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SOIL CONSERVATION CENTRES AND THEIR CONTRIBUTION TO AGRICULTURE IN ANDAMAN AND NICOBAR ISLANDS

INTRODUCTION

The nucleus of Soil Conservation Organisation in these Islands was set up at Rangat in Middle Andaman in the year 1958. A pilot Soil Conservation Survey was carried out to assess the magnitude and causes of Soil Erosion in these Islands. On the basis of the findings, it was decided to establish demonstration-cum-experimental Centres in different areas with particular reference to soil series of different regions. Experimental work was directed towards observational studies under Engineering, Agronomy and Farm Forestry Sections to evolve suitable Soil Conservation Measures for different Land Capability classes in these Islands and to function as a supporting programme for the Soil Conservation Extension Work in answering the problems faced by the farmers from time to time and to supply planting materials for the follow-up programme of the Soil Conservation Projects.

Two Soil Conservation Centres were established initially in Middle Andaman and the Second one in South Andaman

SOIL CONSERVATION CENTRE, RANGAT, MIDDLE ANDAMAN

Established in 1963 in a representative plot of hilly land which is being allotted to the settlers of these Islands for horticultural or plantation crops and home-stead land. Area of the Centre is 2.02 hect. (5 acres) which is the prescribed norm for each family. Top soil is gravally loam comprising about 7 cms. depth. Sub-Soil represents depth of 60 cms. Sub-Soil section of the profile is composed of partly weathered soil material of sand stone origin. Infiltration capacity is moderate. Topography is moderately sloping to very steep. Rocky patches of land are also met with in the area. There are gullies passing through the area dividing the land into fragments and take away heavy toll of soil year after year. To meet the increasing need of planting materials for the extension projects the area of the farm was extended to 10 hect. in 1970. All crops are grown under rainfed condition.

PROGRAMME OF WORK AND RESULTS ACHIEVED

Work is being carried out under three branches.

- (i) Engineering.
- (ii) Agronomy.
- (iii) Farm Forestry.

A. ENGINEERING

1. Bench Terracing

LAY OUT :- Graded bench terraces with longitudinal slope of 0.5% (1 in 200) and inward gradient of 2.5 per cent (1 in 40) have been constructed. Effective soil depth being less vertical interval is fixed at 0.6 metre. Length of terrace is kept at 60 mt.

OBSERVATION :—This is recommended for the area under Land Capability Class III with special reference to soil depth and soil type. Farming history of these Islands, economic considerations such as prohibitive cost involved in the construction, want of remunerative crops, low effective soil depth and adverse soil characteristics of hill slopes, discourage one to take up this work on extensive scale. However, in exceptional cases this may be constructed for semiaquatic crop paddy or crops that need frequent soil disturbance during the process of its growth. Crop must be remunerative in respect of the high initial cost involved in its construction.

2. Contour Bunding (Field Terracing)

LAY OUT :—Graded bunds are laid out at a spacing of 0.5 metre vertical interval and with longitudinal gradient of 0.5 per cent. Main bund section having 1.5 metre bottom width, 0.5 metre top width, 0.6 metre height is followed. Lateral bunds may be provided at 60 metres.

Provision of 15 per cent is given for shrinkage property of the soil so that the final height after consolidation conforms to the desired specification. For the formation of bunds soil is obtained from borrow pits which are located on the upstream side of the bund and is connected with outlets to eliminate the excess run off.

OBSERVATION :—This can be constructed in Land capability class II and III. This has an added advantage over bench terracing in that the disturbance of top soil is minimised. Top soil disturbance is confined only to borrow pits. These pits will soon be filled up with soil material from upstream side and this eventually reduces the slope of the area between the bunds. Care should be taken in class III land in respect of soil material which is vulnerable to sliding during rains. Soil condition on sloping hilly land is not generally suitable for this.

3. Contour Stone Wall

LAY OUT :—Stones from stony patches of land were collected and given the formation of a stone wall strictly following the contour lines with 0.5 per cent longitudinal gradient so that excess surface run off can be safely eliminated. An economic specification of 60 cms. width, and 60 cms. height above ground level and 15 cms. foundation for better stability is provided.

OBSERVATION :—This method has been found to be very effective and economic in bringing stony patches of land for better utilization. This functions as a permanent contour bund.

4. Puerto Rico Terrace (Mechanical-cum-Vegetative Method)

LAY OUT :—Graded contour trenches were excavated with 0.5 per cent longitudinal gradient and at a spacing of 1.25 metre vertical interval. Dug up earth is deposited on the down stream side leaving a berm of 15 cms. Trenches are constructed with the specification bottom width 30 cms., top width 45 cms., depth 30 cms. Vertical drains at a regular espacement of 60 metre is constructed.

FILTER STRIP :—Different species of grasses viz. *panicum maximum*, *penesitum Purpureum*, *Eragrostis curvula*, *Tripsacum laxum* and *Cymbapogon* sp. were grown on the upstream side of the trench as complimentary practice to facilitate silting of soil material from the upstream side.

SILT PITS :—Loss of soil material is further checked by providing silt pits at the end of each trench. Size of silt pit was given as 30 × 30 × 30 cms.

OBSERVATION :—Results obtained are quite encouraging. Land characteristics, Climatological and above all economic factors are favourable for this item of work in these Islands. The loss of fertile top soil and cost of construction are kept to the minimum. This method is best suited for land capability class IV.

Following results will show the merits and demerits of different methods.

Soil Conservation Measure	Soil loss (tonne per hect.)	Pineapple yield (tonne per hect.)
Bench Terracing	1.6	12.7
Contour trench with filter strip	2.2	24.6
Control	5.5	17.0

Panicum maximum and *Cymbopogon* sp. have been proved quite successful as filter strip.

I. B. Gully Control Measures

Trials on different methods of gully control have been conducted in the gully passing through the farm dividing block A. & B.

TO CHECK GULLY BED EROSION

1. Brush Wood Check Dam :

LAY OUT :—Banks were cut to 1 : 1½ slope. Gully bottom is excavated to a depth of 22 cms. through out the length of the dam and earth is thrown on the upstream side. Posts of 15 cms. diametre are then driven at definite intervals 60 cms. in two rows. Long ballies of lesser dimension were fixed on the posts longitudinally to hold the materials packed inside the double post row. Straw is packed into all excavated portion and pieces of brush wood were firmly fixed into place. As the check dam is built up straw is used liberally to fill large interstices.

OBSERVATION :—The structure has been found very effective in reducing gully bed erosion. All materials are indigenous and cost of construction is very little.

2. Brush Wood-cum-Boulder Check Dam :—

LAY OUT :—Double row posts are fixed as in brush wood check dam and inter space is filled up with alternate layers of boulder and brush wood.

OBSERVATION :—The performance of the structure is quite satisfactory. This is more strong and stable than brush wood check dam.

3. Boulder Check Dam

LAY OUT :—Posts were set as in brush wood check dam and stones of appreciable sizes and satisfactory quality may be arranged as a barrier. The stones were carefully arranged to make a dense mass as possible and the structure trenched into gully sides and bottom.

OBSERVATION :—This has been proved effective in portions of gully with steep gradient. Stability and strength are much higher. In an area where stones are available plenty it is economic too.

4. Log Dam

LAY OUT :—These are constructed with 15 cms. diameter logs. The height from the bottom of the notch to the bed of the gully is kept 1 metre. Care is taken to trim the logs so that they are kept close together. The logs forming apron or spill plat-form is continued up and down the stream bed to a point well beyond the extremities of the notch.

OBSERVATION :—It is quite effective in controlling gully bed erosion. In places where logs are available cost of construction is also minimised. This is also suited to satisfy the aesthetic spirit of man.

TO CHECK GULLY BANK EROSION

This is effectively checked by vegetative methods. Several indigeaous and exotic species were tried.

Following exotic species have been tried on gully banks.

1. Bambusa arundinacea (source—Dehradun)
2. Pennisetum Purpureum (source—Dehradun)
3. Panicum Maximum (source IARI, Delhi)
4. Kudzu vine (source IARI, Delhi)
5. Cymbapogon Sp.

OBSERVATION :—These have successfully established and protects gully banks from erosion. Economically all the above plants supply some useful material viz bamboo for fencing, homestead use etc. and other species for fodder (2, 3 & 4). Cyanpogon sp. is an essential oil plant.

I. Grassed Waterway

Elimination of excess run off from the constructed works are very important. Following design is proved to be effective for the purpose.

In slopes up to 8 per cent parabolic section and in seteeper slopes more than 8 per cent trapizoidal section is found to be effective.

Cross Section may vary according to the area to be drained. An inward gradient is provided (1 in 40) within the waterway to keep the velocity of flow to the minimum. At points of overfall silt pits with stone lining is constructed to prevent Scouring.

Of the several indigenous and exotic grasses tried at the centre *Paspalum notatum* introduced from Dehra Dun is found to be excellent in its performance. *Paspalum notatum* has shown its efficacy as a vegetative lining material of permissible velocity of 6 ft. per second.

II. Agronomy

An intensive cropping programme has been designed according to the type of crop and land capability class. More exacting species were planted in lower levels and hardier plants in the higher slopes. Cropping pattern followed is given below in the order of its planting from the foot of the slope to higher reaches.

Main Crop

Class III

- | | | |
|---------------|------------|---------------|
| 1. Arecanut | 2. Coconut | 3. Nutmeg |
| 4. Loquat | 5. Phalsa | 6. Star apple |
| 7. Rose apple | 8. Orange | 9. Lime |

Class IV

- | | | |
|---------------|---------------|----------------|
| 1. Acid lime | 2. Orange | 3. Pomegranate |
| 4. Mango | 5. Sapota | 6. Parsimon |
| 7. Litchi | 8. Amda | 9. Chaltha |
| 10. Jamun | 11. Harithaki | 12. Guava |
| 13. Cashewnut | 14. Tamerind | 15. Jack |

Inter Crop

- | | | |
|-----------------|----------------|----------------|
| 1. Pineapple | 2. Banana | 3. Tapioca |
| 4. Sweet Potato | 5. Arhar | 6. Maize |
| 7. Castor | 8. Yam | 9. Ginger |
| 10. Turmeric | 11. Jowar | 12. Til |
| 13. Mustard | 14. Green gram | 15. Black gram |
| 16. Ground Nut | 17. Sugar cane | 18. Vegetable |

Performance of the above inter crops have been found to be quite successful at the centre.

Observation

EARLY VERSUS LATE PLANTING :—Plants planted in the early periods of south west monsoon that is May-June exhibit better growth than those planted during North East Monsoon period that is in September-October. (This depends on the drainage pattern of the area).

METHOD OF PLANTING :—Observation on growth characteristics reveal that it is much better for plants planted in pits than those of surface planted.

MANURIAL TRIALS :—Application of N. P. K. together with FYM and green manure crop of various Sp. has shown better performance. (Experiment continued for making specific recommendation).

MULCHING :— Soils are gravelly and have no moisture retention capacity. Mulching experiment had shown very effective for the plants during summer months. In the absence of proper mulching young seedlings either fail to survive or suffers set back in its normal growth.

TRIALS ON THE EFFECT OF SHADE CROP :— Green manure cum shade plants have been planted around the pit of young seedlings by the beginning of North East monsoon primarily to provide shade for young plants to tide over drought during the early periods of its growth.

Species

1. *Glyricidia maculata* (Andhra)
2. *Indigofera sumatrana* (IARI Delhi)
3. *Crotalaria striata* (source Madras)

OBSERVATION :— Leguminous plant *Indigofera sumatrana*, recorded excellent performance by serving dual purpose of providing natural shade to young seedlings and also supplies green manure. Best time of its planting is August. Transplanting of two month old seedlings or direct sowing method can be adopted. This plant, besides providing partial shade for young seedlings increases the moisture retention capacity by reducing loss of soil moisture due to evaporation.

NURSERY

Agrostological studies were instituted at the Soil Conservation Centre with a view to selecting promising species of exotic and indigenous origin for soil conservation purpose and for the adequate supply of fodder under existing conditions of this tract. Nursery and field studies were conducted on following indigenous and exotic grasses.

Indigenous Grasses

- | | |
|----------------------------------|-----------------------------------|
| 1. <i>Paspalum scrobiculatum</i> | 11. <i>Brachiaria mutica</i> |
| 2. <i>Paspalum conjugatum</i> | 12. <i>Brachiaria ramosa</i> |
| 3. <i>Paspalidium germinatum</i> | 13. <i>Digitaria longiflora</i> |
| 4. <i>Cynodon dactylon</i> | 14. <i>Eragrostis unioloides</i> |
| 5. <i>Chloris barbata</i> | 15. <i>Chrysopogon aciculatus</i> |
| 6. <i>Echinochloa colonum</i> | 16. <i>Eulalia</i> sp. |
| 7. <i>Echinochloa crusgalli</i> | 17. <i>Eriochloa procer</i> |
| 8. <i>Elusine indica</i> | 18. <i>Setaria palladefusca</i> |
| 9. <i>Ischaemum Indicum</i> | 19. <i>Axonopus comprussus</i> |
| 10. <i>Ischaemum rugosum</i> | |

In general indigenous species tried are not so much effective either as soil binder or as fodder. Few indigenous species that can be useful for Soil Conservation works are described below.

PASPALUM CONJUGATUM : Perennial grass. Develops quick ground canopy. This exhibits satisfactory performance in controlling soil erosion. Fairly good fodder.

CYNODON DACTYLON : Perennial grass. Forms satisfactory ground cover. Protects soil from erosion. Improves soil structure. Good fodder grass.

CHLORIS BARBATA : A perennial grass. Since its growth habit is bunch forming its use in soil conservation work is limited. Tolerates slight salinity. Can be used for stabilization of bunds in the coastal areas.

BRACHIRIA MUTICA : A hardy, coarse, perennial grass, stem is rhizomatous with descending branches. Deep wet loamy soils are best suited and can be grown as a soil binder in foreshore areas of streams.

EXOTIC GRASSES

1. *Pennisetum Perpureum* (improved IARI, Delhi).

Perennial drought resistant grass. Supplies plenty of good fodder and protects gully banks from erosion.

2. *Panicum maximum* (IARI, Delhi)

Very promising grass as fodder and as a vegetative means to check erosion. Functions as an ideal filter strip for contour trenches and as buffer strips.

3. *Eragrostis curvula*. TAMII NADU

Perennial grass can be grown as filter strip and use is restricted in view of its exacting demand on soil type. Grows well in loamy soil. Fodder value is not satisfactory.

4. *Paspalum Notatum* (Dehara Dun)

Perennial fodder grass. Proved as an excellent grass for grassed water ways and to protect slopes from erosion.

5. *Arundo donax*. (DEHRA DUN)

An evergreen perennial grass. Excellent for stream bank protection. Palatability to cattle is medium. The stem is used in cottage Industry for making baskets, mats etc.

LEGUMES (EXOTIC)

1. *Puraria phaseoloides* (Kudzu vine) (IARI, Delhi)

2. *Puraria hirsuta* (Tropical Kudzu) (IARI Delhi). Both the species have shown excellent performance in controlling soil erosion and supplies fodder.

3. *Alylosea Scarabodes* (Bombay).

Perennial, grows well on risers of bench terraces and bund slopes. An excellent cover crop supplying plenty of organic matter.

4. *Indigo-fera Sumatrana* (I. A. R. I., New Delhi).

An excellent shade cum green manure plant for young seedlings. Provides partial shade for young seedlings through out summer.

5. *Glyricidia Maculata* :—

Studies conducted under various soil types of these islands reveal that a high percentage of casualty is observed in the process of propagation by cutting. This is due to the over saturation characteristic of surface soil met with in these islands coupled with continuous high rate of rain fall. Better results are recorded in the method of propagation by seedlings of about three to four months old.

Trial on Hedge Plants :—

Following species are found to be Successful for Establishing live hedge.

1. *Ingadulicis*
2. *Prosopis juliflora*
3. *Thevetia nerifolia*

An economic and effective combination for live farm fence is *Ingadulci* and *prospis juliflora* or *glyricida* and *prospis juliflora*.

II. SOIL CONSERVAION RESARCH, DEMONSTRATION AND TRAINING CENTRE, SIPPIGHAT, SOUTH ANDAMAN

Established in the old small progeny orchard having an area of 5 hect. where some nurseries were maintained for pineapple, arecanut and coconut. Few horticultural and plantation crops like citrus, clove, nutmeg, arecanut were also planted as early as 1965.

Established to take up detailed study on various branches of Soil Conservation Viz. Engineering, Agronomy and Farm Forestry, and to meet the increasing demand for planting materials for Extension Soil Conservation Projects.

The Soil Conservation Research Demonstration and Training Centre was established in 1969 in an area of 20 hec. The activities of the farm in various branches have been initiated and the farm is in the process of establishment.

Soils of the farm are reddish brown and is of basaltic origin. Clay loam texture with moderate permability.

Experimental studies underway are briefly described here.

I. ENGINEERING EXPERIMENTS

I. 1. NAME AND OBJECT: To determine suitable vertical interval for graded contour trenches on slopes between 16 and 33 per cent.

TREATMENTS: 1. Contour trenches at 1 metre vertical interval.

2. Contour trenches with 1.25 metre vertical interval.

LAY OUT: Graded contour trenches with longitudinal slopes of 0.5% (1 in 200) and 20 metres in length will be constructed at two different vertical intervals. Run off and soil loss will be measured through silt collecting tanks and multi silt derivisor. Plot size is 20 x 10 metres (1/50 of an hect).

(There will be only one replication) Run off and soil loss from each plot will be measured and studied by using silt collecting tank and multi-solt devisor. Experiment being laid out).

I. NAME AND OBJECT:---To study and compare the merit and demerits of graded bench terraces and trenches in controlling soil and water loss.

TREATMENTS :---(1) Graded bench terrace at 60 cms. vertical interval.

(2) Graded bench terrace at 1.25 metres vertical interval.

Graded bench terrace with inward gradient of $2\frac{1}{2}\%$ (1 in 40) and longitudinal gradient of 0.5% (1 in 200) will be constructed. Plot size will be 20×10 metre (1/50 of an hect).

Run off and soil loss from each plot will be studied by using silt collecting tank and multi slot devisor. (Experiment being laid out).

II. AGRONOMY EXPERIMENTS.

II. (1) NAME AND OBJECT:---To study and compare different methods of pineapple cultivation and effect on soil loss.

TREATMENTS :---1. Planting of pineapple inside contour trenches.

2. Triangular method of planting of pineapple with contour trenches and vegetative filter strip. (Spacing between plants 50 cms.)

3. Contour planting of pineapple at close interval.

4. Triangular planting of pineapple with contour trenches filter strips and partial shade by banana.

5. Two row system of planting with buffer strip.

6. Two row system of planting without buffer strip.

7. Two row system with contour furrow.

LAY OUT :---Plot size is of 20×10 metre (1/50 of an hect). Treatment No. 1 is based on the technique being followed in Mysore state. In this method suckers are planted in rows in trenches which is 90 cms. wide, 60 cms. deep. These are spaced at 150 cms. apart from edge to edge. Two furrows are opened in each trench so that each furrow is 15 cms. inside from the edge of the trenches and then furrows are 60 cms. apart. Suckers are planted in furrows and are 50 cms. apart in the row and 60 cms. from row to row in triangular method.

In treatments 2,3 and 4 spacing between plants has been given as 50 cms. and from row to row 60 cms.

In treatment 5,6 and 7 two rows of each pair are 60 cms. apart, and the double rows 180 cms. apart, centre to centre.

Treatments 1,2,3 and 4 were laid out in October 1969 and observations continued. Treatments 5,6, and 7 will be laid out during 1971.

There is only one replication.

Experiment II. 2.

NAME AND OBJECT :---To determine the effect of planting of pineapple in different months under different fertiliser levels.

TREATMENT :---(1) Planting is done in October, November, December, January, May, June, July, August, and September.

(2) Planting is done under two fertiliser levels.

LAY OUT :---Plots are laid out in 10 x 5 metres (1/200 of an hect).

Fertiliser level N. P. K. 110,50,150 and 80,25 100 kg. per hect. are being followed. (Experiment is continued There is only one replication).

Variety cum fertiliser trial to assess the merits of the type of paddy in respect of yield, variety, fertility status.

LAY OUT :---Plot size is 6 x 4 metre spacing between lines 15 cms. apart planted in lines 10 cms. apart with 2 seedlings per hill. Control for each set of fertiliser trial is also laid out. Nitrogen is applied in three split doses.

There is only one replication.

Experiment is continued

II. 4. NAME AND OBJECT :---To evolve wilt resistant variety of tomato for cultivation in these Islands.

LAY OUT :---Plot size 3 x 2 metres. Varieties under trial.

- | | |
|----------------|----------------|
| 1. Pusa Rubi | 2. Perfection. |
| 3. Bombay best | 4. Earliana. |
| 4. Pritchard | 6. Red Cherry. |

(Other Varieties will be tried).

Experiment is continued.

II. 5. NAME AND OBJECT :---To study the performance of different varieties of potato under different treatment to select a suitable variety for these islands.

LAY OUT :---Plot size is kept at 3 x 2 metre. Improved varieties released from time to time from the Central Potato Research station will be tried.

Varieties Under Trial

- | | | |
|--------------------|-----------------------|-----------------|
| 1. Royal Kidney | 6. Kufri Chandramukhi | 11. Kufri Sethi |
| 2. Kufri President | 7. Kufri Red | 12. Extra Early |
| 3. Kufri Kuber | 8. Kufri Chamatkar | 13. Great Scot |
| 4. Kufri Kumar | 9. Kufri Sinduri | 14. Up to date. |
| 5. Kufri Alankar | 10. Kufri Shakti | |

The varieties tried so far are not successful. Trials continued.

II. 6. NAME AND OBJECT :—To select suitable variety of Jute for these Islands.

Different varieties of jute as and when released for high land as well as low land will be tried.

LAY OUT :—Plots of 50 sq. metres will be tried. Varieties under trial.

1. Japani 632
2. Bombay Hemetgarh
3. JRO 878
4. Mesta

Experiments continued.

II. 7. NAME AND OBJECT :—To evolve suitable crop rotation.

TREATMENT :—	1. Paddy	...	Arhar
	2. Maize	...	Green manure
	3. Jute	...	Paddy
	4. Paddy	...	Cotton
	5. Paddy	...	Maize
	6. Paddy	...	Oil Seed
	7. Paddy	...	Pulse
	8. Green Manure	...	Tapioca

LAY OUT :—Plots of 60 sq. metre (10 × 5) is laid out. Trials are conducted on different varieties of field crops.

Following rotations can be successfully followed.

- | | | |
|----------|-----|------------|
| 1. Paddy | .. | Arhar |
| 2. Paddy | ... | Green gram |
| 3. Paddy | ... | Black gram |
| 4. Paddy | ... | Til |
| 5. Paddy | .. | Mustard |
| 6. Jute | ... | Paddy |

Trials continued.

II. 8. NAME AND OBJECT:--To determine suitable interval for contour furrowing in increasing pasture growth and minimising soil loss.

- TREATMENTS :--
1. Contour furrowing at 0.5 metre V-I
 2. Contour furrowing at 0.75 metre V-I
 3. Contour furrowing at 1.00 metre V-I
 4. Contour furrowing at 1.25 metre V-I

LAY OUT :--Plot size will be 20 x 10 metres.

NAME AND OBJECT:--II-9. To compare and determine the efficiency of different grasses and legumes for protecting the risers of bench terraces.

LAY OUT :--Different species of grasses and legumes will be grown on different terrace risers. Observational studies will be conducted on its performance, its effect on the terrace system and crop growth in the terrace.

Species

1. Pueraria phaseoloides
 2. Calapagonium mucunoides
 3. Centrosema pubescens
 4. Pueraria hirsuta
 5. Paspalum notatum.
- Experiment continued.

II. 10. NAME AND OBJECT:--To compare and determine the efficiency of different grasses for filter strip on Puerto Rico type of terraces.

Following citronella grass species are being tried to explore the possibility of economic exploitation.

1. Cymbopogon nardus
2. Cymbopogon winterianus.

LAY OUT :--These will be grown along the contour trenches as filter strip. (experiment continued.)

III. FARM FORESTRY

To study the effect of different cover crops on Soil loss in establishing Plantation Crops

TREATMENTS :--I. With contour trenching

1. Pueraria phaseoloides
2. Calapagonium
3. Paspalum notatum
4. Natural vegetation

2. WITHOUT CONTOUR TRENCHING :--The above four varieties will be tried under this section.

LAY OUT: Plots will be laid out in 400 sq. metre (1/25 of an hect) plantation crop like arecanut coconut will grown.

(Experiment will be laid out in 1971).

III-4, NAME AND OBJECT: To observe the growth and performance as an aid to.

PLANT INTRODUCTION: Plants under various sections viz. Horticulture, Plantations Crops, spices, cereals, pulses, millets, vegetable etc. are being studied.

Horticulture/Plantation Crop

- | | |
|------------------------------|--------------|
| 1. Avacado | 12. Clove |
| 2. Ber | 13. Cinnamon |
| 3. Black berry | 14. Peppar |
| 4. Cocoplum | 15. Nutmeg |
| 5. Giant grandilla | 16. Vinilla |
| 6. Grape fruit | |
| 7. Mangosteen | |
| 8. Malayan apple | |
| 9. Grape Vine | |
| 10. Sornam cherry | |
| 11. Papaya | |
| (i) Coorg honey dew (Mysore) | |
| (ii) Washington (Kumaon) | |
| (iii) Cylon (Kumaon) | |
| (iv) Ranchi dwarf (Kumaon) | |

Giant granadilla has established well and performance is satisfactory. Performance of Clove, peppar, Nutaneg and Cinnamon are quite satisfactory.

Cereals

1. Sorgham (CSHI)
2. Bajra (HBI)
3. Wheat (Sonalik)
4. Maize (Decan hybrid)
5. Maize (Ganga Safed)
6. Maize (Ganga Safed)
7. Mecican white.

Sorgham (CSHI), Bajra (HBI), Maize (Decan hybrid, Ganga hybrid 101, Ganga safed I) have proved successful in its performance.

Pulses

1. Green gram (D-45-6)
2. Arhar (Short duration variety from Tamil Nadu)
3. Soyabean

Items 1 and 2 have shown excellent performance as Rabi Crop

Oil seeds

1. Mustard (Pattan—67)
2. Groundnut TMV 2
3. Safflower
4. Castor —Aruna

Item No. 1 and have shown successful performance. Safflower needs are under further trials. Castor is under trial.

Sugar and starch crops

- | | | |
|--------------|---|--------------------|
| 1. Sugarcane | — | CO449 (Coimbatore) |
| 2. " | — | CO419 (Coimbatore) |
| 3. " | — | CO997 (Coimbatore) |
| 4. Tapioca | — | M4 (Kerela) |

(All have exhibited good performance).

V E G E T A B L E S**Cabbage**

- VARIETIES :—
1. No. 11 Giant special
 2. No. 14 Red
 3. No. 2 Settia
 4. No. 3 Settia

(No. II Giant Special from West Bengal has shown promising growth).

Cauliflower

- VARIETIES :—
- Pusa katki
 - No. 1 Pausi
 - Early Patna
 - Snow ball

(Pusa katki and early Patna have proved successful).

Knol Knol

- VARIETIES :—
1. No. 4 Best big giant
 2. No. 5 Delicete

(No. 4 Best big giant is successful in its performance).

Brinjal

- VARIETIES :—
- Elekeshi
 - Muktakesbi
 - American Red.

(Elekeshi and Muktakeshi have shown good performance).

Spinach

- VARIETIES: 1. Banararji Giant
2. Bombay Jhar

Both have shown good performance.

Turnip

- VARIETIES: 1. Purple top white
2. Flat early
3. Market winner

Purple top white has shown good performance.

French Beans

- VARIETIES: 1. Suttons premier
2. Runner No. 3
3. Jhupuri No. 2
4. Pencilar

Suttons premier and pencilar have shown encouraging results.

Raddish

- VARIETIES: 1. Bombay Red
2. Bombay white
3. Khasi Katta
4. Real Red
5. No. 5 Exhibition
6. Chinese white
7. Long Scarlet glob
8. Knotai short
9. Long scarlet
10. Knotia long

(Bombay red, Bombay white and Khasi katta have shown good performance.)

Capsicum

- VARIETIES: 1. Bull nose
2. Chinese giant
3. Hangarian wax
4. Yellow wonder
5. California wonder
6. Sunny brook
7. Long Red
8. Elephant trunk

Hangarian wax bull nose, California wonder and elephant trunk have shown satisfactory growth.

AGRICULTURAL METEOROLOGICAL STATION

This has commenced functioning and will be fully established with all instruments during 1971. Crop weather studies as per the recommendation of the Directorate of Agricultural Meteorology, Poona will be conducted.

NURSERY

NURSERY is established to raise seedlings of various crops under plantation, horticulture, Arboriculture, Agrostology, Legumes etc. which are to be distributed to Soil Conservation Extension Projects.

Nursery trials are also conducted on different exotic species.

LEGUMES

Following legumes were introduced :—

1. *Pueraris phaseoloides*.
2. *Pueraria hirsuta*
3. *Calapagonium mucunoides*
4. *Centrosema pubescens*
5. *Desmodium ovalifolium*
6. *Mimosa invisa var inormis*
7. *Stylosanthes gracilis*
8. *Pueraria javanica*
9. *Crotalaria anagyroides*
10. *Crotalaria striate*
11. *Crotalaria juncea*
12. *Leucana glauca*

Observations so far have shown that the following species can be effective in growing as cover crop.

1. *Pueraria phaseoloides*
2. *Pueraria hirsuta*
3. *Centrosema pubescens*
4. *Calapagonium mucunoides*

(observation continued.)

AGROSTOLOGY :

With a view to studying the possibility of cultivation of essential oil plants following species are under trial on the recommendation of the Forest Research Institute, Dehra Dun.

Citranella grass :

1. *Cymbapogon nardus*
 2. *Cymbapogon winterianus*
- (Nursery trials have proved successful)

Port Blair,
2-2-71

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