstration and sale. The statement below shows the quantities of seeds, etc., of paddy, potato, vegetables and sugarcane issued during the year.

Name of seeds	Quantity issued for demonstration	Quantity sold	Total
1. Paddy seed ...	1,750 mds. 6 srs.	245 mds. 4 srs.	1,995 mds. 10 srs.
2. Potato seed ...	566 mds. 29 srs.	1,373 mds. 38 srs.	1,940 mds. 27 srs.
3. Vegetable seed	4,903 pkts. and 29 srs.	24,941 pkts. and 19 srs.	29,844 pkts. and 1 md. 8 srs.
4. Sugarcane setts	592,720 setts.	3,000 setts.	595,720 setts.

The Seed Depots at Sylhet, Jorhat and Gauhati incurred a loss of Rs.1,424-9-0, Rs.626-3-0 and Rs. 484-13-0 respectively, during the year under report. Thus, the Department incurred a total loss of Rs.2,535-9-0, compared to a profit of Rs.1,228-1-0 during the previous year. The profit in 1939-40 was, however, due mainly to the return of two power-driven pumping setts, valued at Rs.2,376-8-0, to the Sylhet Seed Depot by hire-purchasers.

20. *Gauhati Seed Depot.*—The principal items of supply from the Gauhati Seed Depot were :—Paddy worth Rs.2,494, potato worth Rs.516, vegetable seeds worth Rs.1,855, sugarcane setts worth Rs.2,123, pineapple suckers worth Rs.52, various manures worth about Rs. 233 and improved implements to the value of Rs.2,372. The assets and liabilities of the Depot amounted to Rs 13,644-3-0 and Rs.14,129 respectively, resulting in a loss of Rs.484-13-0 during the year, compared to a loss of Rs.72-8-3 in 1939-40.

21. *Jorhat Seed Depot.*—The main items of issue from the Jorhat Seed Depot were :—Paddy worth Rs.1,286, potato worth Rs.3,108, sugarcane setts worth Rs.1,050, vegetable seeds worth Rs.1,517 and pineapple suckers worth Rs.728. The assets and liabilities of the Depot amounted to Rs. 13,066-2-9 and Rs.13,692-5-9 respectively, resulting in a loss of Rs.626-3-0 during the year, compared to a profit of Rs.76-2-0 in 1939-40.

22. *Sylhet Seed Depot.*—The principal items of supply from the Sylhet Seed Depot were :—Paddy worth Rs.1,373, potato worth Rs.8,530, vegetable seeds worth Rs.1,560, manures worth Rs.1,099 and implements worth Rs.1,879. The assets and liabilities of the Depot amounted to Rs.16,513-2-6 and Rs.17,937-11-6 respectively, resulting in a loss of Rs.1,424-9-0 during the year, compared to a profit of Rs.1,224-7-3.

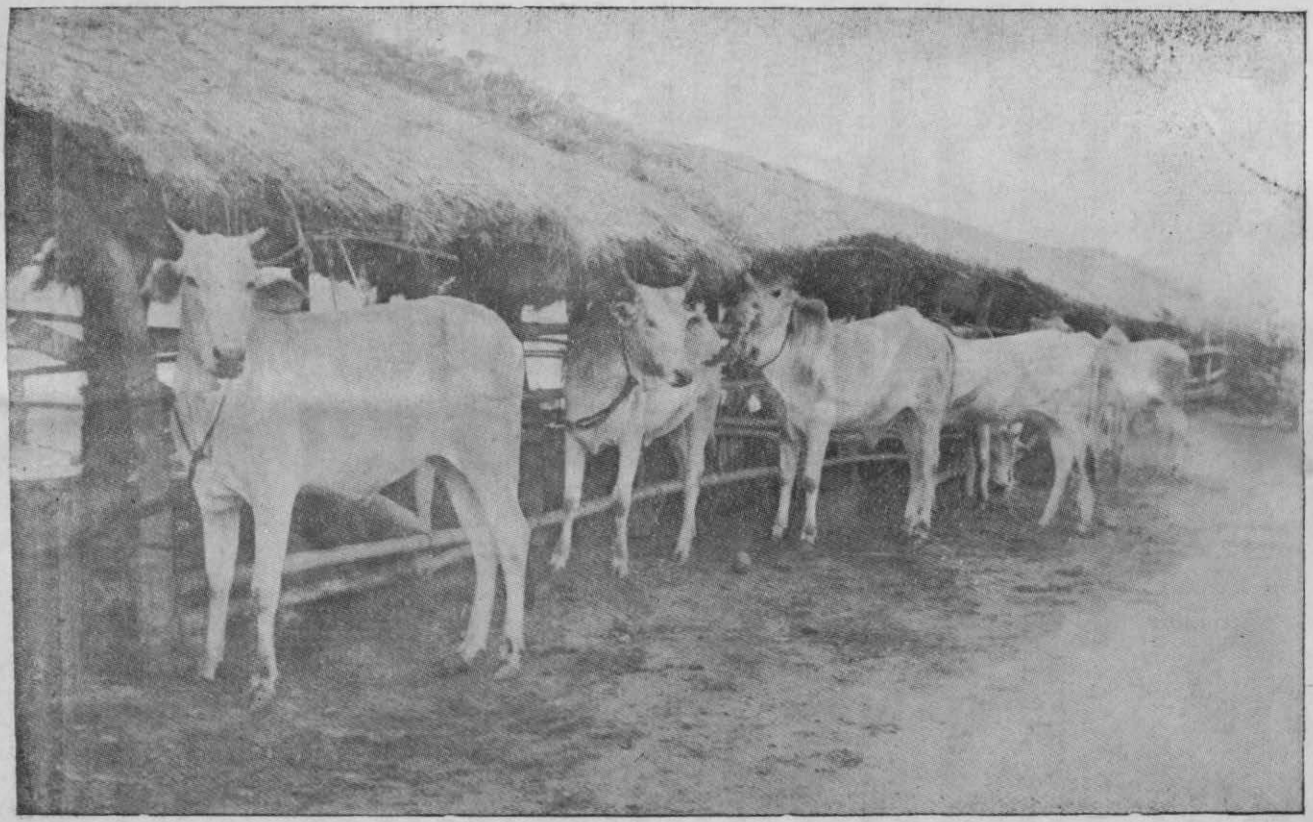
CHAPTER V

ANIMAL HUSBANDRY

23. *General.*—The district staff of the Livestock Section consisted of 5 Agricultural Inspectors, Livestock, 5 Agricultural Demonstrators and 21 Stockmen.

The activities of the Livestock Section consisted of the supply, breeding and management of cattle, poultry, goats and sheep and production of fodder. These operations were conducted through the agency of Government Farms, Jail Dairies, Village Cattle Breeding Centres, Notified Grazing Reserves, the Livestock Improvement Association of Assam, Tea Estates, Municipalities, the Livestock, Improvement Centre at Digboi (Assam Oil Company) and through individuals interested in animal husbandry.

The demand for livestock improvement activities from all parts of the Province continued to increase, people on the whole being quite conscious of the need for better breeding and rearing of livestock.



Two year-old Harianas at the Aie River Forest Reserve.—Photo by R. C. Woodford.

At the end of the year under report, the livestock owned by the Department numbered 190 cows, 344 bulls, 324 young stock and calves, 15 buffaloes, 71 sheep, 114 goats and 386 poultry, both in the Government Cattle Breeding Farms and outside.

24. *Government Cattle Breeding Farms.*—The Fresian grade diary herd of 22 Cows at the Upper Shillong Experimental Farm averaged lactations of 8,609 lbs. per cow. The best lactation was made by "Fantasy" again with 12,490 lbs. There were two other yields of over 12,000 lbs. An yield of 12,000 lbs. indicates over 20 seers of milk daily for 10 months.

The Khanapara and Sylhet Cattle Breeding Farms continued to breed pure Scinde and Scinde × Local grades. The best yield from pure Scinde cow No.104 (Sukrity) was 5,156 lbs. A ½ Scinde × Local cow No.102 (Khana) yielded 4,677 lbs. in a lactation.

The small cattle section of the Jorhat Experimental Farm continued to breed the gereral purpose "Jorhat Grey" type of cattle, derived from a Tharparkar × Maurangia cross, combining strong physique with good milking quality of about 6 seers a day or 2,000 lbs. in a lactation. Bulls of this breed are particularly suited to the cattle of the professional graziers or *khutiwallahs.*

On the 31st March 1941, there were 117 cows, 15 bulls, 15 buffaloes and 215 youngstock in Government Farms. During the year under report, 60 bulls, 33 cows and 16 youngstock were sold, bringing the total issue and sale, from the farms since the beginning of cattle improvement work in 1930 to 354 bulls, 256 cows and 147 youngstock. During the year, farm bulls served 128 cows of the public, bringing the total of such services to 1,544.

25. *Jail Dairies and the Digboi Livestock Improvement Centre.*—Dairies were maintained in the jails at Gauhati, Tezpur, Jorhat, Dibrugarh, Silchar, Sylhet and in the Tezpur Mental Hospital. On 31st March, 1941, Jail Dairies had 58 cows, 7 bulls, and 70 youngstock. Nearly all these cattle were pure Scindes of high quality. During the year, 11 young bulls were supplied to Government Farms, bringing the total of such supplies from jails upto 53. 121 cows of the public were served by jail bulls during 1940-41, bringing the total of such services to 697.

The Livestock Improvement Centre, Digboi, financed by the Assam Oil Company, maintained 6 cows and 4 bulls on loan from the Government, and had in addition 4 bulls and

19 youngstock of its own. These bulls served 136 cows during the year. Two controlled grazing grounds were organised by the Company. Distribution of root cuttings of fodder grasses was also started. Poultry breeding was also taken up there.

26. *General Cattle Breeding Operations.*—The year opened with 354 Government bulls for general service and closed with 345. These bulls served 11,647 cows as recorded, compared with 8,336 and 6,124 in the two preceding years. At least 25 per cent of the services performed by the bulls could not be recorded. 7,314 calves, sired by Government bulls, were seen and recorded, compared with 3,401 and 2,507 of the preceding two years. Many more births, estimated at about 30 per cent of the above figure, could not be recorded owing to movement of cattle in the villages and grazing reserves and limitation of staff.

The total number of cows served and calves sired by Government bulls, since the beginning of these operations came to 30,987 and 14,193 respectively, *plus* the unrecorded services and births. 4,770 castrations of weedy bulls were reported to have been done in the neighbourhood of Government bulls stationed in the different centres, with the help of the Veterinary Department.

27. *Village Breeding Areas.*—Of the 345 bulls mentioned in the preceding paragraph, 229 were concentrated in groups in Village Breeding Areas under Stockmen. The bulls were placed in charge of cultivators willing to maintain them and a maintenance allowance, varying from Rs.2 to Rs.5 per month, was paid to the bull-keepers by the Department. Stockmen also placed he-goats and cockerels in the selected areas. The size of village bulls is worth noting. Local cattle have an average height behind the hump of 33 to 36 inches for cows and 36 to 40 inches for bullocks. Breeding bulls must not, therefore, be too big as very big bulls serve less cows, the cows have trouble in calving, and the big calves cannot thrive on the local food supply. For local village cattle we aim at supplying bulls which are about 44 inches high behind the hump at 2 teeth of age and 48 inches at full growth.

Records of average weight of calves at about 7 days of age shew that the local calves have an average live weight of 18 to 23 lbs., while calves sired by Government bulls average 29 to 35 lbs.

28. *Notified Grazing Reserves.*—The total area of these reserves is about 40,000 acres. The reserves contained about 11,300 heads of assessed cattle during the year under report. As animals under 2 years of age are not assessed, about 50 per cent should be added to arrive at the total.

There were 41 Government bulls in these reserves during the year under report and they served 863 cows as recorded. As the bulls run with herds, many services could not be recorded. 661 calves were recorded as sired by Government bulls ; and 382 castrations and 1,136 vaccinations against rinderpest were done with the help of the Veterinary Department. 1,156 animals of improved breed were actually counted in the reserves.

Recorded number of cows served and calves sired by Government bulls in these reserves from 1931 upto the 31st March 1941, totalled 5,503 and 2,128 respectively. These do not include many unrecorded services and births.

29. *The Livestock Improvement Association of Assam.*—This Association completed its fourth year in December 1940. Its funds are now nearly exhausted, but during its life it has done good work. Duri g the year ending 31st December 1940 the Subdivisional Branches controlled 253 breeding bulls—109 purchased, 39 donated and 105 registered. These bulls served 3,055 cows and sired 1,424 calves according to the records kept.

30. *Activities in Rural Uplift Centres and Excluded Areas.*—Breeding bulls, he-goats, poultry and fodder were supplied to the Rural Uplift Centres. Where possible, Village Breeding Areas of the Livestock Section were located near Rural Uplift Centres. Many lantern lectures on animal husbandry were given in these centres.

3 cows and 8 sheep were supplied to the Deputy Commissioner, Naga Hills, from the Upper Shillong Farm for trial. In the North Cachar Hills, Rhode Island Red and White Leghorn poultry were supplied for schools and 10 stud goats, purchased from Sitamari, were supplied for villagers.

31. *Cattle Improvement in Tea Estates.*—There were 54 Government bulls on loan in tea estates, during the year. 4 bulls were sold in addition bringing the total number of bulls sold to tea estates to 65. Many more estates have applied for bul s. The Panitola Tea Gardens Cattle Improvement Association maintained 31 bulls in 13 estates. Similar Associations were formed at Namdong (Margherita), Doom Dooma, Amguri and Halem.

32. *Co-operative Milk Supply.*—The Gauhati Co-operative Milk Societies' Union continued to function satisfactorily and dealt with about 3½ maunds of milk daily. It earned a profit of Rs.310 for the year 1939-40.

33. *Poultry.*—Small flocks of poultry were maintained at the Government Farms at Upper Shillong, Khanapara, Jorhat and Titabar, totalling 171 in all. Cockerels and hatching eggs were distributed to village areas, mainly from the Upper Shillong Farm. An increase in the number of birds for issue is desirable and for this purpose the flocks in the farms must be increased. The Rhode Island Red breed and its crosses are most popular with villagers.

Duck breeding with types of local ducks was continued at Pukra, near Habiganj. Good results were obtained with two types called the White Breasted Nageswari and the Sylhet Mete, from which individual egg yields upto 157 and 155 eggs per year were obtained respectively.

34. *Goats and Sheep.*—The flock of goats maintained at the Khanapara Farm were increased to 53, using Jamnapuri and local crosses. 8 males were issued for breeding. 27 he-goats were purchased from the Sitamari Mela in Bihar and were distributed in villages. At the end of the year there were 54 Government he-goats in the districts, which served 3,031 she-goats and 2,692 offsprings were recorded.

A flock of 71 Bikanir sheep was maintained at the Upper Shillong Farm. The average wool yield was 5 lbs. 8 oz. in adult rams and 3 lbs. 15 oz. in adult ewes. 55 sheep were sold or issued, bringing the total of sale and issue since the beginning of this work up to 192.

35. *Buffaloes.*—Trials with Murrah buffaloes (imported from the Punjab) along with local buffaloes during the past few years have shewn that local buffaloes can yield more milk than was expected under good management. Local buffaloes have yielded upto 4,000 lbs. in a lactation with a daily yield of 7 seers, which nearly equals the yield of the Murrah buffaloes. It has, therefore, been decided that any buffalo breeding which may be done in future will be done with local buffaloes. One important reason for the low milking capacity of local buffaloes is that buffaloes are not stall-fed or properly domesticated ; they have to rely almost entirely on grazing.

36. *Fodder and Grazing.*—311 fodder growing demonstrations were carried out with Napier grass and Guinea grass for high land, and with Para grass (Mauritius grass), wild rice (Assamese-Uridal, Bengali-Jhora) and Keja for marshy and low land. About 100,000 root-cuttings were distributed. Para grass promises to spread fast. 23 demonstration silo pits were made. Cowpea and Soya bean were also demonstrated as fodder crops.

37. *Cattle Nutrition Scheme.*—Experiments under this scheme could not be started during the year under report as the Physiological Chemist could not be appointed (through the Federal Public Service Commission) earlier than April 1941.

CHAPTER VI

FINANCE

38. *Receipts and Expenditure of the Department.*—The net expenditure incurred during the year 1940-41 and the two previous years is shown below :—

—	1938-39	1939-40	1940-41
	Rs.	Rs.	Rs.
Expenditure	4,58,685	5,00,172	5,90,138
Receipts	58,951	58,249	59,270
Net Expenditure	3,99,734	4,41,923	5,30,868

39. *Financial position of the Farms and Seed Depots.*—The following statements show the actual financial position of the various experimental stations run by the Department and also of the three seed depots during the year under report :—

(*a*)

Name of the Station	Receipts, including value of farm produce and stock in hand and also free supply to exhibitions and other farms	Recurring expenditure	Net expenditure
	Rs. a. p.	Rs. a. p.	Rs. a. p.
1. Jorhat Experimental Station ..	2,024 5 9	15,019 15 0	12,995 9 3
2. Titabar Paddy Experiment Station	291 14 3	7,201 10 3	6,909 12 0
3. Karimganj Paddy Experiment Station.	3,499 10 3	11,274 4 0	7,774 9 9
4. Upper Shillong Farm	16,494 3 9	25,737 9 0	9,243 5 3
5. Khanapara Cattle Breeding Farm..	10,061 7 6	18,655 11 3	8,594 3 9
6. Sylhet Cattle Breeding Farm ..	7,877 5 6	20,866 14 9	12,989 9 3
7. Shillong Fruit Experiment Station	708 0 3	2,922 9 3	2,214 9 0

(*b*)

Name of the Seed Depot	Assets	Liabilities	Loss
	Rs. a. p.	Rs. a. p.	Rs. a. p.
1. Gauhati Seed Depot ...	13,644 3 0	14,129 0 0	484 13 0
2. Jorhat Seed Depot ...	13,066 2 9	13,692 5 9	626 3 0
3. Sylhet Seed Depot ...	16,513 2 6	17,937 11 6	1,424 9 0

CHAPTER VII

MISCELLANEOUS

40. *Agricultural Education.*—During the year under report no stipend was awarded for studying agriculture or animal husbandry. Of the 4 old stipendiaries of this Department at the Agricultural Institute, Allahabad, two passed the final B.Sc. examination in March 1941. Thus, at the close of the year there were two stipendiaries at the Agricultural Institute, all of whom were studying agriculture. The Agricultural Training Classes at Sylhet and Jorhat continued to function satisfactorily during the year, with the fifth batch of students in each.

41. *School Gardening.*—Gardening in schools, introduced with a view to impart an agricultural bias to young boys and girls, was continued during the year under report. It made satisfactory progress in the Surma Valley, where seeds, seedlings, etc., of vegetables were supplied to 77 schools. In the Lower Assam Valley, the work continued in 63 schools. In the Upper Assam Valley, however, it did not make any progress although the demonstration staff did their best to popularise this work. Seeds, etc., of vegetables were supplied to 19 schools in this valley.

42. *Agricultural Propaganda, Exhibition, etc.*—During the year under report, the Department participated in a good number of exhibitions and shows of which the following three may be mentioned—(*i*) Hill men's Exhibition at Lakhipur, Cachar, (*ii*) All Assam Muslim Students' Conference at North Lakhimpur and (*iii*) Lachit Mela at Jhanji in Sibsagar. The Agricultural Inspectors delivered quite a large number of lantern lectures on the improvement of agriculture and animal husbandry,

in addition to tendering advice to small groups of cultivators as opportunity occurred. The Livestock Section delivered 26 such lectures.

Attempts were also continued during the year for organising agricultural associations all over the Province and our efforts met with considerable success. The Livestock Improvement Association of Assam also continued to function during the year.

43. *Agricultural Publications.*—The following publications were issued during the year 1940-41 :—

Serial No.	Name of the publication	Remarks
1.	Tree Fodder (Assamese and Bengali).	Bulletin No.9
2.	Aquatic Grasses and Reeds for use as Cattle Fodder.	,, ,, 10
3.	Annual Report of the Department of Agriculture, Assam (in Bengali and Assamese).	,, ,, 11
4.	Propagation of Fruit Trees by Budding and Grafting	Bulletin No. 14
5.	Cultivated Fodder Crops and Grasses suitable for Assam (in Bengali).	,, ,, 15
6.	Compost Making in Assam ...	,, ,, 16
7.	Improved Methods of Paddy (*Aus* and *Sali*) Cultivation in Assam	,, ,, 17
8.	Possibilities of Green Manuring in Assam (in English, Bengali and Khasi).	,, ,, 18
9.	A Review of Agricultural Experiments in *boro* and *aman* conducted in the Habiganj Farm.	,, ,, 19
10.	Green Manuring of Sugarcane in Assam.	,, ,, 21
11.	Report on the Marketing of Rice in Assam.	,, ,, 23
12.	Sunnhemp Green Manuring	Leaflet ,, 42
13.	Citrus Green Bugs ...	,, ,, 43
14.	Preparing Turmeric for Market	,, ,, 44

Serial No.	Name of the publication	Remarks
15.	Crop Rotation	Leaflet No. 45
16.	Rural Uplift Series No.1 ...	,, ,, 46
17.	How to Keep Improved Paddy Varieties Pure and Store Seed Paddy.	,, ,, 47
18.	Analysis of Principal Manures and Fertilizers.	,, ,, 48
19.	Crop anchoring on soil environed by the surrounding atmosphere.	,, ,, 49
20.	Terraced Cultivation and Planting of Pollard Trees.	,, ,, 50
21.	Planting of Fruit Trees in the Hill-Slopes.	,, ,, 51

Serial No.	Name of the Publication.	Name of Author	Remarks
22	Assam	Dr. S. K. Mitra ..	Published in the *Indian Industries* and by the Publicity Officer, Assam.
23	Fodder and Cattle ..	Srijut L. N. Phukon ..	Published in the *Times of Assam*, 2nd November 1940.
24	Dry and Wet Terracing in Assam.	Mr. R. C. Woodford ..	Published in the *Indian Farming*.
25	Nature Study Training in our Village Schools.	Dr. S. K. Mitra ..	Published in the *Rural India*.
26	Inheritance of Earliness in Surma Valley Rice.	Dr. H. K. Nandi and Mr. P. M. Ganguly	Published in the *Indian Journal of Agricultural Science*.
27	Insoluble Phosphatic Manures in Acid Soils of Assam.	Srijut L. N. Phukon ..	Published in the *Science and Culture*.
28	Canning and Preserving of Fruits and Vegetables on a Cottage Industry Scale.	Dr. S. K. Mitra ..	Published in the *Rural India*.
29	Note on Agriculture and Animal Husbandry in Assam.	Babu S. Chakrabarti ..	Published in the *Indian Farming*, June 1940.
30	Ditto	Ditto	Ditto, December 1940.

44. *Visits and Inspections.*—During the year under report, a large number of persons visited our farms. The Hon'ble Minister for Agriculture visited the farms at Karimganj, Jorhat, Titabar and Khanapara, and the Vice-Chairman of the Imperial Council of Agricultural Research paid a visit to the Jorhat and Khanapara Farms. The Animal Husbandry Commissioner to the Government of India visited the farms at Sylhet and Khanapara. The Imperial Mycologists visited the farms at Karimganj, Jorhat, Burnihat and Sylhet, and the Imperial Entomologist paid a visit to the Jorhat Farm. The Imperial Economic Botanist paid a visit to the Habiganj Farm, and the Entomologist to the Common Wealth of Australian Council of Research paid a visit to the Titabar Farm. I inspected all the farms and seed depots and other officers inspected the farms and depots under their charge.

45. *Supervising Staff.*—I continued to hold charge of the Department throughout the year. Mr. S. Majid, was in charge of the Surma Valley till the end of the year under report. Late Mr. L. Barthakur, Special Rural Uplift Officer, Lower Assam Valley, continued to hold charge of the demonstration work and the seed depot in the Lower Assam Valley in addition to his own duties during the year under report. Late Mr. F. Haque was in charge of the Upper Assam Valley till 1st January, 1941, when he went on four months' leave on the ground of ill-health. Mr. K. K. De, continued to hold charge of the circle for the rest of the year. Mr. R. C. Woodford, Deputy Director of Agriculture, Livestock, was in charge of the Livestock Section and also continued to supervise the organisation of co-operative milk societies, jail dairies and the Provincial Livestock Improvement Association and its constituent branches. He was on leave for one month in October, when Mr. T. Hazarika officiated in his place. Mr. L. K. Handique, Senior Marketing officer, was in charge of the Marketing Section throughout the year. Dr. H.K. Nandi continued as the Economic Botanist, Assam, throughout the year. Mr. P. M. Ganguli, Officiating Economic Botanist, Deep Water Paddy Farm, Habiganj, continued to supervise the work of the Habiganj Farm throughout the year under report.

1941 has been an unlucky year for us, during which we lost two of our senior most Deputy Directors. Mr. F. Haque died in Calcutta in March 1941, and in October Mr. L. Barthakur passed away at Shillong. Much of the progress that this Department has achieved has been due to the untiring efforts of these two officers, whose initiative and driving energy will be missed by all of us.

46. *Subordinate Establishment.*—There were 29 Agricultural Inspectors in the Department, including 1 Fruit Inspector, 1 Inspector of Government Gardens, 5 Agricultural Inspectors, Livestock and 3 temporary Agricultural Inspectors—two for the Training Classes at Sylhet and Jorhat and one for power pump irrigation in the Surma Valley. There were also two Agricultural Instructors—one posted at Sadiya and the other at Aijal. There were 7 Farm Managers, including one for the Deep Water Paddy Research Farm, Habiganj. The number of permanent Scientific Assistants continued to be five, that is, one each for the Chemical, Mycological and Entomological Sections and two for the Botanical Section. One temporary Botanical Assistant, one Farm Manager, one Botanical Field Assistant and two Fieldmen assisted the Economic Botanist, Deep Water Paddy Research Farm, Habiganj, in his work. There were also one Chemical Assistant, one Assistant Farm Manager and one Fieldman at the Sugarcane Research Station, Jorhat. An Entomological Assistant, temporarily placed in the Surma Valley in 1936-37, continued to work there. A temporary Mycological Assistant, appointed from the 17th November 1938, was also engaged in investigating the problem of *pan* diseases in the Surma Valley up to the 31st March 1941. The Citrus Fruit Research Station, partly financed by the Imperial Council of Agricultural Research, was started near Burnihat on the Shillong-Gauhati Road in September 1938. One Horticultural Assistant, one Field Assistant and one Grafter Mali were working there up to the end of the year under report. The Animal Nutrition Scheme, partly financed by the Imperial Council of Agricultural Research, has been started with an Assistant Chemist at the Khanapara Farm since the 25th November, 1939. The appointments of the Physiological Chemist and the second Assistant Chemist for the scheme have not yet been made. During the year under report, 3 Assistant Marketing Officers continued to work under the Senior Marketing Officer, Assam.

During the year under report, the special staff, consisting of two Jute Inspectors and 5 Jute Demonstrators, were continuing the jute development work, which is being financed by the Indian Central Jute Committee.

There were 99 Agricultural Demonstrators, during the year. The Agricultural Inspectors, Instructors and Demonstrators, excluding the staff appointed by the Indian Central Jute

Committee and those for the Co-operative Milk Societies, were distributed as shown below :—

Assam Valley

District	Agricultural Inspectors	Agricultural Demonstrators
1. Kamrup ...	4 (including 2 Agricultural Inspectors, Livestock).	8 (including 1 Agricultural Demonstrators, Livestock).
2. Darrang ...	2	8
3. Goalpara ...	2	9 (including 1 Agricultural Demonstrator, Livestock).
4. Sibsagar ...	4 (including 1 Agricultural Inspector, Livestock, and 1 Agricultural Inspector, Training Class).	11 (including 1 Agricultural Inspector, Livestock).
5. Lakhimpur ...	2	6
6. Nowgong ...	1	6
Total ...	15	48

Surma Valley

District	Agricultural Inspectors	Agricultural Demonstrators
1. Sylhet ...	9 (including 1 Agricultural Inspector, Livestock, 1 Agricultural Inspector, Training Class and 1 Agricultural Inspector, Pump Irrigation).	26 (including 1 Agricultural Demonstrator, Livestock).
2. Cachar ...	2 (including 1 Agricultural Inspector, Livestock).	7 (including 1 Agricultural Demonstrator, Livestock).
Total ...	11	33

Hill District

Hill Districts	Agricultural Inspectors	Agricultural Demonstrators
1. Khasi and Jaintia Hills.	1	5
2. Lushai Hills ...	1 (Agricultural Instructor) ...	2
3. Naga Hills ...	.....	4
4. North Cachar Hills Subdivision.	.....	2 (excluding 2 temporary terraced Rice Instructors).
5. Garo Hills ...	.....	2
6. Sadiya Frontier Tract.	1 (Agricultural Instructor) ...	2
7. Balipara Frontier Tract	.....	1
Total ...	3	18

Total.—Agricultural Inspectors 27
Agricultural Instructors 2
Agricultural Demonstrators... 99

47. *Appreciation of Services*.—My thanks are due to Rai Saheb S. C. Ghosh, Director, Veterinary Department, who helped us ungrudgingly in our livestock improvement activities. The Honorary Organisers, as usual, assisted us in all possible ways. I would also thank my colleagues and subordinate officers who rendered me every assistance in carrying out the work of the Department.

Lastly, I would like to mention the services of Babu Sudhirendranath Chakrabarti, B.A. (Hons.), my officiating Stenographer, who ably helped me in writing up this report.

APPENDIX I(*i*)

CULTIVATION OF BORO PADDY ON PRECARIOUS AMON LAND UNDER IRRIGATION BY POWER PUMPS.

During the year under report, the Department had 25 power driven pumps in all, 18 in the Surma Valley and 7 in the Assam Valley. A brief account of the work done with these pumps is given below.

Surma Valley

In the Surma Valley, the demonstrations with power pumps were conducted by a Special Agricultural Inspector, under the supervision of the Deputy Director of Agriculture, Surma Valley. There were altogether 18 pumps, of which 12 were issued for demonstration. One of these pumps, however, broke down and operations at the centre concerned had to be discontinued. So 11 pumps were actually employed in demonstration. With the help of these 11 pumps, an area of 782 acres of land were put under *boro* paddy, from which an estimated yield of 23,460 maunds of paddy, at the rate of 30 maunds per acre, was obtained. The total value of the produce, at the rate of Rs.2-8 per maund (the current market rate), would come to Rs.58,650. The total expenditure incurred for running the pumps amounted to Rs.7,593, of which the cultivators would pay Rs.3,785. Thus at a cost of Rs.3,808 to the Government the cultivators reaped a harvest of 23,460 maunds of paddy from land which ordinarily goes without cultivation of any sort.

The average area cropped per machine came to about 71 acres and the average cost per harvested acre came to about Rs. 9. The working expenses were somewhat higher than that of the preceding year. But this was due to the increase in price of mobile and Diesel oil. The price of the former rose from Re.1-15 per gallon in 1939-40 to Rs.2-5 during the year under review, while that of the latter rose from Rs.60-4-0 per ton to Rs.79 during the same period. During the year under report, each pump worked on an average for 1,101 hours compared to 1,145 hours of the previous year. The average consumption of fuel and lubricant per machine was 400 and 70 gallons respectively, compared to the last year's average of 400 gallons of fuel and 50 gallons of lubricant.

Assam Valley

The number of pumps in the Assam Valley was 7, of these 2 were in Upper Assam Valley and 5 in the Lower Assam Valley. The Agricultural Inspectors of the Circles concerned conducted the operations under the supervision of the Deputy Director of Agriculture in the Upper Assam Valley and the Special Rural Uplift officer in the Lower Assam Valley. In the Lower Assam Valley, with the help of 4 pumps—of the 5 pumps in this valley one was not used—55 acres were put under *boro*, from which an yield of 1,029 maunds of paddy was obtained. The total expenditure for running the pumps came to Rs.773, of which the cultivators paid Rs.201-13-6. In the Upper Assam Valley, two pumps irrigated an area of 58 acres. The crop did well under irrigation and a good harvest was expected. But a storm in April and constant rain up to the middle of May damaged the crop very severely, as a result of which a very poor outturn of paddy was obtained. The total working expenses amounted to Rs.526, of which the cultivators paid Rs.39 only.

RURAL UPLIFT

The Rural Uplift Campaign, launched during the previous year, made satisfactory progress during the year under review, during which there were 34 centres—each under a Rural Organizer. Of these, 15 centres were in the Surma Valley, 7 in the Upper Assam Valley and 12 in the Lower Assam Valley. A brief report of the activities conducted in these centres is given below, separately for each Valley.

SURMA VALLEY

During the year under report, there were 15 Rural Uplift Centres in the Surma Valley—12 in Sylhet and 3 in Cachar. A list showing the centres subdivision-wise is given below :—

SYLHET DISTRICT

Subdivision	Rural Uplift Centres
1. North Sylhet	1. Tajpur.
	2. Bhadeswar.
	3. Jaintiapur.
2. South Sylhet	4. Kamalganj.
	5. Kulaura.
3. Karimganj	6. Beanibazar.
	7. Gangajal.
4. Sunamganj	8. Jagannathpur.
	9. Jamalganj.
	10. Pagla.
5. Habiganj	11. Nabiganj.
	12. Shaistaganj.

CACHAR DISTRICT

1. Silchar	13. Narsingpur.
	14. Buribail.
2. Hailakandi	15. Chandrapur.

A detailed account of the work carried out in these centres is given in the following pages.

1. TAJPUR RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on 14th February 1940. The centre includes 34 villages. The following work was done at the centre during the year under report.

Common Hall.—A Common Hall situated at a central site, near the bazar and the Mangalchandi High School, was built on a site donated by some people.

Road.—Three roads, covering a distance of 2¼ miles, were constructed and a few more repaired.

Medical help.—About 250 persons in Shibpur and Tahirpur villages were inoculated against cholera and 50, mostly children, were vaccinated against smallpox. Homeopathic drugs were kept at the centre for treating simple ailments.

Sanitation.—People were apprised of the harm that results from scattering house wastes all around the homested and were shown how to conserve and utilize them as manure. Two persons of Esabpur and Tahirpur begun preserving all household wastes in pits. Seven bore-hole latrines were made in Haringar, Thanabazar, Tajpur, Eshabpur, Osmanpur, Tahipur and Pachpara.

Weaving.—Two hand looms were provided—one at the Common Hall and the other at Mullapara. Four students were working in the former and two at the latter. A training in jute weaving was given to some people in Tajpur bazar by the Weaving Demonstrator. One of the trained men took to weaving jute bages.

Cattle Improvement.—Eighteen scrub bulls were castrated in Pariarkhai, Tahirpur, and Mulapara, and about 350 cattle were vaccinated in Osmanpur, Tahirpur, Pachpara, Shiboampur and Baraya.

Napier and Para grasses were grown in two demonstration plots at Tajpur and Ilashpur.

Preservation of Manure.—Six manure pits were made in Eshabpur, Routhkhai, Tahirpur, Pariarkhai and Osmanpur and the necessity of preserving cowdung under covered sheds were explained to the people.

Distribution and sale of seeds.—Six hundred sugarcane setts were distributed in Huzri, Osmanpur, Mullapara and Tahirpur. Fifteen to twenty seedlings each of cabbage, cauliflower and tomato were distributed at nine villages. Thirteen maunds of potato tubers and 4½ mds. of sail paddy seeds were sold.

Education.—About 100 books were collected from various sources for the library, housed in the Common Hall.

Demonstration plot.—Thirty papaya and 60 arecanut seedlings were raised and 8 litchi and 3 kagji grafts, 150 arecanut plants, 6 Jahaji and 35 Champa banana plants were planted in the demonstration plot. Napier grass and dhaincha were also grown for green manuring. Winter vegetables and rabi crops were grown with moderate success in the demonstration plot.

2. BHADESWAR RURAL UPLIFT CENTRE

Common Hall.—A Common Hall was erected on a tilla, which was donated by Maulvi Najimuddin Chowdhury. It commands a magnificent view.

Nursery.—One hundred and twenty pineapple suckers, 1 Dingamanik, 6 Sapri, 26 Champa, 5 Sail and 4 Athia banana plants, 40 arecanut and 29 guava plants were planted in the nursery. Twelve litchi and 6 lemon grafts were also planted. Cabbage, cauliflower, carrot turnip, tomato, egg-plant, chillies, tobacco (pusa 18 and Bhengi) and sugarcane (Co. 213) were also, grown successfully during the winter.

Distribution of seeds and seedlings.—Rainy season vegetable seeds, *viz.*, Karala, Denga, Kumra, Cucumber, Barsati tomato, Barbati and water melon were distributed amongst cultivators. 2 maunds of Latisail and 2 maunds of Aus jaria were also supplied to the cultivators. English vegetable seedlings were raised in the nursery and distributed and sold to 14 cultivators of the locality. The growers were advised from time to time. The crop was satisfactory. As a result of propaganda there has been a large increase of vegetable cultivation, which has now doubled. Tobacco and Langli brinjal seedlings were also distributed amongst cultivators.

Livestock Improvement.—Inoculation of cattle in the centre was promptly carried out while an epidemic broke out during the rainy season. Eight bulls were castrated. One breading bull was given by the Livestock Section. It covered 5 cows In Purbabhag two demonstrations with fodder grasses (Para and Napier) were organised. One dozen White Leg Horns and one dozen Rhode Island Reds were issued for demonstration. Three of these are alive and rest died of various diseases.

Roads.—The following roads and bridges were constructed—

(*a*) From the Common Hall to the private road of Maulvi Nazimuddin Chowdhury—150 yds. long.

(*b*) From the main road of Purbabhag to the Nursery road—400 yds. in length.

(*c*) Two permanent bridges in village Dakshinbhag.

Sanitation.—Three nalas serving as drains, two in Purbabhag and one in Maizbhag, were cleaned and re-dug. Eighteen private tanks were cleared. A number of windows were opened in houses in Dakshinbhag, Miabhag, Purbabhag, Paschimbhag and Sheikpara.

Weaving.—Two weaving looms were placed for demonstration. Four persons were working them. Weaving was unknown in this centre before.

Education.—A night school was started in Dakshinbhag.

Propaganda.—Two lantern lectures were delivered on rural reconstruction by the Agricultural Inspector.

3. JAINTIAPUR RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on the 28th January 1940. The centre includes a wide area embracing 36 villages.

Common Hall.—A Common Hall was erected in a plot behind the Thana compound, near the Inspection Bungalow.

Nursery.—The whole jungle surrounding the plot was cleared and levelled. Pineapple, plantain, arecanut, English vegetables, radish, groundnut, potato, papaya, orange, mustard, tejpata, pan, black-pepper, noona, castard apple, wild clachi, Kagji and Batabilebu were grown at the demonstration plot, which it is proposed to develop as a nursery. Seedlings of English vegetables were raised and supplied to the villagers.

Distribution of seeds.—Amon, sail, murali, and *boro* paddy seeds of improved types were issued on return system to the cultivators. Some of the seeds were destroyed by flood and some by drought. Eleven maunds of seeds were realised and would be issued on this basis to other cultivators with a view to extend their cultivation.

Manure pits.—30 covered and 42 uncovered manure pits were made in Jaintiapur, Malifoud, Dhupi, Dagari, Rani, Darbast, Sreekhol, Soya, Kakunakhai, Noakhel and Baurbarag.

Livestock.—The area being an important centre for cattle propaganda for improvement of bulls was carried on. Eleven bulls, maintained by the Livestock Section, covered 282 cows during the year in this centre. One dozen white Leg Horn and two dozen Rhode Island Red eggs were distributed to cultivators. Of the chickens hatched, 8 were living and the rest died of various diseases. Weedy bulls were castrated and cattle were inoculated by the Veterinary Assistant Surgeon.

Sanitation.—Jungles by the road sides and adjoining dwelling houses were cleared. Four bore-hole latrines were made. Fourteen windows were opened in the houses of 8 cultivators.

Education.—Three night schools at Jaintiapur, Darpast and Soya and two primary schools at Nishichenlapur and Lasmigram were established.

Communication.—Village paths, covering a distance of 5½ miles, were repaired.

Bee-colonies.—Eleven bee-colonies were working well. Attempts for establishing more colonies were made.

Propaganda.—Over four lantern lectures were delivered by the Agricultural Inspector on rural reconstruction. The Additional District Magistrate gave a cinema show on pineapple cultivation.

4. BEANIBAZAR RURAL UPLIFT CENTRE

Common Hall.—A Common Hall was constructed on the demonstration plot which was donated by Babu Promotha Nath Das, an Honorary Organiser of this Department.

Demonstration Plot.—Two thousand seedlings of English and country vegetables were grown successfully in the demonstration plot. Thirty litchi and Kagzi grafts were planted. Black pepper cuttings, pineapple suckers and orange plants, were also planted. Castor seeds were also sown. Orange and arecanut plant nurseries were made and plants would be distributed to villagers from this centre.

Distribution of seeds and plants.—Fourteen maunds of Ausjaria, Latisail, Ar. C. 353/148 and Amon II were distributed on the return system, which were realised later on. These seeds will be distributed again in order to extend the cultivation of improved varieties. Litchi and Kagzi grafts were distributed amongst the villagers. 2,950 seedlings of English and country vegetables were sold and 5,725 distributed.

Livestock.—The he-goat supplied by the Livestock Section gave 90 services. Eggs of White Leghorns were distributed amongst the villagers.

Road.—Roads, covering 8¼ miles, were constructed and repaired during the year under report.

Sanitation.—Six bore-hole latrines were made. People were instructed to cut windows in their houses and to keep their surroundings neat and clean.

Education.—One Middle English Madrassa was established at Chotodesh. Four night schools, one at Chotodesh, one at Nayagram, two at Mathura were reported. One Middle Vernacular School with agriculture as one of the subjects of instruction, was started at Dasgram.

Veterinary Aid.—About 1,000 cattle were vaccinated. People were given necessary instructions to save cattle from anthrax and other diseases.

Weaving.—Five spinning machines were distributed and one kept with the Organizer. About ¼ seer of *eri* silk was spun. One jacquard loom was supplied to the Supatola Weaving School for instruction in weaving designed textiles.

5. GANGAJAL RURAL UPLIFT CENTRE

A Common Hall was constructed on a plot of three bighas of land, which was made available to us by the Local Madrassa Committee. The people supplied the material for the hall and the department gave the corrugated sheets.

Road.—Roads, covering about 3 miles. were constructed during the year under report.

Clearing of Tanks and Jungle.—Ten tanks were excavated and five re-excavated at the villagers' cost. At Nij-Gangajal, 4 private tanks were cleared by the owners according to our instructions. 3 tanks in Halahat and 4 in Issapore were also cleared of water hyacinth and other weeds. Ten bighas of jungles were cleared in the centre.

Sanitation.—About 50 houses were made in the whole locality by the villagers in different places with sufficient doors and windows. People were instructed to keep their houses neat and clean and the surrounding tidy. They were also instructed to construct their cattle shed at a reasonable dis tance from dwelling houses.

Livestock.—Sixty weedy bulls were castrated. A he-goat was kept at the centre for breeding, but it died. Before death, it served 12 she-goats. One dozen Rhode Island Red eggs were issued to villagers. The hatched chicken all died.

Manure pits.—One hundred manure pits were made for preserving cow dung. Villagers were realising the value of this practice.

Demonstration Plot.—English vegetables and tobaco were grown successfully in the demonstration plot.

Distribution of seeds and plants.—Eight maunds of improved varieties of paddy were distributed amongst the villagers. 1,200 English vegetable seedlings were distributed amongst them together with tobacco seedlings.

Weaving.—Two looms were kept at the centre and some of the villagers were learning weaving. Six spining machines were also provided.

Education.—Three night schools were organised—one each at Gangajal, Illabaz and Geschna.

6. JAGANNATHPUR RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on the 24th January 1940. Twelve villages within a radius of 2 miles have been included in the centre.

Road.—One road, 150ft. in length, was constructed. Some village paths of Jagannathpur, Bara Jagannathpur and Ghosegaon were reconstructed. Four bamboo bridges were also made.

Sanitation.—Jungles were cleared in Bara Jagannathpur, Jagannathpur, Bhowanipur, Chilaura and Ghosegaon. Drains and nalas were also made. A very old tank, known as Ratbari tank, near the Middle English School, Jagannathpur was re-excavated. Five bore-hole latrines were made in Bara Jagannathpur by Babu Mahendra Kumar Paul.

Improvement of Cattle.—Most of the village cattle were inoculated against Rinderpest. Breeding bulls were placed in Majidpur, Chilaura, Ghosegaon, Hiranpur, Jagannathpur, Bhowanipur, Khshabpur, Bara Jagannathpur, Sachayani and Syedpur.

Distributton of seeds.—Thirteen maunds and five seers of *amon* and *boro* paddy seeds were distributed on return system in Jagannathpur, Habipur, Bara Jagannathpur and Shillong potato, Ladys' finger, Water melon, Barsati tomato, Kerala, Brinjal, Cabbage, Cauliflower, Khol-robi and tomato were also distributed amongst the cultivators. Baniachong Kachu was also introduced in that centre.

Planting of trees.—On the bank of the tank dug by Rahat Ulla of Habibpur, banana, cocoanut and betelnut trees were planted at the instance of the Organiser. The owner was intending to plant bamboo and karach.

Construction of bunds.—To protect paddy fields from flood the following bunds were constructed :—

	Dimension	Value of work
		Rs.
(*a*) Boalidair to Charalchapri ...	60′×10′×8′	254
(*b*) East of Samdal river ...	300′×16′×15′	144
(*c*) Hooglia dao	60′×16′× 8′	28
(*d*) Barakandi	50′×10′× 9′	14

Co-operative.—A Co-operative Saving Society was formed at Jagannathpur Bazar in order to encourage thrift among the members, who would also receive help from the Society at the time of distress. Three paddy societies—two at Syedpur and the other at Bhowanipur, were organised. Three weaving societies—one at Syedpur, one at Jagannathpur and one at Bhowanipur, were organised. Weaving was carried on under these societies which helped the workers in getting raw materials and marketing the finished products.

Silo pits.—Two silo pits for keeping fodder were dug by Babu Rajani Kanta Roy and Maulvi Basir Ali Mia of Bara Jagannathpur.

Manure pits.—For the preservation of cowdung and the utilisation of wastes 16 manure pits were made in this centre.

Village Defence Party.—Two defence parties, one in Syedpur and the other at Bara Jagannat pur, were organised. Two cases of rioting at Jagannathpur Bazar and Bara Jagannathpur were amicably settled.

7. JAMALGANJ RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on the 28th March 1940. It embraces 18 villages within a radious of 2 miles.

Education.—Ten night schools were organised at Sachna, Jamalganj, Rahimpur, Surlapur, Noaholat, Kamlabaj, Kamlabaj II, Lambak, Silmostpur and Fatepur. There were 25 students in each of the schools. One Lower Primary School was started at Fatepur.

Sanitation.—Jungles were cleared and water hyacinth removed from tanks in Kamlabaz, Golamipur, Jamalganj and Mamadpur. Twenty windows were cut in the houses of the cultivators in the different villages.

Demonstration plot.—In the demonstration plot, denga, karela, shasha, cabbage, Kholrabi, turnip, tomato, cauliflower and peas were grown. Seedlings of some of the English vegetables were distributed among the cultivators.

Distribution of seeds.—Three maunds 20 seers of Habiganj Amon II seeds, 2 maunds of Kerr sail and 8 maunds of other paddy seeds were distributed. One maund 22 seers of Shillong potato, 10 packets of Pusa tobacco, 20 packets of chillies, 955 seedlings of kachu, 3 tolas of muktakeshi brinjal seeds were distributed among the cultivators.

Manure pits.—Twenty-four manure pits were made.

Cattle.—Eight hundred cows of Noahalat and Kamlabaz were inoculated against Rinderpest.

Propaganda.—Two lantern lectures were delivered by the Agricultural Inspector at Jamalganj and Lambabak. Six lectures were delivered on public health by Dr. K. S. Das, Secretary, Jamalganj Rural Uplift Centre. Four lectures were delivered by the Sub-Inspector of Schools on educatoinal subjects.

One quarrel in Telia was amicably settled.

8. PAGLA RURAL UPLIFT CENTRE

This centre consists of 29 villages.

Education.—Sixteen night schools were organised in Pagla Paschim, Pagla Purva, Durgapasha, Joykalash, Birgaon, Hashkuri, Bobmoha, Chikerkandi, Akhtapara, Sultanpur, Assampur, Parvatipur, Kararai, Kamrup, Basiakhauri and Jaysidhur.

Sanitation.—Five hals of jungles were cleared and 26 tanks cleared of water hyacinth. In thirty houses five doors and forty windows were cut. Twenty-nine bore hole latrines were made in Pagla, Sibpur, Baramaha and Basiakhauri.

Roads and bunds.—The old bund (5,280′ × 10′ × 2′) of village Bhumria were reconstructed. It has made possible the cultivation of boro on 300 hals of land. In Sibpur a bund (660′ × 7′ × 2′) was put up for irrigating 30 hals of boro land. In Durgapasha to protect amon crops from flood and water hyacinth a bund (covering one mile) was constructed. In Baramoka to irrigate 18 hals of boro, a bund 24 feet × 10 feet was made. One bamboo bridge to Pagla village on the road from Pagla I. B. about 30 feet long was made by the people themselves with materials supplied by villagers.

Demonstration plot.—Lady's finger, kerella, barsati tomato, jhinga, cabbage, cauliflower, kholrabi, radish, potato and mustard were grown successfully in the demonstration plot.

Distribution of seeds,—Ten maunds 20 seers of Habiganj Amon II and 15 maunds of Habiganj Amon I seeds were distributed on return system.

Live stock,—A breeding bull was kept at Pagla. Cattle of Asthama, Kamrup, Pagla, Chandpur, Raipur, Kandigaon, Tegharia, Assampur, were inoculated against Rinderpest.

Propaganda.—Two lantern lectures were delivered by the Agricultural Inspector, North Sylhet on the improvement of agriculture and cattle.

Co-operative.—Three paddy societies were organised in Purangovindpur, Govindpur, and Chikerkandi.

Village disputes were amicably settled.

9. NAB GANJ RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on the 8th April 1940.

A plot of land for the Common Hall and Demonstration plot was obtained on the opposite bank of the Barak. A tank was constructed along with a labour shed.

Agricultural work.—Forty maunds of Habiganj Amon II seeds were distributed in 13 villages of the centre. Seventeen packets of country vegetable seeds were also distributed in order to popularise the cultivation of vegetables among the cultivators. Ten maunds of boro seeds were also distributed. Some English vegetable seeds were distributed and also sold at the centre

Education.—Seven night schools were started at Jantari, Ganda, Nabiganj, Kanaipur, Purba Timirpur, Pachim Timirpur and Jaynagar. Only one was financed by the Mass Literacy Campaign. A Girls' School was started at Chargaon.

Roads.—The construction of the following roads were taken up and completed partly by voluntary labour and partly with help from the Rural Reconstruction Grant.

(*a*) Chargaon Ganganagar Road ... ... ½ mile.
(*b*) Ganda Road ... ... ¼ mile.
(*c*) Jantari Road ... ... ¼ mile.

Manure pits.—Forty covered manure pits were made in the villages in the centre.

Water hyacinth eradication.—Twenty-three tanks were cleared of this pest. A water hyacinth week was observed between 21—27th June 1940 and a large area of khal and paddy land was cleared.

Excavation of khal.—Two khals were excavated at Jantari and Kargaon.

10. SHAISTAGANJ RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on 9th April 1940.

Education.—Two night schools were established at Shaistaganj and Birampur. One batch has passed through each and a second batch has been admitted.

Roads.—A few roads were repaired in the villages—Narapati, Baliari and Chanao, covering 2¼ miles.

Demonstration plot.—The demonstration plot was duly prepared and different English vegetables were grown with success. Two manure pits were dug. Some banana plants (Kulpati and Champa) were planted. A tube well donated by the Sub-divisional Officer, Habiganj was put up in the plot. With the tube-well the demonstration plot was irrigated. Villagers also took drinking water from it.

Distribution of seeds.—Fifteen packets of country vegetable seeds were distributed. Fifty maunds of superior varieties of sail paddy and 20,000 setts of Co.213 sugarcane were distributed on return system.

Implements.—One sugarcane crushing mill, one *gur* boiling iron pan, one Kirlaskar plough, one Planet Junior hand hoe and some small garden implements were purchased for demonstration.

Livestock.—One bull was maintained at the centre for covering village cows.

Manure pits.—Twenty-three manure pits were made in this centre.

Propaganda.—One lantern lecture was delivered by the Livestock Section and three by the General Section at Saistaganj, Kutirgaon and Narapati.

Water hyacinth.—Four tanks were cleared of this pest at Abahata, Rajakpur, Hatikandi and Chano.

11. KAMALGANJ RURAL UPLIFT CENTRE

This centre was formally opened by the Senior Extra Assistant Commissioner, South Sylhet on the 16th March 1940. The villages included in the centre are, Kumrakapan, Gobardhanpur, Kusalpur, Chandipur, Kamargaon Panichola and Ballarpar.

Education.—The following schools were started during the year under the initiative of the Rural Uplift Organiser.

(*a*) Langurpar Lower Primary School	...	40 students.
(*b*) Kumrakapan Night School	... ...	12 ,,
(*c*) Gopalpur Lower Primary School	...	45 ,,
(*d*) Srinathpur Night School	... ...	15 ,,

Sanitation.—Thirty-one covered and 168 uncovered manure pits were made and nalas and jungles cleared. The necessity of the sanitary methods were explained to villagers who were induced to keep clean the surroundings of their houses. Some of the old tanks in Kumrakapan and Usirpur were cleared of water hyacinth and other water weeds.

Roads and bunds.—The following roads and bunds were either constructed or reconstructed by the villagers under the initiative of the Organiser. A sum of Rs.60 was contributed by the Department for the purpose. In most cases the villagers worked themselves.

(*a*) Baligaon Road, (*b*) Satak Road, (*c*) Kandigaon Road, (*d*) Kumrakapan Road, (*e*) Tilakpur Road I, (*f*) Tilakpur Road II, (*g*) Nashratpur Road, (*h*) Kumrakapan Bund, (*i*) Rompassa Bund, (*j*) Alepur Bund and (*k*) Langurpar Bund.

Demonstration plot.—Potato, khesari, masuri, mung, gram, oat, wheat, brinjal, cabbage, cauliflower, khoirabi, radish and turnip were grown in the demonstration plot. The crops did very well in the beginning but afterwards suffered from excessive drought which resulted in poor yield.

Distribution of seeds.—The following seeds of improved paddy varieties were issued on return system amongst the cultivators :—

Dumai 138/6—worth Rs.2, Murali—worth Rs.4, Kachalat—worth Rs.2, Latisail—worth Rs.8, Nagrasail—worth Rs.12 and Badshabhog—worth Rs.2.

Jhinga, karella, barsati tomato and radish seeds, worth Rs.2-13-0, were sold by the Rural Uplift Organiser.

Livestock.—Improved bulls for breeding purposes were placed at the villages—Tilakpur, Ballarpar, Chandipur, Rampassa. Cattle of the villages were inoculated against Rinderpest. Two dozen eggs of Rhode Island Reds and White Leghorns were distributed amongst the villagers.

Weaving and Sericulture.—Looms and yarns were received for introducing weaving in this centre, but because of want of *charka* the work could not be started. One thousand mulberry cuttings were distributed. The plants did not succeeded. Six eri-spinning charkas were received.

Propaganda—The Rural Uplift organiser delivered several lectures on different rural uplift subjects to the villagers. Two lantern lectures were also organised and they were attended by a large number of villagers.

Co-operative efforts—One Young Men's Association at Belagaon was formed. A quarrel of 20 years' standing at Baligaon was amicably compromised through the efforts of the Organiser. A very successful Agricultural Association was started at Tilakpur, the centre of the vegetable growing industry in the subdivision.

12. KULAURA RURAL UPLIFT CENTRE

This centre was formally opened by the Hon'ble Minister of Agriculture on the 26th January 1940.

Education—The following schools were started through the efforts of the Rural Uplift Organizer :—

(*a*) A Girls' Lower Primary School at Kulaura—40 students, (*b*) a Girls' Middle Vernacular School with Maktab classes at Kulaura with 35 students (*c*) a Boys' Lower Primary School Maktab at Behala with 32 students, (*d*) a Boys' Maktab at Joypassa and (*e*) a Night School at Sadekpur.

Sanitation.—Drains were dug and jungles cleared. Water-hyacinth was removed from the tanks at Sadekpur, Magura and Behala. Windows were cut in 15 houses which were without windows and 30 manuring pits were made.

Roads.—A number of roads, covering about 2 miles, were made. These were done by the villagers themselves under the initiative of the Rural Uplift Organiser, only a little contribution being made by the Department. Three of the roads are motorable. Two tanks of Magura and one of Sadekpur were reclaimed and made fit for drinking purposes in the course of earth work for these roads.

Demonstration plot.—Practically nothing could be done in the demonstration plot on account of the excavation of the tank and the raising of the land. A few plants of cabbage and cauliflower were planted. Shillong potatoes and peas were also sown but they were destroyed on account of the raising of the land by earth from the tank. 12 cocoanut and 18 lichi plants were planted in the plot.

Distribution of seeds.—The following seeds were distributed on return system :—

Aus paddy—6 mds., *Sail* paddy—18 mds. 20 seers, Sugarcane setts Co.213—3,500.

The following seeds were issued for demonstration :—

Pusa tobacco—9 packets, Bhengi—10 packets, Chillies—9 packets, Karella—1 packet, cucumber—1 packet, tomato—3 packets, Shillong potato —20 seers, Pan—80 cuttings and Black pepper—25 cuttings.

Weaving and Spinning.—There was no hand loom weaving industry in this centre before the scheme started. Three fly shuttle looms were working during the year and 15 students were attending the weaving class. In all, 44 towels and a shirting piece were woven. Rupees 10-14-6 were realised from the sale of these articles.

Livestock.—Cattle of Sadekpur and Behala Sonapur were inoculated against Rinderpest.

Propaganda.—The Rural Uplift Organizer delivered a large number of lectures to villagers on different subjects of rural welfare.

13. NARSINGPUR RURAL UPLIFT CENTRE

This centre was formally opened on the 23rd March 1940. It comprises the following villages :—

(1) Meharpur, (2) Jatrapur, (3) Salehpur, (4) Salgangapar, (5) Singarigram, (6) Kaluganj, (7) Pakairpar, (8) Portion of Claber House and (9) Balijur.

About 4 bighas of land were made over to us by the villagers for a nursery and demonstration plot. A Common Hall, 35′×15′, was constructed on this land. The Hall has three rooms, one of which is used as a seed store, another as Common Hall and the third for accommodating the Organiser.

Village Survey.—The villages included in the centre were surveyed during the year under report. The total area of these villages is about 6 square miles, the number of families 733, and the total population 3,874, of which 1,935 are male and 1,879 female.

There are three Boys' Lower Primary Schools, 1 Boys' Middle Vernacular School, 1 Boys' Middle English School, 4 Girls' Lower Primary Schools and 1 Girls' Middle Vernacular School in these villages. The percentage of literacy is 19·2.

The culturable area in the centre is about 2,129 acres and the distribution under different crops is, *aus* paddy—660 acres, *sail*—1,294 acres, *asra*—262 acres, *amon*—33 acres, jute—4 acres, sugarcane—13 acres, oilseeds—80 acres, potato—39 acres, tobacco—10 acres, chillies—10 acres and vegetables —12 acres.

In this centre there are 323 bullocks, 333 calves, 10 bulls (local), 1 bull of superior breed, 50 milch buffaloes, 435 draught buffaloes and 110 goats. The grazing area is about 11 acres.

There are 80 tanks and wells in these villages—70 are used for drinking only, the rest are not fit for drinking purpose.

Mango, jack fruit and banana are the principal fruits grown.

Marketing facilities are quite good. At a very short distance there is a good market named Nutanbazar. The Silchar market is only 12 miles away and there is a regular bus service from the locality to Silchar.

Distribution of seeds.—Thirty-eight maunds of seeds of different paddy varieties were distributed on return system amongst 102 cultivators. Thirty packets of rainy vegetable seeds and 40 packets of English vegetable seeds were also distributed amongst the cultivators.

Manure pits.—Sixteen covered manure pits were made by the people at our instance for properly preserving cowdung.

Fodder grass.—Napier, Para and Guinea grasses were grown in our demonstration plot and also by a few cultivators with success.

Livestock.—One bull and one he-goat were placed at the centre for serving cows and goats. The goat unfortunately died. The bull was rendering good service.

Inoculation against Rinderpest.—The Veterinary Assistant Surgeon, Silchar inoculated 1,359 cattle against rinderpest.

Propaganda.—The Agricultural Inspector, Cachar delivered one lecture with magic lantern regarding rural uplift work. About 500 people attended it.

Demonstration plot.—The demonstration plot was properly fenced. During the winter, a very good crop of English vegetable and potato was grown. Due to drought the crop did not do very well. Some fruit trees were also planted.

Night School.—One night school for adults was started. The Organiser was acting as a teacher. There were 13 students and classes were held in the Common Hall.

Weaving.—A jacquard loom was supplied in the centre and this was in operation during the year.

Sanitation and Hygiene.—People were insturcted to open out windows in their houses.

Towards the end of the year, an augar and tripod was supplied to the rural uplift centres in Cachar and people were being encouraged to go in for bore hole latrines.

14. BURIBAIL RURAL UPLIFT CENTRE

The centre was opened by the Deputy Commissioner, Cachar, on the 24th March 1940. The centre comprises the Buribail village.

Six bighas of land on the bank of the Barak was obtained for the demonstration garden. A Common Hall (35′×15′) was constructed for storing seeds, accommodating the Organiser and for holding meetings.

Village Survey.—The village is inhabited by 310 families and its total population is 2,025. There are two Boys' Lower Primary Schools and one Girls' Lower Primary School. The percentage of literacy is 14·2. The culturable area is 1,650 acres. *Aus* paddy covers 666 acres, *sail* paddy—688 acres, jute—4 acres, sugarcane—1 acre, oilseeds—25 acres, potato—20 acres, tobacco—3 acres, chillies—13 acres and vegetables—50 acres. There are 231 cows, 32 bullocks, 10 bulls, 166 calves, 120 milch buffaloes and 285 draught buffaloes. The total number of goats is 569 and the grazing area is 24 acres. The total number of tanks and wells is 50, of which 10 are useless.

Mango, banana, guava, jack fruit are the principal fruits.

Marketing facilities are good. There is a small bazar in the village. The cultivators can attend the Silchar and Sialtek Bazars, which are at a distance of 7 miles.

Distribution of seeds.—Thirty-seven maunds of different varieties of paddy were distributed on return system amongst 76 cultivators of the village. Twenty-six packets of rainy season vegetable seeds and 22 packets of English vegetable seeds were also distributed amongst the people.

Manure pits.—Five manure pits were made for preserving cowdung.

Fodder grass.—Para grass roots were distributed amongst cultivators. They grew it well. It was also grown successfully in the demonstration plot.

Cattle Improvement.—One improved he-goat was kept in the centre for serving village goats and a few kids were born to it during the year. The Veterinary Assistant Surgeon inoculated about 150 cattle against Rinderpest.

Poultry.—Eight eggs of ducks and 12 eggs of Rhode Island Reds were supplied to the people and these were hatched.

Lantern lecture.—The Agricultural Inspector, Cachar delivered one lecture with the help of a magic lantern regarding rural uplift work. It was attended by 300 villagers.

Night Schools.—Two night Schools were started in the centre ; about 25 adult students were reading in the schools.

Demonstration plot.—During the winter, English vegetables were grown in the demonstration plot. Due to the abnormally dry season the crops did not do well. The cultivation of these crops was unknown to the people of the locality. But the cultivators have realised the possibility of growing these crops and it is expected that most of them will take up their cultivation in future.

15. CHANDRAPUR RURAL UPLIFT CENTRE

The centre was formally opened by the Sub-divisional Officer, Hailakandi on the 22nd March 1940. The centre is one and half mile away from the Lala Railway Station and comprises a single village.

Two and half *bighas* of land was obtained for a nursery and demonstration plot. A Common Hall was constructed to accommodate the Organiser and to serve as a meeting place.

Village Survey.—The area of the village has been found to be 1,030 acres, the number of families — 283 and the total population 1,551. There is a Boys' Lower Primary School and a Girls' Lower Primary School in the village. The percentage of literacy is 12·8. The total area under

cultivation is 800 acres. Aus paddy covers 166 acres, sail paddy — 752 acres, amon — 2 acres, jute —1 acre, sugarcane — 3 acres, pulse—12 acres, oilseeds — 16 acres, potato — 7 acres, tobacco — 2 acres, chillies — 4 acres and vegetables — 25 acres. There are 261 cows, 132 bullocks, 25 bulls, 208 calves, 57 milch buffaloes and 176 goats and sheep in the village. There are 65 tanks and one well, 55 of these are used for drinking purpose. The principal fruits grown are banana, orange and pineapple. Marketing facilities are satisfactory. Lalabazar is only at a distance of 10 miles and Hailakandi is also only 10 miles away.

Distribution of seeds.—Thirty five maunds of paddy seeds were distributed on return system amongst 48 cultivators. 25 packets of rainy season vegetable and 41 packets of English vegetable seeds were also distributed. All these were grown with interest

Manure pits.—Four manure pits were made by the villagers for preserving cattle dung at our instance.

Fodder grass.—Napier and Para grass cuttings were distributed amongst some cultivators. These were grown well. These were also grown in the demonstration plot successfully.

Cattle.—One breeding bull was kept at the centre. 27 weedy bulls were castrated by the Veterinary Assistant Surgeon. About 80 per cent. of the cattle of the village were inoculated against Rinderpest.

Poultry.—Ten eggs of White Leg Horns and six of Rhode Island Reds were supplied to the villagers. Nine eggs were spoiled during hatching, the rest gave good chickens.

Propaganda.—The Agricultural Inspector, Cachar delivered two lectures with magic lantern on rural reconstruction. A good number of villagers attended these lectures.

Night Schools.—One night School was started in the centre.

Demonstration plot.—English vegetables were grown very successfully during the cold weather in the demonstration plot.

Weaving and Sericulture.—Some six spinning wheels were supplied to the centre. Two hand looms were also supplied. Weaving, which was unkown in this centre, was started for the first time by encouraging the villagers to take it up. It is gratifying to find that villagers are becoming interested in it. To encourage weaving, a Weaving Demonstrator was temporarily posted to the centre.

Sanitation and Hygiene.—Necessary propaganda was made to induce people to cut windows in their houses to let in fresh air. A few bore-hole latrines were also made.

S. MAJID,

Deputy Director of Agriculture, Surma Valley.

UPPER ASSAM VALLEY

The sanction to start the Rural Uplift Campaign was received in March 1940, and the selection of centres had therefore to be hurridly made. There are altogether seven centres in the Upper Assam Valley. A list showing the centres subdivision wise is given below:—

District.	Subdivision	Rural Uplift Centre
Sibsagar ...	Golaghat ...	1. Naharani.
	Jorhat ...	2. Majuli.
	Sibsagar ...	3. Samaguri.
Nowgong ...	... ...	4. Bhotaigaon.
		5. Rupahi.
		6. Barpujia.
Lakhimpur ...	Dibrugrah ...	Rahmaria.

One Rural Uplift Organiser was appointed in each centre towards the middle of March 1940. Each centre comprises 3 to 10 villages. The localities selected are all backward tracts. The inhabitants are mostly poor and a vast majority of them are illiterate. Inspite of various difficulties, such as, party faction and general apathy, etc., work was started in all the 7 centres. People were induced to co-operate with us and most of them slowly realised the benefit of mutual help and supplied manual labour for the execution of various items of work. The success of the scheme goes to the credit of the Organisers who worked whole heartedly.

Common Hall and Library.—In each centre, excepting Rupahi in Nowgong, a Common Hall has been erected. The inhabitants contributed manual labour and the cost of materials was borne by the Government. A small library has been provided in each Common Hall. One monthly magazine, " Avahan, " and a weekly news paper, " Tarun Assam ", have been subscribed for the benefit of the members. It is gratifying to note that most of the inhabitants have taken interest in gathering in the Common Hall and reading the news papers.

Education.—Night Schools have been opened in all the centres. The Education Department has taken a good deal of interest in maintaining these schools. Grown-up people have regularly attended the schools and most of them have successfully passed the test held by the Education Department. Altogether 14 night schools have been started in all the 7 centres.

Sanitation.—The first and foremost drawback of the villages in the centres is the shortage of pure drinking water and bad drainage. People draw drinking water from filthy tanks, which are the source of various infectious diseases. Great stress had to be laid on the necessity and importance of pure drinking water. Almost all the existing old tanks were renovated and some new tanks were dug out in each centre, but there remains still more work to be done in this direction. The drains around houses and house compounds were cleared.

Medical help.—Some common medicines, worth about Rs. 100, have been stocked in each centre. The local Sub-Assistant Surgeon attends the centres and prescribes medicines for the patients.

Communication.—The next item of importance is communication in the villages. The village paths remain neglected throughout the year and become muddy during the rain. The movements of the villagers become very difficult. Since the starting of the Rural Uplift Campaign, almost all the roads running through the villages have been repaired and some new roads constructed. The total length of these road in all the centres is about 48 miles. The inhabitants did the manual labour but the cost of culverts had to be borne by the Department.

Agricultural Improvement.—Agriculture being the main occupation of the rural population, due attention has been paid towards its improvement in all the centres. Distribution of improved seeds and demonstrations of the recommended varieties of paddy, pulses, potato, sugarcane, etc., have been conducted in all the centres. Attempts have also been made to introduce some improved types of implements. Improved seeds of the following important crops were supplied to all the centres during the year:—paddy — 167 mds. 35 seers, potato— 50 mds., pulses—27 mds., garlic and onion — 1 mds., mustard — 4 mds., linseed — 4 mds., pineapple suckers—4,600 and Para and Napier grass cuttings 4100. Besides these, sufficient quantity of vegetable seeds, chillies, suckers of better varieties of plantain was given to the centres.

Improvement of Livestock.—Stress has been laid on the necessity of improving the livestock of the localities. The Livestock Section of the Department have already supplied 6 bulls in 4 centres. The people have greatly appreciated these stud bulls and have take keen interest in their up-keep. A good number of cows have already been served in each centre. The Veterinary Department has greatly co-operated in the matter, a large number of weedy bulls being castrated by them. Four stud goats of Jamnapuri breed have been put in at Naharani and 3 at Samaguri. The result so far obtained is encouraging. It remains, however, to be seen how far they bring fair price in the markets. Rhode Island Red cockerels have been found quite useful and have been appreciated by the rearers.

Industries.—The Department of Industries have whole-heartedly co-operated with us in our attempt to improve rural industries. 36 spinning charkas and 23 fly shuttle looms have been supplied to the Rural Uplift Centres. All these machines are working nder the guidance and supervision of the Departmental Demonstrators. Although the looms ha e been appreciated by those who handle them, very few of them can afford to buy them as the price of the looms are prohibitive for the poor villagers. Besides these, silk and the *endi* reeling machines have been provided in the centres. The rearing of silk *muga* and *endi* cocoons has been encouraged in these centres where facilities are available.

Bee-keeping has been introduced and encouraged. 16 up-to-date bee boxes have been supplied and colonised. The result obtained is reported to be satisfactory. There being an abundant supply of natural grazing, it is expected that this industry, if taken earnestly, will prove a lucrative subsidiary business to the villagers.

Visitors.—His Excellency the Governor of Assam paid a visit to the Bhotaigaon Rural Uplift Centre in Nowgong. The Hon'ble Ministers of Agriculture and Revenue visited almost all the centres of this valley. The Directors of Industries and Agriculture and the Deputy Director of Agriculture, Live-stock inspected the centres occasionally. Inspectors in charge of the centres and I regularly visited these centres.

Special.—It has been decided to create a stock in each centre of the different kinds of improved seeds. With this object in view all available seeds, have been issued on the return system. These seeds, when realised, will be stocked in the store house of the centres for distribution in the next season with some more addition. If the system is properly worked, it is hoped that in five years we can create a stock sufficient to cover all available land in each centre.

K. K. DE,

Deputy Director of Agriculture, Upper Assam Valley.

LOWER ASSAM VALLEY

During the year under report, there were 12 Rural Uplift Centres in the Lower Assam Valley. These were:—

Goalpara District—(1) Rangjuli, (2) Kharmuza, (3) Ghagmari, and (4) Kokrajhar.

Kamrup District—(5) Rampur, (6) Goral, (7) Rangiya, (8) Digheli, (9) Kamarkuchi, (10) Howli, and (11) Goreswar.

Darrang District—(12) Ketekibari.

Every centre was in charge of a Rural Uplift Organiser, guided and controlled by an Agricultural Inspector. The Rural Uplift Centres were distributed among the Agricultural Inspectors as shown below :—

1. Goalpara	Agricultural	Inspector—	Rangjuli, Kharmuza, and Ghagmari.
2. Dhubri	,,	,,	—Kokrajhar.
3. Gauhati	,,	,,	—Rampur and Goral.
4. Barpeta	,,	,,	—Rangiya, Digheli, Kamarkuchi and Howli.
5. Mangaldai	,,	,,	—Goreswar.
6. Tezpur	,,	,,	—Ketekibari.

An ecnomic survey of the various villages, under the Rural Uplift Centres, was carried out.

Communication sanitation

Improvement of communication and sanitation was taken up in all the centres and 75 roads, covering a distance of 53½ miles, were constructed or improved. In constructing and repairing the roads, the manual labour was supplied by the villagers. 24 wells and 8 tanks were dug or repaired, during the year. Here also, manual labour was supplied free by the villagers. There has been a marked tendency to repair existing tanks and wells and to construct new ones by comparatively well-to-do individuals. The Rural Upl ft Organisers were always very helpful to all concerned.

22 acres of road-side jungles were cleared by the villagers in all the centres.

People were encouraged to go in for better houses wherever possible. They were induced to keep windows for ventilation in all newly constructed houses and also to make a few in the old ones. As a result it was found that windows and other means of ventilation were provided for in the newly constructed houses of all the centres. Intensive propaganda was made also to improve cattlesheds. All points of a good shed were duly explained to the people.

Medical help

Cinchona tablets, distributed by the Department with the start of monsoon, were of great help in controlling attacks of fever. This work was highly appreciated by the poorer people. Over 8,000 cinchona tablets were thus distributed, which cured about 900 persons.

Livestock

Cattle breeding and goat breeding were conducted in nearly all the Rural Uplift Centres. There were 16 bulls and 7 he-goats in the Rural Uplift Centres of this valley during the year under report.

People were taught to conserve cattle manure in properly constructed manure pits under covered sheds. In the coming year we expect that almost all the villagers will take to this as they have appreciated its utility.

Nurseries

Nurseries for seeds and seedlings were started in all the Rural Uplift Centres. At Rangjuli 8½ bighas of land was given by the Bijni Raj Wards' Estate for this purpose. At Kharmuza 6½ bighas of land was provided by the late R. N Chowdhury, Zaminder, Mechpara. At Ghagmari 4 bighas of land was given by Maulana A. H. Khan. At Kokrajhar land for the nursery was obtained from the Bijni Raj Wards' Estate as free grant. At Rampur the area of the nursery is about 8 bighas. The land was acquired from local individuals. At Garal the area of the nursery is 8¼ bighas, which was taken on lease from private individuals at Re.1 per bigha. At Rangiya about 6 bighas were taken on lease at Rs.2 per bigha from Muhammad Sukush and Srijut Abhi Ram Talukdar At Digheli about 11 bighas of Government land was taken for the nursery with about 2 bighas given free by one private individual. At Kamarkuchi 8 bighas of land was taken on lease from Srijut P. C. Barua, Mauzadar of that locality. At Howli 25 bighas of land was acquired by cancelling the annual pattas. At Goreswar and Ketekibari 10 and 8 bighas of land was obtained from Srijut G. C. Chow, Mauzadar and Messrs. C. Bora and K. Sarma and their brothers.

The statement below shows the number of grafts, seedlings, etc., received and planted in each of the nurseries :—

Centre	Mango grafts	Lichee grafts	Sopeta	Plum	Kardai	Lemon	Cocoanut trees	Pineapples	Plantains	Bedana
Rangjuli ..	..	11	3	12	3	12	..	515	170	..
Kharmuza ..	..	9	4	5	3	4	30	500	100	..
Ghagmari ..	4	4	2	7	4	10	30	..	..	..
Kokrajhar ..	12	14	2	2	..	14	41	2,050	..	2
Rampur ..	..	11	3	9	4	11	12	300	100	..
Garal	2	11	3	10	5	25	24	270	100	..
Rangiya ..	..	9	3	6	5	9	21	500	..	..
Digheli ..	8	13	5	10	5	31	22	300	35	..
Kamarkuchi ..	3	2	1	..	..	5	80	1,000	..	..
Howli	6	5	5	9	4	10	26	..	..	..
Goreswar ..	..	10	3	6	5	10	20	500	30	..
Ketekibari ..	..	12	8	10	5	15	45	250	50	..

Besides the above grafts and plants, the following seeds of betelnuts and cocoanuts were planted for future use. Betelnuts germinated well.

Centre	Betelnuts	Cocoanuts
Rangjuli	...	...
Kharmuza	500	...
Ghagmari	700	...
Kokrajhar	3,000	...
Rampur	2,000	...
Garal	500	...
Rangiya	3,000	250
Digheli	2,500	...
Kamarkuchi	3,000	...
Howli	4,000	...
Goreswar	3,000	250
Ketekibari	15	...

Common Hall

Excellent Common Halls were constructed or were in the process of construction in most of the centres.

Demonstartion and distribution of seeds and other agricultural activities were conducted in all the centres. The statement below shows the quantity of seeds, etc. of various crops distributed :—

Name of centre	Paddy	Sugar-cane setts	Pulses	Fibre	Oilseeds	Other Kharif crops	Other rabi crops	Tobacco	Potato
	M. sr. ch.		M. sr. ch.	M. sr. ch.	M. sr. ch.	M. sr. ch.	M. sr. ch.	Pkts	M. sr. ch.
Rangjuli	21 0 0	3,000	nil	...	1 0 0	4 0 0	2 0 0	4	2 0 0
Kharmuza	27 10 0	5,000	0 5 0	...	1 10 0	4 0 0	13 0 0	8	2 0 0
Ghagmari	10 0 0	2,000	nil	...	nil	nil	2 0 0	8	nil
Kokrajhar	13 0 0	5,000	0 8 0	...	1 20 8	4 0 0	1 26 0	56	4 0 0
Rampur	15 0 0	4,000	0 30 0	...	1 0 0	8 0 0	15 0 0	10	3 0 0
Garal	10 0 0	1,000	20 0 0	...	1 0 0	2 0 0	6 0 0	10	3 0 0
Rangiya	10 0 0	nil	0 10 0	...	0 20 0	nil	2 0 0	10	2 0 0
Digheli	10 0 0	2,000	0 10 0	...	0 20 0	2 0 0	2 0 0	10	1 0 0
Kamarkuchi ...	8 0 0	3,000	0 10 0	...	0 20 0	1 0 0	2 0 0	10	1 0 0
Howli	10 0 0	nil	0 10 0	2 0 0	0 20 0	1 0 0	3 0 0	10	2 0 0
Goreswar	2 0 0	10,000	0 15 0	...	0 20 0	0 20 0	1 0 0	5	1 0 0
Ketekibari	95 0 0	20,000	0 30 8	...	0 20 0	2 2 8	1 0 0	...	2 0 0

Industries

Industrial activities, such as, spinning, weaving and preparing of Jhapi, etc., were also conducted in the Rural Uplift Centres. Progress was not very marked, but the cultivators were gradually taking interest in these activities. 45 looms and 32 spinning wheels were being worked in the Rural Uplift Centres.

Education

Educational activities, including adult literacy campaign, were conducted in the Rural Uplift Centres. Nine night schools also were opened—one each at Rangjuli, Rampur, Garal, Kamarkuchi, Howli and two each at Digheli and Ketekibari.

Public Meetings

A large number of meetings were held in most of the Uplift Centres to discuss the improvement of the villages.

Varying response was received from the public in different centres in the way of giving bamboos for fencing the nurseries and for other items of work, ploughing the nurseries, improving the roads, wells and clearing jungles. In Digheli the cultivators observed "KRISAK SAPTAHA" in the first week of "Magh" and during those days they devoted all their time in improving the village-roads and clearing jungles of roadsides and homesteads.

All the Rural Uplift Organisers worked to the best of their capacity to make the campaign a success.

L. BARTHAKUR,

Special Rural Uplift Centre, Lower Assam Valley.

GOVERNMENT OF ASSAM

ORDERS BY THE GOVERNOR

Resolution on the Report of the Department of Agriculture, Assam, for the year ending the 31st March 1941.

Extract from the proceedings of the Government of Assam in the Education Department, No. EAG.187/42/9, dated the 27th March 1942.

READ—

The Report of the Department of Agriculture, Assam, for the year ending the 31st March 1941.

RESOLUTION

The extended activities of the Department continued in the year under report in its different spheres.

The experiments and researches conducted by the Department resulted in the evolution of 117 improved strains of crops (46 of paddy, 21 of sugarcane and 52 of potatoes) compared with 103 (44 of paddy, 20 of sugarcane and 43 of potato) of the previous year. Experiments on propagation and improvement of various acclimatised deciduous fruits were carried on and 663 grafts of these fruits were issued from the nursery at the Fruit Experiment Station, Shillong. The results of the experiments on the grafting of apple to make it immune from its main pest, Woolly Aphis, were particularly hopeful. Pyrethrum and Digitalis were found to grow and thrive well at this station and endeavours are being made to extend the cultivation, especially of Pyrethrum. The marketing staff investigated the marketing of cotton and jute and submitted their reports during the year. Enquiries were also instituted about marketing conditions of limes and lemons.

Demonstrations and propaganda on the part of the Department resulted in 102, 691 acres of land being cultivated with improved strains of paddy, sugarcane, potato and jute against 100,560 acres of the previous year. Demonstrations of the cultivation of *Boro* paddy in precarious Amon lands were continued by means of 17 power-driven pumps. Through the marketing agency of this Department in Calcutta, fruits worth

Rs.22,960-10-9 were disposed of as against fruits worth Rs.15,700 in the previous year, and through the propaganda of the marketing staff, a number of merchants agreed to deal in pure 'Agmark' *ghee* and *Ata*. For the first time in the history of this Department, improved agricultural tools were made at Sylhet with the assistance of this Department. Three hundred and eleven fodder-growing demonstrations were made and one lakh root-cuttings distributed. There were 99 demonstrators during the year against 85 of the previous year.

Seeds, plants, manures, etc., were issued both for demonstration and sale from the Seed Depots at Jorhat, Gauhati and Sylhet. There was a notable increase in the issue of potato seeds and sugarcane setts during the year. Five hundred and sixty-six maunds and 29 seers of potato seeds were issued for demonstration and 1,373 maunds and 38 seers for sale against 289 maunds and 35 seers and 291 maunds respectively in the previous year ; similarly 5,92,720 sugarcane setts were issued for demonstration and 3,000 setts for sale against 2,89,977 and nil respectively in the preceding year.

The increased popularity of the live-stock Section is reflected in the growing demand for live-stock improvement from all parts of the Province and the desire of the people for better cattle and other live-stock. During the year under report 60 bulls, 33 cows and 16 young stock were sold against 23 bulls, 16 cows and 11 young stock of the previous year. Measures to improve breeding of cattle and other live-stock and lactation of cows were taken in the different Government Farms. In the Upper Shillong Farm, cattle breeding was directed towards high milk production. The best lactation was made by a Frisian cross cow (" Fantasy ") with 12,490 pounds indicating over 20 seers of milk daily for ten months. Besides breeding operations in the Farms, such operations were also continued in different village breeding areas, notified grazing reserves and live-stock improvement centre, Digboi. Live-stock Improvement Associations and the Rural Uplift Centres also did their part towards the improvement of the live-stock. Jail Dairies at Gauhati, Tezpur, Jorhat, Dibrugarh, Silchar and Sylhet were occasionally supervised by the Department. These Jails are now able to breed their own cows and are even arranging service to cows of the public by their bulls.

The Department had the advantage of visits during the year from the Vice-Chairman of the Imperial Council of Agricultural Research, Animal Husbandry Commissioner of the Government of India, the Imperial Mycologist, the Imperial

Entomologist and the Imperial Economic Botanist. The Government are particularly glad to notice that the Titabar Farm was visited by the Entomologist to the Common-Wealth Australian Council of Research.

The Rural Uplift campaign inaugurated in 1939-40 has succeeded in gaining increased popularity. During the year under report, there were 34 Rural Uplift Centres in which useful work was done mainly towards improvement of communications, live-stock, cottage industries, health, sanitation and education.

The Government note with deep regret the deaths of two of their senior-most Deputy Directors of Agriculture, Mr. F. Haque and Mr. L. Barthakur, during the year, causing serious loss to the Department and place on record their appreciation of the long and faithful services rendered by these officers. Their thanks are due to Rai Bahadur Dr. S. K. Mitra for his interesting report and efficient administration. This is his last report and Government desire to express their regret at losing his services on his retirement.

ORDER :—Ordered that the Resolution be published in the *Assam Gazette*.

By Order of the Governor of Assam,

R. DHAR,

Deputy Secretary to the Government of Assam,
Education and Local Self-Government Department.