



VASANTRAO NAIK MARATHWADA KRISHI VIDYAPEETH
PARBHANI, (M.S.) 431402

वसंतराव नाईक मराठवाडा कृषि विद्यापीठ
परभणी, (म.रा.) ४३१४०२



6th Annual Zonal Workshop of KVK's (Maharashtra, Gujrat and Goa)



WELCOME



Dr. D.K. Patil
Principal Scientist (Pigeonpea)
Agril. Research Station, Badnapur
Dist. Jalna, M.S.

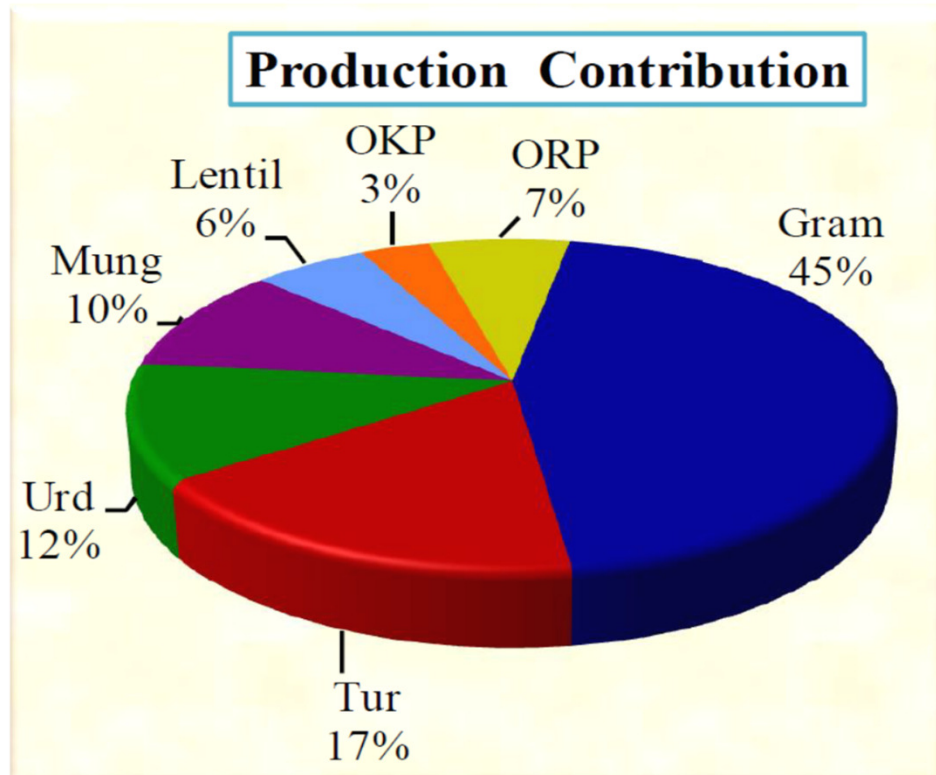
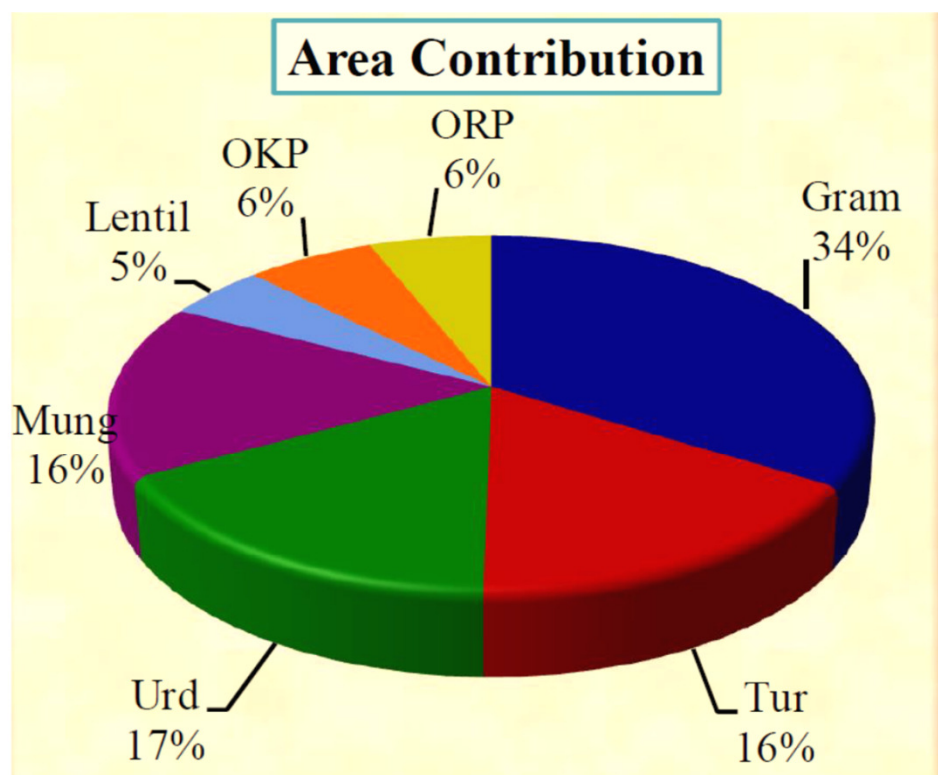


Pulse crops contribution in Area and Production

{Area-lakh ha, Production-lakh tons, Yield-kg/ha}

Crop	Normal (2016-17 to 2020-21)			Contribution (%)	
	Area	Production	Yield	Area	Production
Gram	98.86	107.37	1086	34	45
Tur	47.17	41.37	877	16	17
Urd	48.07	27.39	570	17	11
Mung	46.07	24.48	531	16	10
Lentil	14.29	13.34	934	5	6
Other Kharif Pulses	18.47	8.05	436	6	3
Other Rabi Pulses	17.45	16.22	930	6	7
Total Kharif Pulses	140.18	87.04	621	48	37
Total Rabi Pulses	150.19	151.18	1007	52	63
Total	290.37	238.22	820		

Source: DES, Min.of Agri. & FW (DA&FW), GOI, OKP ,Other Kharif Pulses, ORP –Other Rabi Pulses.



States' Contribution in Area & Production – Pigeonpea

States	Area	% Contri.	Production	% Contri.	Yield
Karnataka	13.52	29	9.97	24	737
Maharashtra	12.81	27	11.74	28	916
Madhya Pradesh	4.04	9	4.72	11	1170
Telangana	3.27	7	2.47	6	756
Uttar Pradesh	2.90	6	3.09	7	1063
Andhra Pradesh	2.71	6	1.00	2	370
Gujrat	2.65	6	3.08	7	1163
Jarkhand	2.25	5	2.39	6	1060
Odisha	1.35	3	1.37	3	1016
Others	1.67	4	1.54	4	925
All India	47.17		41.37		877

Area-lakh ha, Production-lakh tons, Yield-kg/ha

Source: DES, Ministry of Agri. & FW (DA&FW), Gol. Normal Area & Prod. (2016-17 to 2020-

States' Contribution in Area & Production – Mungbean

States	Area	% Contri.	Production	% Contri.	Yield
Rajasthan	21.40	46	10.97	45	513
Maharashtra	4.29	9	1.96	08	457
Madhya Pradesh	4.18	9	3.46	14	828
Karnataka	4.15	9	1.43	06	346
Odisha	2.51	5	0.87	04	346
Bihar	1.70	4	1.13	05	666
Tamil Nadu	1.70	4	0.69	03	408
Gujarat	1.41	3	0.86	04	611
Andhra Pradesh	1.21	3	0.82	03	677
Others	3.51	8	2.27	09	646
All India	46.07		24.48		531

Area-lakh ha, Production-lakh tons, Yield-kg/ha

Source: DES, Ministry of Agri. & FW (DA&FW), Gol. Normal Area & Prod. (2016-17 to 2020-

States' Contribution in Area & Production – Urdbean

States	Area	% Contri.	Production	% Contri.	Yield
Madhya Pradesh	17.23	36	8.61	31	500
Rajasthan	5.96	12	2.98	11	500
Uttar Pradesh	5.89	12	3.11	11	528
Tamil Nadu	4.21	9	2.78	10	662
Andhra Pradesh	3.83	8	3.41	12	889
Maharashtra	3.50	7	1.67	6	478
Jharkhand	1.38	3	1.21	4	876
Gujarat	1.32	3	0.88	3	667
Karnataka	0.93	2	0.48	2	514
Others	3.82	8	2.26	8	591
All India	48.07		27.39		570

Area-lakh ha, Production-lakh tons, Yield-kg/ha

Source: DES, Ministry of Agri. & FW (DA&FW), Gol. Normal Area & Prod. (2016-17 to 2020-

States' Contribution in Area & Production – Chickpea

States	Area	% Contri.	Production	% Contri.	Yield
Madhya Pradesh	28.10	28	36.16	34	1291
Maharashtra	19.80	20	19.17	18	968
Rajasthan	18.59	19	19.72	18	1061
Karnataka	9.95	10	6.14	6	617
Uttar Pradesh	5.73	06	7.09	7	1236
Andhra Pradesh	4.65	05	4.61	4	992
Gujrat	3.70	04	5.42	5	1464
Chattisgarh	3.26	03	2.73	3	838
Jarkhand	2.26	02	2.73	3	1208
Others	2.92	03	3.60	3	1232
All India	98.86		107.37		1086

Area-lakh ha, Production-lakh tons, Yield-kg/ha

Source: DES, Ministry of Agri. & FW (DA&FW), Gol. Normal Area & Prod. (2016-17 to 2020-



Area, Production of Productivity of Pigeonpea



Year	India			Maharashtra			Marathwada		
	A	P	Y	A	P	Y	A	P	Y
2011-12	4.04	2.65	656	12.09	8.51	704	5.08	3.91	770
2012-13	3.81	3.02	806	10.81	7.71	713	4.54	2.70	515
2013-14	3.88	3.17	849	11.41	10.34	906	5.23	5.16	946
2014-15	3.85	2.81	↓ 783	12.10	3.53	↓ 292	5.36	1.34	↓ 241
2015-16	3.96	2.56	673	12.37	4.44	359	5.28	1.10	208
2016-17	5.34	4.87	↑ 913	14.36	20.89	↑ 1455	6.04	9.60	↑ 1459
2017-18	4.43	4.29	960	13.75	12.50	909	6.00	5.47	863
2018-19	4.10	3.59	875	12.61	08.34	662	4.80	2.08	380
2019-20	4.54	3.89	858	13.19	11.97	907	5.03	4.57	919
2020-21	4.80	4.32	900	13.40	14.50	1082	5.08	5.69	1134
2021-22	--	4.00	--	14.18	16.49	1163	4.93	3.04	651
2022-23*	---	---	---	11.75	8.48	722	3.86	3.10	1283

India: Area-M. ha, Production-M. tons, Yield-kg/ha * II adv. estimate

M. S. & Marathwada: Area-lakh ha, Production-lakh tons, Yield-kg/ha



Area, Production of Productivity of Mungbean



Year	India			Maharashtra			Marathwada			
	A	P	Y	A	P	Y	A	P	Y	
2011-12	3.38	1.63	474	3.98	2.42	612	1.28	0.66	516	
2012-13	2.71	1.19	469	4.12	1.95	474	1.52	0.73	373	
2013-14	3.38	1.60	474	4.30	2.00	465	1.43	0.82	635	
2014-15	3.02	1.50	498	3.15	0.84	268	1.58	0.29	184	
2015-16	3.83	1.60	↓ 418	3.66	0.69	↓ 190	1.58	0.17	↓ 107	
2016-17	4.32	2.17	502	4.44	2.60	585	1.87	1.08	596	
2017-18	4.26	2.01	472	4.32	1.59	367	1.75	0.49	324	
2018-19	4.25	2.41	567	4.81	2.04	424	2.15	0.97	386	
2019-20	4.58	2.51	548	3.87	1.51	390	1.34	0.59	442	
2020-21	5.13	3.09	601	4.01	2.07	517	1.41	0.85	612	
2021-22	---	3.06	---	4.40	2.11	↑ 481	1.40	0.73	↑ 511	
2022-23*	India: Area-M. ha,	2.69	Production-M. tons,	1.70	Yield-kg/ha,	632	1.03	* II adv. estimate	0.65	635

M. S. & Marathwada: Area-lakh ha, Production-lakh tons, Yield-kg/ha



Area, Production of Productivity of Urdbean



Year	India			Maharashtra			Marathwada		
	A	P	Y	A	P	Y	A	P	Y
2011-12	3.21	1.77	572	3.36	2.28	678	1.27	0.71	560
2012-13	3.11	1.90	642	3.45	1.86	539	1.44	0.68	392
2013-14	3.06	1.70	555	3.33	2.06	617	1.47	0.96	694
2014-15	3.24	1.96	604	2.76	0.92	333	1.51	0.34	224
2015-16	4.01	2.19	547	2.86	0.61	214	1.46	0.18	123
2016-17	4.50	2.83	628	3.38	1.83	542	1.63	0.71	503
2017-18	5.44	3.56	655	3.51	1.21	346	1.51	0.53	362
2018-19	4.83	3.36	696	3.67	1.54	421	1.56	0.73	405
2019-20	4.53	2.08	459	3.41	1.51	444	1.38	0.65	451
2020-21	4.14	2.23	538	3.56	2.26	636	1.43	1.04	781
2021-22	--	2.66	--	3.89	1.84	484	1.67	0.96	552
2022-23*	<i>India: Area-M. ha,</i>		<i>Production-M. tons,</i>	3.58	2.26	630	1.34	<i>* II adv. estimate</i>	

M. S. & Marathwada: Area-lakh ha, Production-lakh tons, Yield-kg/ha



Area, Production of Productivity of Chickpea



Year	India			Maharashtra			Marathwada		
	A	P	Y	A	P	Y	A	P	Y
2010-11	9.19	8.22	895	14.40	13.00	903	4.23	3.86	868
2011-12	8.32	7.70	912	10.50	8.20	775	3.77	2.32	615
2012-13	9.51	8.83	929	12.54	10.58	844	4.40	2.70	495
2013-14	9.93	9.53	960	18.20	16.22	891	5.38	5.22	905
2014-15	8.25	7.33	889	14.27	10.88	762	4.87	3.90	715
2015-16	8.39	7.06	840	14.42	7.77	539	4.50	1.29	286
2016-17	9.63	9.38	974	19.29	17.19	891	8.18	9.14	1103
2017-18	10.56	11.37	1077	20.00	18.34	917	8.70	9.18	1027
2018-19	09.55	9.94	1041	16.94	13.97	825	5.50	4.11	718
2019-20	9.68	11.08	1142	20.43	22.39	1096	8.18	8.92	1057
2020-21	9.99	11.91	1192	22.31	23.96	1074	9.10	9.38	990
2021-22	--	13.98	--	23.72	27.15	1145	12.85	13.40	1023
2022-23				28.30	36.39	1285	14.62	*19.17	1336

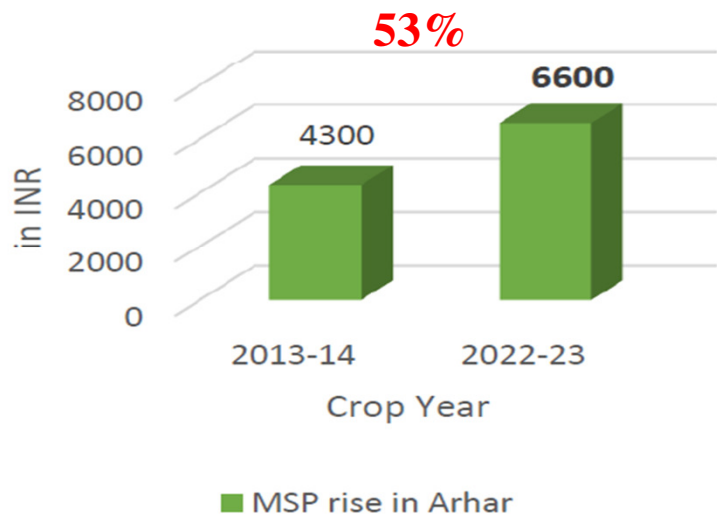
India: Area-M. ha, Production-M. tons, Yield-kg/ha

M. S. & Marathwada: Area-lakh ha, Production-lakh tons, Yield-kg/ha

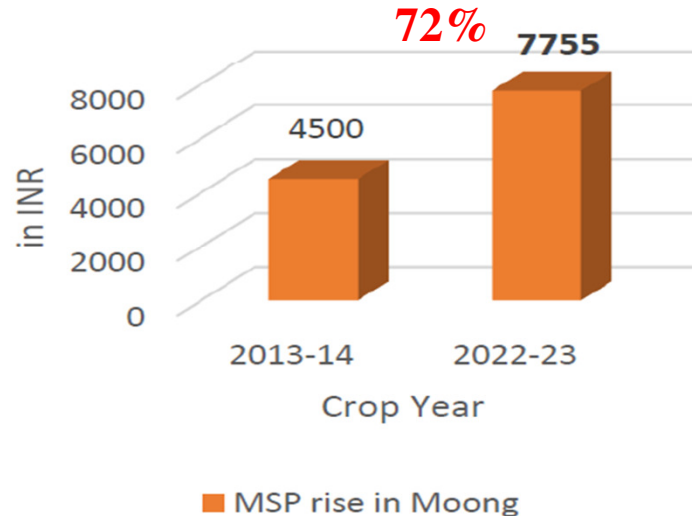
*IT adv. estimate

M. S. & Marathwada: Area-lakh ha, Production-lakh tons, Yield-kg/ha

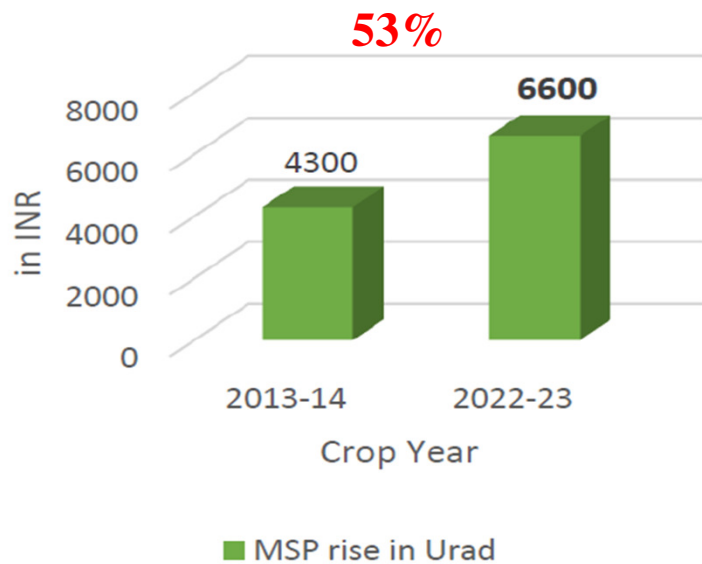
MSP rise in Arhar



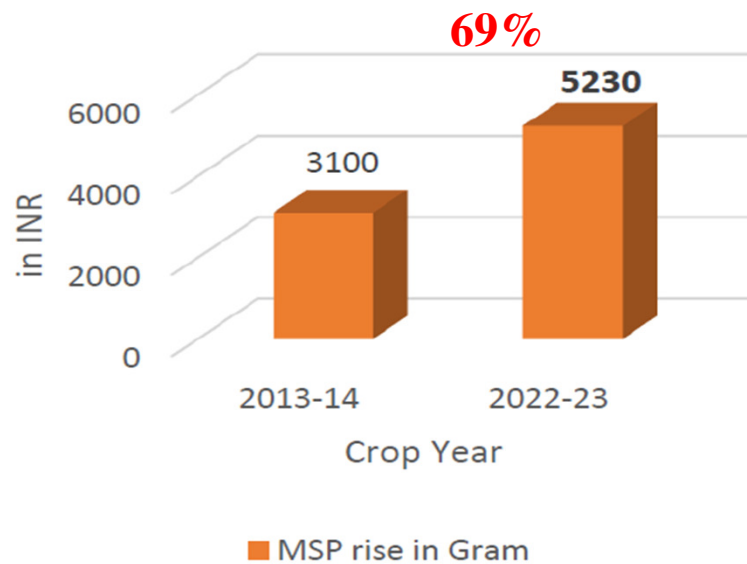
MSP rise in Moong



MSP rise in Urad



MSP rise in Gram



India's Import & Export Trade of Major Pulses (2020-

Crop	Major countries (<i>In terms of Quantity</i>)	
	Major Import Sources	Major Export Destinations
Tur/Pigeon pea	(98% contribution) i) Tanzania Rep (36%); ii) Mozambique (35%); iii) Myanmar (20%); iv) Sudan (5%) ; v) Uganda (2%)	(92% contribution) USA (40%), Canada (15%), UAE (11%), Nepal (9%), Singapore (4%), Australia (3%), Malaysia (3%), UK (3%), Qatar (3%).
Urdbean	(100% contribution) i) Myanmar (98%) ii) Singapore (2%)	(92% contribution) USA (37%), Nepal (27%), Canada (8%), UAE (5%), UK (5%), Singapore (4%), Australia (3%), Malaysia (2%).
Mungbean	(96% contribution) : i) Kenya (30%); ii) Mozambique (24%) iii) Tanzania Rep (18%); iv) Brazil (11%); v) UAE (4%); vi) Australia (3%); vii) South Africa (2%); viii) Uganda (2%); ix) Venezuela (2%)	(90% contribution) USA (24%), Nepal (18%), UK (18%), Canada (10%), Bangladesh (6%), Qatar (4%), Netherland (4%), Australia (2%), UAE (2%), Malaysia (2%).

∴ Deptt. of Commerce, Min. of Commerce & Industry, GoI. (%) figures in parenthesis indicates percentage share of global import/export. ; Peas*- 2019-20

Year	Area	Prodn	Prodt y
1980-81	6.44	3.18	495
1985-86	7.56	4.51	597
1990-91	10.08	4.21	418
1995-96	10.45	6.22	595
2000-01	10.96	6.60	602
2007-08	11.81	11.06	937
2008-09	10.09	6.05	600
2009-10	10.93	9.19	841
2010-11	13.02	9.76	750
2011-12	12.09	8.51	704
2012-13	10.81	7.71	713
2013-14	11.41	10.34	906

Year	Area	Prodn	Prodt y
2014-15	12.10	3.53	292
2015-16	12.37	4.44	359
2016-17	14.36	20.89	1455
2017-18	13.75	12.50	909
2018-19	12.61	8.34	662
2019-20	13.19	11.97	907
2020-21	13.40	14.50	1082
2021-22	14.18	16.49	1163
2022-23	11.75	8.48	722
% increase	82	167	46

Area, Production and Productivity of Pigeonpea in Maharashtra

Pulses Scenario

In Million Tonnes

Pulses	Present Status	Target	Projections		
	2020-21	2021-22	2028-29	2029-30	2030-31
Demand	28.18	29.26	31.83	32.64	35.23
Production	25.72	26.96*	29.79	30.75	33.95
Import Requirement	2.46	2.30	2.04	1.89	1.28
Dependency on Import	9%	8%	6%	5.7%	3.6%

*2nd Advance Estimates

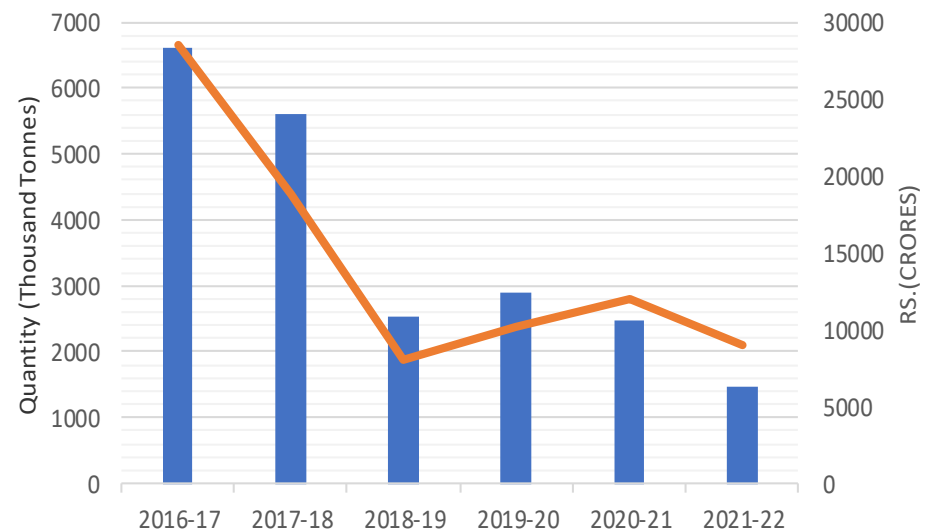
Source: Working Group recommendations on Final Projections, Niti Ayog

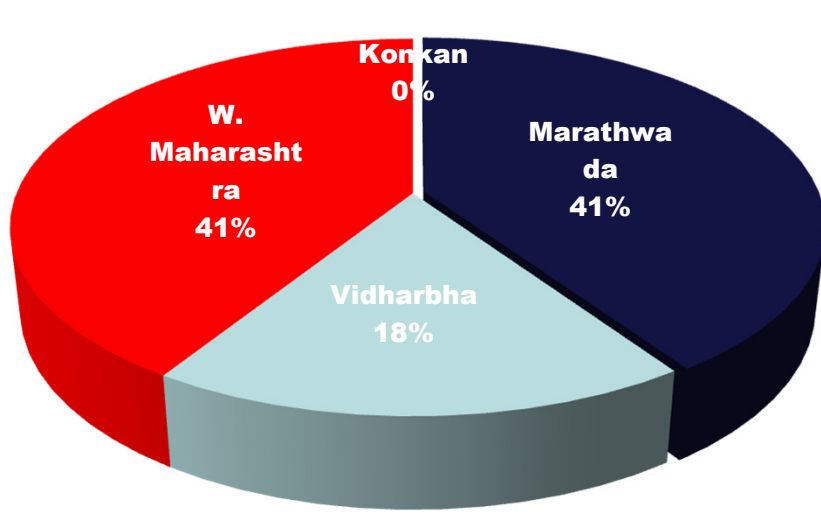
Dependency on import can easily be neutralized by little additional production of 1.5-2.0 million tonnes than the target

Import Substitution

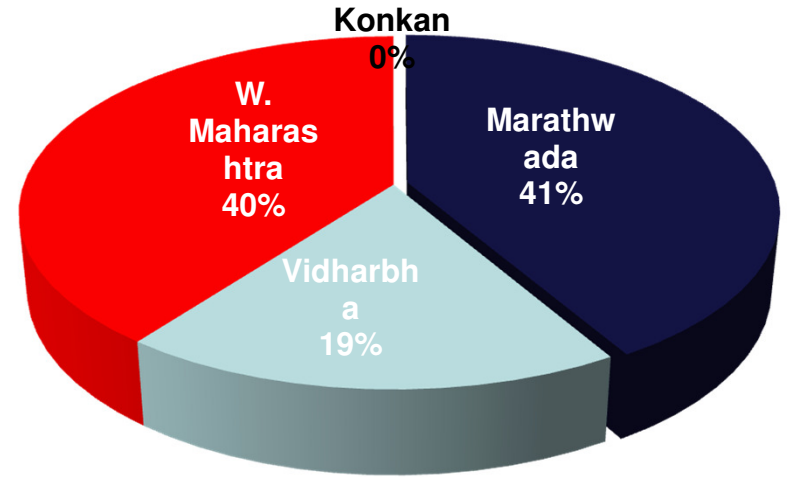
Rs. 28523.90 crore in 2016-17
to Rs.11937.59 crore from 6.6 Mt in
2016-17 to 2.46 Mt in 2020-21

Dependency on Import (2016-21)

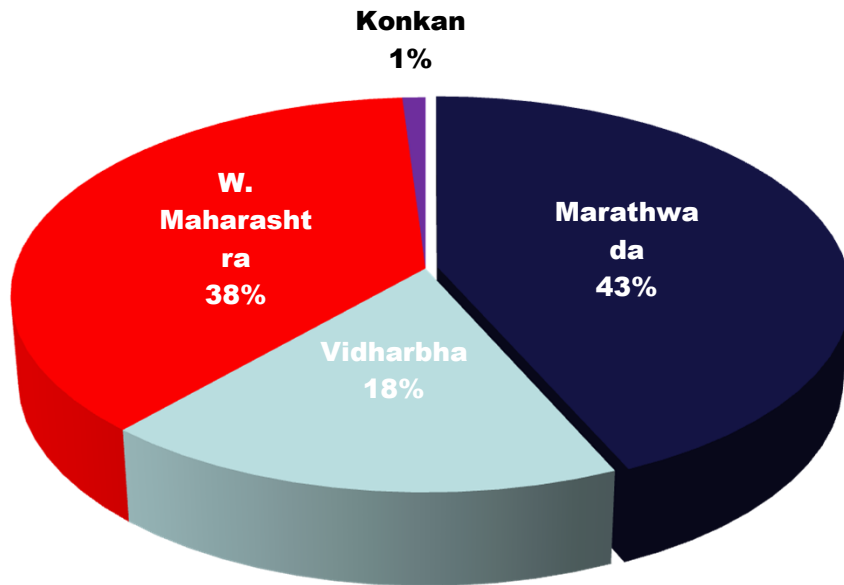




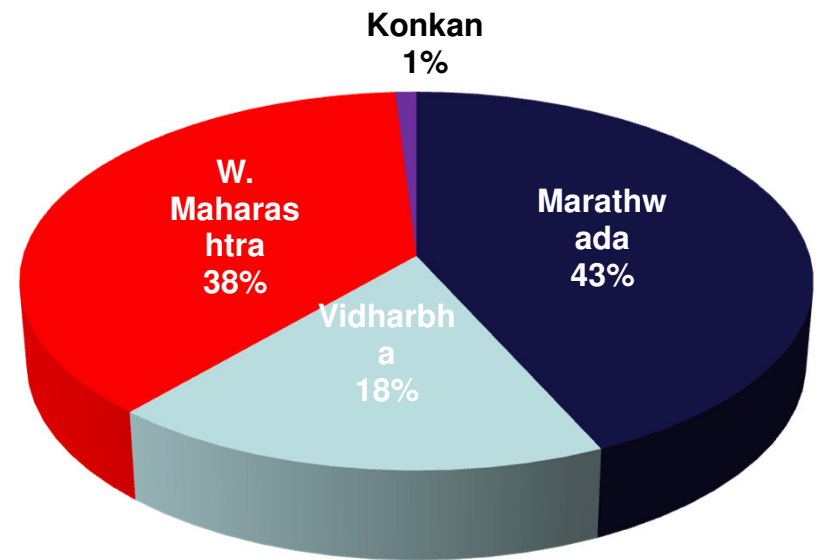
Mungbean Scenario (Area)



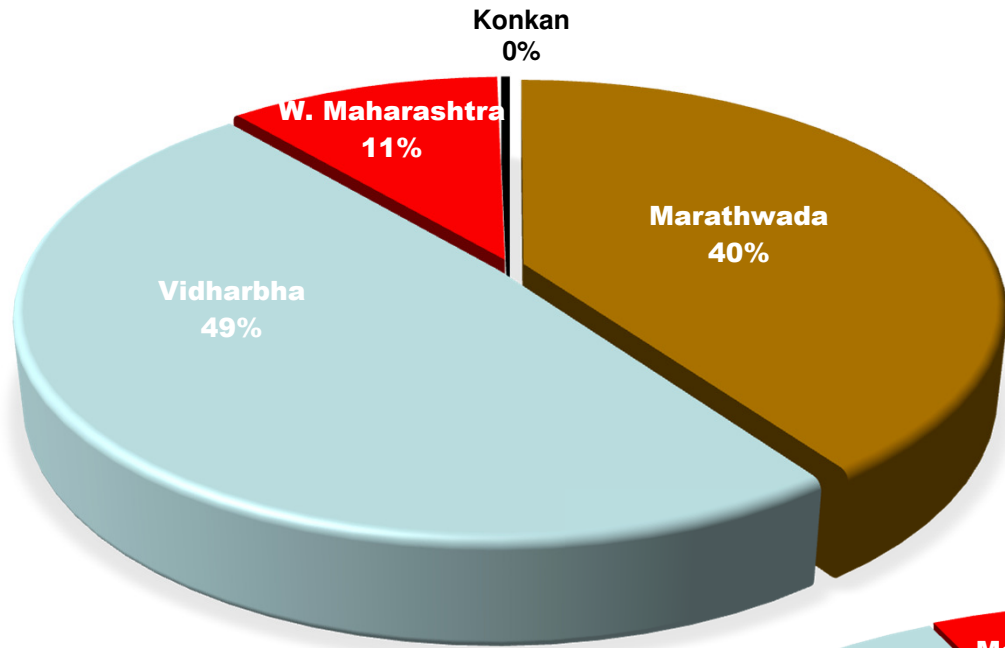
Mungbean Scenario (Production)



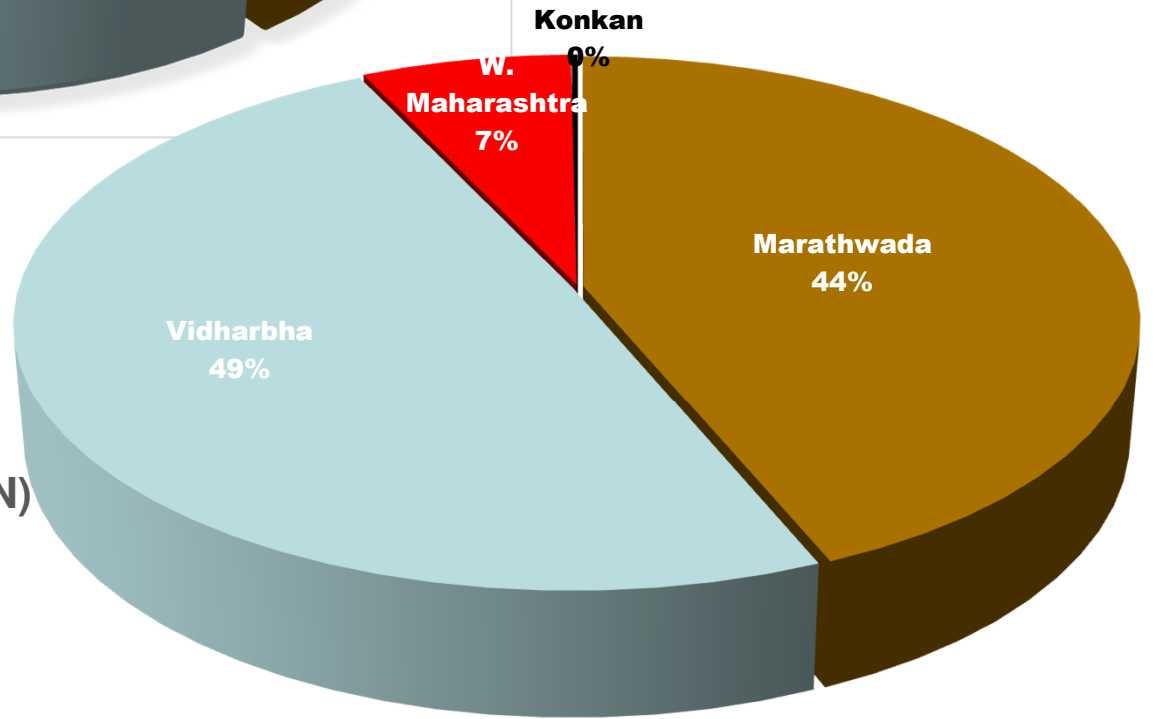
Urdbean scenario (Area)



Urdbean scenario (Production)



PIGEONPEA SCENARIO (AREA)



GEONPEA SCENARIO (PRODUCTION)

Why pulses?

Crops	Total Biomass in intercropping (Kg/ha)		Leaf fall of Pigeonpea (Kg/ha)	Total Biomass (Kg/ha)
	Mungbean	Urdbean		
Intercropping				
Pigeonpea + Mungbean	862	----	1707	2569
Pigeonpea + Urdbean	----	999	1787	2786
Sole Pigeonpea			2802	2802

Crops	Increase in nutrients due to Mungbean and Urdbean (Kg/ha)			Increase in nutrients due to Pigeonpea (Kg/ha)			Total increase in nutrients (Kg/ha)		
	N	P	K	N	P	K	N	P	K
Pigeonpea + Mungbean	7.5	4.1	6.8	25.3	5.4	15.6	32.5	9.52	22.4
Pigeonpea + Urdbean	8.1	4.9	8.2	25.4	5.5	15.7	33.2	10.4	23.9
Sole Pige.	-	-	-	38.8	8.4	24.4	38.8	8.42	24.4

Ref.: R. K. Nagar and V. V. Gaud, Dr. PDKV, Akola

Organic Carbon (%) in cropping sequence

Soil Depth (cm)	Total Organic Carbon (%) Method : Walkley and Black			
	Rice-Wheat -Fallow	Bajra-Wheat -Fallow	Sole Pigeonpea	Vegetable
0-15	0.95	0.38	1.05	1.06
15-30	0.71	0.26	1.01	0.90
30-45	0.60	0.14	0.73	0.52
45-60	0.43	0.10	0.60	0.14
Average	0.67	0.22	0.85	0.66

Source : K. Rajan *et.al*, CURRENT SCIENCE, VOL. 120, NO. 8, 25 APRIL 2021

Year	Variety	Stage	Total	Area on farms ha	% share	FLD Yield kg/ha	Prod. Tonnes	MSP	TOTLA LAKHS RS.	Creore	State AV. Yield	Produ. tonnes	Rs. Crore	Difference (FLD-AVG)
2019-20	BDN 711	BR	13.68	56802										
	BDN 716	BR	11.28	46837										
	BDN 708	BR	0	0										
	BDN 711	FS	1.44	5979										
	BDN 711	TL	339.3	338122										
	BDN 716	TL	16.74	16682										
	BSMR 736	TL	25.68	25591										
2020-21	BDN 711	BR	13.98	48542										
	BDN 716	BR	31.62	109792										
	BSMR 853	BR	0.24	833										
	BSMR 736	BR	4.68	16250										
	BDN 2013-41	BR	1.26	4375										
	BDN 711	FS	0.72	2500										
	BDN 716	FS	9.8	34028										
	BDN 711	CS	46.44	38700										
	BDN 711	TL	300.78	250650										
	BDN 716	TL	60.84	50700										
	BDN 2013-41	TL	19.05	15875										
			498.05	579444	54	1782	1130679	6600	746248	7462	722	458109	3024	4439*
			8	507202	54	1433	8	6300	9	6922	1163	2	3010	1312

Important Points

-  **Right Cultivar at Right Place-Soil type**
-  **Right Cultivar at Right Time- Sowing time**
-  **Right Cultivar as per Regional Choice (Seed colour)**
-  **Right Protection at Right Time-Pest and Disease Management**
-  **Proper irrigation and nutrient Management**

Right Seed in Right Place

Heavy Soil: BMSR 736, BSMR 853, Godavari, Renuka, ICPL 87119, PKV TARA, PDKV Ashlesha, Phule Trupti

Medium soil with irrigation: BMSR 736, BSMR 853, Godavari, Renuka, ICPL 87119, PKV TARA, PDKV Aahlesha, Phule Trupti

Medium soil & Rainfed condition: BDN 711, Godavari, Rajeshwari, AKT 8811, Vipula,

BSMR 736 (1995)



- **Released for Maharashtra**
- **Days to maturity:175-180 days**
- **100 seed wt. : 10-11 g**
- **Highly resistant to wilt and sterility mosaic**
- **Red colour seeds**
- **Responsive to irrigation**
- **Suitable for medium to heavy black soil**
- **Suitable for intercropping due to profuse branching**



Yellow flower

BSMR 736



Green stem



Green pod



BSMR 853 (Vaishali)



- Released for Maharashtra and Gujarat
- Days to maturity: 175-180 days
- 100 seed wt. : 11-12 g
- Highly resistant to wilt and sterility mosaic
- White colour seeds
- Responsive to irrigation

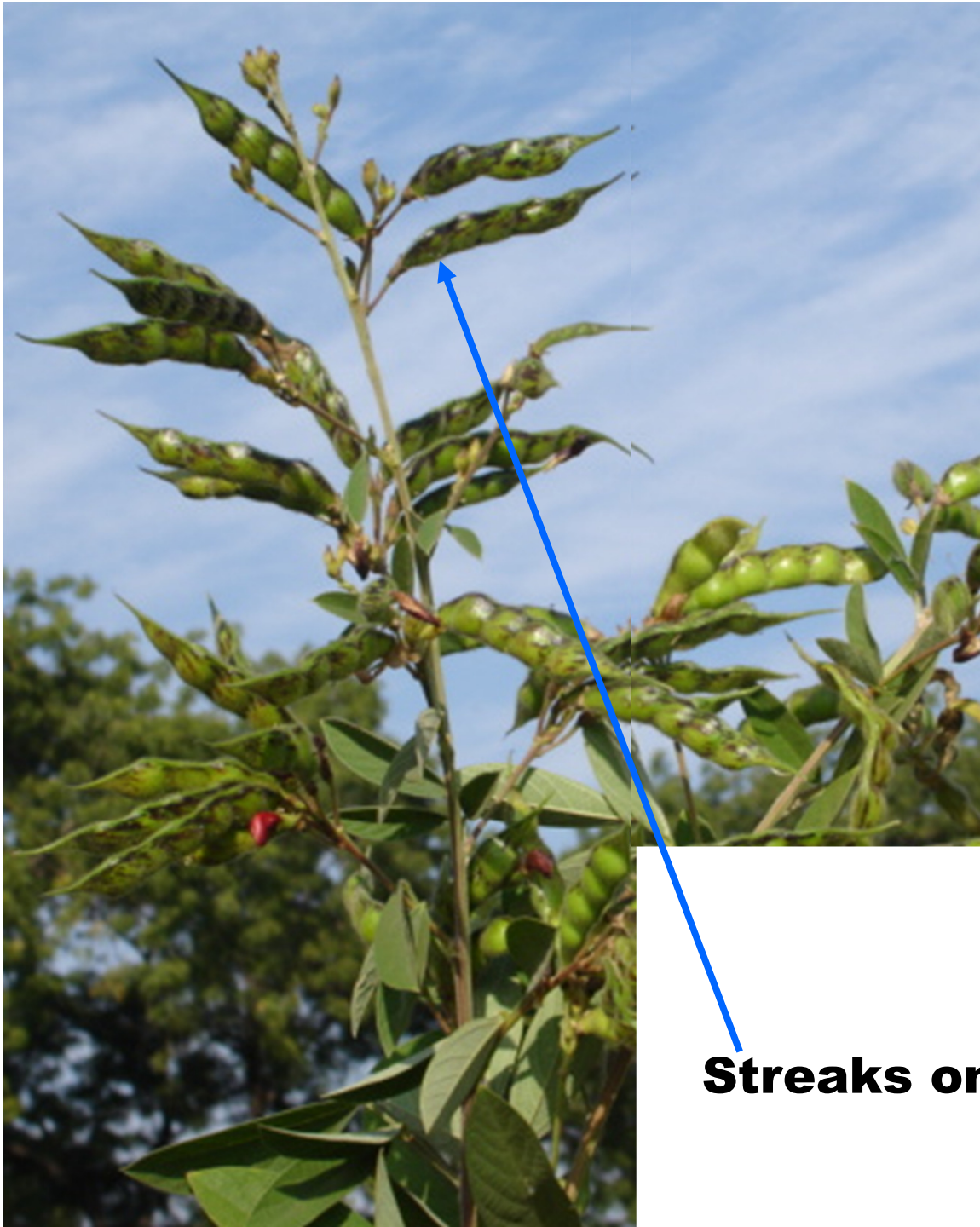


Dorsal side of standard red



BSMR 853

**Anthocynin pigmentation
(Sun red stem colour)**



Streaks on pod

White Seed



BSMR 853

Why? (150-155 days)

❖ **Extra Early: Heavy attack by pod borer**
(<130 days) **Heavy rains at the time of**
harvesting.

Medium Late: Terminal drought.




(>175)

Second crop not possible

Not suitable for low rainfall
zone

Exposed to foggy condition

BDN 711 (2012)

- Released for Marathwada and Western Maharashtra
- Days to maturity:150-155days
- 100 seed wt. : 10-11 g
- Moderately resistant to wilt
- Resistant to sterility mosaic
- White colour seeds
- Suitable for rainfed condition in light to medium soil
- Escape terminal drought due to earliness
- Synchronized Maturity 
- Suitable for Mechanical harvesting 
- Non-shattering 



BDN 711



BDN 711



1. Short duration matures in 150-155 days
2. Yellow flower
3. Red streaks on pod
4. White seed



BDN 716

Stem Colour	: Sun red
Growth habit	: Indeterminate
Flower Colour	: Yellow
Seed Colour	: Red
Maturity Days	: 165-170 days