## **Crop Production**

For improved Agronomical practices total forty technologies has been developed and recommended for the sorghum growing farmers in the area of fertilizers, time and spacing of sowing, weed control, inter cropping, crop sequencing etc. as below

45	Effect of mitages school-line and colliness on bloods socie	2025
45	Effect of nitrogen scheduling and cultivars on kharif grain sorghum (21 <sup>st</sup> CJA 2025)	2025
	Farmers of south Gujarat growing <i>kharif</i> sorghum crop are recommendations.	mandad to
	apply 80 kg/ha N in three splits viz.; 25% N as basal + 50% N at 3	
	25% N at boot leaf stage (at 55-65 DAS) for achieving higher and	
	returns.	promadic
44	Effect of different age of seedling for transplanting of kharif	2025
	grain sorghum (21st CJA 2025)	2025
	The farmers of south Gujarat growing sorghum crop are recommendations.	nended to
	grow sorghum with direct sowing by drilling at onset of monsor	
	case of delayed onset of monsoon, nursery sowing during mid of	
	transplanting in 1 <sup>st</sup> week of July (21 days age of seedling) gi	
	production and net returns.	8000
43	Integrated nitrogen management in <i>kharif</i> grain sorghum	2023
	The farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmers of South Gujarat growing Kharif sorghum are recommended to the farmer of the fa	nended to
	apply 20 kg N/ha through Neem cake (803 kg/ha) + 20 kg N/h	a through
	Castor cake (463 kg/ha) well mixed with soil during land preparate	tion along
	with recommended basal application of phosphorus (40 kg P <sub>2</sub> O <sub>5</sub> /h <sub>2</sub>	a) and top
	dressing of 40 kg N/ha through urea at 30 DAS to achieve higher	yield and
	net return.	
<b>42</b>	Studies on intercropping of grain legumes in sorghum	2022
	The farmers of South Gujarat growing sorghum during kharif s	season are
	recommended to sow the sorghum + black gram in 2:1 proportion	
	apart with plant to plant spacing of 15 cm for sorghum and 10 cm	
	gram to achieve higher yield and net return on system basis a	s well as
	efficient use of land.	
<b>41</b>	Weed management in kharif grain sorghum [Only scientific	2020
	community]	
	Application of atrazine 1.5 kg/ha as a pre-emergence fb one hand v	_
	40 DAS was found effective for weed control in kharif sorghum	
	analysis of the herbicide was carried out and found below detectable	
40	Weed management in kharif grain sorghum	2020

	The farmers of South Gujarat Agro-climatic Zone growing kharif are recommended to carry out two hand weeding at 25 and 50 DAS inter culturing at 50 DAS for effective weed control and achievily yield and net return.	S and one
39	Refinement of sowing dates for <i>kharif</i> grain sorghum varieties/ promising lines under changing climate of South	2016
	Gujarat  The farmers of South Gujarat Agro-climatic Zone II (AES-II) grow sorghum are advised to sow sorghum during onset of monsoon or days after onset of monsoon for getting higher grain yield, stove	within 13
	well as net profit and to escape from shoot fly and stem borer att sowing of sorghum significantly reduces the grain yield, stover yield return.	tack. Late
38	Integrated weed management in kharif sorghum	2013
	The farmers of south Gujarat agroclimatic zone-II growing kharif GJ-38 are advised to apply 0.75 kg/ha atrazine as pre emergence he one hand weeding at 50 DAS for getting higher yield and net profit.	erbicide -
37	Response of single cut fodder sorghum genotypes to different levels of NPK	2012
	The farmers of south Gujarat agroclimatic zone-II growing kha sorghum are advised to grow genotype CSV-21F with the appl 120:60:00 kg NPK/ha (50%N and whole P as basal, while remaining as top dressing at 30 DAS) for higher fodder yield and net profit.	ication o
36	Response of forage sorghum to different seed rate and nitrogen levels for higher production	2004
	The farmers of North Saurashtra agro climatic zone VI growing sorghum as a green fodder crop during <i>Kharif</i> season are advised to seed rate of 50 kg/ha and the crop should be fertilized with 120 kg kg as a basal dose and 60 kg as a top dressing at 30 days after Phosphorus @ 40 kg/ha should be applied as common dose.	keep the N/ha (60
35	Nitrogen and phosphorus requirement of sorghum varieties GJ 39 and GFS 4	2002
	Farmers of North Saurashtra Agro climatic Zone-VI who are sorghum as a green fodder crop are advised to grow <i>Kharif</i> sorghu 39 and fertilize it with 40 kg N/ha for getting maximum green for and return. Phosphorus application is not found beneficial.	m var. G
	Varietal response to fertilizer on fodder sorghum	2000
34	The farmers of North Gujarat (Agro climatic Zone-IV) growing	ng fodde

	sorghum variety GFS-5 are advised to fertilize the crop with nitr	_
	The farmers of North Gujarat (Agro climatic Zone-IV) growing	
34	Varietal response to fertilizer on fodder sorghum	2000
	39 and fertilize it with 40 kg N/ha for getting maximum green for and return. Phosphorus application is not found beneficial.	ider yield
	sorghum as a green fodder crop are advised to grow <i>Kharif</i> sorghum	
	Farmers of North Saurashtra Agro climatic Zone-VI who are	
	GJ 39 and GFS 4	
55	Nitrogen and phosphorus requirement of sorghum varieties	2002
	Phosphorus @ 40 kg/ha should be applied as common dose.	sowing).
	kg as a basal dose and 60 kg as a top dressing at 30 days after	
	sorghum as a green fodder crop during <i>Kharif</i> season are advised to seed rate of 50 kg/ha and the crop should be fertilized with 120 kg	-
	The farmers of North Saurashtra agro climatic zone VI growing sorghum as a green fodder grown during Kharif season are advised to	-
	nitrogen levels for higher production	·
6	Response of forage sorghum to different seed rate and	2004
	120:60:00 kg NPK/ha (50%N and whole P as basal, while remaining as top dressing at 30 DAS) for higher fodder yield and net profit.	
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	varieties/ promising lines under changing climate of South Gujarat	
<b>39</b>	Refinement of sowing dates for kharif grain sorghum	2016
	yield and net return.	
	inter culturing at 50 DAS for effective weed control and achieving	ng higher
	are recommended to carry out two hand weeding at 25 and 50 DAS	
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	phosphorus @ 80 kg and 20 kg/ha, respectively. Of the total fertilizent of nitrogen and entire quantity of phosphorus should be applied and remaining 50 per cent of nitrogen as top dressing at 30 kg/ha, respectively. Of the total fertilization of nitrogen and remaining 50 per cent of nitrogen as top dressing at 30 kg/ha, respectively. Of the total fertilization of nitrogen and entire quantity of phosphorus should be applied and remaining 50 per cent of nitrogen as top dressing at 30 kg/ha, respectively.	ed as basa
33	Response of sorghum (GJ 41) to various levels of fertilizer	2000
	The farmers of North Gujarat (Agroclimatic Zone-IV) growing sorghum var.GJ-41 are advised to fertilize the crop with nitrogen phosphorus @ 80 kg and 40 kg/ha, respectively. Of the total fertilize cent of nitrogen and entire quantity of phosphorus should be applied and remaining 50 per cent nitrogen as top dressing at 30 days after the same of the same	rogen and zer, 50 pe ed as basa
32	Fertilizer management in sorghum based cropping system	1999
	The farmers of South Gujarat zone (AES-II) adopting <i>kharif</i> sor 38) – cotton (Hy. 6) rotation are advised to apply 50% of recomme of fertilizer for sorghum (80:40) and 100% of recommended dose of (320:00) to cotton.	nded dos
31	Bio fertilizer of Sorghum Grain	1998
	Formers of South Guignet Zona AES II are advised to cost soral	um cood
	Farmers of South Gujarat Zone AES II are advised to coat sorgh with PSM strain PBA 16 (Bacillus coagulans) having 108 CFU/ gr @ 30 g culture/kg seeds (ICBR 1:382) before seeding to save 40 kg and to get higher grain and stover yield.	am carrie
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	fertilizer with N and P @ 80:40 kg/ha (CBR-1:3.30).	
5	Seed rate and spacing for sorghum GJ 37	1997
	The farmers of North Saurashtra are advised to sow sorghum variet	y GJ - 37
	with a seed rate of 40 kg/ha and inter row spacing of 30 cm.	
5	Time of sowing for sorghum	1997
	In North Gujarat agro climatic conditions, sorghum variety GJ –	39 should
	be sown at the onset of monsoon.	
•	Seeding technique in <i>rabi</i> sorghum / sowing depth in <i>rabi</i> sorghum	1996
	The farmers of South Gujarat agro climatic Zone (AES V) grow	wing <i>rabi</i>
	sorghum should sow the seed in the moist zone.	
}	Crop geometry in sorghum	1996
	The farmers of South Gujarat Agroclimatic Zone (AES-V) are a	ndvised to
	grow rabi sorghum GJ 36 keeping 60 cm distance between rows a	and 10-12
	cm distance between two plants.	
)	Fertilizer management in Rabi sorghum	1996
	The farmers of South Gujarat Agroclimatic Zone (AES-V) are a	advised to
	grow rabi sorghum GJ 36 by fertilizing the crop with 80 kg N/ha	. Though,
	application of P <sub>2</sub> O <sub>5</sub> @ 20 kg/ha increased the yield, it was not econo	omical.
	Nitrogen and phosphorus for sorghum	1994
	The farmers of North Gujarat (AES IV) growing sorghum (G	J 39) are
	advised to fertilize the crop with 120 kg N/ha (NICBR 1:19) and 4	,
	/ha(NICBR 1:4.5). Half of the nitrogen dose and all of the P dose	-
	given as basal and 50% of the nitrogen to be topdressed 30 of	
	sowing.	-
	Nitrogen and phosphorus for sorghum	1994
	The farmers of South Gujarat (zone-II) are advised to grow sorghui	n GJ – 38
	by fertilizing the crop by 160 kg N/ha (ICBR 1:13.4) and 60 kg	
	(NICBR 1:5.3). Half of the nitrogen dose and all of the P dose	
	applied as basal and remaining half of nitrogen is to be top dresse	d 30 days
	after sowing.	
)	Time of sowing for sorghum	1994
	The farmers of South Gujarat (zone-II) are advised to sow GJ-36 20 <sup>th</sup> July and 5 <sup>th</sup> August and GJ – 39 in the first week of July f	
	maximum yield.	4004
}	Spacing requirement of sorghum	1994
	The farmers of South Gujarat Agro climatic Zone II growing sorgh	
	1, GJ-35-15-15 and GJ $-$ 38 are advised to drill the crop at a distant 12 or 60 x 9 cm for getting maximum yield. (The distance between	
	I I I OF BUT I I om tog gotting mayimilm field. (The dictance between	n niant to

	plant in a row is to be adjusted at the time of thinning)	
	Bio fertilizer in sorghum	1993
	For obtaining higher sorghum grain and fodder yield, seed inocular	
	with Azospirillum ASA 1 (ICBR 1:10.0) or Azotobactor ABA	
	1:9.46) each having 108 viable cell/g (200 g culture/10 kg seeds)	_
	the recommended dose of 40 kg N/ha is recommended for margin of South Gujarat.	
	Weed management in sorghum for North Gujarat	1993
	The farmers of North Gujarat (zone IV) advised to control the	•
	application of Atrazine (Pre-emergence) @ 1.5 kg/ha with one hand	d weeding
	and one interculturing for highest economical return in sorghum.	
5	Weed management in Sorghum	1993
	The farmers of South Gujarat Agro climatic (Zone I,II) are advised	
	weed management involving application of Atrazine as pre emerge	
	kg/ha in 600 lit. of water for getting higher economic return (C BR	
ļ	Fertilizer management in Sorghum – Isabgul	1993
	The farmers of North Gujarat Zone are advised to grow the crop of	f sorghum
		•
	with 100% recommended dose (i.e. 80-40-00 NPK kg/ha) in khar	if and the
	with 100% recommended dose (i.e. 80-40-00 NPK kg/ha) in khar succeeding Isabgul crop should be fertilized with the 50% reco	if and the
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	with 100% recommended dose ( <i>i.e.</i> 80-40-00 NPK kg/ha) in <i>khar</i> succeeding Isabgul crop should be fertilized with the 50% records ( <i>i.e.</i> 25-50-00 NPK kg/ha) to get maximum economic return.  Seed rate and N requirement for fodder sorghum	if and the mmended
	with 100% recommended dose ( <i>i.e.</i> 80-40-00 NPK kg/ha) in <i>khar</i> succeeding Isabgul crop should be fertilized with the 50% records ( <i>i.e.</i> 25-50-00 NPK kg/ha) to get maximum economic return.  Seed rate and N requirement for fodder sorghum  The farmers of Dhari area of South Saurashtra zone growing	rif and the ommended  1993 sorghum
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	with 100% recommended dose ( <i>i.e.</i> 80-40-00 NPK kg/ha) in <i>khan</i> succeeding Isabgul crop should be fertilized with the 50% recordose ( <i>i.e.</i> 25-50-00 NPK kg/ha) to get maximum economic return.  Seed rate and N requirement for fodder sorghum  The farmers of Dhari area of South Saurashtra zone growing variety GFS 4 are advised to plant the crop with the seed rate of 80 apply nitrogen @ 40 kg/ha to get economic return of green fodder the total fertilizer, 50% nitrogen should be applied as basal dre remaining 50% of nitrogen should be given as top dressing 25 sowing.  Fertilizer Requirement of Fodder Sorghum GFS – 4  The farmers of South Gujarat (Agroclimatic zone-I and II) growing fodder variety GFS- 4 are advised to fertilizer the crop with 80 kg getting higher economic return. Of the total 80 kg nitrogen, 40 should be applied as basal dose, 20 kg N/ha after 1 <sup>st</sup> cut immed remaining 20 kg N/ha at 15 days after 1 <sup>st</sup> cut.  Seed Rate and Fertilizer Dose for Fodder Sorghum GFS – 4  The farmers of South Gujarat agro climatic zone (I & II) growing variety GFS – 4 are advised to sow the crop with seed rate of 80	1993 sorghum kg/ha and yield. Of ssing and days after  1992 g sorghum g N/ha for kg N/ha iately and  1992 g sorghum kg/ha and
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	basal dose and remaining 50% of nitrogen should be given as topdressing
	days after sowing.
	Marginal farmers should adopt 60 kg seed rate and 40 kg N and 40 kg P
	/ha with similar method of application as above.
10	Seed Rate and Fertilizer Requirement of Fodder Sorghum 199
	The farmers of North Gujarat growing variety GFS-4, are advised to sow
	crop with the seed rate of 80 kg/ha and fertilize it with the application of
	kg N/ha and 60 kg P <sub>2</sub> O <sub>5</sub> /ha to get economic return of green fodder yield.
	the total fertilizer, 50% nitrogen and whole quantity of P <sub>2</sub> O <sub>5</sub> should
	applied as basal dressing and remaining 50% of nitrogen should be given
Λ	top dressing 30 days after sowing.
9	N and P requirement of Sorghum GJ – 35 and GSH – 1
9	The farmers of North Gujarat region growing sorghum varieties GSH-1
	GJ- 35 are advised to fertilize the crop with nitrogen and phosphorus @
9	kg and 40 kg/ha, respectively. Of the total fertilizer, 50% nitrogen and wh
	quantity of P <sub>2</sub> O <sub>5</sub> should be applied as basal dressing and remaining 50%
9	nitrogen should be given as top dressing 30 days after sowing.
	For marginal farmers, it should be apply 80 kg N and 40 kg P <sub>2</sub> O <sub>5</sub> per hec
	with similar method of application as above.
8	Fertilizer Management in Sorghum GJ – 37
	The farmers of North Gujarat zone are advised to apply 80 kg N/ha (IC
	1:10.9) and 40 kg $P_2O_5$ /ha (ICBR 1:2.84) to sorghum variety GJ-37 to
	economic return of grain and stover yield.
7	Seed rate and spacing for sorghum GJ 37 199
,	The farmers of North Gujarat growing sorghum variety GJ 37 for o
	purpose are advised to sow at a distance of 30 cm between rows using 20
	seed rate per hectare.
6	Time of sowing for SORGHUM var. GJ 36
	The farmers of South Gujarat Agro-climatic zone-II are advised to sow
	GJ 36 of Sorghum up to 20th August. Later sowing resulted in reduction
	yield.
5	Fertilizer management in Forage Sorghum 198
	Farmers of North Saurashtra zone are advised to fertilize their for
	sorghum crop (Gundri or SSG-59-3) with 60 kg N (additional net return
	Rs. 1660 /ha) and 20 kg P2O5 /ha (additional net return of Rs.300/ha).
	marginal farmers may apply 20 kg N (additional net return of Rs. 810
	and 10 kg P2O5 (additional net return of Rs. 145/ha).

Farmers of South Gujarat growing sorghum – CSH 6 with pigeon pea in ratio of 2 (Sorghum): 1 (pigeon pea) rows are advised to carryout sow with the onset of monsoon. They are also advised to take recommended protection measures for the control of stem borer.  Fertilizer Management for grain sorghum  • Farmers of South Gujarat growing sorghum GJ-36 and GJ-39 advised to fertilize the crop at the rate of 80 kg N/ha and 40 kg I/ha.  • Of the total fertilizer, 50 per cent N + whole quantity of P <sub>2</sub> O <sub>5</sub> should applied at the time of sowing and remaining 50 per cent of N should be controlled to the solution of the solution	n the wing plant  89  are P <sub>2</sub> O <sub>5</sub>
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<ul> <li>Fertilizer Management for grain sorghum</li> <li>Farmers of South Gujarat growing sorghum GJ-36 and GJ-39 advised to fertilize the crop at the rate of 80 kg N/ha and 40 kg l/ha.</li> <li>Of the total fertilizer, 50 per cent N + whole quantity of P<sub>2</sub>O<sub>5</sub> should applied at the time of sowing and remaining 50 per cent of N sh</li> </ul>	are $P_2O_5$
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be given as top dress, one month after sowing.	
• The farmers who cannot afford to apply this quantity of fertilizers	are
advised to apply 40 kg N/ha and 40 kg P <sub>2</sub> O <sub>5</sub> /ha. The me	
application of fertilizers will remain the same.	
Transplanting of sorghum 19	89
In the heavy rainfall areas of South Gujarat, when the field conditions do	not
permit direct sowing, the farmers can transplant the crop. The transplar should be in the first week of August with 24 days old seedlings.	ıting
Sowing time x fertility level interaction in sorghum variety GJ 35	
In South Gujarat, sorghum variety GJ 35 for grain purpose should be s	
during the first fortnight of August with the basal dose of 80 kg N and 4	0 kg
$P_2O_5$ per ha.	