Hybrid Pigeonpea Scenario in India
Today & Tomorrow

A bumper crop of ICPH 2740 in Jalgaon, Maharashtra, December, 2011

A Brief for Presentation to National Food Security Mission

3 April, 2012

ICAR

ICRISAT
Science with a human face

A Grower-friendly Seed Technology

Location	Area (ha)	Yield (kg/ha)
Madhya Pradesh		
Tikamgarh	5.0	3040
Seoni	1.0	2500
Indore	0.15	2267
Rewa	1.0	1740
Katni	3.0	1450
Jabalpur	1.5	1333
Andhra Pradesh		
Nizamabad	0.4	1750
Patancheru	0.4	1250
Medchal	1.4	1214
Warangal	1.2	1063
Nalgonda	2.0	1000
Maharashtra		
Risod	0.8	1000
Gujarat		
Ahmedabad	0.8	1063

The extent of yield advantage and success in identifying ideal seed production locations suggest that hybrid technology can be used to break yield barrier in pigeonpea.

NFSM Target for 2014

State	Area (ha)	Co-ordinator	Collaborators	Seed Producers
A.P	20,000	Dr CV Sameer Kumar	DoA, AP	NSC, SFCI, APSSDC
Maharashtra	20,000	Dr IA Madrap	DoA, MS	NSC, SFCI, MSSC
Karnataka	20,000	Dr PS Dharmaraj	DoA, Kar	NSC, SFCI, KSSC
M.P. 1	20,000	Dr AN Tikle	DoA, MP	NSC, SFCI, MPSSC
M. P. 2	20,000	Dr SK Rao	DoA, MP	NSC, SFCI, MPSSC
Jharkhand	20,000	Dr ZA Haider	DoA, Jhar	NSC, SFCI
Total	**1,20,000**			

CAN WE CROSS

YIELD BAR OF "50 Q/Ha"

Yield (kg/ha) of ICPH 2740 under high input sole crop in Maharashtra, 2010

Village	Area (m2)	Yield (kg/ha)		% Gain
		Hybrid	Control	
Salod	450	3956	2044	94
Nimgaon	1012	3951	2469	60
Kothoda	450	4667	3556	31
Tamoli	450	3889	2278	71
Mean		**4116**	**2587**	**59**

HYBRID breeding technology that has evolved over decades in crop plants has helped in raising the production and productivity of a number of food, fruit, and vegetable crops. The commercial exploitation of hybrids in pulses was never possible due to their peculiar flower structure that does not allow cross pollination. Pigeonpea, however, is an exception with 25-30% out-crossing and ICRISAT took an initiative to exploit this phenomenon for enhancing productivity in pigeonpea.

In India, the cropped area of pigeonpea has increased from 2.3 m ha in 1950 to 3.93 m ha in 2010; but its productivity for the past 5-6 decades has remained stagnant at around 700 kg/ha and to date, this yield plateau has remained a challenge. To achieve a breakthrough in this direction a project to breed commercial hybrids was initiated at ICRISAT in 1974; this however required the availability of a cytoplasmic nuclear male sterility (CMS) system. Since it was not present in the global pigeonpea germplasm, a Herculean task of breeding a CMS system was undertaken.

A major breakthrough in breeding CMS was achieved in 2005 - after 30 years of intensive research. In the last five years a significant progress has been made in addressing most issues related to hybrid breeding with liberal support from NFSM and ICAR.

At present the pigeonpea hybrid technology is at the verge of commercialization and we need more hands to create a history in plant breeding.

Advantages of Hybrids

* 25-50% more yield
* 44% greater shoot mass
* 50% less seed rate
* Ideal for inter-cropping
* Compete well with weeds
* Greater drought tolerance
* Greater water-logging tolerance

The High Yielding Hybrids

ICPH 2671 – the first choice of farmers in Madhya Pradesh and Jharkhand

OFTs in Madhya Pradesh				OFTs in Jharkhand			
District	ICPH 2671	Asha (C)	% Gain	District	ICPH 2671	Asha (C)	% Gain
Jabalpur	2310	1690	37	Darisai	1865	950	96
Narsinhpur	1950	1500	30	Garhwa	1661	925	79
Rewa	2870	1680	73	Daltanganj	1203	725	66
Raisen	2600	1400	86	Dumra	1694	900	88
Panna	1160	500	132	Dhanbad	1843	910	102

A field demonstration in Ranchi

ICPH 2740 – a new option to farmers

Yield (kg/ha) of ICPH 2740 in OFTs

State	Hybrid	Asha (C)	% Gain
Madhya Pradesh	1646	1194	37.9
Maharashtra	1643	1224	34.2
Andhra Pradesh	1063	650	63.5
Mean	1451	1023	41.8

On - farm trials in Maharashtra