ORGANIC FARMING RESEARCH CENTRE
ZARS, NAVILE, SHIMOGA

Analysis of Liquid manures and their use

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Preparation of Beejamrutha

Cow dung

Cow urine

Lime water

Water

Soil

Preparation of Jeevamrutha

Soil

Water

Jaggery

Cow dung

Pulse flour

Cow urine

Preparation of Panchagavya

Analytical studies of Beejamrutha Jeevamrutha and Panchagavya

Nutrient contents of Beejamrutha

Samples	Content in Per cent					
	N	P	K	pH	Mn	Cu
Beejamrutha	2.38	0.127	0.485	8.02	16	36
Cow dung (desi)	0.70	0.285	0.231	8.08	9.33	3.60
Cow urine (desi)	1.67	0.112	2.544	8.16	6.3	20.00

Nutrient contents of Jeevamrutha

Samples	Content in Per cent					
	N	P	K	pH	Mn	Cu
Jeevamrutha	1.40	0.104	0.084	4.92	46	51
Jaggery	0.84	0.209	0.290	6.37	9.1	28.80
Flour	1.47	0.622	0.910	6.70	12.6	12.40
Cow dung (desi)	0.70	0.285	0.231	8.08	9.33	3.60
Cow urine (desi)	1.67	0.112	2.544	8.16	6.3	20.00

Micro nutrients contents of beejamrutha and jeevamrutha

Nutrient	Content in ppm	
	Beejamurtha (fresh)	Jeevamrutha (7 days old)
Zn	18	12
Cu	36	51
Mn	16	46
Fe	168	318

Copper and manganese content of jeevamrutha

Days after preparation (DAP)	Content in ppm	
	Cu	Mn
7	51.00	46.00
10	35.70	26.10
13	25.20	15.10
16	16.00	13.60

Microbial studies of beejamrutha and jeevamrutha

Microorganisms	Beejamrutha (First day)	Jeevamrutha (10th DAP)
Bacteria (10^5)	523	825
Fungi (10^4)	17	47
Actinomycetes (10^3)	8	9
N- fixers (10^3)	46	55
P- solubilizers (10^3)	50	54

Microbial studies

- Highest colony forming units (CFU's) of microbes in beejamrutha were recorded on first day after preparation (DAP)
- Bacterial count (mostly N fixers) was almost double than cow dung
- Fungi, actinomycetes, N-fixers and P-solublisers count was less than cow dung
- Highest colony forming units (CFU's) of microbes in jeevamrutha were recorded between 9^{th} to 12^{th} DAP
- Maximum bacterial and N-fixers count was observed at 11^{th} and 12^{th} DAP
- P- solublisers, fungal and actinomycetes count was more at 9th DAP
- 13^{th} DAP there was a reduction in the microbial count


Actinomycetes


N-fixers


P-solubilisers

Microbial studies of Beejamrutha

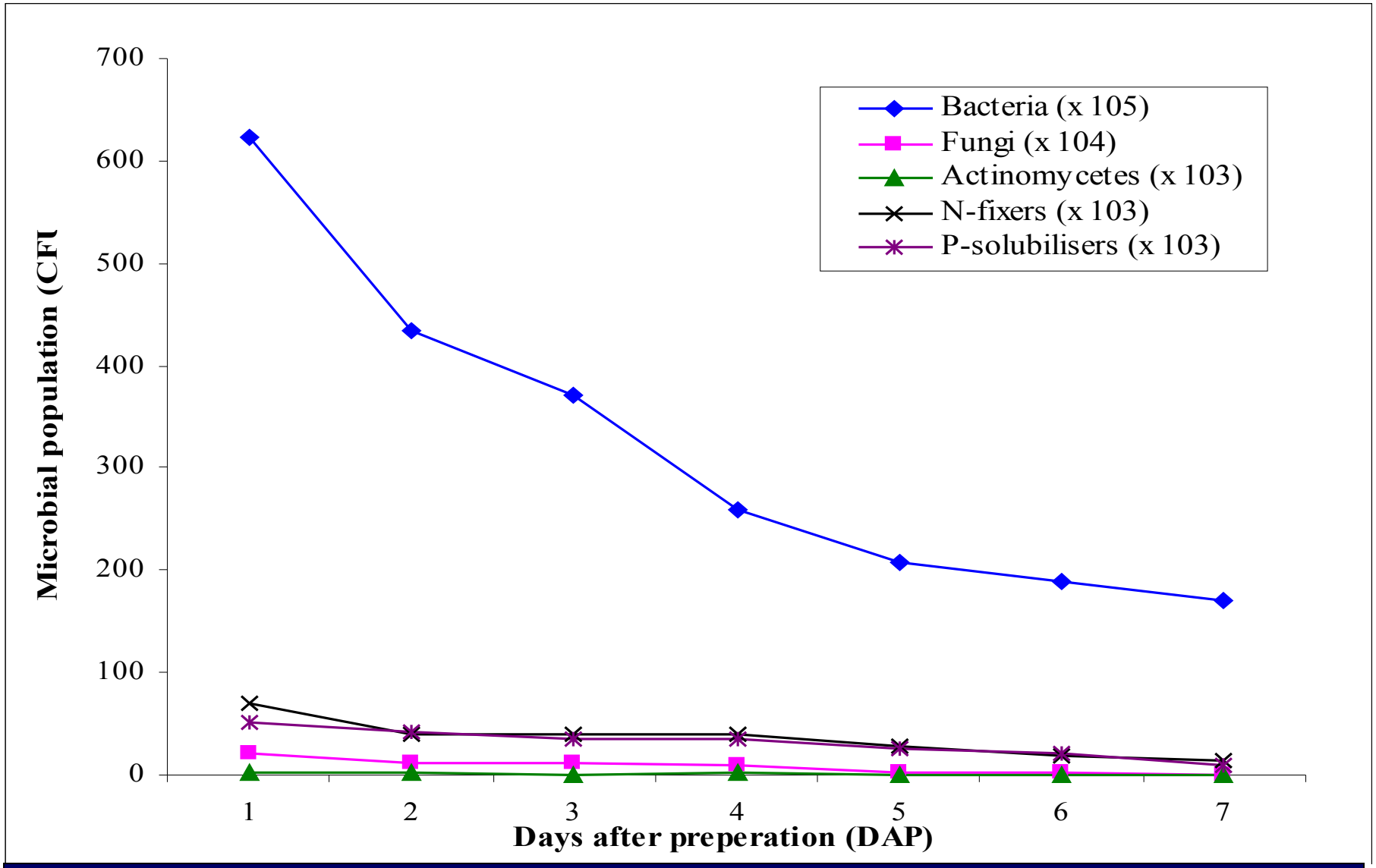
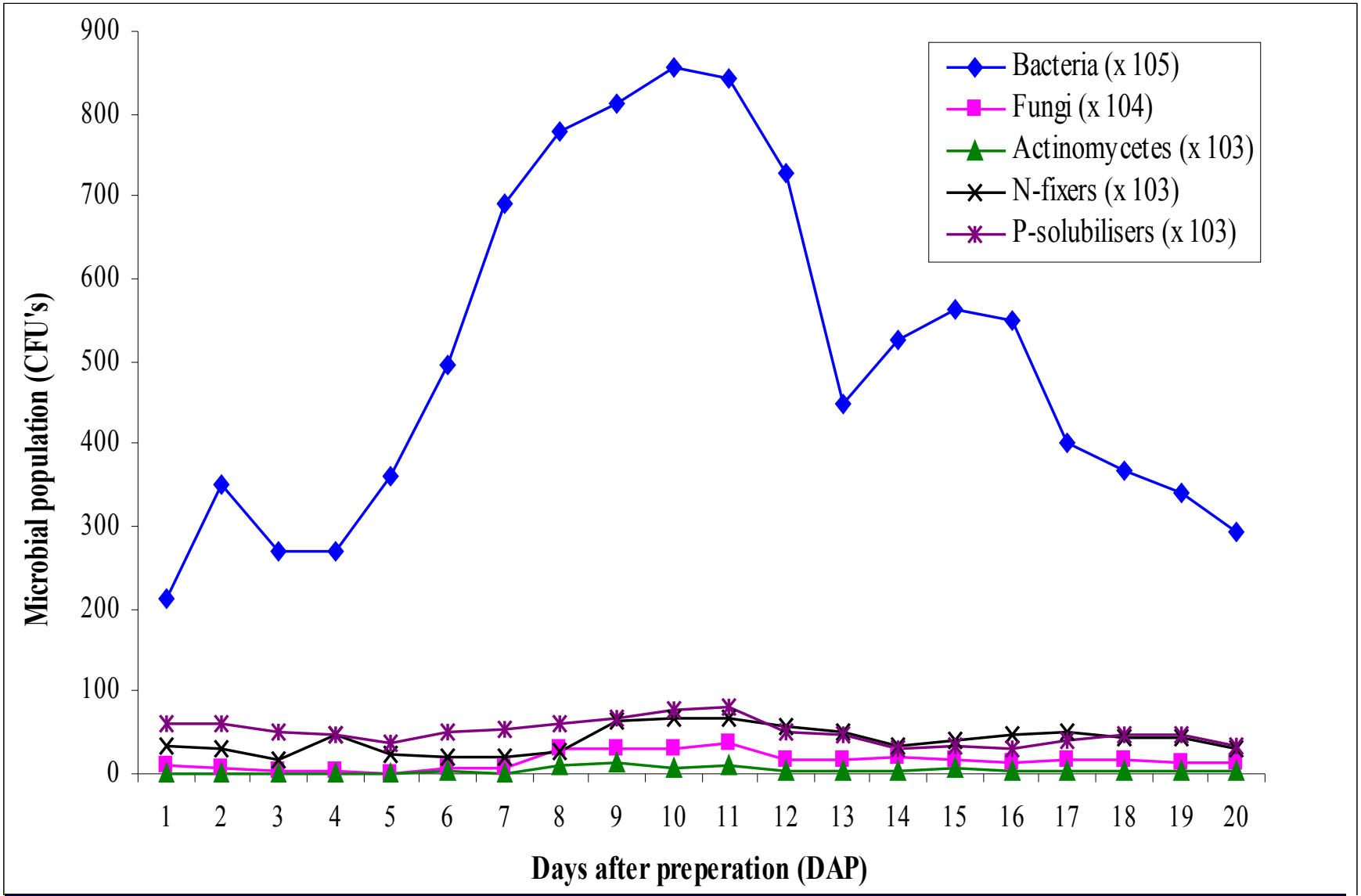


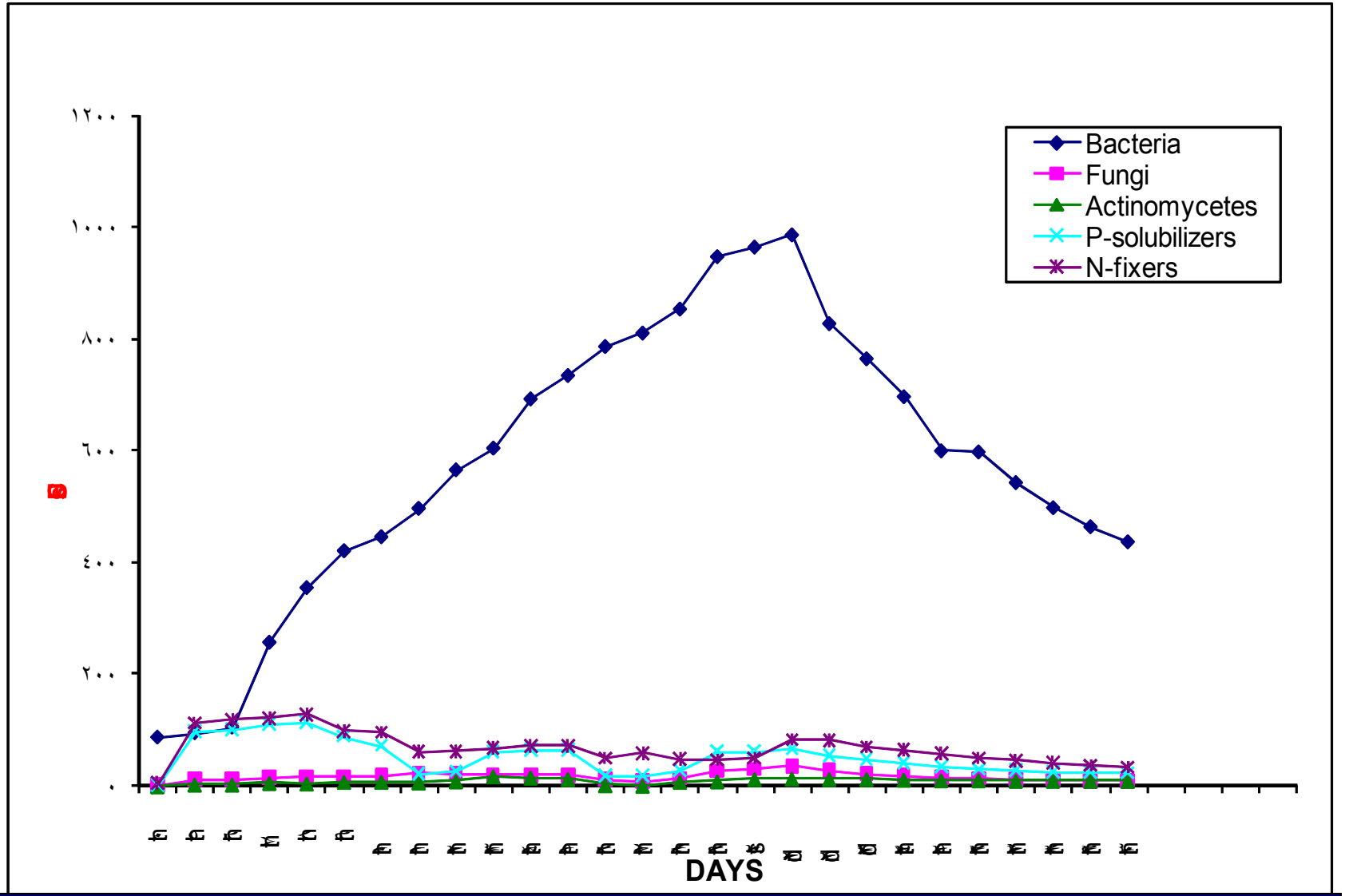
Fig 1. Microbial population of beejamrutha at different days after preparation

Microbial studies of jeevamrutha



Microbial population of jeevamrutha at different days after preparation

Microbial studies of Panchagavya



Microbial population of panchagavya at different days after preparation

Use of Liquid manures in Rice and Fieldbean

Seedling treatment

Beejamrutha

Panchagavyva

Cow urine

Biofertilizers

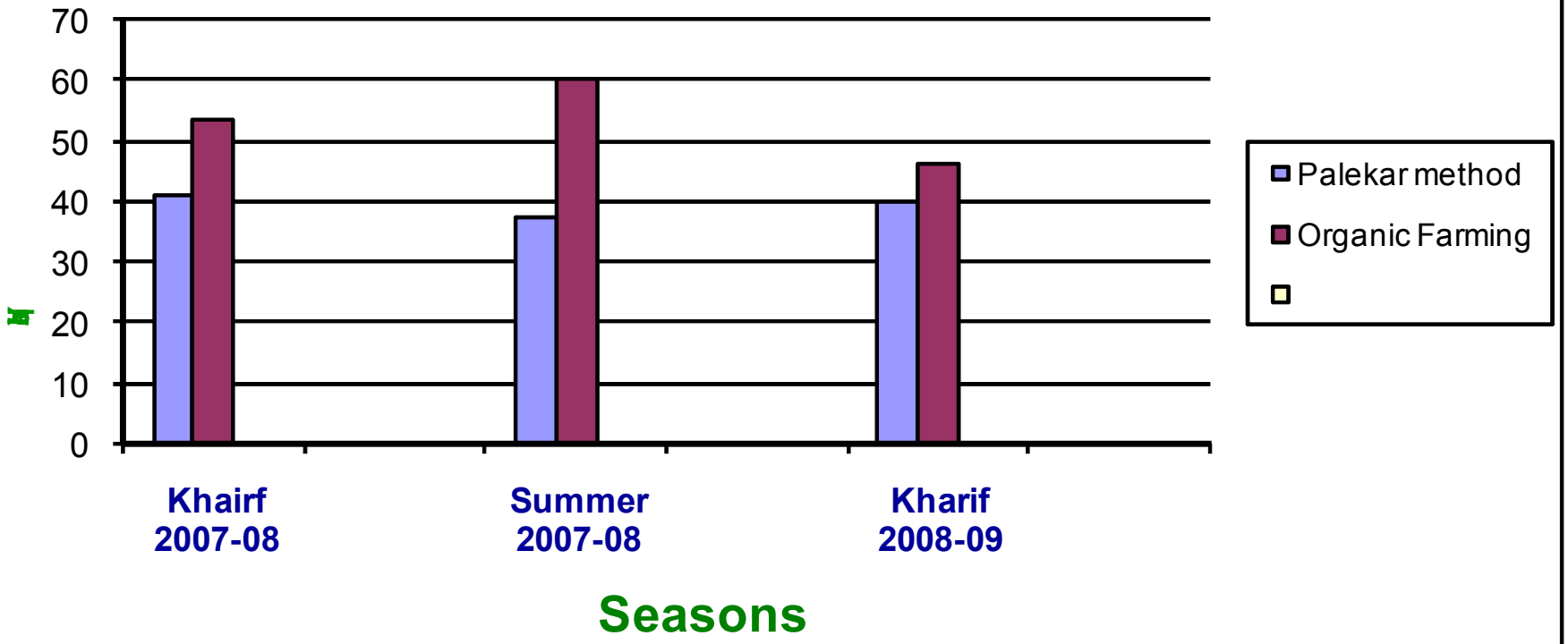
Application of jeevamrutha

Spraying of panchagavya at different stages of crop growth

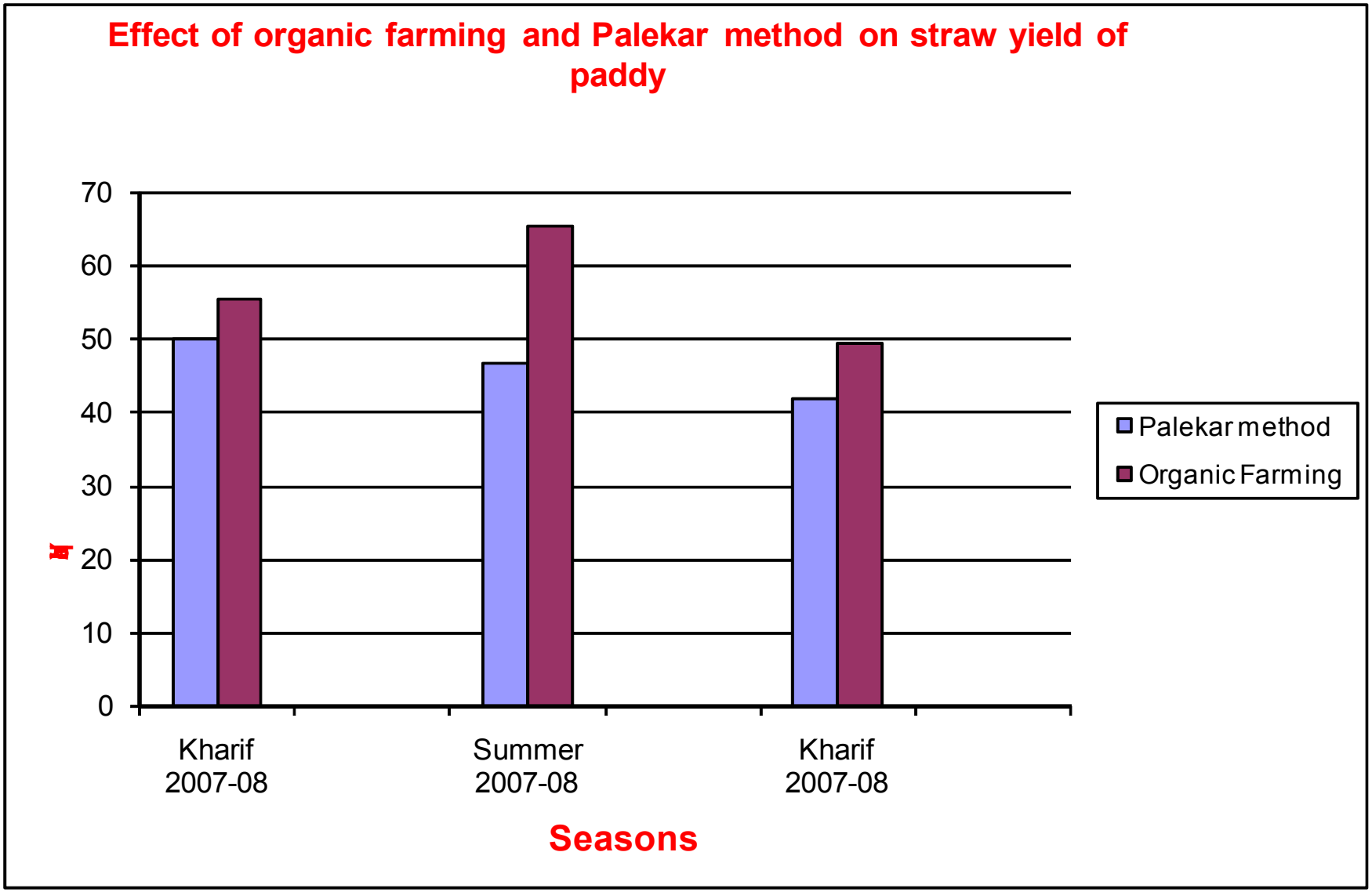
Mulching at different crop growth stages

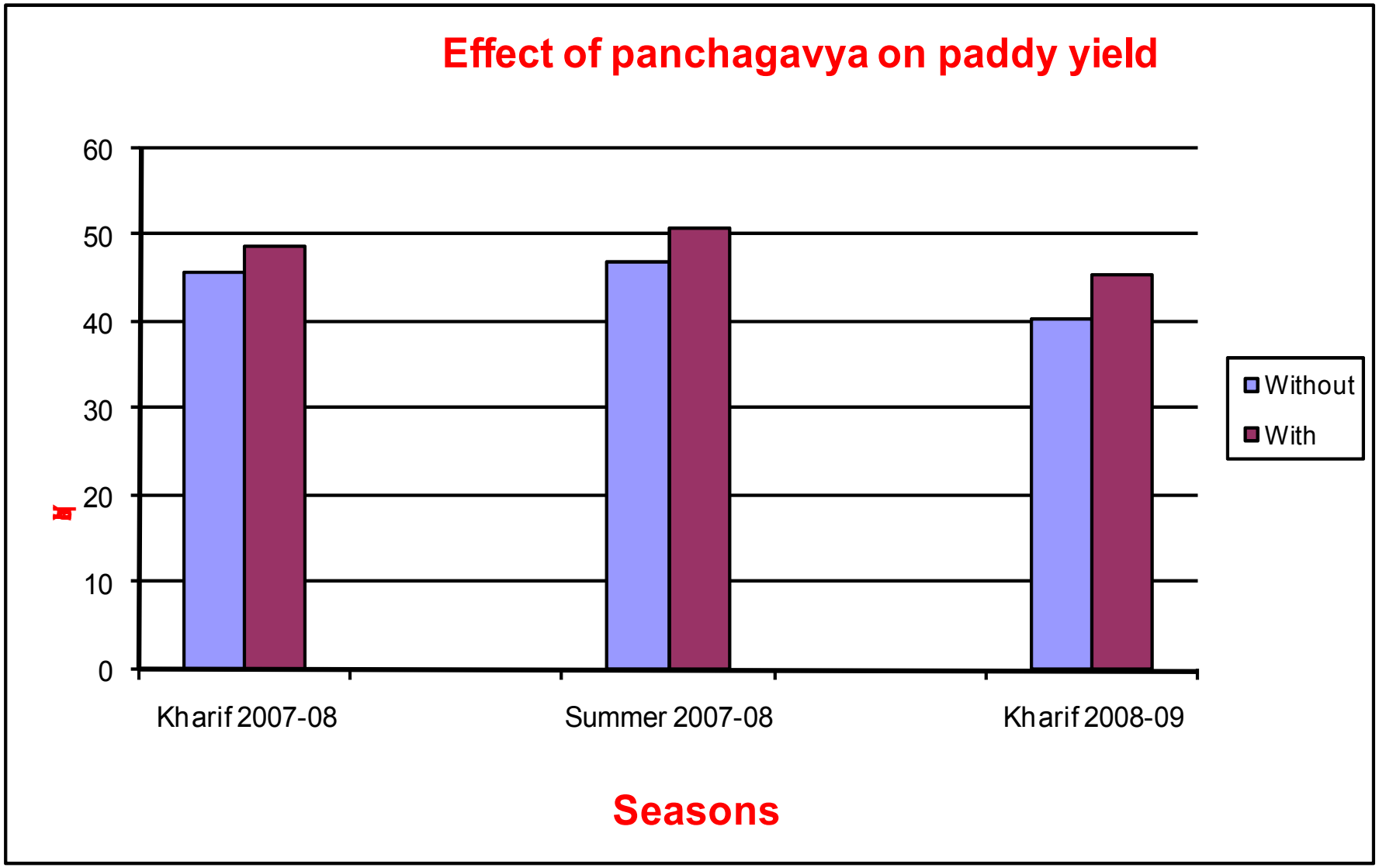
Different stages of crop growth

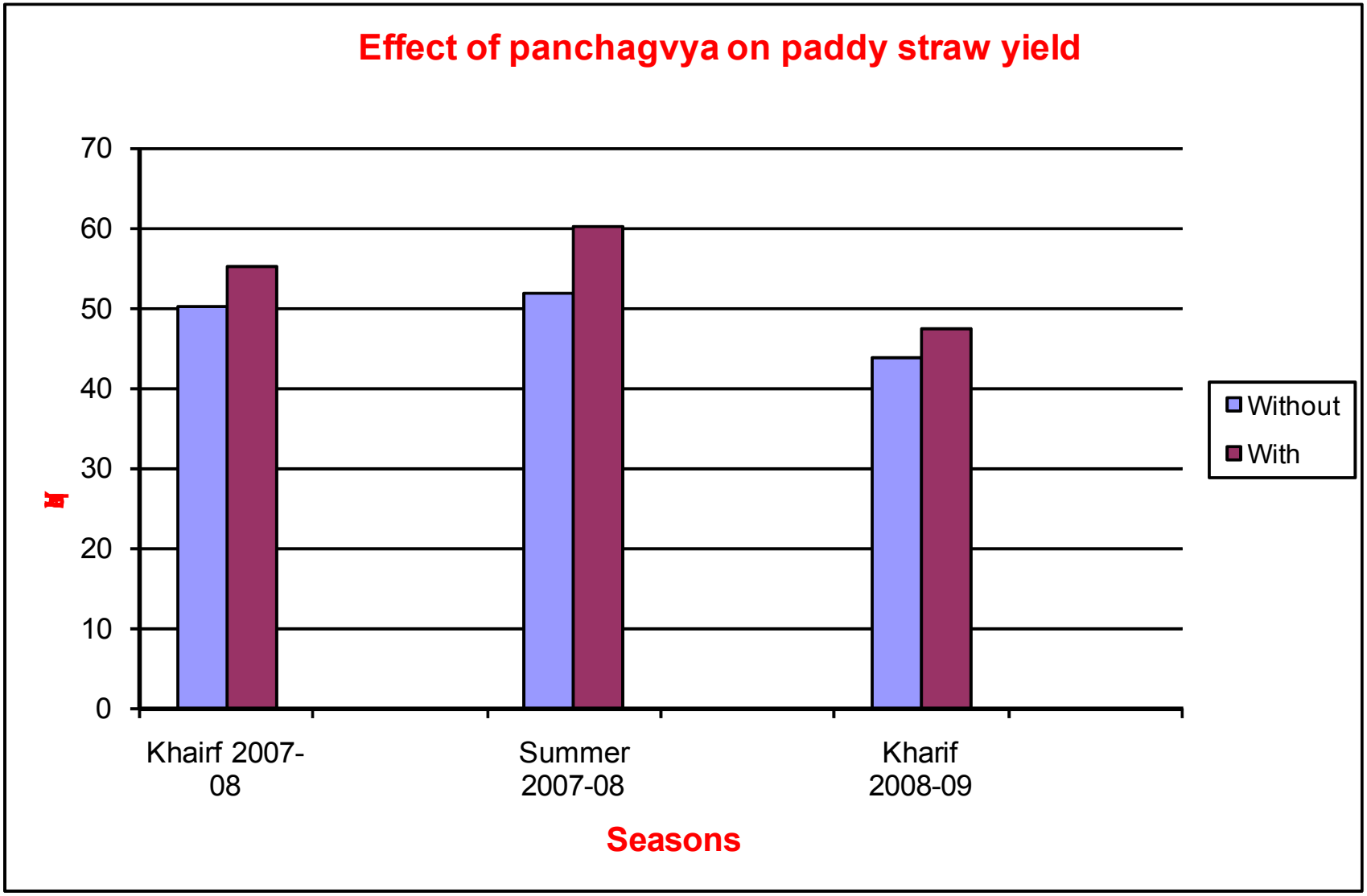
Effect of organic farming and Palekar method of cultivation on yield of paddy

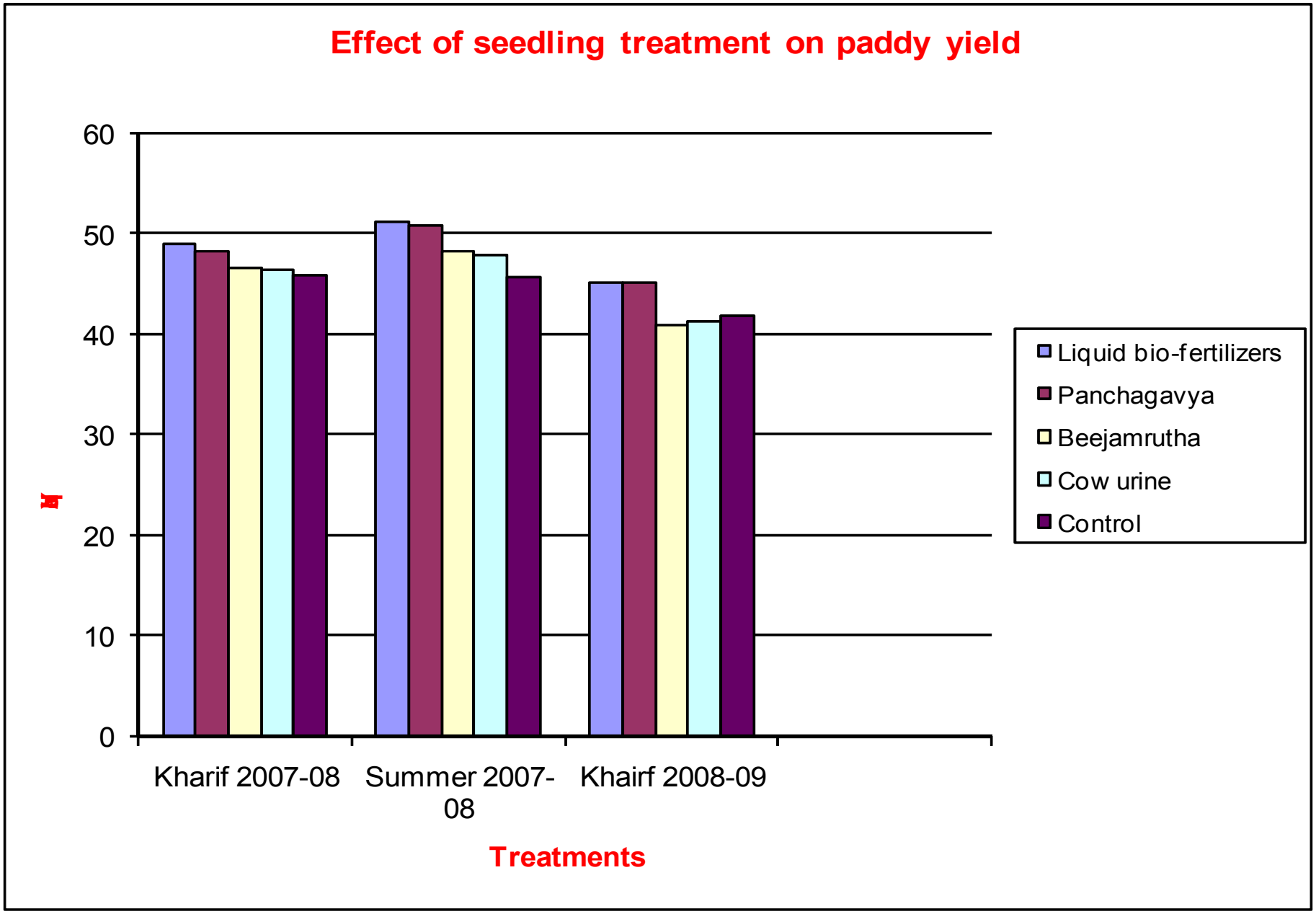


Effect of organic farming and Palekar method on straw yield of paddy




Effect of panchagavyya on paddy yield
60
50
40
30
20
10
0
Kharif 2007-08
Summer 2007-08
Kharif 2008-09
Without
With
Seasons


Effect of panchagvya on paddy straw yield
70
60
50
40
30
20
10
0
Khairf 2007-08
Summer 2007-08
Kharif 2008-09
Seasons
Without
With


Effect of seedling treatment on paddy yield
60
50
40
30
20
10
0
Kharif 2007-08
Summer 2007-08
Khairf 2008-09
Treatments
Liquid bio-fertilizers
Panchagavya
Beejamrutha
Cow urine
Control

Effect of Panchagavya on yield of field bean

Sl No	Pachagavya Concentration (%)	Yield (Q/ha)	% increase
1	0	6.35	-
2	3	7.41	16.73
3	6	7.51	18.34
4	9	8.05	26.77
5	12	8.00	25.97

Effect of jeevamrutha on yield of field bean

Sl No	Jeevamrutha (l / ac)	Yield (Q / ha)	% increase
1	0	4.27	-
2	200	4.92	15.38
3	300	5.08	18.92
4	400	5.43	27.29
5	500	6.00	40.63

Table 1. Effect of panchagavya on paddy

Treatments	2007-08				2008-09	
	Kharif		Summer		Kharif	
	Yield	Percent increase	Yield	Percent increase	Yield	Percent increase
Grain yield (q / ha)						
With Panchagavya	48.7	6.3	50.8	8.6	45.4	12.4
Without	45.8	-	46.8	-	40.4	-
Straw yield (q / ha)						
With Panchagavya	55.4	10.24	60.2	16.0	47.4	7.1
Without	50.25	-	51.9	-	43.9	-

Table 2. Effect of seedling treatment on paddy yield (q / ha)

Treatments	2007-08				2008-09	
	Kharif		Summer		Kharif	
	Yield	Percent increase	Yield	Percent increase	Yield	Percent increase
Liquid bio-fertilizers	49.0	6.7	51.2	12	45.2	7.9
Panchagavya	48.2	5.0	50.9	11.4	45.1	7.6
Beejamrutha	46.6	1.57	48.2	5.5	41	-
Cow urine	46.4	1.1	47.9	4.8	41.3	-
Control	45.9	-	45.7	-	41.9	-

Table 3. Effect of organic farming and Palekar method of cultivation

Treatments	2007-08				2008-09	
	Kharif		Summer		Kharif	
	Yield	Percent decrease	Yield	Percent decrease	Yield	Percent decrease
Grain yield (q / ha)						
Palekar method	41.2	22.7	37.5	37.5	39.9	13.1
Organic Farming	53.3	-	60.0	-	45.9	-
Straw yield (q / ha)						
Palekar method	50.1	9.9	46.8	28.5	42.0	15.0
Organic Farming	55.6	-	65.5	-	49.4	-

Table 1. Effect of seedling treatment, panchagavya application and organic farming systems of cultivation on grain and straw yield of paddy

Kharif paddy (2007-08)

Panchagavya Spray (P)	Grain yield (Kg / ha)				Straw yield (Kg / ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	System II (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
With (P_1)	4222.5	5517.0	4869.7		5442.5	5641.0	5541.8	
With out (P_2)	4007.5	5144.8	4576.1		4575.6	5475.8	5025.7	
Mean	4115.0	5330.9			5009.0	5558.4		
	F-test	S.Em±	C.D at 5 %		F-test	S.Em±	C.D at 5 %	
F	*	123.6	342.6		*	148.7	412.2	
P	NS	123.6	-		*	148.7	412.2	
F x P	NS	174.8	-		NS	210.3	-	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Cont.

Seedling treatments (S)	Grain yield (Kg / ha)			Straw yield (Kg / ha)		
	Organic Farming systems (F)			Organic Farming systems (F)		
	System I (F_1)	System II (F_2)	Mean	System I (F_1)	System II (F_2)	Mean
S_1 – control	3918.60	5252.3	4585.4	4787.0	5614.2	5200.6
S_2 – beejamrutha	4084.00	5242.0	4663.0	4363.1	4787.6	4575.3
S_3 – cow urine	4249.40	5035.2	4642.3	4915.1	5914.0	5414.6
S_4 – panchagavya	4073.50	5572.8	4823.2	5221.3	6017.3	5619.3
S_5 – liquid biofertilizers	4249.40	5512.1	4900.8	5759.0	5459.0	5609.0
Mean	4115.00	5330.9		5009.1	5558.4	

	F-test	S.Em±	C.D at 5 %	F-test	S.Em±	C.D at 5 %
S	NS	195.4	-	*	235.1	651.7
F x S	NS	276.3	-	NS	332.5	-

Effect of seedling treatment, Panchagavya application and organic farming systems of cultivation on grain and straw yield of Paddy

Summer paddy (2007-08)

Panchagavya Sprays (P)	Grain yield (q/ha)				Straw yield (q/ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	SystemII (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
With (P_1)	38.88	62.65	50.77		52.90	67.50	60.20	
With out (P_2)	36.15	57.43	46.79		40.70	63.00	51.90	
Mean	37.52	60.04			46.80	65.50		
	F-test	S.Ed±	C.D at 5 %		F-test	S.Ed±	C.D at 5 %	
F	**	1.06	2.93		**	1.12	3.10	
P	**	1.06	2.93		**	1.12	3.10	
F x P	NS	2.36	-		*	1.50	4.40	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Cont…

Seedling treatments	Grain yield (q/ha)				Straw yield (q/ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	SystemII (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
S_1 – control	35.07	56.30	45.70		45.90	68.50	57.20	
S_2 – beejamrutha	37.13	59.33	48.20		42.30	61.90	52.10	
S_3 – cow urine	37.07	58.73	47.90		47.40	59.80	53.60	
S_4 – panchagavya	38.87	62.92	50.90		46.20	71.30	58.80	
S_5 – liquid biofertilizers	39.46	62.92	51.20		52.20	65.30	58.60	
Mean	37.52	60.00			46.80	65.30		
	F-test	S.Ed±	C.D at 5 %		F-test	S.Ed±	C.D at 5 %	
S	NS	1.67	-		*	1.77	4.9	
F x S	NS	2.36	-		NS	2.50	-	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Effect of seedling treatment, Panchagavya application and organic farming systems of cultivation on grain and straw yield of Paddy

Kharif paddy (2007-08)

Panchagavya Sprays (P)	Grain yield (q/ha)				Straw yield (q/ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	SystemII (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
With (P_1)	38.88	62.65	50.77		52.90	67.50	60.20	
With out (P_2)	36.15	57.43	46.79		40.70	63.00	51.90	
Mean	37.52	60.04			46.80	65.50		
	F-test	S.Ed±	C.D at 5 %		F-test	S.Ed±	C.D at 5 %	
F	**	1.06	2.93		**	1.12	3.10	
P	**	1.06	2.93		**	1.12	3.10	
F x P	NS	2.36	-		*	1.50	4.40	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Cont…

Seedling treatments	Grain yield (q/ha)				Straw yield (q/ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	SystemII (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
S_1 – control	35.07	56.30	45.70		45.90	68.50	57.20	
S_2 – beejamrutha	37.13	59.33	48.20		42.30	61.90	52.10	
S_3 – cow urine	37.07	58.73	47.90		47.40	59.80	53.60	
S_4 – panchagavya	38.87	62.92	50.90		46.20	71.30	58.80	
S_5 – liquid biofertilizers	39.46	62.92	51.20		52.20	65.30	58.60	
Mean	37.52	60.00			46.80	65.30		
	F-test	S.Ed±	C.D at 5 %		F-test	S.Ed±	C.D at 5 %	
S	NS	1.67	-		*	1.77	4.9	
F x S	NS	2.36	-		NS	2.50	-	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Effect of seedling treatment, panchagavya application and organic farming systems of cultivation on transplanted paddy

Kharif paddy (2008-09)

Panchagavya Sprays (P)	Grain yield (q/ha)				Straw yield (q/ha)			
	Organic Farming systems (F)				Organic Farming systems (F)			
	System I (F_1)	SystemII (F_2)	Mean		System I (F_1)	System II (F_2)	Mean	
With (P_1)	42.00	48.80	45.40		44.70	50.20	47.40	
With out (P_2)	37.80	43.00	40.40		39.30	48.60	43.90	
Mean	39.90	45.90			42.0	49.4		
	F-test	S.Ed±	C.D at 5 %		F-test	S.Ed±	C.D at 5 %	
F	**	0.80	2.13		**	1.11	3.00	
P	**	0.80	2.13		**	1.11	3.10	
F x P	NS	1.00	-		NS	1.57	-	

F_1 : Palekar's method *F_2 : Without Palekar's method*

Cont…

Seedling treatments	Grain yield (q/ha)			Straw yield (q/ha)		
	Organic Farming systems (F)			Organic Farming systems (F)		
	System I (F_1)	SystemII (F_2)	Mean	System I (F_1)	System II (F_2)	Mean
S_1 – control	39.00	44.90	41.90	40.60	49.90	45.20
S_2 – beejamrutha	38.50	43.50	41.00	38.10	43.60	40.80
S_3 – cow urine	38.80	43.70	41.30	40.70	51.20	45.90
S_4 – panchagavya	41.60	48.60	45.10	42.40	53.40	47.80
S_5 – liquid biofertilizers	41.80	48.60	45.20	48.00	49.20	48.70
Mean	39.90	45.90		42.00	49.40	
	F-test	S.Ed±	C.D at 5 %	F-test	S.Ed±	C.D at 5 %
S	NS	1.21	-	*	1.75	4.85
F x S	NS	0.80	-	NS	2.48	-

F_1 : Palekar's method *F_2 : Without Palekar's method*

Effect of seedling treatment, panchagavya application and organic farming systems of cultivation on transplanted Paddy

Treatments	Paddy grain yield (kg/ha)		
	With out FYM (Only Jeevamrutha)	With out Jeevamrutha	
		With FYM	Yield increase (%)
Control	3507	5630	60.5
Beejamrutha	3769	5933	57.4
Cow urine	3707	5873	58.4
Panchagavya	3887	6292	61.9
Liquid biofertilizers	3946	6254	58.5
Mean	3763	5996	59.3


THANKING YOU