new alfalfa meal processing unit in the area studied, so as to help the entrepreneurs to venture into this business. The economic, technical, financial and managerial feasibilities were analysed.

In the feasibility analysis for starting alfalfa meal unit to produce and market 300 tonnes per year, resulted in the benefit- cost ratio of 1.06. The net present value and internal rate of return were Rs.2,63,502.96 and 44.80 per cent respectively. The feasibility analysis further revealed that the project would yield reasonable profit. The break-even analysis for the proposed alfalfa meal plant indicated that the plant would break-even at 257.35 tonnes. Therefore, an entrepreneurial development programme may be thought of to train the rural unemployed educated youths.

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HYBRID RICE : PRESENT STATUS IN TAMIL NADU, INDIA

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Rice is cultivated both under wet and dry conditions in Tamil Nadu, India. It is cultivated in about 20 lakh ha with an average yield of three t of rice per ha (4.5 t of grain per ha) in different seasons throughout the year in different parts of the State with number of varieties under different duration group (Table 1).

Even though the seasons are named differently in different parts of the State, they may be broadly classified as Summer, First season (*kharif*), Second season (*rabi*) and Winter. Semi dry *samba* and dry *samba* are usually grown in single crop lands. Out of the total rice cultivated area, about 16 lakh ha are covered during second, winter, semi dry *samba* and dry *samba* seasons. The remaining 4 lakh ha (25% of the total rice area) are being covered during summer and first season.

Production and productivity

Wet paddy is cultivated either by lift irrigation or tank irrigation under upland condition and by canal irrigation under lowland condition. Semi dry paddy is cultivated with pre-monsoon dry sowing and subsequently under wet condition either by tank or canal water. Dry paddy cultivation is completely under rainfed condition. Productivity is usually more, about 4 t of rice per ha. in summer and first season crops while it is about 3 t in second season crop and 1 to 3 t in dry and semidry season crops (Table 2).

Varieties

Important varieties which are under cultivation are ASD 17(100), IR 50(105), TKM 9 (105), ADT 37 (105), ASD 18 (105), ADT 36 (110), ASD 16 (115) and Co 37 (115) in short duration group : ADT 39 (120), IR 36 (120), IR 64 (120), IR 20 (130), Ponni (130), White Ponni (130), Bhavani (130), MDU 4 (130), Co 43 (135) and Co 45 (140) in medium duration group and ADT 40 (150) Co 42 (150) and Savithri (160) in long duration group. Figures in parenthesis are duration in days from seed to seed.

Hybrid rice

Possibility for hybrid rice cultivation is more in area where there is assured water supply and potentiality for increased production. First preference is for summer and first season wet crop wherein the yield potential is more due to high solar energy and low incidence of pest and diseases, even though the varieties cultivated fall under 100 to 115 days duration group. Second area of preference is the second season wet crop, wherein 120 to 140 days duration varieties are predominantly cultivated. Third area is winter season crop, wherein 100 to 115 days duration

Table 1. Rice seasons and duration groups.

Condition	Classification	Duration groups (days)
Wet	Summer	100 to 115
	First season *(Kharif)*	100 to 115
	Second season *(Rabi)*	120 to 160
	Winter	100 to 115
Semi dry	First season	100 to 115
Dry	Second season	120 to 160

varieties are cultivated. Considering the above points, Tamil Nadu requires three types of hybrids which will be able to give atleast 20 per cent increase or one tonne more grain yield per ha over the present day cultivars.

Progress

Intensive research on hybrid rice was not taken up until 1980 in Tamil Nadu, even though heterosis for yield was recorded as early as in 1993 (Ramiah, 1933). First genetic male sterile line was identified in the year 1980 (Sivasubramanian and Rangaswamy, 1980) and latter CMS lines of China and the International Rice Research Institute were introduced in the year 1981. In the next decade (1981-1991) research work was carried out on various aspects of pollination, seed set etc.

Identification of new sources of Cytoplasm and further work is in progress.

Out of the 40 CMS lines evaluated so far, IR 62829A is found to be stable and suitable for large scale seed production. Among the hundreds of heterotic combinations tested so far under field condition, only IR 62829A / IR 10198-66-2R has recorded on an average 14 per cent increased yield over ADT 36. This hybrid has recorded 5716 kg/ha in 113 days (seed to seed) while ADT 36 has recorded 5015 kg/ha in 112 days, tested in seven locations under multilocation trial.

Ideotype

An ideal plant type should be able to give maximum grain yield by utilising available sunlight and input during a particular season without spending much of its energy in vegetative parts. Under second crop with 130 days duration varieties, the attainable yield may go down even upto 50 per cent, on account of low light intensity and pest and disease incidence. Unless it is aimed for ideal plant types, it may not be possible to popularise our hybrids for cultivation, since the hybrids require high seed cost.

The plant type should have

- quick establishing capacity with single seedling per hill,
- suitability for wider spacing (25 hills per m^2),
- high tillering ability (20 productive tillers per hill),
- high grain number per panicle (200 grains),
- long and profuse root system having 50:30:20 of grain: straw: root ratio
- high harvest index (50%),
- acceptable 1000 grain weight and quality (20 g),
- resistance / tolerance for pests and diseases and
- adaptability for the situation for which it is released.

Table 2. Rice area and productivity in different seasons

Seasons	Area in ha.	Per cent to total rice area	Productivity kg/ha	
			Rice	Paddy
Summer	80,000	5	4,000	6,000
First season				
a.. Wet	2,40,000	15	4,000	6,100
b. Semidry	80,000	5	3,150	4,750
Second season				
a.. Wet	8,00,000	50	2,650	4,000
b. Semidry	1,60,000	10	2,000	3,000
c. Dry	1,60,000	10	1,500	2,250
Winter season	4,80,000	30	2,650	4,000
Total	20,00,000	125	3,000	4,500

Seed yield of A (AXB) and F1 (AxR) should be aimed for 2000 kg. per hectare with field area ratio of AxB : AxR : F1 at 1:100:5000 ha. Out of 20 lakh ha of rice area in Tamil Nadu, 50 per cent should be brought under hybrid rice cultivation to get 10 lakh t of increased production within five years by hybrid rice alone.

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PHENOTYPIC STABILITY FOR SEED YIELD IN GREEN GRAM (*Vigna radiata*) IN SODIC SOIL

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ABSTRACT

A set of five improved advanced, genotypes of green gram were evaluated in summer '92, *rabi* '92 and Summer '93 seasons in saline/sodic soil conditions (soil pH 8.6, 8.7 and 8.5). Pooled analysis of variances indicated significant differences among the genotypes and the environments. Moreover, the genotype environment interaction was highly significant indicating differential performance of the genotype under varied environmental conditions. The genotype SSRC 9 showed higher yield and stability of yield performance. The genotype SSRC 7 and CO.5 had high yield stability, better adapted to rich environments. SSRC 6 showed average yield, high stability and better adapted to poor environments.

KEY WORDS : Stability, GXE interaction, Linear Component, Green Gram.

In Tamil Nadu, more than 3 lakh ha are under saline sodic soil. Green gram is generally grown during *kharif*, *rabi* and summer seasons. In addition to cultivation in submarginal lands and poor crop management, low yield potential of the cultivars is a major factor of low productivity of the crop. Most of the improved varieties in the crop show inconsistent performance under varied environmental conditions due to genotype-environment (G.E.) interation. The yielding ability of crop plant is a quantitative character, showing continuous variation and is highly influenced by environmental factors.

The main aim of this study was to evaluate the advanced stage genotypes and to identify the superior ones with high yields over environments especially under sodic soil condition. Finlay and Wilkinson (1963) have suggested use of linear regression (bi) as a measure of stability of genotypes while Eberhart and Russell (1966) have emphasised the need for considering both linear (bi) and non- linear (S^2d) components of G.E. interaction for judging phenotypic stability of genotypes. Bilbro and Ray (1976) suggested use of (bi) as a measure of adaptation and the coefficient of determination (r^2) as the stability parameter. The present investigation was undertaken to identify high yielding stable genotypes suitable for cultivation in saline/sodic soils.

MATERIALS AND METHODS

The material comprised five improved genotypes of green gram developed at different research centres in Tamil Nadu. These were grown in a randomised block design with four replications at the Soil Salinity Research Centre, Tamil Nadu Agricultural University, Tiruchirappalli. The experiment was repeated during summer seasons of 1992, 1993 (January-April) and *rabi* season of 1992 (October-January). The data on seed yield were taken for study of G.E. interaction. The linear (bi) and non-linear (S^2d) components of G.E interaction were calculated as suggested by Eberhart and Russell (1966), while the coefficient of determination (r^2) of the linear regression coeffi cients was estimated after Bilbro and Ray (1976).

RESULTS AND DISCUSSION

Pooled analysis of variance revealed the existence of significant genetic differences among