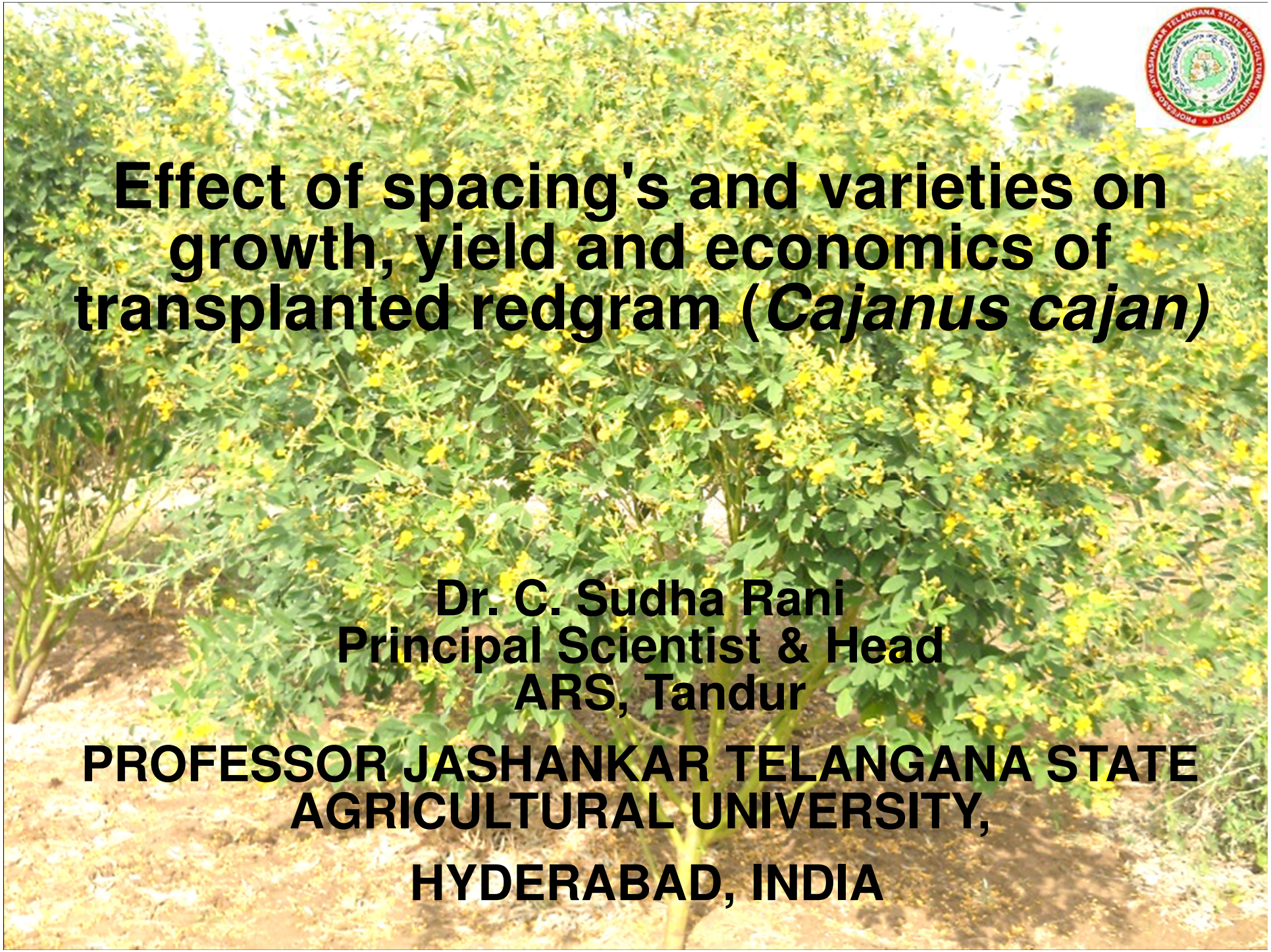

Effect of spacing's and varieties on growth, yield and economics of transplanted redgram (*Cajanus cajan)*

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INTRODUCTION

Redgram (*Cajanus cajan* (L), commonly known as pigeonpea, Arhar and Tur is an important pulse crop in grown in India.

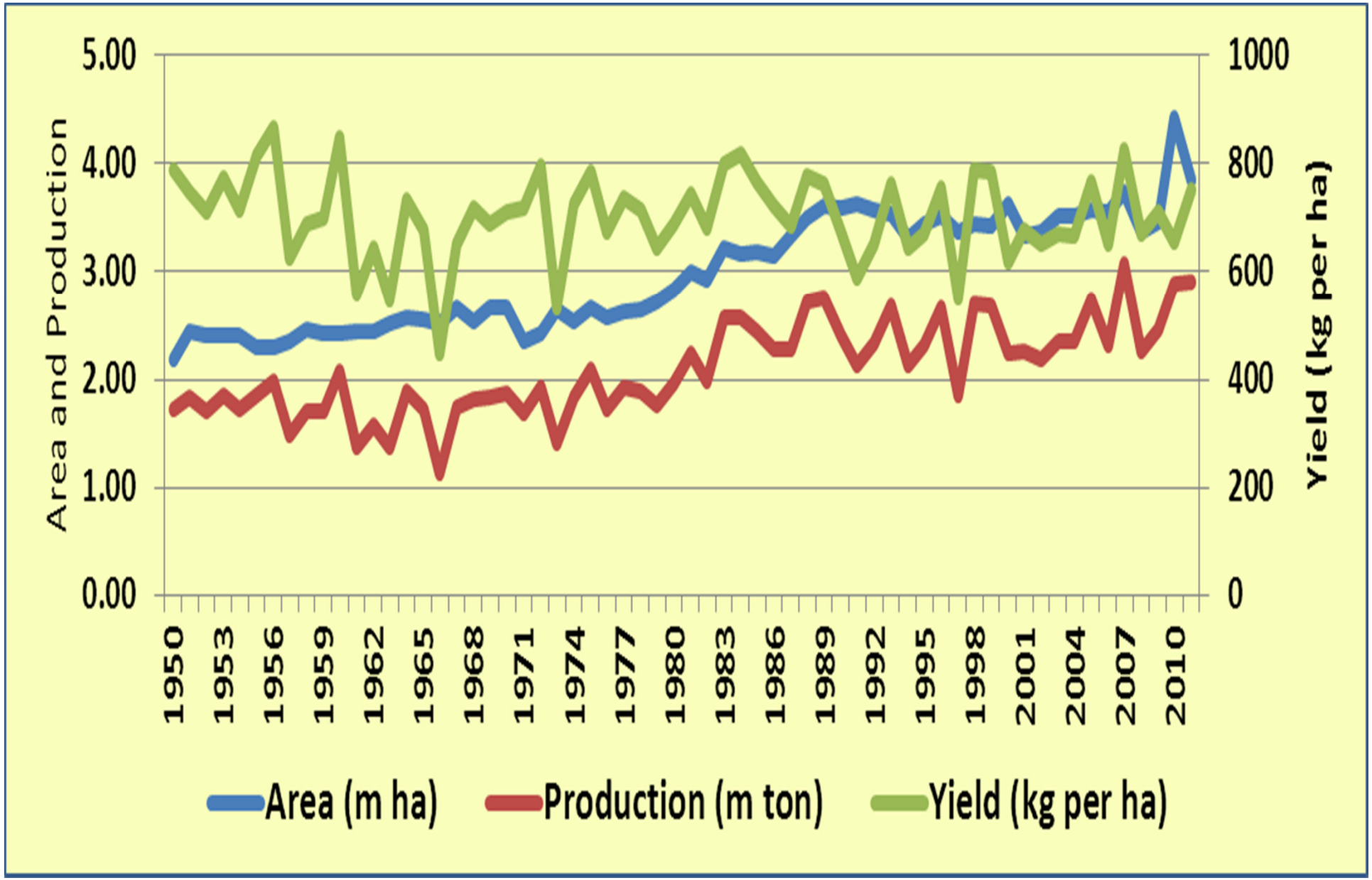
Redgram is mainly cultivated and consumed in all the developing countries of the world. Redgram is widely grown in India. India is the largest producer and consumer of Redgram in the world.

Redgram accounted for about 20 percent of the total production of pulses in the country during the year 2000-01.

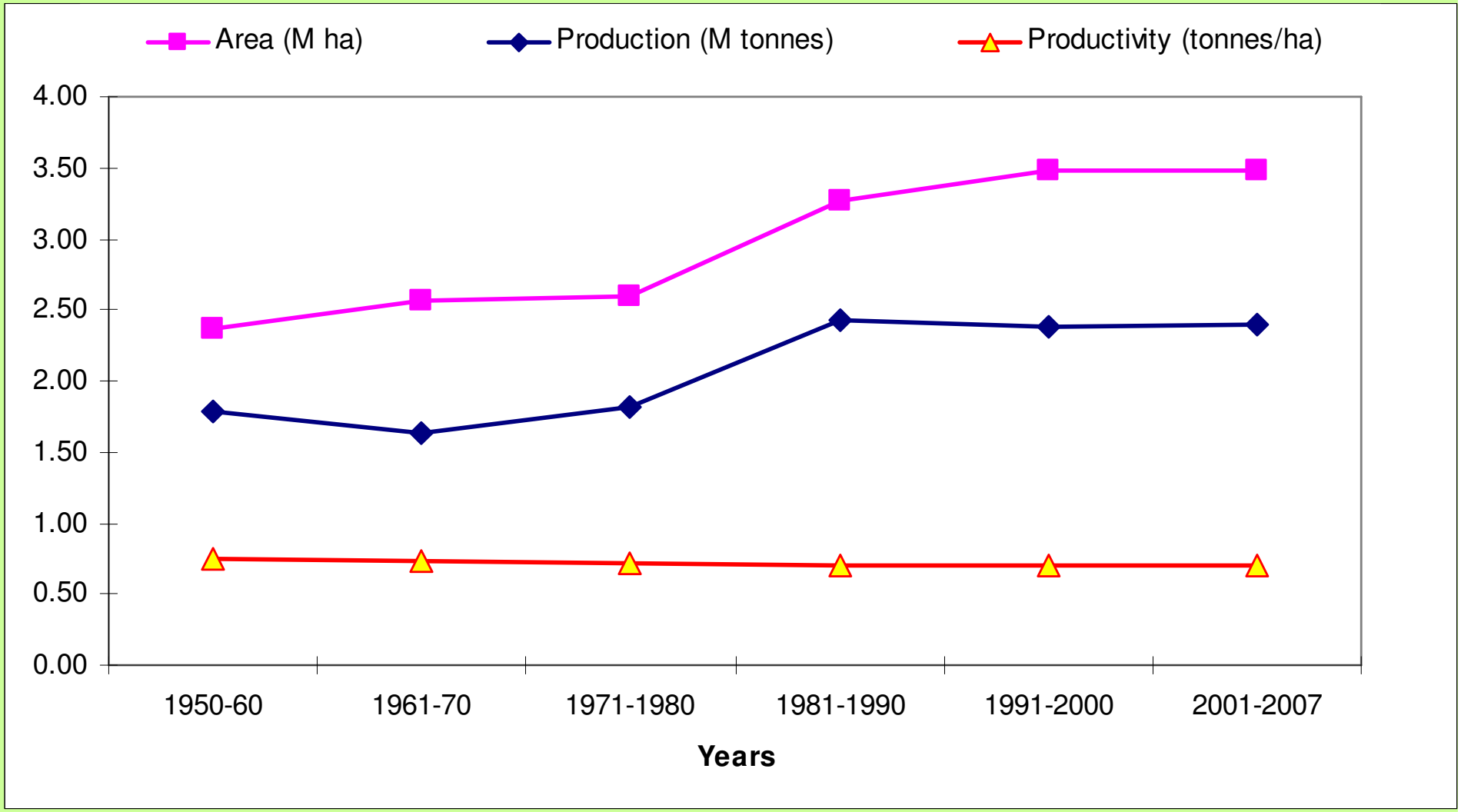
Redgram is a protein rich staple food. It contains about 22 percent of protein, which is almost three times higher than that of cereals.

- **The biological value improves greatly when rice / wheat is consumed with Redgram because of the complementary relationship of the essential amino acids. It is particularly rich in lysine, riboflavin, thiamine, niacin and iron.**
- **This protein rich pulse occupies an important place among rainfed resource poor farmers because it provides quality food, fuel and fodder.**
- **Its soil rejuvenation qualities such as release of soil bound phosphorous, atmospheric nitrogen fixation, recycling of soil nutrients and addition of organic matter and other nutrients make the pigeonpea crop an ideal crop of sustainable agriculture in the tropical and sub-tropical regions of India.**
- **Major Redgram producing countries are India, Myanmar, Malawi, Uganda and others.**

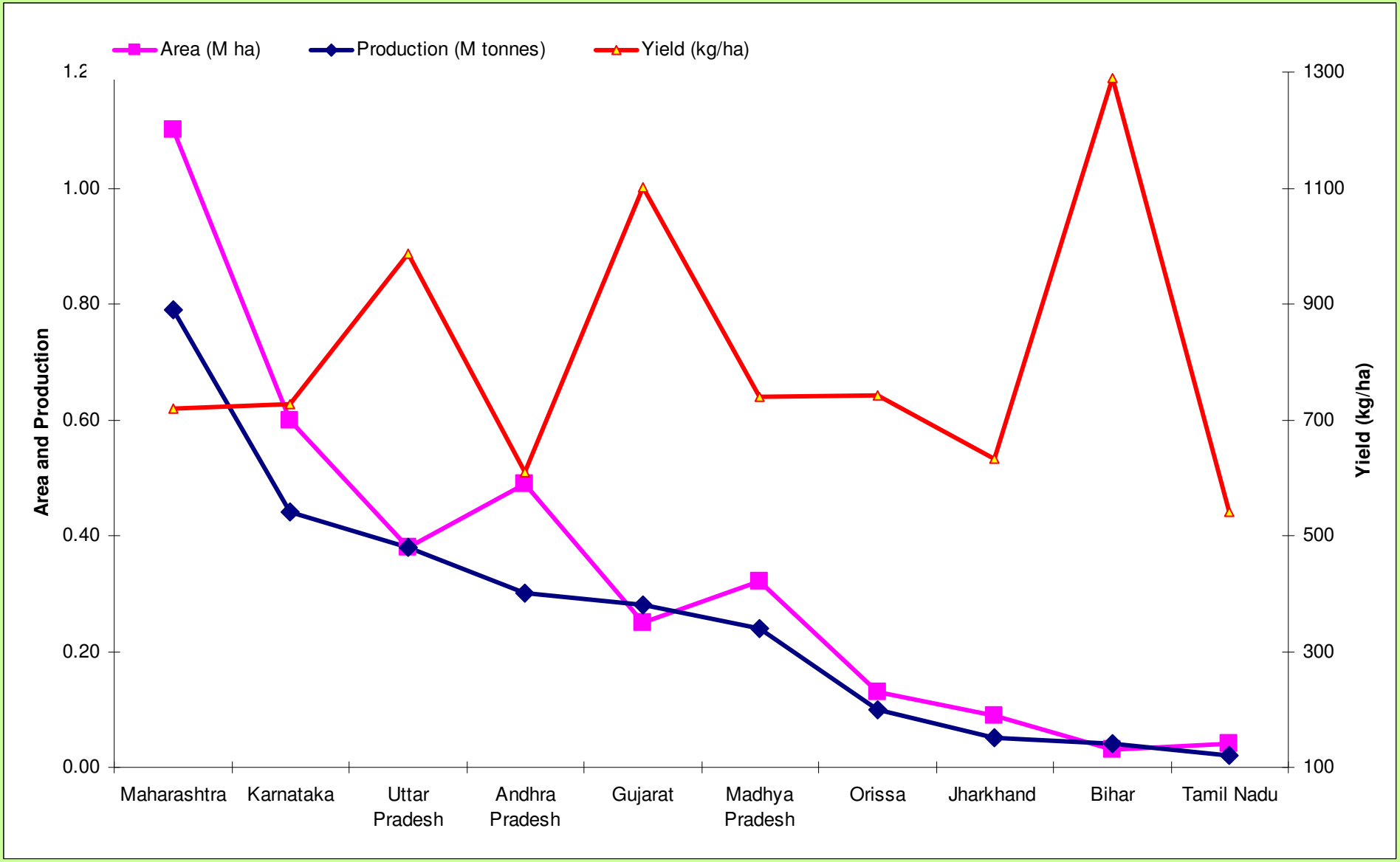
Area, Production and productivity of pigeonpea in Asia for the last 60 years



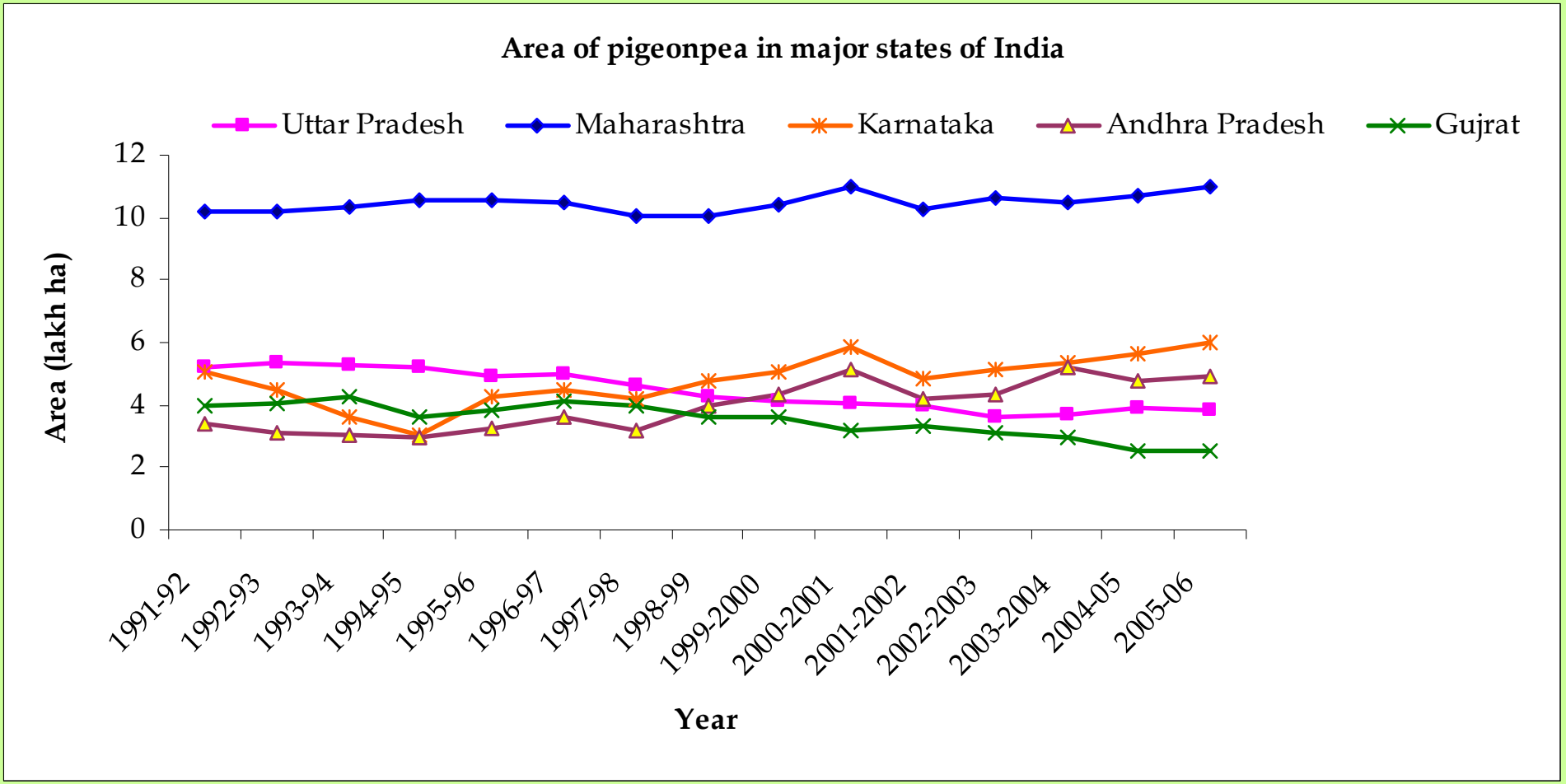
Area, Production and productivity of pigeonpea in India for the last 50 years

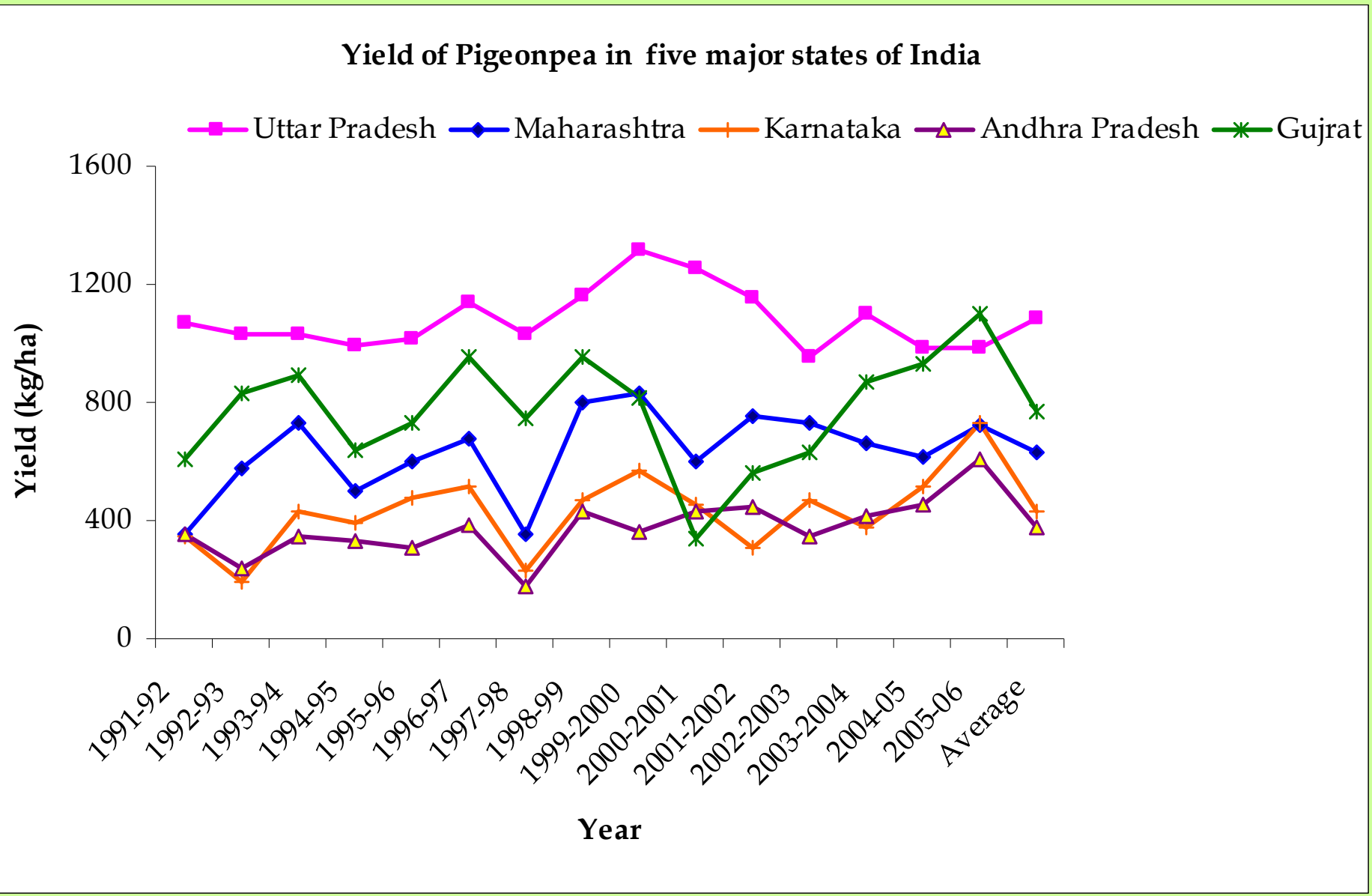


Area, Production and productivity of pigeonpea in major states of India



Area of pigeonpea in major states of India




Yield of Pigeonpea in five major states of India
Uttar Pradesh
Maharashtra
Karnataka
Andhra Pradesh
Gujrat
Yield (kg/ha)
1600
1200
800
400
0
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-05
2005-06
Average
Year

Basis for experimentation

- **Timely sowing is very important in redgram crop in realizing good yields. In our Telangana state, generally redgram is sown between June and August months in various agro-climatic zones.**

- **The crop comes to reproductive stage between September to November months. During the years of low rainfall, the reproductive phase of the crop coincides with moisture stress conditions and associated terminal drought situations.**

- **Any measure of advancing the planting time reduces the risk from terminal drought stress. But, late onset of monsoons, which are being experienced more frequently, doesn't allow for timely sowing.**

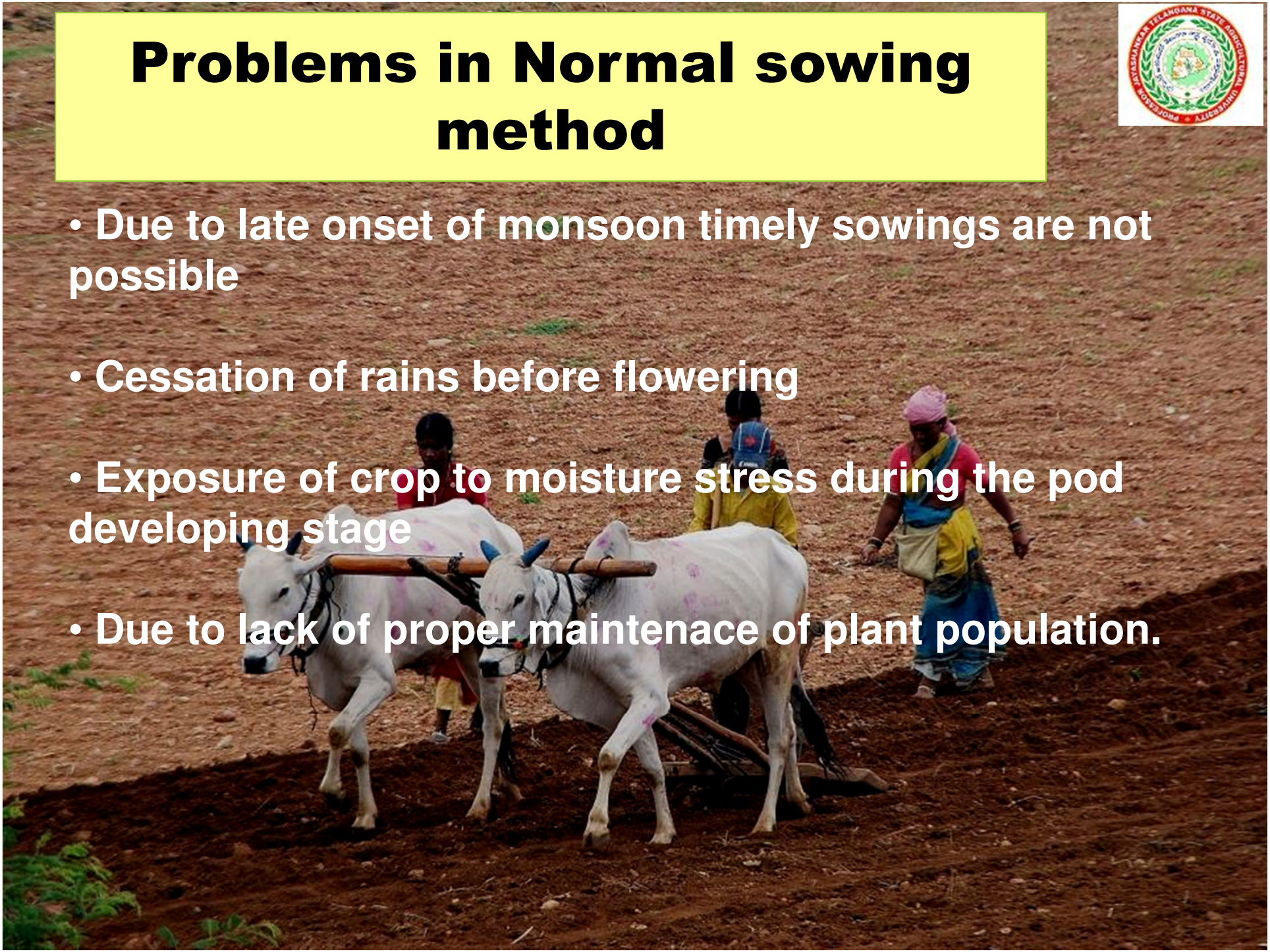
- **In such situations raising the nursery in advance (in the month of May) and transplanting the 30 – 45 days old redgram seedlings with the onset of monsoon is the best method to protect the crop from terminal drought stress during poor rainfall years due to enhanced deep rooting.**

- **The main objective of the study was to study the effect of different spacings and redgram varieties and their interaction under Transplanted conditions**

Transplanted Redgram (Nursery)

Yields can be increased twice or thrice by transplanting method

Problems in Normal sowing method



- Due to late onset of monsoon timely sowings are not possible
- Cessation of rains before flowering
- Exposure of crop to moisture stress during the pod developing stage
- Due to lack of proper maintenace of plant population.

Sowing will be taken up at the end of June in normal sowing method

….In Transplanting method 35-45 days old seedlings will be transplanted by June end

Management practices in Transplanting method

- Selection of varieties
- Raising of Nursery
  - Seed Rate
  - Seed Treatment
- Management of nursery
- Preparation of Main field
- Transplanting
- Fertilizer Management
- Weed control
- Nipping of the tops
- Harmonal spray
- Water management

Package of practices for Transplanted redgram

Varieties selection

- Mediyum duration varieties suitable to our area
  - Asha (ICPL 87119)
  - Maruthi (ICPL 8863)
  - Laxmi (ICPL 85063)
  - Surya (MRG 1004)
  - Palem Redgram(PRG 158) etc.

Seed Rate

- Vertisols– 825 gm/acre
- Alfisols-- 1470 gm/acre

Transplanted Redgram package practices

Seed Treatment

Trichoderma viridae 4gm/kg

Rhizobium 100 gm /kg

Transplanting in Redgram – Can evade terminal drought stress

Transplanting in Redgram – Can evade terminal drought stress

One irrigation was provided at transplanting for proper establishment

Transplanting in Redgram – Can evade terminal drought stress

Transplanting in Redgram – Can evade terminal drought stress

Transplanting in Redgram – Can evade terminal drought stress

Transplanted Redgram package of practices

Nursery management

- Grow healthy nursery.
- Transplanting should be completed within 30-40 days.
- use 4”x6” HDPE bags for nursery raising.
- Fill the nursery packets with correct proportion of soil, Fym and Carbendazim
- For rainfed crop the transplanting must be completed by the end of June.
- Under irrigated conditions the transplanting should be completed by first week of June.
- Due to high temperatures of may and June see that the nursery in under the shade.
- See that the nursery is near the main field.
- Meet the day today water requirements of the nursery.

Transplanted Redgram package of practices

Fertilizer management

- Soils with out any salinlty problems and with good drainage are most suitable .
- As redgram is a deep rooted crop the soils must be well ploughed.
- At one side we have to maintain the nursery at the other side the main field has to be prepared by running the plough deeply which facilitate for easy transplanting.
- Main field should be get ready by the time the nursery reaches to 35-45 days.

- See that the ball of earth should not break at the time of transplanting so that the plant establish in the main field within 2 days

TREATMENT DETAILS

Mainplot: Spacings -4

Sub-plot: Varieties-5

Design: Split-plot

Replications: 3

Soils : Vertisols with PH: 7.8

Av Nitrogen : Low

Phosphoru: medium

Potassium: Medium

Table : Effect of spacing and genotypes on growth of Transplanted Redgram (2011-12 & 2012-13 pooled data)

Treatments	Plant height (cm)	Primary branches	Secondary branches	Number of pods	Stem girth (cm)	100 seed weight (gm)
A) Main plots – 4 Spacings						
S_1- 90 X 60 cm	232	19.1	8.4	826	8.4	9.97
S_2-120 x 90 cm	227	**19.6**	**9.3**	960	9.0	10.07
S_3- 150 x 120cm	211	18.2	8.7	1482	9.4	10.04
S_4- 180 X 120cm	198	15.1	8.0	**1617**	**10.2**	9.75
Sem ±	8.82	1.34	0.37	132	0.35	0.21
C.D. (p=0.05)	NS	2.92	1.79	465	1.24	NS
C. V (%)	-	14.6	16.5	20.15	10.7	-
B) Sub-plots – 5 Genotypes						
G_1- Aasha	219	**15.5**	**10.6**	**1542**	9.2	**10.79**
G_2- PRG 158	229	14.4	9.7	1224	**9.3**	10.21
G_3- Maruthi	215	14.2	7.7	1127	8.8	9.89
G_4- Laxmi	208	14.3	6.5	915	9.1	10.18
G_5 _ MRG 66	216	15.1	7.7	1302	**9.3**	8.8
Sem ±	5.06	1.15	1.02	127	0.30	0.13
C.D (p=0.05)	10.51	2.72	2.07	366.2	NS	NS
C. V (%)	16.2	15.2	17.4	3.5	-	-
Interaction (A X B)						
Sem ±	8.42	1.29	1.2	180	0.43	0.26
C.D (p=0.05)	24.2	NS	NS	NS	1.23	NS
C.V (%)	11.6	-	-	-	8.3	-

Table : Effect of spacing and genotypes on yield and Economics of Transplanted Redgram (pooled)

Treatments	Seed yield (Kg/ha)	Dry matter Kg/ha	Harvest index	Gross returns	Net returns	B:C ratio
A) Main plots – 4 Spacings						
S_1- 90 X 60 cm	3532	19828	21.45	133980	96480	2.59
S_2- 120 x 90 cm	3193	20059	21.0	121422	96465	3.74
S_3- 150 x 120 cm	2638	24952	18.9	100012	77562	3.46
S_4- 180 X 120 cm	2546	23292	21.18	97138	78638	4.24
Sem ±	133.0	2068	1.46	5152	5146	0.20
C.D. (p=0.05)	397.2	715.6	5.04	17829	17810	0.84
C. V (%)	15.3	18.3	13.13	15.31	16.88	17.86
B) Sub-plots – 5 Genotypes						
G_1- Aasha	3435	25802	21.79	130624	104705	4.32
G_2- PRG 158	3056	22965	19.79	116216	90415	3.48
G_3- Maruthi	2789	20333	19.6	106071	80220	3.18
G_4- Laxmi	2567	19232	20.36	97515	71664	2.90
G_5 _ MRG 66	3038	21831	21.74	115328	89477	3.51
Sem ±	116.1	1210	0.67	4392	4395	0.20
C.D (p=0.05)	334.2	3487	1.92	12654	12663	0.58
C. V (%)	12.9	17.8	11.87	13.65	16.9	21.37
Interaction (A X B)						
Sem ±	223	2420	1.33	8785	8790	0.40
C.D (p=0.05)	NS	NS	NS	NS	NS	NS
C.V (%)	-	-				

Transplanting in Redgram – Can evade terminal drought stress

Quick establishment – robust growth at various stages

Stem girth after harvest

ICPL 87119

PRG - 158

MRG - 1004

ICPL-8863

ICPL-85063

VISIT OF Dr. Emmanuel, ICRISAT Visiting Scientist

17-11-12

29-11-12

Training to Farmers

22-12-12

22-12-12

Thank You