EVALUATION OF ECONOMIC CROPPING SYSTEMS
FOR CAUVERY DELTA ZONE

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ABSTRACT

An experiment was conducted during 1996-2001 at Soil and Water Management Research
Institute, Thanjavur for evolving more economic cropping system for cauvery delta zone with 9
cropping sequences. The five years experiment revealed that Rice + Sesbania rostrata direct
sowing (DS) at 10:1 in kharif – Rice + Sesbania rostrata direct sowing (DS) at 10:1 in Rabi –
Redgram in summer recorded the maximum rice grain equivalent yield of 14,356 kg/ha/yr with
net income of Rs.51,054/- ha/yr and BC ratio of 3.2 and it was comparable with rice – rice –
redgram and Rice + Sesbania rostrata transplanting (TP) at 10:1 in kharif - Rice + Sesbania
rostrata transplanting (TP) at 10:1 in Rabi and Sesame in summer.

Key words : Cropping systems, Cauvery delta zone, Economic evaluation.

Increasing demand for food due to population
pressure and practically less scope for expansion of
area under cultivation warrants the stepping up of
food production through increased cropping
intensity. Oilseeds and pulses are receiving more
attention owing to higher prices. Inclusion of these
crops in the sequences change the economics of the
cropping sequence (Tomar and Tiwari, 1990 and
Gupta and Rai, 1990). Monocropping of rice being
a common practice in Cauvery Delta Zone of Tamil
Nadu, incorporation of green manure in rice
cropping may improve the soil fertility and
sustainability in yield can be achieved
(Subramaniam et al., 1999). The present paper is
an outcome of the results of economic evaluation
of various cropping systems in Cauvery Delta Zone
with inclusion of food and green manure crops.

The study was conducted during 1996 to 2001
at Soil and Water Management Research Institute,
Tamil Nadu Agricultural University, Kattuthottam,
Thanjavur.

The soil was sandy loam with low organic
carbon (0.32%), low in available nitrogen (212 kg/
ha), high in available P2O5 (112 kg/ha) and medium
in available K2O (253 kg/ha). The soil reaction was
neutral (pH 6.8) and Electrical conductivity was 0.21
dsm-1.

The treatments consisted of nine cropping
sequences viz., Rice-Rice-Redgram (C1), Rice +
Sesbania rostrata D.S (10:1) – Rice + Sesbania
rostrata D.S (10:1) - Redgram (C2), Rice +
Sesbania rostrata T. P.(10:1) - Rice + Sesbania
rostrata T. P.(10:1) – Sesame (C3), Sesbania rostrata
(Seed) – Rice – Sesame (C4), Blackgram – Rice –
Blackgram (C5), Groundnut – Rice –
Blackgram(C6), Soybean – Rice - Sunhemp seed
(C7), Sun hemp (GM) – Rice – cotton (C8), Maize –
Rice – Soybean (C9). They were tested in
randomized block design with three replications. All
the crops were raised as per the recommended
package of practices as per Crop Production Guide
(CPG, 1999).The varieties tested were ADT 36, ADT
43 rice in kharif, ADT 39 rice in rabi, VBN-1
redgram, ADT 5 blackgram, Ganga-5 maize, TMV-
6 sesame and CO 1 soybean and Sunhemp. For
comparison between crop sequences the yield of all

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### Table 1. Economic Evaluation of Different Crop Sequences (1996-2001)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Crop Sequences</th>
<th>Kharif</th>
<th>Rabi</th>
<th>Summer</th>
<th>Grain Yield (kg/ha)*</th>
<th>Rice grain income (Rs./ha/yr)</th>
<th>Gross* Income (Rs./ha/yr)</th>
<th>Net* Income (Rs./ha/yr)</th>
<th>CB Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Rice (Short duration)</td>
<td>Rice (Medium duration)</td>
<td>Redgram (Short duration)</td>
<td>5694</td>
<td>5052</td>
<td>909</td>
<td>13923</td>
<td>71821</td>
<td>48952</td>
</tr>
<tr>
<td>C2</td>
<td>Rice (Short duration)</td>
<td>Rice (Medium duration)</td>
<td>Redgram (Short duration)</td>
<td>5846</td>
<td>5229</td>
<td>956</td>
<td>14356</td>
<td>74147</td>
<td>51054</td>
</tr>
<tr>
<td>C3</td>
<td>Rice (Short duration)</td>
<td>Rice (Medium duration)</td>
<td>Gingelly TMV 6</td>
<td>5700</td>
<td>4944</td>
<td>764</td>
<td>13390</td>
<td>69062</td>
<td>45975</td>
</tr>
<tr>
<td>C4</td>
<td>Sesbania rostrata (Seed)</td>
<td>Rice (Medium duration)</td>
<td>Gingelly TMV 6</td>
<td>840</td>
<td>5096</td>
<td>761</td>
<td>10626</td>
<td>54784</td>
<td>38529</td>
</tr>
<tr>
<td>C5</td>
<td>Blackgram ADT 5</td>
<td>Rice (Medium duration)</td>
<td>Blackgram ADT 5</td>
<td>820</td>
<td>4961</td>
<td>683</td>
<td>9864</td>
<td>50918</td>
<td>34975</td>
</tr>
<tr>
<td>C6</td>
<td>Groundnut VRI 2</td>
<td>Rice (Medium duration)</td>
<td>Blackgram ADT 5</td>
<td>1935</td>
<td>4942</td>
<td>677</td>
<td>12178</td>
<td>63163</td>
<td>46335</td>
</tr>
<tr>
<td>C7</td>
<td>Soybean CO 1</td>
<td>Rice (Medium duration)</td>
<td>Sunhemp (Seed)</td>
<td>1850</td>
<td>5242</td>
<td>1173</td>
<td>11499</td>
<td>59204</td>
<td>42649</td>
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<tr>
<td>C8</td>
<td>Sunhemp (GM)</td>
<td>Rice (Medium duration)</td>
<td>Cotton MCU 7</td>
<td>10007</td>
<td>5151</td>
<td>965</td>
<td>8851</td>
<td>45386</td>
<td>26718</td>
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<tr>
<td>C9</td>
<td>Maize Ganga 5</td>
<td>Rice (Medium duration)</td>
<td>Soybean CO 1</td>
<td>3767</td>
<td>4868</td>
<td>841</td>
<td>10912</td>
<td>56048</td>
<td>37130</td>
</tr>
</tbody>
</table>

* Data not statistically analyzed

* Market value for the produces (Rs./kg)

Rice – Rs. 5.75/-, Redgram – Rs. 20/-, Gingelly – Rs. 20/-, Blackgram – Rs. 18/-, Groundnut pod – Rs. 15/-, Soybean – Rs. 11/-, Maize – Rs. 6/-, Cotton – 12/-, Sesbania rostrata – Rs. 15/-, Sunhemp – 12/- and Greenmanure – Rs. 0.50/-. 
crops was converted into rice grain equivalent yield on price basis (Yadav and Ram Newaj, 1990).

\[
\text{Rice Grain equivalent Yield } = \frac{\text{Grain yield of the crop} \times \text{Price of grain}}{\text{Price of rice}}
\]

Net income and BC ratio was worked out by dividing the gross income by the cost of cultivation.

The results of five years pooled data on rice grain equivalent yield are presented in Table 1. The Rice + Sesbania rostrata DS(10:1) in kharif – Rice + Sesbania rostrata DS at 10:1 in rabi and Redgram in Summer (C2) recorded the maximum rice grain equivalent yield of 14,356 kg/ha/yr with net return of Rs. 51,054 /ha/yr and BC ratio of 3.2 and it was comparable with Rice-Rice-Redgram (C1) of rice grain equivalent yield of 13923 kg/ha/yr with net income of Rs. 48,952 /ha/yr and BC ratio of 3.1 and also with Rice + Sesbania rostrata T. P. 10:1 in kharif – Rice + Sesbania rostrata T.P. 10:1 in rabi and Sesame in summer (C3) having the rice grain equivalent yield of 13390/kg/ha/yr with net income of Rs. 45,975 /ha/yr and BC ratio of 3.0 (Table 1). Sustainability is a prime concern throughout rice farming systems as most Asian countries have moved into post green revolution phase. Use of organic manures along with fertilizers is the key to sustainable agriculture. Green manuring in rice crop has proved to be highly promising in increasing the yields. The increased rice yields due to Sesbania rostrata addition has also been reported by Raju and Reddy (1999) in Rice–Rice system.

The increasing future demand of food can probably be achieved with more intensive crop production. We have to produce needed quantity of food to feed the teeming population on one hand and sustain production taking due care on soil health on the other hand. To achieve this objective, more productive, efficient and remunerative cropping systems are to be promoted. Since, Cauvery Delta zone is regarded as the rice bowl of Tamil Nadu, evaluation of economic cropping systems based on rice is highly useful to cater the food needs of the state. The performance of any cropping system is judged in terms of productivity and profitability. Similar studies were carried out by Soni and Kaur, (1976), Tomar and Tiwari (1990) and Gangwar et al. (1999) in various crop sequences for different ecosystems. In the present study, based on the findings, the rice with or without Sesbania rostrata as intercrop and incorporated at 50th day in kharif and Rabi and either redgram or sesame in Summer is found to be successful and economic cropping system for Cauvery Delta Zone.

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REFERENCES


