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Identification of efficient cropping zone for Redgram in Tamil Nadu

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Abstract

The methodological study was made in Department of Agronomy, Tamil Nadu Agricultural University (TNAU), Coimbatore. The study was conducted to identify the efficient cropping zone of redgram for Tamil Nadu. The data on area, production and productivity of Redgram for 1997-98 to 2011-12 were collected and indices such as Relative Spread Index (RSI) and Relative Yield Index (RYI) were computed and the potential cropping districts for the Redgram were identified. The results indicated that among the different districts in Tamil Nadu, Selam, Theni, Namakkal, Madurai, Vellore, Thiruvannamalai, Dharmapuri were most efficient cropping zone. Among all the districts of Tamil Nadu, Vellore had a high relative spreading index and while Theni had a high relative yield index. In some of the districts though RSI is low, RYI is high which indicates the suitability of that Redgram. Market demand and value of the produce, suitability of the crop made farmers to cultivate redgram in their location which relates in low RSI with high RYI.

Keywords: Relative spread index (RSI), Relative yield index (RYI)

Introduction

Redgram also known as Pigeonpea or Arhar is a very old crop of this country. After chickpea, Redgram is the second most important pulse crop in India. It contains high amount of protein and is a major source of the protein requirement of the vegetarian population of the country. Seeds of redgram are rich in iron and iodine. They are rich in essential amino acids like lysine, tyrosine, cysteine, and arginine. Redgram contributes about 15% in total pulses area as well as production of India.

Materials and Methods

The data on percent area and Productivity of Redgram for different districts of Tamil Nadu were collected from the indiastat.com. From this 15 years (1997-98 to 2011-12) data Relative Spread Index (RSI) and Relative Yield Index (RYI) were computed by using Kanwar (1972) formula.

Relative spread index (RSI)

$$RSI = \frac{\text{Area of particular crop expressed as \% of total cultivable area in the district}}{\text{Area of crop expressed as percentage to the total cultivable area in the State}} \times 100$$

Relative yield index (RYI)

$$RYI = \frac{\text{Mean yield of a particular crop in a district (Kg/ha)}}{\text{Mean yield of the crop in the State (Kg/ha)}} \times 100$$

Criteria (Table 1)

Relative Spread Index (RSI)	Relative Yield Index (RYI)
> 125 High	> 100 High
75-125 Medium	75-100 Medium
<75 Low	< 75 Low

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Table 1: RYI RSI Category

RYI	RSI	Category
High	High	Most efficient zone
High	Medium	Most efficient zone with variation
High	Low	Efficient zone
Medium	High	Efficient zone with little year to year variation
Medium	Medium	Efficient zone with medium year to year variation
Medium	Low	Efficient zone with great year to year variation
Low	High	Not efficient zone with greater variation
Low	Medium	Not efficient zone with medium year to year variation
Low	Low	Not efficient zone with little variation

For each year, the RYI and RSI were calculated separately. Based on the criteria for efficient cropping zone, the efficient cropping zone among the different district of Tamil Nadu and the potential district for Red gram were identified.

Results and Discussion

Relative Spread Index (RSI): The data of relative spread index for Redgram indicated that among all districts, the RSI was maximum in Vellore (665.69) district followed by Dharmapuri district (431.07). Higher RSI indicates the major redgram cultivating area. The soil type, rainfall pattern and other climatic factors of that area was highly favoured for Redgram cultivation.

Relative Yield Index (RYI): The relative yield index was maximum in Theni district (185.76) followed by Namakkal (143.65) and Erode(139.65)district. Higher RYI shows those areas have higher yield of Redgram.

Most efficient zone: From the computed data, Selam, Theni, Namakkal, Madurai, Vellore, Thiruvannamalai, Dharmapuri districts have high RSI & high RYI. These seven districts are most efficient cropping zone for Redgram where in hi-tech agriculture can be introduced for Redgram.

Apart from this, Karur district having a greater scope to increase the productivity since the spread was more.

Table 2: Identification of Efficient Zone for Redgram

Districts		RSI	R	YI	CATEGORY
Coimbatore	33.98	LOW	107.9192	HIGH	Not efficient zone with greater variation
Cuddalore	38.84	LOW	118.5885	HIGH	Not efficient zone with greater variation
Dharmapuri	431.07	HIGH	127.1665	HIGH	Most efficient zone
Didugul	64.37	LOW	110.3091	HIGH	Not efficient zone with greater variation
Erode	65.05	LOW	139.6495	HIGH	Not efficient zone with greater variation
Karur	299.02	HIGH	81.60892	MEDIUM	Most efficient zone with variation
Madurai	131.52	HIGH	118.4284	HIGH	Most efficient zone
Namakkal	208.8	HIGH	143.6505	HIGH	Most efficient zone
Perambalur	120.39	MEDIUM	99.06377	MEDIUM	Efficient zone with medium year to year variation
Pudukkottai	101.94	MEDIUM	95.06281	MEDIUM	Efficient zone with medium year to year variation
Salem	148.54	HIGH	128.2548	HIGH	Most efficient zone
Sivagangai	27.18	LOW	116.7747	HIGH	Not efficient zone with greater variation
Thanjavur	3.57	LOW	117.6282	HIGH	Not efficient zone with greater variation
Theni	226.93	HIGH	185.7619	HIGH	Most efficient zone
Thiruvallur	86.21	MEDIUM	105.8814	HIGH	Efficient zone with little year to year variation
Thiruvarur	0.514	LOW	47.12597	LOW	Not efficient zone with little variation
Thootukudi	5.82	LOW	104.1423	HIGH	Not efficient zone with greater variation
Tiruchirapalli	110.77	MEDIUM	76.64773	MEDIUM	Efficient zone with medium year to year variation
Tirunelveli	5.81	LOW	113.4672	HIGH	Not efficient zone with greater variation
Tiruvannmalai	147.57	HIGH	102.6486	HIGH	Most efficient zone
Vellore	665.69	HIGH	107.3111	HIGH	Most efficient zone
Villupuram	44.66	LOW	120.2529	HIGH	Not efficient zone with greater variation
Virudunagar	57.28	LOW	95.31887	MEDIUM	Not efficient zone with medium year to year variation
Kancheepuram	2.28	LOW	98.637	MEDIUM	Not efficient zone with medium year to year variation
Kanyakumari	0.016	LOW	17.73225	LOW	Not efficient zone with little variation
Nagapattinam	0.008	LOW	5.334613	LOW	Not efficient zone with little variation
Ramanathapuram	1.68	LOW	50.5828	LOW	Not efficient zone with little variation
Krishnagiri	113.8	MEDIUM	65.05028	LOW	Efficient zone with greater year to year variation

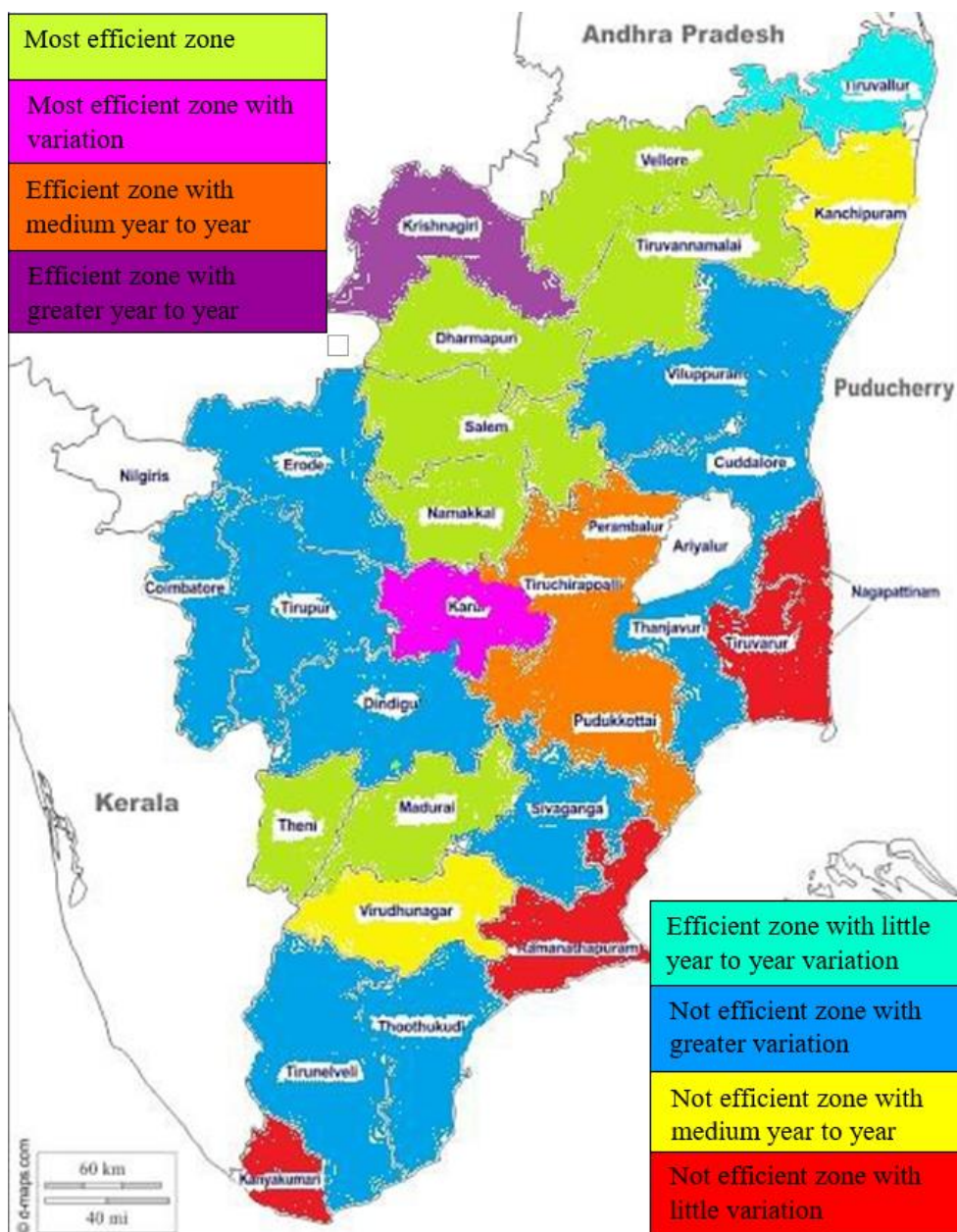


Fig 1: Efficient Cropping Zone for Redgram in different districts of Tamil Nadu.

Conclusion

In this methodological analysis most efficient cropping zones were Selam, Theni, Namakkal, Madurai, Vellore, Thiruvannamalai, Dharmapuri. These area may having optimum situation for redgram production such as soil fertility, favourable climatic condition and good quality o ground and irrigation water which leads to high yield of the crop. Some districts(karur) are having high area under crop but medium yield due to the lack of quality inputs or resources, lack of knowledge and technology adoption by the farmers. Because of this, government policies and input subsidies, transfer of technology by extension workers and evolving high yielding varieties and hybrids by the breeders and researchers can helps to increase the yield which will protect the farmers from loss of yield.

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