

RESEARCH WORK RABI 2018-19



VEGETABLE RESEARCH INSTITUTE FAISALABAD

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1. TOMATO (Solanum lycopersicum L.)

1. TITLE	COLLECTION AND MAINTENANCE OF DETERMINATE TOMATO GERMPLASM						
OBJECTIVE	Collection and maintenance of local and exotic germplasm for future use in breeding programme.						
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION /TREATMENTS	Continuous Entries (Existing) = 144 (local and exotic).						
METHODOLOGY	Nursery sowing=Mid October, 2018Transplanting= 3^{rd} week of November, 2018Experimental design=Non replicatedPlant spacing=50 cmBed width=1.25 mOff-type plants will be rouged out to maintain the purity.						
PREVIOUS YEAR'S RESULTS	109 entries of determinate tomato were maintained and selected 15 entries will be used in breeding program.						
	Characteristics Range						
	Fruit length (mm) 19.4 – 77.3						
	Fruit width (mm) $15.8 - 61.9$ Fruit width (mm) $0.76 - 1.45$						
	Fruit shape index (L/W) $0.76 - 1.45$ Fruit firmness (kg/cm ²) $1.7 - 4.6$						
	Fruit weight (g) 8.3 - 128						
2. TITLE	STUDY OF FILIAL GENERATIONS IN DETERMINATE TOMATO						
OBJECTIVE	To develop/select high yielding, disease resistant, good quality determinate tomato purelines.						
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION	Continuous						
TREATMENTS	i) $F_2 = 26$ cross combinations						

METHODOLOGY	ii) $F_3 = 98$ single plant progenies of 17 crossesiii) $F_4 = 124$ single plant progenies of 18 crossesiv) $F_5 = 70$ single plant progenies of 10 crossesv) $F_6 = 14$ single plant progenies of 5 crossesvi) $F_7 = 16$ single plant progenies of 3 crossesNursery sowing = Mid October, 2018Transplanting = 3^{rd} week of November, 2018Plant to plant distance = 50 cmExperimental design = Non-replicated $F_2 - F_6$ will be advanced by using Pedigree method. Desirable plantprogenies will be selected for further studies.								
PREVIOUS YEAR'S RESULTS	S. No.	Generation	No. of Cross	ses / Progeny					
RESULIS			Studied	Selected	_				
	1	F ₁	30	26					
	2	F ₂	<u>18</u> 22/39	17/98	-				
	3	F ₃ F ₄	22/39	18/124 10/70	-				
	5	F_5	11/76	5/14	-				
	6	F ₆	7/23	3/16					
	7	F ₇	1/25	1/20					
3. TITLE	PURELI	NES	UATION OF D						
OBJECTIVE	generation		omato purelines s	selected from ad	vanced				
RESEARCH WORKERS	Mr. Kash	Ahmad Shah Cl if Nadeem ammad Najeebul							
LOCATION	Faisalaba	d							
DURATION	2018-19								
TREATMENTS	18285, 18	8277, 18278, 18	luding 3 checks) 8279, 18280, 18 288, 18289, Nac	3281, 18282, 18	3283, 18284,				
METHODOLOGY	Plot size Plant Spa Repeats	nting = ntal design = cing = =	Mid October, 20 3^{rd} week of Nov RCBD 8.0×1.25 m 50 cm 3 h, fruit width, fru	ember, 2018	ruit				

firmness,	fruit weig	ght and fr	uit yield w	vill be record	ed.			
During p	During previous year 18 entries including three checks were studied.							
01				U				
	Data recorded for fruit length, fruit width, fruit shape index, fruit firmness, fruit weight and fruit yield is given below.							
	F 4	F . 4	T . 4	D . 4	T . 4	T* 4		
	Fruit	Fruit	Fruit	Fruit	Fruit	Fruit yield		
	length	width (mm)	shape index	firmness (l_{ra}/am^2)	weight	(T/ha)		
	(mm)	(mm)	(L/W)	(kg/cm^2)	(g)	(1/14)		
	58.4	46.9	1.24	3.80	83.2	50.62		
	62.4	45.6	1.37	3.56	89.6	49.71		
	63.4	48.9	1.30	3.74	90.2	47.39		
	60.5	50.7	1.19	3.84	90.6	46.05		
neck)	58.2	51.3	1.13	3.78	88.4	45.14		
Check)	58.1	49.7	1.17	3.80	87.8	44.54		
de (Check)	58.0	48.4	1.20	3.88	84.2	39.57		
-	51.4	45.2	1.14	3.70	65.6	28.49		
5)						3.54		
	cultivation. Dr. Saeed Ahmad Shah Chishti							
Mr. Kash	Mr. Kashif Nadeem							
	Mr. Muhammad Najeebullah							
Faisalaba	Faisalabad							
2018-19	2018-19							
	Entries = 10 (including 3 checks) viz; 13234, 17256, 17257, 17260, 17261, 17264, 17265, Nadir (Check), Naqeeb (Check) & Rio Grande							
(Check).								
Nursery s	Nursery sowing = Mid October, 2018							
Transplar	Transplanting $= 3^{rd}$ week of November, 2018							
Exp. Des	ign	= R	CBD					
Plot size		= 8.	.0 imes 1.25 m	n				
Repeats		= 3						
Plant spa	cing	= 50	0 cm					
•	•	•		, fruit shape vill be record		t		
During p	During previous year 11 entries including 3 checks were evaluated.							
	During p	During previous ye	During previous year 11 ent	During previous year 11 entries includ	During previous year 11 entries including 3 checks	During previous year 11 entries including 3 checks were eval Data recorded for fruit length, fruit width, fruit shape index, f		

			firmness,	fruit weig	ght and fr	uit yield is	given below	<i>.</i>		
				1			1			
	Rank	Entry		Fruit length (mm)	Fruit width (mm)	Fruit shape index (L/W)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)	
	1	13234		57.7	50.0	1.15	3.70	82.6	51.11	
	2	13240		44.7	44.5	1.00	3.66	64.8	50.92	
	3	10139		61.4	48.5	1.27	3.82	87.4	50.47	
	4	Nadir (Chec	: k)	57.2	50.5	1.13	3.80	86.2	49.28	
	5	16249	•	51.7	49.0	1.06	4.12	75.2	48.15	
	6	Naqeeb (Ch		57.6	48.6	1.19	3.82	83.8	45.96	
	10 11	Rio Grande	(Cneck)	59.3 53.7	50.4 51.8	1.18 1.04	3.92 4.04	85.4 94.4	41.06 39.22	
	11	LSD (0.05)		55.7	51.0	1.04	4.04	74.4	39.22 3.71	
5. TITLE MULTI-LOCATIONAL / ZONAL EVAL DETERMINATE TOMATO PURELINE					LINES		man field			
OBJECTIVE	To evaluate the selected determinate tomato purelines for open field cultivation at different locations.									
RESEARCH V	RESEARCH WORKERS			Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Muhammad Najeebullah Mr. Amir Latif Mr. Ijaz Khan						
LOCATION			Faisalaba	ad, Sheikh	upura, Ra	aiwind & I	Bahawalpur			
DURATION			2018-19							
TREATMENT	S		Entries 13234, 1		-	0	cks) viz; 10 (Check) & F			
METHODOLOGY			Nursery sowing= Mid October, 2018Transplanting= 3^{rd} week of November, 2018Experimental design= RCBDPlot size= 8.0×1.25 mPlant Spacing= 50 cmRepeats= 3							
			Data regarding fruit length, fruit width, fruit shape index, fruit firmness, fruit weight and fruit yield will be recorded at VRI, Faisalabad whereas; only yield data will be recorded at out-stations.							
PREVIOUS Y	EAR'S		During previous year 8 entries including 3 checks were studied at four							
RESULTS			different	locations.	Fruit yie	ld data is j	presented bel	ow.		

	Denl	E 4			Fr	uit yield (T/	ha)			
	Rank	Entry		FSD	S. Pura	Multan	B. Pur	Average		
	1	10173		53.38	37.87	30.27	17.18	34.68		
	2	10142		48.82	36.65	29.01	15.98	32.62		
	3	10139		46.40	34.59	29.43	18.42	32.21		
	4	Nadir (Cheo	ek)	50.15	33.73	26.61	14.63	31.28		
	5	Naqeeb (Ch	eck)	44.11	30.76	27.22	15.03	29.28		
	7	Rio Grande	(Check)	42.08	29.43	24.23	12.34	27.02		
	8	13198		28.33	23.83	22.38	10.80	21.34		
		LSD (0.05)		3.03	2.08	2.19	2.36	-		
6. TITLE MULTILOCATIONAL EVALUATION OF TOMATO ADVANCED LINES/ HYBRIDS FOR AUTUMN PLANTIN OBJECTIVE To select high yielding and disease tolerant tomato genotypes statements						NTING				
for early / Autumn planting. RESEARCH WORKERS Dr. Saeed Ahmad Shah Chishti							F			
			Mr. Kashif Nadeem Mr. Muhammad Najeebullah Mrs. Naveeda Anjum							
LOCATION(S)		Faisalaba	d & Chakwa	1					
DURATION			2018-19							
TREATMENT	ſS			Ũ		Γ-302, AUT- 1057 F ₁ (Che		309, AUT-		
METHODOLO	DGY		Nursery s Transplar	sowing nting ental design	$= 2^{nd}$ we explored $= 2^{nd}$ we explore $= 2^{nd}$ w	ek of August, ek of Septem	, 2018			
			Data regarding fruit yield and disease incidence will be recorded at VRI Faisalabad whereas; only fruit yield data will be recorded at BARI Chakwal.							
PREVIOUS YEAR'S10 selected lines along with 1 check were studied during the previousRESULTSyear. Data regarding fruit yield is presented below:								he previous		

			Det. Ad	lvanced Lines	<u>s:</u>	
	Rank	Entry		Fru		a)
				VRI, Faisalabad	BARI, Chakwal	Average
	1	RS-1312	F ₁ (Check)	17.87	12.19	15.03
	2	AUT-315	1 ()	14.96	10.55	12.76
	3	AUT-312		13.10	11.01	12.06
	4	AUT-318		13.93	10.10	12.02
	5	AUT-305		13.50	9.33	11.42
	10	AUT-330		6.73	5.94	6.34
		LSD (0.05)	2.27	1.28	-
7. TITLE			INTERCR	OPPING STU	DIES IN DE	TERMIN
OBJECTIVE				ne the suitable i per unit area ba		combinatio
RESEARCH WORKERS Dr. Saeed Ahmad Shah Chishti						
			Mr. Kashif			
				nmad Najeebull	ah	
LOCATION			Faisalabad	~		
DURATION			2018-19			
TREATMENTS			Vegetables $T_1 = \text{Sole c}$ $T_2 = \text{Saanda}$ $T_3 = \text{Saanda}$ $T_4 = \text{Saanda}$ $T_5 = \text{Saanda}$ $T_6 = \text{Sole c}$ $T_7 = \text{Naquee}$ $T_8 = \text{Naquee}$ $T_9 = \text{Naquee}$ $T_{10} = \text{Naque}$	b + Strawberry b + Onion eb + Turnips	ped = Peas, S) rry	trawberry,
METHODOLOG	Y		Nursery so Transplanti Experiment Plot size Plant spacin Repeats Tomato see	ng = tal design = =		lovember, 2 to)
			the crops (e	each treatment)	will be transp	planted on o

PREVIOUS YEAR'S RESULTS		ent intercropping con ld is presented below	mbinations were tested and o	lata regarding
RESULIS	Iruit yie.	id is presented below	w:	
	Rank	Combination	Gross Income (Rs.)	
	1	Saandal F ₁	468924/-	
		Turnip		
	2	Naqeeb	347801/-	
		Turnip		
	3	Saandal F ₁	276654/-	
		Peas		
	4	Saandal F ₁	262262/-	
		Strawberry		
	5	Naqeeb	219292/-	
		Strawberry		
	6	Saandal F ₁	207870/-	
	7	Saandal F ₁	179356/-	
		Onion (D.S)		
	8	Saandal F ₁	175238/-	
		Onion		
	9	Naqeeb	152857/-	
		Peas		
	10	Naqeeb	82404/-	
	11	Onion	(2026/	
	11	Naqeeb Naqeeb	62836/-	
	12	Nageeb	58244/-	
		Huqeeb	56217	l
8. TITLE			APPROVED DETERMIN OR GENERAL CULTIVA	
OBJECTIVE		uce the seed of appr tunnels and open fie	oved determinate tomato va	rieties suitable
RESEARCH WORKERS		ed Ahmad Shah Chis		
		hif Nadeem hammad Najeebulla	h	
LOCATION	Faisalab	ad		
DURATION	2018-19			
TREATMENTS	Determi	nate variety(s) = 02	(Nadir & Naqeeb)	
METHODOLOGY	Nursery Transpla	sowing $= \mathbf{N}$ anting $= 3^{1}$	Iid October, 2018 rd week of November, 2018	

	Area Spacing		= 04 = 50	Kanals cm				
	4.0 kg pre-		d of appr	oved dete	rminate varie ect No. 916).		be	
PREVIOUS YEAR'S RESULTS					te tomato va			
9. TITLE		BILITY	-		FIC TOMA			
OBJECTIVE	To find ou resistant /	•••	•	-	l, better qual /brids.	ity and dis	ease	
RESEARCH WORKERS	Dr. Saeed Mr. Amir Mr. Muha	Latif						
LOCATION	Faisalabad	1						
DURATION	2018-19							
TREATMENTS	Varieties / hybrids will be supplied by the Seed Companies and commercial cultivars will be used as standard checks.							
METHODOLOGY	 Transplant Experimen Plot size Plant Space Repeats Data regan 	Plant Spacing $= 50 \text{ cm}$						
PREVIOUS YEAR'S RESULTS	along with entries + 2 along with trial. Data	38 determinate tomato hybrids / varieties were studied in open field along with checks (19 entries + 3 checks in set-1 and set-2) and (2 entries + 2 checks in set-3) whereas; 1 indeterminate tomato F_1 hybrids along with two checks was studied under high tunnel in a separate trial. Data recorded for fruit length, fruit width, fruit shape index, fruit firmness, fruit weight and fruit yield is given below:						
<u>Set-1 (Det.)</u>								
Rank Variety/ Hy	brid	Fruit length (mm)	Fruit width (mm)	Fruit shape index (L/W)	Fruit firmness (kg/cm ²)	Ave. fruit weight (g)	Fruit yield (T/ha)	
$\frac{1}{14T-1184} F_1$		50.1	49.0	1.02	3.58	72.4	52.35	
2 Randah F ₁ 3 TAI-14-6242		53.4	49.0	1.09	3.64	80.8 73.6	52.18	
3 TAI-14-6242 4 TO-2048		52.7 51.0	45.1	1.17	3.72	/ 3.0	50.11	

	7	T-1359 F ₁ (Check))	52.2	44	5.9	1.14	3.4	2	68.	.8	43.24
	11	Ahmar Hybrid (C		51.6		8.5	1.06	3.4		76.		41.15
	13	Nadir (Check)	,	60.0	52	2.0	1.15	3.6	60	91.	.2	38.88
	21	TTM-503		59.2		2.3	1.13	3.4		80.	.6	33.28
		LSD (0.05)		•				•				4.06
	Set-2	(Det.)										
[Variety/ Hybrid		Fruit	Fr	uit	Fruit	Fru	ıit	Av	e.	Fruit
				length		dth	shape	firm		fru		yield
				(mm)		m)	index	(kg/c		weig		(T/ha
				(1111)	(,	(L/W)	-	, , ,	(g	_	(= / = = =
·	1	Avenue F ₁		55.4	4	7.4	1.17	3.5	0	68.		46.61
·	2	Rover F ₁		55.1		5.9	1.17	3.6		74.		44.56
•	3	T-1359 F ₁ (Check)		52.1		7.4	1.10	3.4		69 .		44.47
	4	Qasba F_1 (Check)		60.7		5.7	1.09	3.6		110		43.45
	5	Miracle F_1		57.5		1.4	1.12	3.4		79.		42.23
·	6	Ahmar Hybrid (Cl	heck)	56.5		0.2	1.12	3.5		79 . 78 .		41.11
·	10	Nadir (Check)	neck)	58.1		l.1	1.13	3.6		88.		37.05
•	21	US-3383 F ₁		57.3		9.8	1.15	3.4		85.		27.85
·	21	LSD (0.05)		51.5	,	.0	1.15	5.7	-	05.	.0	3.43
L		LSD(0.05)										5.45
	<u>Set-3</u>	(Det.)										
	Rank	Variety/ Hybrid		Fruit	Fr	uit	Fruit	Frı	ıit	Av	e.	Fruit
				length	wi	dth	shape	firm	ness	fru	it	yield
				(mm)		m)	index	(kg/c	(\mathbf{m}^2)	weig	ght	(T/ha
				` <i>`</i>		,	(L/W)		,	(g	-	
	1	Ahmar Hybrid (C	(heck)	55.1	48	8.0	1.15	3.5	6	74.		19.85
	2	Bull's Eye F_1	/====	67.0		1.5	1.30	3.6		100		18.07
	3	SV-3543 TE		71.1		2.2	1.36	3.4		108		16.72
	4	T-1359 F ₁ (Check)	55.1		6.6	1.18	3.3		69.		16.04
	-	LSD (0.05))				1.10	010	0	071		3.15
												0.10
	Inde	terminate										
	Rank	Variety/ Hybrid	Fru	nit F	ruit	Fru	it I	ruit	Av	7 e	Frui	it
			leng		dth	sha		mness	fru		yiel	
			(m	9	nm)	ind	-	g/cm^2	wei		(T/h	
					шт)			g/cm/)		0	(1/11)	a.)
	1			0 4	0.4	(L/\	,	4.02	(g		105 (
	1	Salar F ₁ (Check)	59		9.4	1.2		4.02	85		125.0	
	2 3	Sahel F ₁ (Check)	63		4.4	1.1		<u>3.94</u>	112		121.1	
	5	Cosmic F ₁	57	.3 5	1.5	1.1	12	3.98	92	.4	101.5	
		LSD (0.05)									5.48	
		C	YNTH	ESIS OI	F DET	FERN	MINAT	E TOM	ATO	HYB	RIDS	
). TITLE		S	UITAB			W TU	UNNEL	S AND	OPEN	N FIE	LD	

RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti
	Mr. Kashif Nadeem Mr. Amir Latif
	Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2018-19
TREATMENTS	Parental lines = 15
METHODOLOGY	Nursery sowing $=$ Mid October, 2018
	Transplanting $= 3^{rd}$ week of November, 2018
	Plot size $= 8.0 \times 1.75 \text{ m}/\text{ as per requirements}$
	Plant Spacing $= 50 \text{ cm}$
	The crosses amongst desirable parents will be made to develop 30
	new and 20 selected/ promising F_1 hybrids.
PREVIOUS YEAR'S	A total of 49 F ₁ crosses seed (40 fresh & 9 under evaluation hybrids)
RESULTS	was produced.
11. TITLE	PRELIMINARY EVALUATION OF DETERMINATE
	TOMATO HYBRIDS SUITABLE FOR LOW TUNNELS AND
	OPEN FIELD CULTIVATION
OBJECTIVES	To evaluate locally developed determinate tomato hybrids suitable for
	low tunnels and open field cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti
	Mr. Amir Latif
	Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2018-19
TREATMENTS	F_1 hybrids = 32 (including 2 checks) viz; LTH-491, LTH-492, LTH-
	493, LTH-494, LTH-495, LTH-496, LTH-497, LTH-498, LTH-499,
	LTH-500, LTH-501, LTH-502, LTH-503, LTH-504, LTH-505, LTH-
	506, LTH-507, LTH-508, LTH-509, LTH-510, LTH-511, LTH-512,
	LTH-513, LTH-514, LTH-515, LTH-516, LTH-517, LTH-518, LTH-
	519, LTH-520, TO-1057 F_1 (Check) and Ahmar Hybrid (Check).
METHODOLOGY	Nursery sowing $=$ Mid October, 2018
	Transplanting $= 3^{rd}$ week of November, 2018
	Experimental design $= RCBD$
	Plot size $= 8.0 \times 1.25 \text{ m}$
	Plant Spacing $= 50 \text{ cm}$
	Repeats = 3
	Data regarding fruit length, fruit width, fruit shape index, fruit
	firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S	40 locally developed determinate F ₁ hybrids along with three checks

RESULTS			were ev	aluated in	two diffe	erent sets ($20 F_1$ hybrids	s & 3 chec	ks in each
							uit width, fru		
			-				is given belo	-	
					e	•	C		
	Sot	1							
	<u>Set</u>	1		-	-			-	-
	Rank	Entry		Fruit	Fruit	Fruit	Fruit	Fruit	Fruit
				length	width	shape	firmness	weight	yield (T/ha)
				(mm)	(mm)	index	(kg/cm^2)	(g)	(1/lla)
	1	1.50		54.0	17 5	(L/W)	2.02	70.0	50.25
	1	LTH-459	1)	54.8	47.5	1.16	3.92	78.0	50.35
	2 3	TO-1057 F ₁ (Chec	ск)	53.4	48.7	1.10	4.04	75.4	49.78
	4	LTH-457 LTH-465		51.9 43.3	47.6 46.6	1.09 0.93	3.66 3.50	76.0 80.4	46.93 45.91
	5	T-1359 F ₁ (Check)	53.3	40.0 47.0	1.13	3. 30	71.0	4 5.72
	6	LTH-458)	52.3	49.0	1.07	3.72	78.8	45.18
	9	Ahmar Hybrid (C	heck)	51.3	4 5.9	1.07	3.72	73.2	43.18
	23	LTH-460	men	47.6	47.3	1.01	3.46	63.2	32.38
	25	LSD (0.05)		17.0	17.5	1.01	5.10	05.2	4.83
									4.00
	<u>Set</u>								
	Rank	Entry		Fruit	Fruit	Fruit	Fruit	Fruit	Fruit
				length	width	shape	firmness	weight	yield
				(mm)	(mm)	index	(kg/cm^2)	(g)	(T/ha)
						(L/W)			
	1	LTH-482		48.8	49.0	1.00	3.80	73.0	50.13
	2	LTH-478		49.0	50.8	0.96	3.70	72.2	47.28
	3	TO-1057 F ₁ (Chec		55.8	47.8	1.17	3.94	79.2	46.81
	4	T-1359 F ₁ (Check)	53.8	47.5	1.13	3.82	72.4	44.35
	5	LTH-471	The ala)	53.2 53.5	48.5	1.10	3.52	62.6	44.25
	6 7	Ahmar Hybrid (C	леск)	52.5	46.9	1.12	3.88 3.56	74.0	43.23
	7 23	LTH-476 LTH-489		45.9 49.9	46.5 46.8	0.99 1.07	3.36	57.8 66.8	41.85 27.17
	23	LSD (0.05)		49.9	40.0	1.07	5.40	00.8	4.60
									4.00
12. TITLE			SECO	NDARY	/ STATIO	ON YIEL	D EVALUA	TION OF	
			DETE	RMINAT	TE TOM	АТО НҮН	BRIDS SUIT	TABLE FO	OR LOW
			TUNN	ELS ANI	D OPEN	FIELD C	ULTIVATI	ON	
OBJECTIV	ES		To eva	luate the s	selected lo	ocally deve	eloped tomat	o hybrids s	suitable
						field cultiv		,	
RESEARCI	HWOR	KERS	Dr. Sa	eed Ahma	d Shah C	hishti			
-				nir Latif	_				
			Mr. Muhammad Najeebullah						
LOCATION	N		Faisalabad						
DURATIO	N		2018-19						

TREATMENTS	•	ng 2 checks) viz; LTH-421, LTH-436, LTH- 66, LTH-469, LTH-471, TO-1057 F ₁ (Check) heck).			
METHODOLOGY	e e	= Mid October, 2018 = 3^{rd} week of November, 2018 = RCBD = 8.0×1.25 m = 50 cm = 3 ngth, fruit width, fruit shape index, fruit and fruit yield will be recorded.			
PREVIOUS YEAR'S RESULTS	S 10 determinate F ₁ hybrids along with three che Data recorded for fruit length, fruit width, frui firmness, fruit weight and fruit yield is given b				

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit shape index (L/W)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
1	LTH-421	54.4	47.0	1.16	3.80	70.4	47.52
2	TO-1057 F ₁ (Check)	53.3	45.6	1.17	3.78	72.6	46.57
3	LTH-420	54.7	47.7	1.15	3.60	72.6	45.47
4	LTH-405	48.5	47.4	1.02	3.64	69.4	44.15
6	T-1359 F ₁ (Check)	52.9	45.9	1.15	3.74	69.2	43.74
7	Ahmar Hybrid (Check)	53.8	46.1	1.17	3.82	69.6	43.32
10	LTH-444	52.6	45.2	1.16	3.66	71.6	33.88
	LSD (0.05)						3.04

13. TITLE	MULTI-LOCATIONAL / ZONAL EVALUATION OF DETERMINATE TOMATO HYBRIDS SUITABLE FOR LOW TUNNELS AND OPEN FIELD CULTIVATION
OBJECTIVES	To evaluate the selected locally developed tomato hybrids suitable for low tunnels and open field cultivation at different locations.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah Mr. Ijaz Khan
LOCATION	Faisalabad, Sheikhupura, Raiwind & Bahawalpur
DURATION	2018-19
TREATMENTS	Entries = 7 (including 2 checks) viz; LTH-324, LTH-421, LTH-422, LTH-436, LTH-440, TO-1057 F_1 (Check) and Ahmar Hybrid (Check).

	1			
METHODOLOGY	Nursery sowing	= Mid October, 2018		
	Transplanting	$= 3^{rd}$ week of November, 2018		
	Experimental design	= RCBD		
	Plot size	$= 8.0 \times 1.25 \text{ m}$		
	Plant Spacing	= 50 cm		
	Repeats	= 3		
	Data regarding fruit length, fruit width, fruit shape index, firmness, fruit weight and fruit yield will be recorded at V Faisalabad whereas; only fruit yield data will be recorded stations.			
PREVIOUS YEAR'S	10 F ₁ hybrids along with	th three checks were studied at four different		
RESULTS	locations. Data recorde	d for fruit yield is presented below.		

Rank	Entry	Fruit yield (T/ha)							
Nalik	Entry	FSD	S. Pura	Multan	B. Pur	Average			
1	LTH-324	48.30	39.75	35.20	22.08	36.33			
2	NBH-5	45.34	40.67	33.94	21.75	35.43			
3	T-1359 F ₁ (Check)	48.04	37.96	32.15	19.14	34.32			
4	Ahmar Hybrid (Check)	44.21	35.79	30.34	17.89	32.06			
5	NBH-149	38.29	36.29	30.72	19.39	31.17			
6	TO-1057 F ₁ (Check)	42.16	34.65	27.01	16.08	29.98			
7	LTH-350	37.06	32.61	24.97	16.90	27.89			
10	LTH-379	37.63	28.19	23.85	13.50	25.79			
	LSD (0.05)	3.72	2.41	2.15	2.03	-			

14. TITLE	COLLECTION AND MAINTENANCE OF INDETERMINATE TOMATO GERMPLASM
OBJECTIVE	Collection and maintenance of local and exotic germplasm for future use in breeding programme.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION /TREATMENTS	Continuous Entries (Existing) = 148 (local and exotic).

METHODOLOGY	Nursery sowing = Mid October, 2018						
	Transplanting = 3^{rd} week of November, 2018						
	Experimental design = Non replicated						
	Plant spacing $=$ 40 cm						
	Bed width $=$ 1.50 m (on both sides)						
	Off-type plants will be rouged out to maintain the purity.						
PREVIOUS YEAR'S	148 entries of indeterminate tomato were maintained and selected	115					
RESULTS	entries will be used in breeding program.						
	Characteristics Range						
	Fruit length (mm) 20.4 – 81.2						
	Fruit width (mm) 18.9 – 73.3						
	Fruit shape index (L/W) $0.48 - 1.75$						
	Fruit firmness (kg/cm2) $1.5 - 4.5$ Example 1 (a) $12.1 - 15.6$						
	Fruit weight (g) 13.1 – 156						
15. TITLE	STUDY OF FILIAL GENERATIONS IN INDETERMINATE TOMATO	£					
OBJECTIVE	To develop/select high yielding, disease resistant, good quality indeterminate tomato purelines.						
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti						
	Mr. Kashif Nadeem						
	Mr. Amir Latif						
	Mr. Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION	Continuous						
TREATMENTS	i) $F_2 = 21$ cross combinations						
	ii) $F_3 = 49$ single plant progenies of 15 crosses						
	iii) $F_4 = 11$ single plant progenies of 7 crosses						
	iv) $F_5 = 22$ single plant progenies of 9 crosses						
	v) $F_6 = 21$ single plant progenies of 4 crosses						
	vi) $F_7 = 18$ single plant progenies of 6 crosses						
METHODOLOGY	Nursery sowing = Mid October, 2018						
	Transplanting $= 3^{rd}$ week of November, 2018						
	Plant to plant distance $= 50 \text{ cm}$						
	Experimental design = Non-replicated						
	Plant spacing $= 40 \text{ cm}$						
	Bed width $= 1.50 \text{ m} \text{ (on both sides)}$						
	$F_2 - F_6$ will be advanced by using Pedigree method. Desirable pl	lant					
	$F_2 - F_6$ will be selected for further studies.	iant					
PREVIOUS YEAR'S							
RESULTS	S. No. Generation No. of Crosses / Progeny						
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
	$1 F_1 30 21$						

Г								
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $							
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $							
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
	$6 F_6 5/42 6/18$							
	7 F ₇ 3/5 2/4							
16. TITLE	SYNTHESIS OF INDETERMINATE TOMATO HYBRIDS							
	SUITABLE FOR TUNNEL CULTIVATION							
OBJECTIVES	To develop high yielding indeterminate tomato hybrids suitable for tunnel cultivation.							
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti							
	Mr. Kashif Nadeem Mr. Muhammad Najeebullah							
LOCATION	Faisalabad							
DURATION	2018-19							
TREATMENTS	Parents =15							
METHODOLOGY	Nursery sowing= Mid October, 2018Transplanting= 3^{rd} week of November, 2018Plot size= 4.5×1.50 m (on both sides)Plant Spacing= 40 cm							
	The crosses amongst desirable parents will be made to develop 30 new and 20 selected/ promising F_1 hybrids.							
PREVIOUS YEAR'S RESULTS	A total of 60 F_1 crosses seed (38 fresh & 22 under evaluation hybrids) was produced.							
17. TITLE	PRELIMINARY EVALUATION OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION							
OBJECTIVES	To evaluate locally developed indeterminate tomato hybrids suitable for tunnel cultivation.							
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Bashir Hussain Mr. Muhammad Najeebullah							
LOCATION	Faisalabad							
DURATION	2018-19							
TREATMENTS	32 F1 hybrids (including two checks) in two sets viz: LITTH-917, LITTH-918, LITTH-919, LITTH-920, LITTH-921, LITTH-922, LITTH-923, LITTH-924, LITTH-925, LITTH-926, LITTH-927, LITTH-928, LITTH-929, LITTH-930, LITTH-931, LITTH-932, LITTH-933, LITTH-934, LITTH-935, LITTH-936, LITTH-937, LITTH-938, LITTH-939, LITTH-940, LITTH-941,							

	LITTH-942, LITTH-943, LITTH-944, LITTH-945, LITTH-946, Saandal F_1 (Local check) & Sahel F_1 (Exotic check).					
METHODOLOGY	Nursery sowing= Mid October, 2018Transplanting= 3^{rd} week of November, 2018Experimental design= RCBDPlot size= 4.5×0.75 mPlant Spacing= 40 cmData regarding fruit length, fruit width, fruit shape index, fruitfirmness, fruit weight and fruit yield will be recorded.					
PREVIOUS YEAR'S RESULTS	 42 locally developed indeterminate F₁ hybrids along with two checks were evaluated in three different sets (14 F₁ hybrids & 2 checks in each set). Data recorded for fruit length, fruit width, fruit shape index, fruit firmness, fruit weight and fruit yield is given below. 					

	5	<u>Set-1</u>						
	Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit shape index (L/W)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
	1	LITTH-879	55.2	52.4	1.05	4.02	95.2	129.81
	2	LITTH-872	57.6	43.4	1.33	3.68	65.2	120.72
	3	LITTH-877	65.0	50.2	1.29	3.72	106.0	118.86
	4	LITTH-874	67.8	44.9	1.51	3.80	84.0	118.26
	5	Saandal F ₁ (Check)	60.0	54.2	1.11	3.84	108.4	118.25
	6	Sahel F ₁ (Check)	64.2	54.9	1.17	3.80	110.0	116.18
	16	LITTH-885	38.6	42.4	0.91	3.70	51.6	62.93
		LSD (0.05)						6.04
		<u>Set-2</u>						
	Rank	Entry	Fruit	Fruit	Fruit	Fruit	Fruit	Fruit
			length	width	shape	firmness	weight	yield
			(mm)	(mm)	index (L/W)	(kg/cm ²)	(g)	(T/ha)
	1	LITTH-901	62.9	45.0	1.40	3.66	88.4	128.24
	2	LITTH-900	71.6	45.5	1.57	3.76	82.0	124.08
	3	LITTH-895	44.5	49.9	0.89	3.54	72.8	122.88
	4	LITTH-899	79.7	45.2	1.76	3.60	95.2	121.50
	6	Sahel F ₁ (Check)	63.1	53.0	1.19	3.70	105.6	115.75
	7	Saandal F ₁ (Check)	60.9	54.3	1.12	3.72	109.2	114.91
	16	LITTH-890	41.8	45.6	0.92	3.66	58.6	70.58
	<u></u>	LSD (0.05) Set-3						5.88
	Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit shape index (L/W)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
	1	LITTH-908	67.5	53.5	1.26	3.70	112.4	136.60
	2	LITTH-907	67.3	53.5	1.26	3.78	116.0	128.18
	3	LITTH-903	66.3	52.2	1.27	3.68	113.2	124.46
	4	LITTH-914	56.5	49.7	1.14	3.56	89.6	123.09
	7	Sahel F ₁ (Check)	64.1	54.3	1.18	3.70	111.6	119.01
	8	Saandal F ₁ (Check)	60.9	55.2	1.10	3.76	115.4	117.47
	16	LITTH-905	64.4	49.3	1.31	3.58	98.4	90.27
		LSD (0.05)						5.75
18. TITLE		INDET	SECONDARY / STATION YIELD EVALUATION OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION					
OBJECTIVE	To evaluate selected locally developed tomato hybrids suitable for tunnel cultivation.							le for

RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti						
	Mr. Kashif Nadeem						
	Mr. Bashir Hussain						
	Mr. Muhammad Najee	bullah					
LOCATION	Faisalabad						
DURATION	2018-19						
TREATMENTS	9 F ₁ Hybrids (including two checks) viz: LITTH-879, LITTH-900, LITTH-901, LITTH-903, LITTH-904, LITTH-907, LITTH-908, Sahel F ₁ (Exotic check) & Saandal F ₁ (Local check).						
METHODOLOGY	Nursery sowing Transplanting Experimental design	$= 3^{rd}$ week of November, 2018					
	Plot size	$= 4.5 \times 1.5 \text{ m}$					
	Plant Spacing	= 40 cm					
	Data regarding fruit le	ngth, fruit width, fruit shape index, fruit					
	firmness, fruit weight a	and fruit yield will be recorded.					
PREVIOUS YEAR'S	7 locally developed inc	determinate F ₁ hybrids along with two checks					
RESULTS	(one exotic & one loca	l) were evaluated. Data recorded for fruit					
	length, fruit width, fruit shape index, fruit firmness, fruit weight and fruit yield is given below.						

	Rank	Entry		Fruit length	Fruit width	Fruit shape	Fruit firmness	Fruit weight	Fruit yield
				(mm)	(mm)	index (L/W)	(kg/cm ²)	(g)	(T/ha)
	1	LITTH-835		62.7	53.1	1.18	3.58	103.8	120.24
	2	LITTH-861		65.3	51.1	1.28	3.72	106.0	118.11
	3	Sahel F ₁ (C	(heck)	66.7	56.4	1.18	3.84	118.6	117.42
	4	LITTH-869		57.3	49.5	1.16	3.84	94.4	115.88
	5	Saandal F ₁	(Check)	61.2	55.3	1.11	3.80	116.2	115.56
	6	LITTH-844		68.3	50.6	1.35	3.68	109.2	113.61
	9	LITTH-852	r	61.6	48.1	1.28	3.82	88.8	101.00
LSD (0.05)								4.73	
INDETH					ГЕ ТОМ	ATO HY	EVALUATI BRIDS SUI		OR
OBJECTIVE To evaluate selected 1 tunnel cultivation at d				-		•	rids suitab	le for	
RESEARCH WORKERS Dr. Saeec			d Ahmad	Shah Chi	shti				
Mr. Kashif Nadeem Mr. Muhammad Najeebullah Mr. Ijaz Khan									

	Mrs. Naveeda Anjum Mr. Bashir Hussain				
LOCATION	Faisalabad, Sheikhupura, Bahawalpur and Chakwal				
DURATION	2018-19				
TREATMENTS	8 F_1 Hybrids (including three checks) viz: LITTH-682, LITTH-765, LITTH-835, LITTH-861, LITTH-869, Sahel F_1 (Exotic check), Salar F_1 & Saandal F_1 (Local checks).				
METHODOLOGY	Nursery sowing= Mid October, 2018Transplanting= 3rd week of November, 2018Experimental design= RCBDPlot size= 4.5×1.50 mPlant Spacing= 40 cmData regarding fruit length, fruit width, fruit shape index, fruitfirmness, fruit weight and fruit yield will be recorded at VRI,Faisalabad whereas; only fruit yield data will be recorded at out-stations.				
PREVIOUS YEAR'S RESULTS	5 F_1 tomato hybrids along with three checks were studied at four different locations. Data recorded for fruit yield is presented below.				

Donk	Rank Entry		Fruit yield (T/ha)					
Kalik	Entry	FSD	S. Pura	Multan	Chakwal	Average		
1	Salar F ₁ (Check)	115.15	110.22	104.55	-	109.97		
2	LITTH-682	116.46	109.38	101.54	83.47	102.71		
3	Sahel F ₁ (Check)	113.79	107.49	101.05	84.62	101.74		
4	Saandal F ₁ (Check)	111.57	108.75	100.14	86.22	101.67		
5	LITTH-710	112.48	105.88	95.94	80.84	98.79		
6	LITTH-765	104.29	98.39	98.39	81.51	95.65		
8	LITTH-818	101.39	93.49	90.62	74.09	89.90		
	LSD (0.05)	4.12	6.18	5.65	4.35	-		

20. TITLE	EARLY PRODUCTION OF TOMATO HYBRID(S)				
OBJECTIVE	To select high yielding tomato genotypes suitable for early planting.				
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Muhammad Najeebullah				
LOCATION(S)	Faisalabad				
DURATION	2018-19				
TREATMENTS	3 Entries = Saandal F_1 , Salar F_1 & Sahel F_1 .				
METHODOLOGY	Nursery sowing= Last week of August, 2018Transplanting= Last week of September, 2018Experimental design= RCBD				

Plant Spacing	_			
	5	=40 cm		
Data regardin	ig fruit y	ield will be recorde	ed.	
3 indeterminate tomato hybrids (2 local + 1 exotic) were studied for				
earlier fruit p	roduction	n pattern. Pickings	were started from	21.12.2017
and lasted up	to 06.06.	2018 with total nu	mber of 19 pickin	gs. The fruit
yield data is p	presented	l below;		
	Damle	F == 4 == = =	Fruit yield	
	капк	Entry	(T/ha)	
	1	Salar F ₁	144.86	
2 Saandal F ₁ 140.77				
3 Sahel F_1 140.25				
		LSD (0.05)	3.92	
	3 indetermina earlier fruit p and lasted up	3 indeterminate tomat earlier fruit production and lasted upto 06.06. yield data is presented Rank 1 2	B indeterminate tomato hybrids (2 local- earlier fruit production pattern. Pickings and lasted upto 06.06.2018 with total nur yield data is presented below; $\hline \hline Rank Entry \\ \hline 1 Salar F_1 \\ \hline 2 Saandal F_1 \\ \hline 3 Sahel F_1 \\ \hline \hline 1 \\ 1 \\$	RankFruit yield (T/ha)1Salar F_1 144.862Saandal F_1 140.773Sahel F_1 140.25

2. ONION	N	(Allium cepa L.)					
1. TITLE		COLLECTION AND M	AINTAINCE OF GERMPLASM				
OBJECTIVES	:	Collection and maintenance of local and exotic germplasm for future use in breeding programme.					
RESEARCH		Mrs. Mehvish Tahir					
WORKER (S)		Dr. Akhter Saeed					
		Dr. Saeed Ahmad Shah Cl	hishti				
LOCATION		VRI, Faisalabad					
DURATION		Continuous					
TREATMENT	S	Varieties for sets production					
		Varieties for seed producti	ion = 30				
METHODOLC	Nursery sowing = 2^{nd} fortnight of November, 2018 Harvesting of nursery sets = 2^{nd} fortnight of April, 2019 For seed production Transplanting of bulbs (In isolations) = Nov-Dec, 2018 Plot size = up to 5 Marla						
	G N	Sets and seeds will be har					
	Sr. No	Characters	Range				
	1	Bulb diameter(cm)	5.6-11.6				
	2	Neck diameter	0.62-1.4				
	3	Bulb weight(g)	76-130				
	4	Bulb color	White, piazi, purple, red				
	5	Bulb shape	Spherical, Tall, Flat				
	6	Ring/bulb	6-11				
	7	Centres/bulb	1-9				
2. TITLE		DEVELOPMENT OF O	NION INBRED LINE				
OBJECTIVES	:	For the development of h	ybrids/synthetic varieties				
RESEARCH		Mrs. Mehvish Tahir					
WORKER (S)		Dr. Akhter Saeed					
		Dr. Saeed Ahmad Shah Chishti					
LOCATION		VRI, Faisalabad					
DURATION		Continuos					
TREATMENT	S	S_0 Sets = 10 varieties S_1 Sets = 6 varieties					
		S_1 Seed = 4 varieties					
		S_2 Sets = 2 varieties					
		S_2 Seed = 2 varieties					
		S_3 Sets = 5 varieties					

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	S_3 Seed								
	S_4 Sets								
		S_4 Seed = 4 varieties							
	S_5 Sets = 2 varieties S_5 Seed = 1 varieties								
METHODOLOGY		The nursery sets (harvested during May 2018) has been planted in August for bulb formation. The bulb of S_{1} , S_{2} , S_{3} and S_{4} generation will be planted during Nov-Dec 2018 for							
	seed pr	oductio	n. At flowering	(March-April)	25 single umbel	s will be bagge	d with butter		
	inbred	-	ach variety. At h	naturity seed w	ill be collected f	or further selfin	ig to develop		
			seed will be nl	anted during 2	nd fortnight of C	october 2018 to	produce bulbs		
			stored for next y	-	-	2010 10			
PREVIOUS		Sr.	S ₁	\mathbf{S}_2	S ₃	S ₄	S ₅		
YEAR'S		No.	~1	~2	~3	~4	~3		
RESULTS	Sets	1	Red King	VRIO-4	VRIO-3	Desi Large	Faisal red		
		2	Robina	Red Imposta	VRIO-6	VRIO-9-75	Mirpurkhas		
		3	Desi Red	<u>^</u>	Red Imposta	Early Red	Î		
		4	T1-172		Early red	Faisal Red			
		5	Prema		Robina	PK-10321			
		6	Kareem			VRIO-9-79			
	Seed	1	Yellow	Desi Red	Mirpurkhas,	Nasarpuri	4466		
		2	Granex	Ded Meen	Ded Imagete	Desi Ded			
		2	Golden ORB	Red Moon	Red Imposta Faisal Red	Desi Red			
		3 4	Pink Panther White Pearl	Ceylon	Selection I	HON-1069			
		4	white Pearl		yellow	-			
		5			Selection I				
		6			Selection IV				
3. TITLE	DEVE	LOPM	LENT OF OPEN	N POLLINATI	ED ONION VA	RIETIES			
OBJECTIVES	To deve	elop hig	gh yielding, dise	ase resistant/to	lerant and better	adapted open	oollinated		
	onion v	varieties	b.						
RESEARCH	Mrs. M	ehvish	Tahir						
WORKER (S)	Dr. Akl								
			nad Shah Chisht	i					
LOCATION	VRI, Fa								
DURATION	Continu	uous							
TREATMENTS	A. Seed	d of sou	rce population						
			varieties						
METHODOLOGY	A. Seed	d of one	source populati	ion will be plan	ted during 2 nd fo	ortnight of Octo	ber and		
			• •	•	esirable bulbs wi	•			
	-		-	-	mber to facilitat		ng in isolation.		
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	Seed will be harvested at maturity.								
PREVIOUS	A. One source population was developed.								
YEAR'S	B . Bulbs of genotypes were produced and stored.								
RESULTS									
4. TITLE	EVALUATION OF	EVALUATION OF EXOTIC VARIETIES/HYBRIDS IN ADAPTABILTY TRIAL							
OBJECTIVES:	To test adaptability o	f imported v	varieties.						
RESEARCH	Mrs. Mehvish Tahir								
WORKER (S)	Dr. Akhter Saeed								
	Dr. Saeed Ahmad Sh	ah Chishti							
LOCATION	VRI, Faisalabad								
DURATION	Continuous								
TREATMENTS	Varieties provided by								
METHODOLOGY	Nursery sowing $= 2^{nd}$			18					
	Transplanting = De	cember, 201	18						
	0	CBD							
	Replication = 3								
		× 1.5 m							
	Data on diameter of t		ek diameter, a	verage bulb w	eight, nu	nber of ring	s per bulb		
	and yield will be reco								
PREVIOUS	Performance of varie	1							
YEAR'S		Bulb	Bulb	Neck	No. of	No.of	Yield		
RESULTS	Entrica.	Weight	Diameter	Diameter	Rings	Centres	(t/ha)		
KESULIS	Entries	(g)	(cm)	(cm)	0.47	0.12	25.26		
	Pink Panther	235.67	7.25	0.88	9.47	2.13	35.36		
	Kareem F1 Hybrid Yellow	103.54	6.10	0.60	8.00	1.73	32.50		
	Granex	147.53	6.49	0.82	9.07	2.33	25.72		
	Red Flame	125.80	6.05	0.69	8.73	2.13	22.67		
	F1 Mustang	151.07	5.93	1.01	9.20	2.07	21.72		
	Texas Early	151.07	5.75	1.01	9.20	2.07	21.72		
	Grano	151.33	6.45	0.77	8.40	2.40	21.54		
	Golden ORB	136.73	5.89	0.71	8.33	1.73	20.63		
	Premium F1	147.13	5.85	0.71	7.20	2.20	20.50		
	Hike	163.44	6.01	0.73	8.53	1.60	20.07		
	Super Sarhad	115.67	5.79	0.82	9.53	2.27	20.04		
	Phulkara(Check)	104.73	5.93	0.83	9.20	3.60	18.30		
	F1 Zeus	123.20	5.58	0.85	9.00	2.27	17.89		
	Red ORB F1	111.80	5.61	0.87	8.07	1.60	17.00		
	F1 Amaloan	124.93	5.79	0.69	9.13	1.87	16.37		
	Anoki F1	111.73	5.63	0.72	9.20	2.40	16.04		
		98.67	5.71	0.75	8.73	3.33	15.75		
	Rania								
	Rania Diana					4.60	14.82		
	Rania Diana White Pearl	89.33 114.67	5.27 5.66	0.93	8.93 7.53	4.60 1.73	14.82 13.86		

	Marvi	96.67	5.48 (0.78 8.93	3.53	13.06			
	LSD (0.05)	55.47	0.65	0.18 1.28	0.76	4.606			
5. TITLE		MULTILOCATIONAL/ ZONAL EVALUATION OF HIGH YIELDING ONION VARIETIES FOR SPRING SEASON							
OBJECTIVES:	To screen out hi	gh yielding on	ion varieties for sp	oring season in diffe	rent location	l .			
RESEARCH WORKER (S)	Dr. Akhter Saee	To screen out high yielding onion varieties for spring season in different location. Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti							
LOCATION	VRI-Faisalabad	, Jhang and Ra	iwind						
DURATION	2018-19								
TREATMENTS	Varieties = 10 v Mirpur Khas and		0-2, Vrio-3, Vrio-4	4, Vrio-6, Local, Da	rk red, Phull	kara,			
	P x P R x R	= RCBD = 3 = 10 cm = 30 cm = 7 × 1.5 m							
PREVIOUS YEAR'S RESULT	recorded. During previous	year six entrie		gs/bulb, bulb weight	•				
	recorded. During previous and Data is pres	year six entrie ented below. Bulb			ultan and Bal	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries	year six entrie ented below. Bulb Weight (g)	s were evaluated a Bulb Diameter (cm)	nt two locations (Mu Neck Diameter (cm)	ultan and Bal	hawalpur).			
YEAR'S RESULT	 recorded. During previous and Data is pres Entries Dark red 	year six entrie ented below. Bulb Weight (g) 125.67	Bulb Diameter (cm) 6.29	nt two locations (Mi Neck Diameter (cm) 1.28	ultan and Bal Yield (t/h 24.73	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1	year six entrie ented below. Bulb Weight (g) 125.67 115.00	Bulb Diameter (cm) 6.29 6.07	nt two locations (Mu Neck Diameter (cm) 1.28 1.44	Yield (t/h 24.73 23.33	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check)	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33	Bulb Diameter (cm) 6.29 6.07 6.29	Neck Diameter (cm) 1.28 1.44 1.31	Yield (t/h 24.73 23.33 22.13	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas	Bulb Weight (g) 125.67 115.00 104.33 94.33	Bulb Diameter (cm) 6.29 6.07 6.29 5.59	Neck Diameter (cm) 1.28 1.44 1.31 1.81	Yield (t/h 24.73 23.33 22.13 22.58	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85	Yield (t/h 24.73 23.33 22.13 22.58 21.60	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00 87.67	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56	Vield (t/h 24.73 23.33 22.13 22.58 21.60 20.98	hawalpur).			
YEAR'S RESULT Bahawalpur	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05)	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00 87.67 2.90	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45	Yield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01	hawalpur).			
YEAR'S RESULT	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05) Dark red	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00 87.67 2.90 120.17	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50 6.39	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45 1.08	Vield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01 22.22	hawalpur).			
YEAR'S RESULT Bahawalpur	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05) Dark red Mirpurkhas	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.60 87.67 2.90 120.17 98.33	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50 6.39 5.69	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45 1.08 1.91	Vield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01 22.22 22.18	hawalpur).			
YEAR'S RESULT Bahawalpur	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05) Dark red Mirpurkhas VRIO-1	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00 87.67 2.90 120.17 98.33 111.08	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50 6.39 5.69 6.27	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45 1.08 1.91 1.14	Vield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01 22.22 22.18 20.33	hawalpur).			
YEAR'S RESULT Bahawalpur	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05) Dark red Mirpurkhas VRIO-1 Phulkara(Check)	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.60 87.67 2.90 120.17 98.33 111.08 101.03	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50 6.39 5.69 6.27 6.21	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45 1.08 1.91 1.14 1.21	Yield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01 22.22 22.18 20.33 20.03	hawalpur).			
YEAR'S RESULT Bahawalpur	recorded. During previous and Data is pres Entries Dark red VRIO-1 Phulkara Check) Mirpurkhas Early red Desi red LSD (0.05) Dark red Mirpurkhas VRIO-1	year six entrie ented below. Bulb Weight (g) 125.67 115.00 104.33 94.33 87.00 87.67 2.90 120.17 98.33 111.08	Bulb Diameter (cm) 6.29 6.07 6.29 5.59 5.44 5.57 0.50 6.39 5.69 6.27	Neck Diameter (cm) 1.28 1.44 1.31 1.81 1.85 1.56 0.45 1.08 1.91 1.14	Vield (t/h 24.73 23.33 22.13 22.58 21.60 20.98 1.01 22.22 22.18 20.33	hawalpur).			

	CCTION AND MAINTENAN	ICE OF PEA	S GERMPLAS		
To main				5111	
To maintain and evaluate lines/varieties of pea to be used in future breeding					
program					
Mudassa	ar Iqbal				
Ghazanf	ar Hammad				
Dr. Muhammad Iqbal					
Faisalabad					
Continuous					
Varieties/lines = 77					
Sowing date = 1^{st} week of November, 2018					
Plot size = 5.0×1.25 m					
Off-type	plants will be roughed out fro	m each line/va	ariety to mainta	in purity.	
75 lines/	varieties were evaluated and r	naintained by	selecting desira	able plants	
and roug	shing off-type plants.				
S. No	Traits	Minimum	Maximum		
1.	Days to 50 % Flowering	29	81		
2.	No. of Seeds/pod	5	9		
3.	Pod Length (cm)	6	11	•	
4.	Pod Width (cm)	1.4	2.1	•	
5.	Plant Height (cm)	32	110	•	
6.	Fresh 100- Seed Weight (g)	14	65	•	
HYBRI	DIZATION AND STUDY O	F FILIAL GI	ENERATIONS	5 IN	
PEAS					
To comb	oine desirable traits for the dev	elopment of h	igh vielding, ea	ırlv	
		-	6 , 8,	J	
-					
	1				
Dr. Muh	ammad Iqbal				
	-				
	5				
Continu	ous				
		de to induce po	owdery mildew t	olerance in	
•		1	-		
1) 77. 1		40 14 -			
1) High	yielding = Peas-2009, 937_{\odot}	4& Meteor			
	Ghazanf Dr. Muh Faisalab Continua Varieties Sowing Plot size Design Off-type 75 lines/ and roug S. No 1. 2. 3. 4. 5. 6. HYBRI PEAS To comb maturing Mudassa Ghazanf Dr. Muh Muhami Faisalab Continua	Ghazanfar Hammad Dr. Muhammad IqbalFaisalabadContinuousVarieties/lines = 77 Sowing date = 1^{st} week of Nova Plot size = 5.0×1.25 mDesign =Observational plOff-type plants will be roughed out fro 75 lines/varieties were evaluated and r and roughing off-type plants.S. NoTraits1.Days to 50 % Flowering 2.2.No. of Seeds/pod3.Pod Length (cm)4.Pod Width (cm)5.Plant Height (cm)6.Fresh 100- Seed Weight (g)HYBRIDIZATION AND STUDY O PEASTo combine desirable traits for the dev maturing and diseases resistant/toleranMudassar Iqbal GhazanfarHammad Dr. Muhammad Iqbal Muhammad Iqbal Muhammad Iqbal Muhammad Iqbal Muhammad Iqbal Parents.	Ghazanfar Hammad Dr. Muhammad IqbalFaisalabadContinuousVarieties/lines = 77 Sowing date = 1^{st} week of November, 2018Plot size = 5.0×1.25 mDesign =Observational plotOff-type plants will be roughed out from each line/v.75 lines/varieties were evaluated and maintained by and roughing off-type plants.S. NoTraitsMinimum1.Days to 50 % Flowering292.No. of Seeds/pod53.Pod Length (cm)64.Pod Width (cm)1.45.Plant Height (cm)326.Fresh 100- Seed Weight (g)14HYBRIDIZATION AND STUDY OF FILIAL GI PEASTo combine desirable traits for the development of h maturing and diseases resistant/tolerant varieties.Mudassar Iqbal GhazanfarHammad Dr. Muhammad Iqbal Muhammad NajeebullahFaisalabadContinuousHybridization: Four crosses will be made to induce pr desirable parents.	Ghazanfar Hammad Dr. Muhammad Iqbal Faisalabad Continuous Varieties/lines = 77 Sowing date = 1 st week of November, 2018 Plot size = 5.0×1.25 m Design = Observational plot Off-type plants will be roughed out from each line/variety to mainta 75 lines/varieties were evaluated and maintained by selecting desira and roughing off-type plants. S. No Traits Minimum Maximum 1. Days to 50 % Flowering 29 2. No. of Seeds/pod 5 9 3. Pod Length (cm) 6 11 4. Pod Width (cm) 1.4 2.1 5. Plant Height (cm) 32 110 6. Fresh 100- Seed Weight (g) 14 65 HYBRIDIZATION AND STUDY OF FILIAL GENERATIONS PEAS To combine desirable traits for the development of high yielding, ea maturing and diseases resistant/tolerant varieties. Mudassar Iqbal GhazanfarHammad Dr. Muhammad Iqbal Muhammad Najeebullah Faisalabad Continuous	

3. PEAS (*Pisum sativum* L.)

2) **Powdery mildew tolerant line** = PTL 1.

b) Study of Filial Generations

The segregating populations will be advanced by selecting desirable plants for further studies.

Generation	Cross	No. of selected plants in each generation/cross
Б	Pea-2009 ×9374	Bulk seed
\mathbf{F}_1	PTL-1 ×9374	Bulk seed
	9200-1×9374	Bulk seed
\mathbf{F}_2	Safeer× 9374	Bulk seed
	9800-5 × 9374	Bulk seed
F ₃	Meteor \times 9374	5
	Linapak \times 9374	10
	$1300-8 \times 9374$	11
F ₄	Meteor \times 2001-40	19
	9374 × 2001-40	12
\mathbf{F}_{5}	$9800-10 \times 2001-40$	5
	$2001-20 \times 2001-40$	20
	Lina Pak × 2001-40	18
F ₆	9375 × 2001-40	12
	Pea-2009 × 2001-40	9
	9200-1 × 2001-40	9
	9375 × 9374	13
F ₇	9200-1 × 2001-60	11

Sowing date = November, 2018

	Seeds of F_0 crosses will be planted along with their parents and selfed plants will be rouged out. Seed of each F_1 cross will be harvested separately as bulk. Seeds of crosses and single selected plants of different segregating generations from F_2 to F_6 will be sown on both sides of the raised beds made 1.25 m apart with plant to plant distance of 10 cm to raise next generation by using modified bulk method and desirable plants will be selected and bulked for each cross from each generation. Seed of selected plants of F_7 will be planted as individual plant to row progeny and superior progenies will be selected.
PREVIOUS YEAR'S	Seed of following generations were harvested
RESULTS	

	Generation	Cross	No. of selected plants in each generation	
		9200-1×9374	Bulk seed	
	\mathbf{F}_1	Safeer× 9374	Bulk seed	
	-	9800-5 × 9374	Bulk seed	
	F ₂	Meteor \times 9374	Bulk seed	
		Linapak × 9374	Bulk seed	
		$1300-8 \times 9374$	Bulk seed	
	F ₃	Meteor \times 2001-40	19	
		$9374 \times 2001-40$	12	
	\mathbf{F}_4	$9800-10 \times 2001-40$	5	
		$2001-20 \times 2001-40$	20	
		Lina Pak \times 2001-40	18	
	\mathbf{F}_{5}	$9375 \times 2001-40$	12	
		Pea-2009 × 2001-40	9	
		9200-1 × 2001-40	9	
		9375 × 9374	13	
	F ₆	9200-1 × 2001-60	11	
	\mathbf{F}_{7}	Pea-09 × 2001-60	4	
		9800-10 × 2001-6		
		Meteor Fsd \times 2001-6		
	$\mathbf{F_8}$	a) 2001-20 × It-96	5 lines	
		b) 9200-1 × No. 2	67 5 lines	
3. TITLE	SECONDAR	Y EVALUATION OF	PEAS FOR EARLY H	PLANTING
OBJECTIVE	To find out his	gh yielding pea varieties	/lines suitable for early	peas planting
RESEARCH	Mudassar Iqbal			
WORKERS	GhazanfarHam	mad		
	Dr. Muhammad	l Iqbal		
LOCATION	Faisalabad	*		
DURATION	2018-19			
TREATMENTS	Varieties/ lines	= 10Includ	ing 2 checks (Meteor Fso	d, Pea-2009)
METHODOLOO	Replications	= 3		
	Design	= RCB		
	Sowing Dates		of October, 2018	
	Plot Size	$= 5.0 \times 1.5$		
	Spacing		lant to plant)	
	Spacing	-	ow to row)	
	Data ragarding		,	n nod viald will be
		days to flowering (50%), 1	100-seeu weigin and gree	n pou yielu will be
	recorded.			

PREVIOUS YEAR'S	AR'S Performance of varieties/strains in early pea varietal trial							
RESULTS	R. No.	Variety/ Line	Days to 50 % flower	No. of pods/ plant	Seeds/ pod	7 100- Seed Weight (g) Fresh	Green Pod Yield (T/ha)	
	1	1300-8	32.67	8.0	7.2	37.33	8.90	
	2	Pea-2009	33.00	7.6	7.0	61.67	8.46	
	3	Sarsabz	39.00	7.6	6.6	62.33	8.26	
	4	Linapak	32.67	4.2	5.8	36.67	8.11	
	5	Meteor	30.67	6.2	5.2	43.33	8.07	
	9	9374	32.00	4.0	5.8	42.67	6.20	
	LSD	(0.05)	0.92	1.71	0.89	4.61	1.31]
4. TITLE		SECONDARY EVALUATION OF PEA FOR NORMAL PLANTING						
OBJECTIVE			n yielding v	arieties su	uitable for	normal peas	planting	
RESEARCH	Mudass	-						
WORKERS	Ghazan	farHammad	l					
	Dr. Mul	Dr. Muhammad Iqbal						
	Muham	mad Najeet	oullah					
LOCATION	Faisalabad							
DURATION	2018-19)						
TREATMENTS/	Varieties	s/ lines =	10 Incluc	ding check	s (Pea-2009	, Green cross	5)	
METHODOLOGY	Replicat	ion =	3	C				
	Design	-						
	Sowing Date = 1st fortnight of November, 2018							
	Plot Size = $5.0 \text{ m} \times 2.5 \text{ m}$							
	Spacing $=$ 10 cm plant to plant distance on both sides of 125 cm beds					of 125 cm beds	5 Da	
	regarding days to flowering (50%), 100-seed weight and green pod yield will be							
	recorded.							
PREVIOUS YEAR'S	Performance of varieties/strains in pea's varietal trial in normal planting.							
RESULTS	R.	Variety	Days	No.	Seeds/	100-	Green Pod]
	No.	-	to	of	pod	Seed	Yield	
			50%	pods/		Weight	(T/ha)	
		D 2000	flowering	plant		Fresh (g)		-
	1	Pea-2009 (Check)	58.67	10.7	7.7	62.17	10.35	
	2	9375	75.00	10.7	7.2	44.87	9.16	-
	3	Climax	66.67	10.4	7.6	43.83	6.73	-
	4	PTL-1	79.00	10.6	7.8	41.73	5.98	-
	5	PTL-6	78.67	10.5	7.5	37.17	5.86	-
	6	PTL-3	78.00	8.6	6.6	34.83	5.65	
	LSD (0.05) 0.74 1.07 0.60 1.26				1.05	1		

5. TITLE	NATIONAL UNIFORM YIELD TRIALS IN PEAS					
OBJECTIVE	To find out high yielding and well adapted variety in different ecological					
	zones of country					
RESEARCH	Mudassar Iqbal					
WORKERS	GhazanfarHammad					
LOCATION	Faisalabad selected by coordinatr					
DURATION	2018-19					
TREATMENTS/	Varieties/Entries = Entries received from coordinator					
METHODOLOGY	Replications = 3					
	Design = RCB					
	Sowing Dates = Third week of October, 2018					
	Plot Size = 5.0×1.50 m					
	Spacing = 5 cm (Plant to plant) = 75 cm (Row to row)					
	Data regarding days to flowering (50%), green pod yield and yield parameters will					
	be recorded.					
PREVIOUS YEAR'S	New experiment					
RESULTS						
6. TITLE	ADAPTABILITY TRIAL OF PEA EXOTIC VARIETIES					
OBJECTIVE	To check the adaptability of exotic pea varieties.					
RESEARCH	Mudassar Iqbal					
WORKERS	GhazanfarHammad					
	Dr. Muhammad Iqbal					
LOCATION	Faisalabad					
DURATION	2018-19					
TREATMENTS/ME	Varieties will be provided by different seed companies					
THODOLOGY	Replication = 3					
	Design = RCB					
	Sowing Date = 1st week of November, 2018					
	Plot Size = $5.0 \text{ m} \times 1.5 \text{m}$					
	$\mathbf{P} \times \mathbf{P} = 5 \text{ cm}$					
	$\mathbf{R} \times \mathbf{R} = 75 \text{ cm}$					
	Data regarding yield its components and disease incidents will be recorded.					

PREVIOUS YEAR'S	Performance of strains/varieties in peas adaptability trail at Vegetable Research Institu								
RESULTS	Faisalabad during 2017-18.								
	Rank	Fresh 100 seed weight (g)	Green pod yield (T/ha)						
	1 Pea-2009 (Check)			36.00	70.67	9.54			
	2	Meteor (47.33	9.37					
	3	Super Po	45.33	7.76					
	4	Prince		59.00	44.67	7.62			
	8	Super Ale	eena	35.00	40.33	6.56			
	9	Mission		37.00	50.67	6.31			
	10	Peas Sum	nmer Plus	58.67	43.33	5.73			
		LSD (0.	05)	0.41	4.81	2.47			
7. TITLE	PRELIMI	NARY Y	IELD TRIAL	FOR EARLY F	PEA PLANTIN	G			
OBJECTIVE	To find or	ıt high vie	elding disease	e tolerant nea v	arieties/lines si	itable for early			
ODJECTIVE			ciuing, uiseas	e toterant pea v		inducie for earry			
	peas plant	ing							
RESEARCH	Mudassar	Mudassar Jahal							
WORKERS		Mudassar Iqbal							
WOKKERS	GhazanfarHammad								
	Dr. Muha	Dr. Muhammad Iqbal							
LOCATION	Faisalabad								
DURATION	2018-19								
TREATMENTS/	Varieties/	Varieties/ lines = 13 Including checks (Meteor, Linapak)							
METHODOLOGY	Replications = 3								
	Design $=$ RCB								
	Sowing Dates = 2^{nd} week of October, 2018								
	Plot Size = 4.0×1.50 m								
	Spacing = 5 cm (Plant to plant)								
	= 75 cm (Row to row)								
	Data regarding days to flowering (50%), 100-seed weight and green pod yield								
	will be recorded.								
PREVIOUS YEAR'S	Performar	nce of var	ieties/strains i	in preliminary y	vield trial in ear	ly planting.			
RESULTS									
		R.	Variety/	100-	Green Pod				
		No.	Line	Seed	Yield				
				Weight	(T/ha)				
				(g) Fresh					
	1	1	Meteor (c)	43.67	8.80				

		2	Sarsabz (c)	57.33	7.93	
		2	1700-1	45.67	6.86	-
		4	1700-1	41.33	6.48	-
		5	1700-2	43.67	6.22	
		6	9374	42.67	5.40	-
		-	(0.05)	3.28	1.06	-
8. TITLE	PRELIMINA		, ,		SEASSION PEA	PLANTING
				011101111	5211551011121	
OBJECTIVE	To find out the high yielding varieties suitable for normal seassion planting					
RESEARCH	Mudassar Iqt	oal				
WORKERS	GhazanfarHammad					
	Dr. Muhamm					
			loai			
LOCATION	Faisalabad					
DURATION	2018-19					
TREATMENTS/	Varieties/ lin	es = 1	12 Including che	ecks (Pea-09&S	Sarsabz)	
METHODOLOGY	Replication $= 3$					
	Design $=$ RCB					
	Sowing Date = 1st week of November, 2018					
	Plot Size = $5.0 \text{ m} \times 2.5 \text{ m}$					
	Spacing $= 10$ cm plant to plant distance on both sides of 125 cm beds					
	The line suitable for normal season will be selected and data regarding yield an					
	yield components will be recorded.					
PREVIOUS YEAR'S	Performance of varieties/strains in preliminary yield trial in normal planting					
RESULTS	seassion.					
		R.	Variety/	100- Seed	Green Pod]
		No.	Line	Weight	Yield	
				(g) Fresh	(T/ha)	
		1	Pea-2009	58.33	9.89	
		1	(Check)			
		2	1700-9	33.67	8.00	
		3	Climax (Check)		7.69	4
		4	1700-4	41.40	7.17	4
		5	1700-10	31.33	6.94	{
		9	1700-8	43.67	4.61	4
		- T)	LSD (0.05)	2.18	0.84	
4. CARROT	(Daucus caroto	1 L.)				
1. TITLE	COLLECTI	ON A	AND MAINTE	NANCE OF C	CARROT GER	MPLASM

1. TITLE	COLLECTION AND MAINTENANCE OF CARROT GERMPLASM
OBJECTIVE	Collection and maintenance of exotic and local germplasm for use in
	breeding program

RESEARCH	Abdul Sattar					
WORKERS	Muneeb Munawar					
	Dr. Muhammad Tasdiq Hussain Shahid					
	Muhammad Najeebullah					
LOCATION	Faisalabad					
Locimon	i dibuluoud					
DURATION	Continuous					
TREATMENTS	Genotypes = 12					
	1. Red Genotype = $10 viz$; DC-3, DC-4, DC-90, DC-W, T-29,					
	Red Rose, Red lady, Red long, Rudhira,					
	AS-725					
	2. Orange genotype $= 01 \ viz$; Orange 2007					
	3. Purple genotype $= 01 viz;$ DC-B (Kanji)					
METHODOLOGY	Sowing Time = 17.10.2018					
	Transplantation of stacklings = 2 nd week of January, 2019					
	Roots will be selected on the basis of root and flesh color, core color					
	and their shape. The selected roots will be transplanted and maintained in					
	isolation.					
PREVIOUS YEAR'S	Genotypes (DC-3, DC-4, DC-90, DC-W, DC-B, Orange 2007 and T-29)					
	were selected and maintained in isolation. Small quantity seed of each					
RESULTS	genotype is available for future use.					
2. TITLE	DEVELOPMENT OF CARROT VARIETIES FOR EARLY SOWING					
OBJECTIVE	To select lines suitable for early planting and early availability of better					
	marketable roots.					
RESEARCH	Abdul Sattar					
WORKERS	Dr. Muhammad Tasdiq Hussain Shahid					
	Muneeb Munawar					
	Muhammad Najeebullah					
LOCATION	Faisalabad					
DURATION	Continuous					
DURATION TREATMENTS						
	Continuous					
	Continuous Genotypes = 4 <i>viz</i> ; DC-3, DC-90, Population 1 (DC-90 × DCPRC) and Pop-					
TREATMENTS	Continuous Genotypes = 4 <i>viz</i> ; DC-3, DC-90, Population 1 (DC-90 × DCPRC) and Pop- 2 (DC-3 and DCPRC).					
TREATMENTS	Continuous Genotypes = 4 <i>viz</i> ; DC-3, DC-90, Population 1 (DC-90 × DCPRC) and Pop- 2 (DC-3 and DCPRC). Sowing date = 17.10.2018					

	he does on the basis of membratchie meets meets there and enter 0.1. (1.1.				
	be done on the basis of marketable roots, roots shape and color. Selected				
	roots of each genotype will be transplanted in isolation to produce seed for next selection cycle.				
PREVIOUS YEAR'S	Selection were made in above mentioned breeding material.				
FREVIOUS LEAR S	Selection were made in above mentioned breeding material.				
RESULTS					
3. TITLE	DEVELOPMENT OF CARROT VARIETIES SUITABLE FOR LATE PLANTING				
OBJECTIVE	To select lines suitable for late planting and prolonged supply of marketable				
	carrot.				
RESEARCH	Abdul Sattar				
WORKERS	Muneeb Munawar				
	Dr. Muhammad Tasdiq Hussain Shahid				
	Muhammad Najeebullah				
LOCATION	Faisalabad				
DURATION	Continuous				
TREATMENTS	Genotypes = $2 viz$; DC-4 and Orange-2007				
METHODOLOGY	Sowing date = 2nd week of November, 2018				
	Plot size = 60 m^2				
	Transplanting = 2nd week of March, 2019				
	Selection will be based on resistance to cold/frost, marketable carrots and non bolting behavior till 2nd weak of March particularly for DC-4.				
PREVIOUS YEAR'S	To develop a frost tolerant and late bolting variety for longer supply,				
	selection against bolting remained in progress till March 2018. The plants				
RESULTS :	having resistance against frost with good roots were selected and				
	transplanted in isolation which produced sufficient seed to continue the				
	selection cycle.				
4. TITLE	DEVELOPMENT OF CMS LINES				
OBJECTIVE	To develop CMS lines (both Maintainer and Restorer lines)				
RESEARCH	Abdul Sattar				
WORKERS	Muneeb Munawar				
	Dr. Muhammad Tasdiq Hussain Shahid				
	Muhammad Najeebullah				

LOCATION	Faisalabad							
DURATION	Continuous							
TREATMENTS	260 genotypes viz;							
	BC_5 female lines = 130							
	F_6 Male lines =130							
METHODOLOGY	Sowing time = 22.10.2018							
	Design = Plant to row progeny							
	Male sterile plants will be identified and classified as Brown anther type							
	and Petaloid type (pt). Crosses will be made to study inheritance of male							
	sterility.							
PREVIOUS YEAR'S	Out of 160 genotypes, 122 genotypes comprising BC ₄ and F ₅ were							
	harvested successfully to advance the generations to develop new cycle of							
RESULTS	three line breeding system.							
5. TITLE	ADAPTABILITY TRIAL OF CARROT EXOTIC VARIETIES							
ODIECTIVE	To avaluate avetic variaties (hybrids up der Esisclahed een ditien							
OBJECTIVE	To evaluate exotic varieties/hybrids under Faisalabad condition.							
RESEARCH	Abdul Sattar							
WORKERS	Muneeb Munawar							
	Dr. Muhammad Tasdiq Hussain Shahid							
	Muhammad Najeebullah							
LOCATION	Faisalabad							
DURATION	2018-19							
TREATMENTS/	Genotype = 13 Genotypes <i>viz;</i> Red Rose, Red lady, Red Long,							
METHODOLOGY	Rudhira, HCR-1131A, HCR-1133B, Maverick							
	F1, Carrot F1 Hybrid, HCR-341A, KQS-HCR-1, Carrot F1 Hybrid (Royal check), DC-3 and T-29(check)Date of sowing = 25-10-2018Design = RCBDPlot size = 16 m2Replications = 03							
	Data on root yield will and disease sesistance be recorded after 100 days of							
	sowing.							
PREVIOUS YEAR'S	SET-I							
RESULTS								
	Rank Entry Yield Root Root Root (T/Ha) Longth Widh Flosh							
	(T/Ha) Length Widh Flesh							

			(cm)	(mm)	Color
1	AS-725	52.9	25.8	39.4	Red
2	DC-90	48.9	24.8	39.8	Red
3	T-29 (Check)	43.6	26.4	43	Red
4	DC-W	41.6	22.4	34.3	Red
5	DC-4	38.6	24.6	36.6	Red
6	Maverick	34.6	27.6	32.9	Orange
	LSD (0.05)	2.33			

SET-11

Rank	Entry	Yield (T/Ha)	Root Length (cm)	Root Width (mm)	Root Flesh Color
1	DC-4	32.1	23.4	40.43	Red
2	Appache	28.6	21.5	28.53	Orange
3	Maverick	27.3	21.3	22.83	Orange
4	DC-3	23.8	22.7	39.95	Red
5	T-29 (Check)	19.0	25.5	34.83	Red
6	DC-W	13.6	24.6	32.68	Red
	LSD (0.05)	3.2			

1. TITLE	ADAPTA	BILITY TRIA	L FOR 2	nd EARLY	SEASON		
	CAULIFLOWER.						
OBJECTIVE	To evaluat	te cauliflower vari	eties suitable f	for production	during high		
	temperatur	e.					
RESEARCH WORKER (S)	Saba Alee	m					
	Kaiser Latif Cheema						
	Dr. Muhammad Tasdiq Hussain Shahid						
LOCATION	Faisalabad						
DURATION	2018-19						
TREATMENTS	Varieties =	= 4					
METHODOLOGY	Nursery so	owing date	= 13-07-2018	3			
	Nursery Tr	ransplanting date	= 20-08-2018	3			
	Plot size		= 5 x 0.75 m.				
	Design		= RCBD				
	Replication		= 5				
	Row to roy	w distance	= 75 cm				
	-	plant distance $= 45 \text{ cm}$					
	U	rding plant weig		•	eld, disease		
		and maturity days					
PREVIOUS YEAR'S	Table I	I: Yield performa			EARLY		
RESULTS	G		n) during 2017		X7 • 1 1		
	Sr.	Varieties	Average	Average	Yield		
	No.		Plant Weight	Curd Weight	(t/ha)		
			Weight	Weight			
	1	Snow Muffin	(kg) 1.28	(kg) 0.67	14.23		
	2	Snow Waltry	1.23	0.59	14.23		
	3	CFH-1522	0.89	0.39	11.24		
	4	FDII (Check)	0.89	0.44	10.39		
	5	Dawn 175	0.79	0.43	9.37		
	6	SV 4051AC	0.70	0.41	9.03		
	7	Esk.002 F ₁	0.70	0.37	8.83		
	8	MEIGETSU- 55	0.88	0.32	6.71		
	LSD (0.05)			1.53		

5. CAULIFLOWER (Brassica oleracea var. botrytis)

2. TITLE	ADAPTABILITY TRIAL OF MID SEASON CAULIFLOWER						
OBJECTIVE	To evaluate	To evaluate cauliflower varieties suitable for mid season.					
RESEARCH WORKER (S)	Saba Ale	em					
	Kaiser La	atif Cheema					
	Dr. Muha	ammad Tasdiq Huss	ain Shahid				
LOCATION	Faisalaba	Faisalabad					
DURATION	2018-19						
TREATMENTS	Varieties	= 27					
METHODOLOGY	Nursery s	sowing date =	August-Septer	nber 2018			
	-	transplanting date =					
	Plot size		' x 1.5m				
	Design	= R	CBD				
	Replicati	ons = 3					
	-		5 cm				
	Plant to p	blant distance = 4	5 cm				
	-	arding plant weight	, curd weight	curd vield	maturity days		
	U	se incidence will be	Ū Ū	, <u> </u>	5 5		
PREVIOUS YEAR'S	Table I:	Yield performance	of hvbrid/va	rieties (Mid	Season) Set-I		
RESULTS	during 2		<u>-</u>				
	Sr.	Varieties/hybrid	Average Pla	Average	Curd Yield		
	No	U U	Weight (kg)	0	(t/ha)		
				weight (kg)			
	1	CF-4180	2.97	1.82	46.70		
	2	HCF-12	2.88	1.80	46.17		
	3	HCF-23	2.61	1.58	40.70		
	4	CF-4175	2.24	1.38	35.43		
	5	HCF-22	2.76 2.24	1.33	34.25		
	6	HCF-13 FD-III (Check)	2.24 2.81	1.28 1.18	32.85 30.35		
	8	Snow Wizard	1.82	0.93	23.86		
	9	Snow Wizard Snow Mountain	1.56	0.95	22.01		
			(0.05)		2.161		
3. TITLE		ABILITY TRIAL (
OBJECTIVE		ate cauliflower varie	ties suitable fo	or late season	l		
RESEARCH WORKERS	Saba Ale						
	Kaiser L	atif Cheema					
	Dr. Muha	ammad Tasdiq Huss	ain Shahid				
		Dr. Muhammad Tasdiq Hussain Shahid					
LOCATION	Faisalaba	ıd					

TREATMENTS	Varieti	Varieties that will be received from the private seed companies							
METHODOLOGY	Nurser	Nursery sowing date = October, 2018							
	Nurser	y Transplanting	date = Novemb	per, 2018					
	Plot siz	ze	= 7 x 1.5 n	1					
	Design	L	= RCBD						
	Replic	ations	= 03						
	-	Row to row distance $= 75 \text{ cm}$							
	Plant t	o plant distance	= 30 cm						
		-		eight, curd vie	eld maturity days				
		sease incidence w	-		5 5				
PREVIOUS YEAR'S	Table	I :Yield perform	nance of hybr	id/varieties (L	Late season)				
RESULTS		Set-I during 20	017-18						
	S.	Varieties	Average	Average Cu	Curd Yield				
	Ν	/hybrid	Plant	Weight	(t/ha)				
	0		Weight	(kg)					
			(kg)						
	1	SARA F ₁	2.85	1.55	44.40				
	2	MADUBANI	2.38	1.32	37.84				
	3	FD-IV(Check)	2.25	1.17	33.52				
	4	MOONLIGHT	2.03	1.06	30.34				
		F_1	2.05	1.00	30.34				
		LS	SD (0.05)		1.33				
	Table	II : Yield perfor	rmance of cau	liflower hvbr	id/varieties				
		season) Set-II du		•					
	Sr.		Average Plan		re Curd				
		/hybrid	Weight (kg)						
		•	8 (8)		(t/ha)				
	1	SARA F ₁	3.31	1.18	33.57				
	2	TCF-601	2.23	1.06	30.31				
	3	FD-IV							
		(Check)	2.68	1.01	28.99				
			SD (0.05)	1	1.62				
4. TITLE		LOPMENT OF RLY SEASON	OPEN POLI	LINATED VA	RITIES FOR				
OBJECTIVE			ng and heat to	arant amlifia	ver veriation				
		velop high yieldi	ng anu neat to	ierani caunno					
RESEARCH WORKERS	Saba A								
	Kaiser	Kaiser Latif Cheema							

	Dr. Muhammad Tasdiq Hussain Shahid
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Seed obtained from open pollinated population.
METHODOLOGY	Nursery sowing date = $6-06-2018$
	Nursery Transplanting date $= 18-07-2018$
	The seed obtained from random matted population has been sown in
	the field keeping plant to plant and row to row distance of 30 and 75
	cm, respectively. Healthy plants on the basis of head size, color,
	shape and compactness will be selected and their duck will be shifted
	in isolation for open pollination. At maturity seeds of individual
	plants will be harvested for further studies.
PREVIOUS YEAR'S	New experiment
RESULTS	
5. TITLE	DEVELOPMENT OF OPEN POLLINATED VARITIES FOR
	2nd EARLY SEASON
OBJECTIVE	To develop high yielding and heat resistant cauliflower varieties.
RESEARCH WORKERS	Saba Aleem
	Kaiser Latif Cheema
	Dr. Muhammad Tasdiq Hussain Shahid
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Seed obtained from open pollinated population.
METHODOLOGY	Nursery sowing date = 13-07-2018
	Nursery Transplanting date = $20-08-2018$
	The seed obtained from random matted population has been sown in
	the field keeping plant to plant and row to row distance of 45 and 75
	cm, respectively. Morphologically similar and healthy plants with
	desirable heads on the basis of color, shape and compactness will be
	selected to get high yielding genotypes to start next selection cycle. At maturity individual plant seeds will be harvested for further
	studies.
PREVIOUS YEAR'S	New experiment
RESULTS	
6. TITLE	DEVELOPMENT OF OPEN POLLINATED VARITIES FOR
	MID SEASON
OBJECTIVE	To develop high yielding disease and insect resistant cauliflower

RESEARCH WORKERS	Saba Aleem						
	Kaiser Latif Che	ema					
	Dr. Muhammad	Tasdiq Hussain Shahid					
LOCATION	Faisalabad	-					
DURATION	Continuous	Continuous					
TREATMENTS	Seed obtained fro	Seed obtained from open pollinated population.					
METHODOLOGY	Nursery sowing	date = 09-08-2018					
	Nursery Transpla	anting date = 27-09-2018	8				
	The seed obtained from random matted population has been sown in						
	the field keeping plant to plant and row to row distance of 45 and 75						
	cm, respectively	. Morphologically simi	lar and healthy plants with				
	desirable heads on the basis of size, color, shape and compactness						
	will be selected to get high yielding genotypes to start Second						
	selection cycle. At maturity seeds of individual plants will be						
	harvested for further studies.						
PREVIOUS YEAR'S	500 gm seed of random mated population was produced.						
RESULTS							
7. TITLE	DEVELOPMENT OF INBRED LINES IN 2nd EARLY AND						
	MID GROUPS.						
OBJECTIVE	-	d lines for hybrid produ	ction.				
RESEARCH WORKER (S)	Saba Aleem						
	Kaiser Latif Che						
		Tasdiq Hussain Shahid					
LOCATION	Faisalabad						
DURATION	Continuous						
TREATMENTS	Varieties	= Local and Exotic v	arieties				
METHODOLOGY			D (0010				
	Group		g Date 2018				
	2 nd Early	Nursery	Transplanting				
	2 nd Early Mid	2 nd fortnight July 2 nd fortnight August	2 nd fortnight of August 2 nd fortnight of Sept				
		8 8	0 1				
	•	-	lanted according to standard plants will be selected in 2 nd				
	=		-				
	Early and Mid season cauliflower. 4-5 branches of all the selected plants will be selfed normally and through bud pollination. At						
	maturity, seeds of individual plant will be harvested for further						
	studies.						
PREVIOUS YEAR'S	New Experiment	t					
RESULTS	-r						
L	1						

6.	CABBAGE	(Brassica oleracea L. var. capitata)
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1. TITLE				RIA	L ON	CA	BBAGE	VARIE	TIES/
		HYBRIDS							
1. TITLE		ADAPTABILITY TRIAL ON CABBAGE VARIETIES/							
		HYBRIDS							
OBJECTIVE		To evaluate exotic cabbage varieties/hybrids for yield performance							e
RESEARCH WORKERS		Saba Aleem							
			nmad Tasdiq H	luss	ain Shahid				
			d Najeebullah						
LOCATION		salabad							
DURATION		8-19							
TREATMENTS			Iybrids = Varie	eties	s that will b	e rec	eived from	the priva	te
		d comp							
METHODOLOGY		•	wing date		-				
			ransplanting da			2018			
		t size			= 7 x 1.5 m				
		sign			RCBD				
	1	plication	ns w distance		= 3 75 am				
	-				75 cm 30 cm				
		-	ant distance ding plant weig			at m	oturity dov	e field he	Idina
		-	lisease reaction	-	-				lunig
PREVIOUS YEAR'S	_	-	ormance of cabl						8
RESULTS	IIC			1	verage		erage		
RESCEIS		Sr.	Varieties/		ant	He	U	Head Y	ield
		No.	Hybrid		eight (kg)		eight (kg)	(t/ha)	
		1	Red Flama		2.09		1.14	32.4	5
		2	HCB-141B		1.80		1.09	31.14	4
		3	Blue Moon		1.56		0.84	23.9	5
		4	T1-138		1.08		0.82	23.4	7
		LSD						2.571	
	Yie	ld perf	ormance of cal	ba	ge hybrid/v	ariet	ties Set-II d	luring 201	7-18
		Sr.	Varieties		0		Average	Head	
		No.	/hybrid	/hybrid Weight (kg) Head			Yield		
							Weight (kg)	(t/ha)	
		1	HCB-142A		1.92		1.24	35.38	
		2	HCB-142A HCB-143C		1.92		0.94	26.79	
		3	T1-138		1.48		0.94	20.79	
		LSD	11130		1.23		0.00	24 .30 2.306	
								_ 1.500	i.

1. TITLE	MAINTENANCE OF GERMPLASM
OBJECTIVE	To maintain the genotypes/lines for their subsequent inclusion in the
	breeding programme
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Varieties/lines = 8
METHODOLOGY	Sowing date = Second fortnight of October
	Plot size = 7×1.5 m
	Row to row spacing $=$ 75 cm
	Plant to plant spacing = 5 cm
PREVIOUS YEAR'S	Green Neck, Mino Local, Mino Selection, Purple Neck, Desi White,
RESULTS	Lalpari, 40Days and Gang Seong
2. TITLE	DEVELOPMENT OF BETTER VARIETIES OF RADISH
OBJECTIVE	To develop early and non-pithy variety.
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS/	Seed of selected group from 3rd selection cycle
METHODOLOGY	Seed of selected plant will be sown in observational plots, containing
	about 1000 -1500 plants, during the month of July with row to row spacing
	of 75 cm. Morphologically similar and healthy plants with desirable roots
	will be selected to get high yield and non-pithy genotypes suitable for
	earliness to start 3rd selection cycle.
PREVIOUS YEAR'S	Non pithy roots after 60 days were harvested.
RESULTS	
3. TITLE	DEVELOPMENT OF INBREAD LINE IN RADISH
OBJECTIVE	To develop homozygous lines
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS/	Population of different varieties viz:
	40 Days, Mino selection ,Green Neck and Gang Seong
METHODOLOGY	Desirable roots will be selected from different population of varieties to
	get stecklings. These steckling will be planted during end of November.
	Selfing will be manually made at flowering stage of plant to get selfed
	seed for 1 st generation
PREVIOUS YEAR'S	New experiment

7. RADISH (Raphanus sativus L.)

RESULTS	
4. TITL	DEVELOPMENT OF RED FLESH WITH LONG ROOT RADISH
OBJECTIVE	VARIETY To develop longer rooted Lal Pari
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	
WORKERS	Dr. Tasdiq Hussain Shahid Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Random mated population (4 th cycle) Red root (flesh color) and long rooted.
METHODOLOGY	A population of 100-200 plants will be developed after sowing during 2nd fortnight of October. The selection of desirable root will be made at maturity. The steckling of selected root will be plant at maturity to start 5th selection cycle.
PREVIOUS YEAR'S	300 gram seed of desirable root and flesh color alongwith long root was
RESULTS	abtained
5. TITLE	DEVELOPMENT OF VARIETY FOR KITCHEN GARDENING
OBJECTIVE	To develop short duration and fascinating variety
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabd
DURATION	2018-2019
TREATMENTS	One group from random population.
METHODOLOGY	The sowing was done during 2nd fortnight of October. The selection of
	desirable root will be planted made at maturity .The steckling of selected
	root will be plant at maturity to develop random population.
PREVIOUS YEAR'S	600 gram seed of random population.
RESULTS	
6. TITLE	EVALUATION OF RADISH VARIETIES FOR LATE SEASON
OBJECTIVE	To select varieties possessing high yield potential and better root quality
	suitable for late planting.
RESEARCH	Dr. Kaiser Latif Cheema
WORKERS	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2018-19
TREATMENTS	Varieties = 9 <i>viz</i> ; White long,HRR-1120A,White Sturdy,NO.45,HRR- 1121B,HRD-225B,HRD-224C,HRD-222B and Mino(check)
METHODOLOGY	Date of sowing. = Second fortnight of September
	Plot size $= 8 \times 0.75 \text{ m}$
	Replications = 3
	Design $=$ RCB
	Data on root yield and root shape will be recorded.

PREVIOUS YEAR'S RESULTS		S. No.	Variety	Root +Leave yield(T/ha)		
		1	Mino selection (Check)	75.83		
		2	Purple neck	67.77		
		3	Small leave	67.22		
		4	Desi white	65.67		
		5	Gang seong	62.22		
		6	Green neck	57.22		
		7	Lal pari	48.33		
		8	Mino local	47.77		
		9	No.025	32.22		
		10	RED PRINCE	28.33		
			LSD (α= 0.05)	6.29		
7. TITLE	PRF _RA	SIC SEED P	RODUCTION IN RADIS	сн.		
OBJECTIVE			to public / private seed co			
ODJECTIVE	interested		i to public / private seed co	inpairies and		
RESEARCH		Latif Cheen	20			
WORKERS						
WURKERS		l Hussain Sh				
LOCATION		ad Najeebulla				
LOCATION	Faisalabac					
DURATION	Continuou		40.0.11.10	•		
TREATMENTS	Varieties =	= Mino Selec	tion, 40-Days, and Lal Pa	r1		
METHODOLOGY	Seed of each variety will be sown according to the recommended practices during second fortnight of September. At the time of steckling preparation, true to type roots will be selected on the basis of root shape, root length, root girth and leaf shape. Stecklings of 40-Days will be transplanted during the month of November while other varieties will be transplanted during December in isolated plots. Rouging of off-type plants will be done at different stages. Early and late bolter plants will be rogued out .At maturity seed of healthy and true to type plants will be harvested separately.					
PREVIOUS YEAR'S RESULTS	The follow	ving quantity	of pre-basic seed was prod	uced		
	S. No.	Varieties	Quantity (g)			
	1	Mino Local	200			
	2	40 Days	5000			
	3	Desi White	200			
	4	Lal Pari	2000			
	5	Mino Selection	on 2000			

8. TITLE	IDENTFICATION OF MALE STERILITY AND MAINTENER LINE IN			
	RADISH.			
RESEARCH WORKE	Dr. Kaiser Latif Cheema			
	Dr. Tasdiq Hussain Shahid			
	Muhammad Najeebullah			
LOCATION	Faisalabad			
DURATION	2018-19			
TREATMENTS	Radish varieties; 40 days and Mino selection			
METHODOLOGY	Male sterile plant will be identified and maintained through crossing /			
	selfing manually.			
PREVIOUS YEAR'S	New Experiment			
RESULTS				

1. TITLE	MAINTENANCE OF GERMPLASM			
OBJECTIVE	To maintain the genotypes/lines for their subsequent inclusion			
	in the breeding programme.			
RESEARCH WORKERS	Kaiser Latif Cheema			
	Dr. Tasdiq Hussain Shahid			
	Muhammad Najeebullah			
LOCATION	Faisalabad			
DURATION	Continuous			
TREATMENTS	Strains = $6 viz$; Golden, Purple Top, Green Top,			
	White, Whit (Late) and White Apple.			
METHODOLOGY	Sowing date = Second fortnight of September			
	Row to row spacing $=$ 75 cm			
	Plant to plant spacing = 5 cm			
	These varieties will be transpltind in isolation additionally these			
	varieties will be maintained through bud pollination.			
PREVIOUS YEAR'S	Turnip Purple (20 g) and Turnip Green top (200 g) was harvested and			
RESULTS	all varieties were maintained.			
2. TITLE	EVALUATION OF HEAT TOLERANT VARIETY			
OBJECTIVE	To develop high yielding, early and better tasted variety.			
RESEARCH WORKERS	Kaiser Latif Cheema			
	Dr. Tasdiq Hussain Shahid			
	Muhammad Najeebullah			
LOCATION	Faisalabad			
DURATION	2018-19			
TREATMENTS/	Five Genotypes: Golden, Green Top, Purple Top Local, Purple			
	Top (Agita) and Purple (exotic).			
METHODOLOGY	Date of sowing = 15July - 15August			
	Plot size $=$ 8 x 0.75 m			
	Replications $=$ 3			
	Design $=$ RCB			
	Data on root yield will be recorded.			
DEVIOUS				
PREVIOUS	New experiment			
YEAR'SRESULTS	DEVELODMENTE OF LATE DOLTING AND CHODE			
3. TITLE	DEVELOPMENT OF LATE BOLTING AND SHORT			
	DURATION VARIETIES			

8. TURNIP (Brassica campestris L. var. rapa)

OBJECTIVE	To develop high yielding, late bolting and better tasted variety.
RESEARCH WORKERS	Dr. Kaiser Latif Cheema
	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Random mated population (8 th cycle)
METHODOLOGY	Seed from Random mated population (7 th cycle) will be sown in
	plant to progeny row method during second fortnight of September.
	Plants within the progeny will be selected on the basis of late
	bolting, root shape, single root weight, taste and single plant weight.
	Harvesting will be done at maturity for marketable roots and selected
	roots will be transplanted for seed production under random mating
	system for 5 th cycle selection. The seed of only those plants will be
	retained which bolted late. Selection will continue until to fix the
	gene for late bolting
PREVIOUS YEAR'S	100 grams seed of 5 selected plants was harvested.
RESULTS	
4. TITLE	EVALUATION OF TURNIP VARIETIES
OBJECTIVE	To select variety with high yield potential and better root quality.
RESEARCH WORKERS	Dr. Kaiser Latif Cheema
	Dr. Tasdiq Hussain Shahid
	Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2018-19
TREATMENTS	Varieties = 9 viz; Golden(Check), Purple Top, Desi Red, Green Top, P
	100,GT-200,HTP-232A,ETP-230A,Super Sultan.
METHODOLOGY	Date of sowing = Last week of September
	Plot size = 8×0.75 m
	Replications = 3
	Design = RCB
	Data on root yield will be recorded.
PREVIOUS YEAR'S	Performance of turnip varieties
RESULTS	

	S. NO.	VARIETY	Root +leave YIELD		
	1		(T /HA)		
	1	GOLDEN	58.33		
	2	Purple TOP (LOT. NO.M-17-6358)	52.22		
	3	DESI RED	52.77		
	4	Purple TOP (LOT. NO.M-17-6299358)	52.22		
	5	PURPLE	50.55		
	6	PURPLE TOP	50.55		
	7	PURPLE GOLDEN	45.00		
	8	GREEN TOP	44.44		
	9	KUNSAR	31.11		
	10	WHITE LOCAL	27.77		
	LSD (a = 0.05)	8.17		
5. TITLE	PRE- BASIC SEED PRODUCTION IN TURNIP				
OBJECTIVE	To produce genetically pure and good quality seed of turnip varieties.				
RESEARCH WORKERS	Dr. Kaiser	Latif Cheema			
	Dr. Tasdiq Hussain Shahid				
	Muhammad Najeebullah				
LOCATION	Faisalabad				
DURATION	Continuous				
TREATMENTS	Varieties = 2 <i>viz</i> ; Purple top and Golden				
METHODOLOGY	Single plant progenies of Purple top and Golden varieties will be				
	sown during 2^{nd} week of September on both sides of ridges made 75				
	cm apart in row length of 7 meters. True to type steckling will be				
	selected and planted in November 2018. Progenies with off-type				
	-	•	ent stages of crop growth. True to		
	type will be selected and bulked for the production of pre-basic seed.				
	seeds from	seeds from single plant will also be retained.			
PREVIOUS YEAR'S			olden (400g) was obtained.		
RESULTS					

9. GARLIC (Allium sativum L.)

1. TITLE		PLASM COI ANAINENC			TION AN	D
OBJECTIVE		out high yield			elf life	
RESEARCH WORKERS	Tahir Iqt					
DURATION	2017-18					
TREATMENTS	Variety =	= G-1801, G	-1802, G-18	803, G-1804		
METHODOLOGY PREVIOUS YEAR'S RESULTS	Design Replicati Plot Size PxP Dist RxR Dis T out to pro- no of clo	e = cance = tance = The crop will	eed. The dat d bulb size	l for disease ta regarding will be recor	bulb weigh ded.	will be rouged t, clove weight,

10. SPINACH (Spinacia oleracea L.)

1. TITLE	MAIN	TENANCE (OF GENEP	OOL IN SPI	NACH		
OBJECTIVE	To maintain genetic purity of existing varieties of Desi and Lahori					l Lahori	
	palak	1 1 01 1					
RESEARCH WORKERS		bal Shah	11 1				
	Muham	mad Najeebu	llah				
LOCATION		Faisalabad					
DURATION	2018-19						
TREATMENTS	Desi and	d Lahori Pala	k				
METHODOLOGY	About 01 Kanal each of "Desi and Lahori Palak" will be sown during 2 nd fortnight of October in rows 75 cm apart in isolation. After germination, crop will be thinned keeping plant to plant distance of 10 cm. At 20-25 cm plants height, the plants will be keenly observed regarding leaf & stem color and plants having minute ting of redness and red color midrib will be roughed out. At bolting stage all early bolters will also be rouged out. Remaining full green and late bolting plants will be kept to produce BNS seed.						
PREVIOUS YEAR'S				ns were mainta	ained.		
RESULTS							
2. TITLE	ADAPTABILITY TRIAL OF SPINACH VARIETIES						
OBJECTIVE	To study the adaptability of spinach varieties under Faisalabad						
	conditons.						
RESEARCH WORKERS	Tahir Iqbal Shah						
LOCATION	Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION	2018-19						
TREATMENTS	Varieties/Hybrids provided by the Private Seed companies.				5.		
METHODOLOGY	Sowing Date Second fortnight of October, 2018					2018	
	Plot Size 5 x 1.5m						
	Reps 3						
	Row to Row spacing 75 cm						
	Design RCBD						
	Data on leaf yield and its parameters will be recorded. Disease data						
		b be recorded			1		
PREVIOUS YEAR'S	Sr.	Varieties	No. of Leaf	Leaf Length	Leaf	Leaf	
RESULTS	No.		/ Plant	(without petiole)	width	Yield (t/ha)	
	1	Desi Palak	10-15	20-25 cm	10-15 cm	73.3	
	2	Green Star	7-10	15-20 cm	8-10 cm	61.8	

	61.8 (Lahori Palak (LSD 0.05) The above tab t leaf yield (73 t/ha) and Laho t he varieties is	.3 T/ha) foll ri Palak wi	th yield of 50	n star with y	vield value of
3. TITLE		ENING OF S BOLTING	PINACH G	ERMPLASM	1 SUITABI	LE FOR
OBJECTIVE		ect genotypes s	uitable for l	ate bolting and	d prolong su	ipply of
RESEARCH WORKERS	Tahir 1	qbal Shah nmad Najeebu	llah			
LOCATION	Faisala					
DURATION	2018-1	9				
TREATMENTS	Local/	Exotic germpl	ams = 3	00 Genotypes		
METHODOLOGY		ze	5 x Au de on the ba			
PREVIOUS YEAR'S RESULTS		xperiment.				

1. TITLE **DEVELOPMENT OF CORIANDER VARIETIES FOR LATE** BOLTING OBJECTIVE To select genotypes suitable for late bolting and prolonged supply of coraidner. **RESEARCH WORKERS** Tahir Iqbal Shah Muhammad Najeebullah LOCATION Faisalabad DURATION Continuous Kandhari, Dilpazeer, T-I-17 TREATMENTS METHODOLOGY The seed will be mixed and planted in the field. The plants will be allowed to random mate at flowering. The seed will be harvested. Then this seed will be planted and selection will be made for the plants having late bolting character. The seed will be harvested and bulked. This selection procedure will be adopted till the late bolting character will be fixed. New experiment PREVIOUS YEAR'S RESULTS

11. CORIANDER (Coriandrum sativum L.)

12. LETTUCE	(Lactuca sativa L.)
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1. TITLE	ADAPTABILITY TRIAL IN LETTUCE
OBJECTIVE	To study the adaptability of exotic varieties, their maintenance and bulk seed multiplication for future use.
RESEARCH WORKERS	Ghazanfar Hammad
	Raja Javed-ur-Rehman
	Dr. Muhammad Tasdiq HussainShahid
LOCATION	Faisalabad
DURATION	2018-19
TREATMENTS	Number of verities = 5
METHODOLOGY	Sowing Date for nursery = 2nd fortnight of October, 2018.
	Transplanting date = 2nd fortnight of November, 2018.
	Plot Size $= 7.5 \times 0.75$ m
	No. of Replication $= 4$
	$P \times P = 40 \text{ cm}$
	The data will be recorded for yield and disease incidence.
PREVIOUS YEAR'S	New Experiment
RESULTS	
2. TITLE	COLLECTION AND MAINTENANCE OF LETTUCE
	GERMPLASM
OBJECTIVE	Collection and maintenance of local and exotic germplasm for future
	use in breeding programme.
RESEARCH WORKERS	Ghazanfar Hammad
	Raja Javed-ur-Rehman
	Dr. Muhammad Tasdiq HussainShahid
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Entries (Existing) = 2 (ICE-BERG-Red and ICE-BERG-Green)
METHODOLOGY	Sowing Date for nursery = 2nd fortnight of October, 2018.
	Transplanting date = 2nd fortnight of November, 2018.
	Plot Size $= 7.5 \times 0.75$ m
	$P \times P = 40 \text{ cm}$
PREVIOUS YEAR'S RESULTS	The seed of the existing entries was harvested and maintained.

1. TITLE	ADAPTABILITY TRIAL IN FENUGREEK					
	ADAI IADILII I IKIAL IN FENUGREEK					
OBJECTIVE	To study the adaptability of exotic varieties, their maintenance and					
	bulk seed multiplication for future use.					
RESEARCH WORKERS	Ghazanfar Hammad					
	Raja Javed-Ur-Rehman					
	Dr. Muhammad Tasdiq HussainShahid					
LOCATION	Faisalabad					
DURATION	2018-19					
TREATMENTS	Seed provided by seed companies.					
METHODOLOGY	Sowing Date = 2nd fortnight of October, 2018.					
	$P \times P = 40 \text{ cm}$					
	$\mathbf{R} \times \mathbf{R}$ = 2.5 feet					
	Data wil be recoreded on yield and disease resistance.					
PREVIOUS YEAR'S	New Experiment					
RESULTS						

13. FENUGREEK (*Trigonella foenum-graecum*)

14. SEED PRODUCTION

Foundation Seed CellRESEARCH WORKERSRespective Scientists of each cropLOCATIONFaisalabad and Sub-stationsDURATIONContinuousTREATMENTSCrop varieties of the following winter vegetables Cauiflower FD-IRadishTomato Cauiflower FD-IICauiflower FD-IICarrotCrop varieties/plantsFenugreek Cauiflower FD-IIIMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.	1. TITLE	BREEDER, PRE B	BASIC AND BASIC SE	ED PRODUCTION OF			
Foundation Seed CellRESEARCH WORKERSRespective Scientists of each cropLOCATIONFaisalabad and Sub-stationsDURATIONContinuousTREATMENTSCrop varieties of the following winter vegetables Cauiflower FD-IRadishTomato Cauiflower FD-IICarotFenugreek Cauiflower FD-IIICorianderTurnip SpinachSpinachPeasMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable season: seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. 2 2 2 3 4 3 3 4 3 4 3 4 3 4 4Pre-Basic Seed (Kg) 4 40.5 3 4 40.5							
RESEARCH WORKERS Respective Scientists of each crop LOCATION Faisalabad and Sub-stations DURATION Continuous TREATMENTS Crop varieties of the following winter vegetables Cauiflower FD-I Radish Cauiflower FD-I Carrot Fenugreek Cauiflower FD-III Coriander Turnip Spinach Peas METHODOLOGY All the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried out seeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly. PREVIOUS YEAR'S RESULTS Sr. Crop No. Crop I Cauiflower FD-I 2 Cauiflower FD-II 3 Cauiflower FD-III	OBJECTIVE	To fulfill the seed requirements of Pre-basic and basic types of seed for					
LOCATION Faisalabad and Sub-stations DURATION Continuous TREATMENTS Crop varieties of the following winter vegetables Cauiflower FD-I Radish Tomato Cauiflower FD-II Carrot Fenugreek Cauiflower FD-III Onion Coriander Coriander Turnip Spinach Peas METHODOLOGY All the crop varieties/plants will be sown/ planted in suitable season: seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly. PREVIOUS YEAR'S The following seeds of winter vegetables were produced during the y 2017-18. Sr. Crop Pre-Basic Seed (Kg) 1 Cauiflower FD-I - 9.5 2 Cauliflower FD-II - 9.5 2 Cauliflower FD-III - 31.5		Foundation Seed Ce	11				
DURATION Continuous TREATMENTS Crop varieties of the following winter vegetables Cauiflower FD-I Radish Tomato Cauiflower FD-II Carrot Fenugreek Cauiflower FD-III Onion Coriander Turnip Spinach Peas Peas METHODOLOGY All the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly. PREVIOUS YEAR'S RESULTS The following seeds of winter vegetables were produced during the y 2017-18. Sr. Crop Pre-Basic Basic Seed (Kg) 1 Cauiflower FD-II - 9.5 2 Cauiflower FD-II - 9.5 2 Cauiflower FD-II - 40.5 3 Cauiflower FD-III - 31.5	RESEARCH WORKERS	Respective Scientist	s of each crop				
TREATMENTS Crop varieties of the following winter vegetables Cauiflower FD-I Radish Tomato Cauiflower FD-II Carrot Fenugreek Cauiflower FD-III Onion Coriander Coriander Turnip Spinach Peas METHODOLOGY All the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried or specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly. PREVIOUS YEAR'S RESULTS Sr. Crop No. Crop Pre-Basic Basic Seed No. Crop Pre-Basic Basic Seed Seed (Kg) (Kg) 1 Cauiflower FD-II 2 Cauiflower FD-II 2 Cauiflower FD-III 3 Cauiflower FD-III	LOCATION	Faisalabad and Sub-	stations				
Cauiflower FD-IRadishTomatoCauiflower FD-IICarrotFenugreekCauiflower FD-IIIOnionCorianderTurnipSpinachPeasMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried on specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. 0CropPre-Basic Seed (Kg)Sr. 2Cauiflower FD-II-9.52Cauiflower FD-II3Cauiflower FD-III-3Cauiflower FD-III-3Cauiflower FD-III-3Cauiflower FD-III-3Cauiflower FD-III-3Cauiflower FD-III-3Cauiflower FD-III-	DURATION	Continuous					
Cauiflower FD-II Cauiflower FD-III Onion Coriander SpinachCarrot Turnip PeasFenugreekMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. CropCropPre-Basic Seed (Kg) (Kg) 1ICauiflower FD-II - 9.52Cauiflower FD-II - 33Cauiflower FD-III -3Cauiflower FD-III -	TREATMENTS	-					
Cauiflower FD-IIIOnion CorianderSpinachPeasMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. No.CropPre-Basic Seed (Kg) (Kg) 1ICauiflower FD-I 40.5 3-9.5 2Cauiflower FD-II 3Cauiflower FD-III 3Cauiflower FD-III 3Ca							
Coriander SpinachTurnip PeasMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. CropPre-Basic Seed (Kg)Sr. 0.Crop1Cauliflower FD-I 40.52Cauliflower FD-II 63Cauliflower FD-III 63Cauliflower FD-III 63Cauliflower FD-III 7			U	eek			
SpinachPeasMETHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. Q CropCropPre-Basic Seed (Kg) (Kg) 1Sr. Q 2 2 2 3Cauliflower FD-I Cauliflower FD-II-9.5 3 3 3 3Cauliflower FD-III Cauliflower FD-III-3Cauliflower FD-III 3-3Cauliflower FD-III Cauliflower FD-III-3Cauliflower FD-III Cauliflower FD-III-							
METHODOLOGYAll the crop varieties/plants will be sown/ planted in suitable seasons seed production of specific variety according to standards of BNS Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. CropCropPre-Basic Seed (Kg) (Kg)1Cauiflower FD-I 3-2Cauliflower FD-II 3-3Cauliflower FD-III 3-3Cauliflower FD-III 3-3Cauliflower FD-III 3-3Cauliflower FD-III 3-3Cauliflower FD-III 3-3Cauliflower FD-III 3-			-				
Pre-basic seed. Rouging of all off type plants will be carried ou specified stages of the crop and selection of the plants will be condu keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. No.CropPre-Basic Seed (Kg)Basic Seed (Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5	METHODOLOGY		es/plants will be sown/ pl	anted in suitable seasons for			
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keeping in view the traits of the variety. At ripening of the c harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. No.CropPre-Basic Seed (Kg)Basic Seed (Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5		Pre-basic seed. Rot	uging of all off type pl	ants will be carried out at			
harvesting and seed collection will be carried out accordingly.PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. No.CropPre-Basic Seed (Kg)1Cauiflower FD-I-2Cauliflower FD-II-3Cauliflower FD-III-3Saliflower FD-III-		specified stages of t	he crop and selection of	the plants will be conducted			
PREVIOUS YEAR'S RESULTSThe following seeds of winter vegetables were produced during the y 2017-18.Sr. No.CropPre-Basic Seed (Kg)Basic Seed (Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5		keeping in view th	ne traits of the variety.	At ripening of the crops			
RESULTS2017-18.Sr. No.CropPre-Basic Seed (Kg)Basic Seed (Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5		harvesting and seed collection will be carried out accordingly.					
Sr. No.CropPre-Basic Seed (Kg)Basic Seed (Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5	PREVIOUS YEAR'S	The following seeds of winter vegetables were produced during the year					
No.CropSeed (Kg)(Kg)1Cauiflower FD-I-9.52Cauliflower FD-II-40.53Cauliflower FD-III-31.5	RESULTS	2017-18.					
No. I Seed (Kg) (Kg) 1 Cauiflower FD-I - 9.5 2 Cauliflower FD-II - 40.5 3 Cauliflower FD-III - 31.5		l ('ron					
2 Cauliflower FD-II - 40.5 3 Cauliflower FD-III - 31.5		No.					
3 Cauliflower FD-III - 31.5							
 4 Coriander 100 1322							
5 Spinach 300 4417 6 Radish (40 Days) - 536							
6 Radish (40 Days) - 536 7 Radish (Mino) 50 1191							
7 Radish (Millo) 50 1191 8 Radish (Lal Pari) - 151			- /				
8 Radish (Lai Fair) - 151 9 Turnip (Golden) 20 843		``````````````````````````````````````	,				
10 Turnip (Purple Top) 20 1469							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
13 Onion 20 81							
14 Fenugreek - 1298		14 Fenugreek	-	1298			
15 Tomato (OPV) - 6				6			
16Tomato (HYBRID)2-			PPV) [-	0			

1.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES					
		FOR THE CONTROL OF WEEDS IN GARLIC					
	Objectives	To investigate the most practicable package of weed management in Garlic					
	RESEARCH	Waseer	n Abbas (Assistant Plant Pathologist)				
	WORKER (S)	Muhammad Ashiq Hussain (Assistant Agronomist)					
	DURATION	Two years					
	LOCATION	Vegetable Research Area					
	TREATMENTS/						
	PLAN OF WORK	SrTreatmentTNo.T		Time of application			
		T ₁	Dual gold @ 8ml/Lit	24 hours after sowing			
		T2 Dual gold @ 6 ml/ Lit		24 hours after sowing			
		T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing			
		T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing			
		T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing			
		T6Stomp @ 6 ml/ Lit		24 hours after sowing			
		T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing			
		T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing			
		T 9	Top Max @ 9 ml/ Lit	24 hours after sowing			
		T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing			
		T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing			
		T ₁₂ Relax @ 5 ml/ Lit		24 hours after sowing			
		T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing			
		T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing			
		T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing			
		T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing			

	T ₁₇ Pert Plus	@ 4 ml/ Lit	24 h	ours after sowing		
	T ₁₈ Pert Plus	@ 5 ml/ Lit	24 h	ours after sowing		
	T ₁₉ Manual H	T ₁₉ Manual Hoeing				
	T ₂₀ Water only	T ₂₀ Water only (Control) 24 hours after set				
METHODOLOGY PREVIOUS YEAR'S RESULTS	 sowing Weedicide e will be recorded Weed count recorded Trial will be Among 20 different 	= 3 = 2 × 5 m of all weedicides effect on germinatio rded. ts after 30 and 45 of ploughed after 50 d	n, weed control alo days after spray of ays nts Dual gold @ 8,	ong with crop saf f weedicides will 6, 4ml/Lit found		
RESULTS	respectively	, in the second s	-,			
RESULTS		Germination	Total weed	Crop Safety		
RESULTS	respectively Treatments T1= Dual gold					
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold	Germination counts %	Total weed counts/m2	Crop Safety level %		
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold	Germination counts % 90	Total weed counts/m2 10	Crop Safety level % 80		
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @	Germination counts % 90 92	Total weed counts/m2 10 15	Crop Safety level % 80 90		
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8	Germination counts % 90 92 92	Total weed counts/m2 10 15 25	Crop Safety level % 80 90 95		
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit T6= Stomp @ 6	Germination counts % 90 92 92 92 95	Total weed counts/m2 10 15 25 10	Crop Safety level % 80 90 95 90		
RESULTS	respectively Treatments T1= Dual gold @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit	Germination counts % 90 92 92 92 95 95	Total weed counts/m2 10 15 25 10 15 10	Crop Safety level % 80 90 95 90 95		

. TITLE		UATION OF DIFFERENT PRE- EN CONTROL OF WEEDS IN PEAS	MERGENCE WEEDICIDES FO		
Objectives	To investigate the most practicable package of weed management in peas Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)				
RESEARCH WORKER (S)					
DURATION	Two ye	Two years			
LOCATION	Vegeta	ble Research Area			
TREATMENTS/					
PLAN OF WORK	Sr No.	Treatment	Time of application		
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing		
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing		
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing		
	T_4	Stomp @ 10 ml/ Lit	24 hours after sowing		
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing		
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing		
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing		
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing		
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing		
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing		
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing		
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing		
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing		
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing		
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing		

	T16Pert Plus	@ 3 ml/ Lit	24	hours after sowing
	T17Pert Plus	@ 4 ml/ Lit	24	hours after sowing
	T18Pert Plus	@ 5 ml/ Lit	24	hours after sowing
	T ₁₉ Manual H	loeing	24	hours after sowing
	T ₂₀ Water onl	y (Control)	24	hours after sowing
METHODOLOGY	\blacktriangleright Design = R	СВ		
	Replication			
	Plot Size	$= 2 \times 5 m$		
		of all weedicides	treatments will s	prayed 24 hour a
	sowing	effect on germination	wood control alor	a with grop safaty y
	be recorded.			ig with crop safety v
		ts after 30 and 45	days after spray	of weedicides will
	recorded			
	Trial will be	ploughed after 50 d	ays	
PREVIOUS	Among 20 different	t weedicides treatme	nts Stomp @ 10, 8	and 6ml/Lit found
YEAR'S	be most effective.		-	
ILAN S	be most encenve.			
RESULTS	Treatments	Germination counts %	Total weed counts/m2	Crop Safety level %
	Treatments	counts %	counts/m2	level %
	Treatments T4= Stomp @ 10 ml/ Lit	counts %	counts/m2	level %
	Treatments T4= Stomp @	counts % 93	counts/m2 10	level % 90
	TreatmentsT4= Stomp @10 ml/ LitT5= Stomp @ 8	counts % 93	counts/m2 10	level % 90
	Treatments T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit T6= Stomp @ 6	counts % 93 95	counts/m2 10 15	level % 90 95
	Treatments T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit	counts % 93 95	counts/m2 10 15	level % 90 95
	Treatments T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit T6= Stomp @ 6	counts % 93 95	counts/m2 10 15	level % 90 95

3.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FOR THE CONTROL OF WEEDS IN TURNIP AND SPINACH CROPS
	Objectives	To investigate the most practicable package of weed management in turnips and

RESEARCH	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)			
WORKER (S)				
DURATION	Two ye	ears		
LOCATION	Vegeta	ble Research Area		
TREATMENTS/				
PLAN OF WORK	Sr No.	Treatment	Time of application	
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing	
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing	
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing	
	T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing	
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing	
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing	
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing	
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing	
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing	
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing	
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing	
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing	
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing	
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing	
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing	
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing	
	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing	

	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
METHODOLOGY	\triangleright	Design = RCB	
		Replication = 3	
		Plot Size $= 2 \times 5 \text{ m}$	
	>	Application of all weedicides treats sowing	ments will sprayed 24 hour after
	\triangleright	Weedicide effect on germination, wee be recorded.	d control along with crop safety will
	\triangleright	Weed counts after 30 and 45 days recorded	after spray of weedicides will be
		Trial will be ploughed after 50 days	
PREVIOUS	Among	g 20 different weedicides no one is for	ound to be effective all weedicides
YEAR'S	-	ents found to be injurious.	
RESULTS			

4.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FO THE CONTROL OF WEEDS IN RADISH			
	Objectives	To investigate the most practicable package of weed m	anagement in radish		
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)			
	DURATION	Two years			
	LOCATION	Vegetable Research Area			
	TREATMENTS/				
	PLAN OF WORK	Sr Treatment No.	Time of application		

	-		
	T_1	Dual gold @ 8ml/Lit	24 hours after sowing
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing
	T_4	Stomp @ 10 ml/ Lit	24 hours after sowing
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing
	T 9	Top Max @ 9 ml/ Lit	24 hours after sowing
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing
	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing
	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
METHODOLOGY	\succ	Design = RCB	
	×	Replication $= 3$	
		Plot Size $= 2 \times 5$ m Application of all weedicides treatments	e will enroved 24 hour often
	-	sowing	s will sprayed 24 nour alter
	\checkmark	Weedicide effect on germination, weed cor	ntrol along with crop safety will

	recorded	ts after 30 and 45 ploughed after 50 d		of weedicides will
PREVIOUS YEAR'S RESULTS	Among 20 differer most effective follor respectively		-	
	Treatments	Germination counts %	Total weed counts/m2	Crop Safety level %
	T2= Dual gold @ 4 ml/ Lit	70	15	85
	T4= Stomp @ 10 ml/ Lit	80	10	80
	T5= Stomp @ 8 ml/ Lit	90	15	90
	T6= Stomp @ 6 ml/ Lit	95	40	95
	T9= Top Max @ 9ml/ Lit	85	10	85
	T10= Top Max @ 7ml/ lit	90	15	90
	T11= Relax @ 3ml/ Lit	90	30	90

5.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FOR THE CONTROL OF WEEDS IN CARROTS
	Objectives	To investigate the most practicable package of weed management in carrots
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)
	DURATION	Two years
	LOCATION	Vegetable Research Area
	TREATMENTS/	
	PLAN OF WORK	

	Sr	Treatment	Time of application
	No.		
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing
	T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing
	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing
	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
METHODOLOGY		Design = RCB Replication = 3	
	\succ	Plot Size $= 2 \times 5 \text{ m}$	

	 Application of all weedicides treatments will sprayed 24 hour after sowing Weedicide effect on germination, weed control along with crop safety will be recorded. Weed counts after 30 and 45 days after spray of weedicides will be recorded Trial will be ploughed after 50 days
PREVIOUS YEAR'S	Among 20 different weedicides only stomp @ 10 ml found to be highly safe and most effective.
RESULTS	

6.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FOR THE CONTROL OF WEEDS IN ONION NURSERY AND SEED CROPS				
	Objectives	To investigate the most practicable package of weed management in onior nursery as well as in onion seed crop				
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist)Muhammad Ashiq Hussain (Assistant Agronomist)				
	DURATION	Two years				
	LOCATION	Vegetable Research Area				
	TREATMENTS/					
	PLAN OF WORK	Sr No.	Treatment	Time of application		
		T ₁	Dual gold @ 8ml/Lit	24 hours after sowing		
		T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing		
		T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing		
		T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing		
		T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing		
		T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing		
		T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing		

	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing
	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing
	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
METHODOLOGY		Design = RCB Replication = 3	
	>	Plot Size $= 2 \times 5 \text{ m}$	
	\checkmark	Application of all weedicides treatme	ents will sprayed 24 hour after
		sowing	
		Woodicide affect on cormination wood	control along with gron safety wil
	>	Weedicide effect on germination, weed of be recorded.	control along with crop safety will
		be recorded. Weed counts after 30 and 45 days after	
		be recorded. Weed counts after 30 and 45 days afrecorded	
		be recorded. Weed counts after 30 and 45 days after	
PREVIOUS		be recorded. Weed counts after 30 and 45 days afrecorded	eter spray of weedicides will be
PREVIOUS YEAR'S	A A A	be recorded. Weed counts after 30 and 45 days af recorded Trial will be ploughed after 50 days	Ther spray of weedicides will be ne is found to be effective all bus in case of onion nursery crop.

7.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FOR

	THE CONTROL OF WEEDS IN FENUGREEK			
Objectives	To investigate the most practicable package of weed management in fenugreek Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)			
RESEARCH WORKER (S)				
DURATION	Two ye	ears		
LOCATION	Vegeta	Vegetable Research Area		
TREATMENTS/				
PLAN OF WORK	Sr No.	Treatment	Time of application	
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing	
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing	
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing	
	T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing	
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing	
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing	
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing	
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing	
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing	
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing	
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing	
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing	
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing	
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing	
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing	
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing	

	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing
	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
METHODOLOGY	\checkmark	Design = RCB	
	\succ	Replication = 3	
	\succ	Plot Size $= 2 \times 5 \text{ m}$	
	\blacktriangleright	Application of all weedicides treat sowing	ments will sprayed 24 hour afte
	\blacktriangleright	Weedicide effect on germination, wee be recorded.	d control along with crop safety wil
	\blacktriangleright	Weed counts after 30 and 45 days recorded	after spray of weedicides will be
	\checkmark	Trial will be ploughed after 50 days	
PREVIOUS	Among	g 20 different weedicides no one is fo	ound to be effective all weedicide
YEAR'S	-	ents found to be injurious.	

8.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICII THE CONTROL OF WEEDS IN CORIANDER		
Objectives To investigate the most practicable package of week		Γο investigate the most practicable package of weed management in coriander		
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist) Two years		
	DURATION			
	LOCATION	Vegetable Research Area		
	TREATMENTS/			
	PLAN OF WORK	Sr Treatment Time of application No.		

	1		
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing
	T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing
	T ₁₇	Pert Plus @ 4 ml/ Lit	24 hours after sowing
	T ₁₈	Pert Plus @ 5 ml/ Lit	24 hours after sowing
	T ₁₉	Manual Hoeing	24 hours after sowing
	T ₂₀	Water only (Control)	24 hours after sowing
]
METHODOLOGY	>	Design = RCB	
		Replication $= 3$	
		Plot Size $= 2 \times 5$ m Application of all weedicides treatment	nts will spraved 24 hour after
		sowing	nto win oprayou 24 nour alter
	\succ	Weedicide effect on germination, weed c	ontrol along with crop safety will

	 be recorded. Weed counts after 30 and 45 days after spray of weedicides will be recorded Trial will be ploughed after 50 days
PREVIOUS YEAR'S RESULTS	Among 20 different weedicides only stomp @ 10 ml found to be highly safe and most effective.

9.	TITLE	EVALUATION OF DIFFERENT PRE- EMERGENCE WEEDICIDES FOR				
		THE CONTROL OF WEEDS IN CAULIFLOWER				
	Objectives	To investigate the most practicable package of weed management in Garlic				
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashiq Hussain (Assistant Agronomist)				
	DURATION	Two years				
	LOCATION	Vegetal				
	TREATMENTS/					
	PLAN OF WORK	Sr No.	Treatment	Time of application		
		T ₁	Dual gold @ 8ml/Lit	24 hours after sowing		
		T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing		
		T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing		
		T ₄	Stomp @ 10 ml/ Lit	24 hours after sowing		
		T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing		
		T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing		
		T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing		
		T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing		
		T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing		

		T ₁₀	Top Max	@ 7 ml/ Lit	24	hours after sowing
		T ₁₁	Relax @	3 ml/ Lit	24	hours after sowing
		T ₁₂	Relax @	5 ml/ Lit	24	hours after sowing
		T ₁₃	Oxyfen @	2 3ml/ Lit	24	hours after sowing
		T ₁₄	Recall @	8 ml/ Lit	24	hours after sowing
		T ₁₅	Recall @	10 ml/ Lit	24	hours after sowing
		T ₁₆	Pert Plus	@ 3 ml/ Lit	24	hours after sowing
		T ₁₇	Pert Plus	@ 4 ml/ Lit	24	hours after sowing
		T ₁₈	Pert Plus	@ 5 ml/ Lit	24	hours after sowing
		T ₁₉	Manual H	Ioeing	24	hours after sowing
		T ₂₀	Water on	y (Control)	24	hours after sowing
	METHODOLOGY		sowing Weedicide e be recorded	= 3 = 2 × 5 m of all weedicides effect on germination	n, weed control alor	sprayed 24 hour aften ng with crop safety wil
			Trial will be	e ploughed after 50 d	lays	of weedicides will be
-	PREVIOUS YEAR'S	Among	Trial will be 20 differen	e ploughed after 50 d t weedicides treatme	lays ents Dual gold @ 8	of weedicides will be 3, 6, 4ml/Lit found to Relax Max @ 7ml/Li
		Among	Trial will be 20 differen effective fo	e ploughed after 50 d t weedicides treatme	lays ents Dual gold @ 8	3, 6, 4ml/Lit found to
	YEAR'S	Among be most respecti	Trial will be 20 differen effective fo	e ploughed after 50 d t weedicides treatme	lays ents Dual gold @ 8	3, 6, 4ml/Lit found to
	YEAR'S	Among be most respecti	20 differen effective fo	e ploughed after 50 d at weedicides treatma blowed by Top max	lays ents Dual gold @ 8 x @7, 9ml/Lit and	3, 6, 4ml/Lit found to Relax Max @ 7ml/Li
	YEAR'S	Among be most respecti	20 differen effective fo vely atments	e ploughed after 50 d it weedicides treatme ollowed by Top max Germination	lays ents Dual gold @ 8 x @7, 9ml/Lit and Total weed	3, 6, 4ml/Lit found to Relax Max @ 7ml/Li Crop Safety

T3= Dual gold 92 25 95 @ 4 ml/ Lit 10 85 T9= Top Max 90 10 85 @ 7ml/ Lit 15 90 T10= Top Max 90 15 90 @ 9ml/ Lit 15 90 15 90	@ 6 ml/ Lit			
T9= Top Max 90 10 85 @ 7ml/ Lit 10 10 10 10 T10= Top Max 90 15 90 10	T3= Dual gold	92	25	95
@ 7ml/ Lit 15 90	@ 4 ml/ Lit			
T10= Top Max 90 15 90	T9= Top Max	90	10	85
	@ 7ml/ Lit			
@ 9ml/ Lit	T10= Top Max	90	15	90
	@ 9ml/ Lit			

10.	TITLE		OF DIFFERENT POST-EMERG	
	Objectives	To investigate th	e most practicable package of weed man	agement in fenugreek
	RESEARCH WORKER (S)		(Assistant Plant Pathologist) iq Hussain (Assistant Agronomist)	
	DURATION	Two years		
	LOCATION	Vegetable Resea	rch Area	
	TREATMENTS/			
	PLAN OF WORK	Sr No.	Treatment	Time of application
		T ₁	Axial @ 3 ml/ Lit	30 days after sowing
		T ₂	Puma super @ 5 ml/ Lit	30 days after sowing
		T ₃	Certain Plus @ 5 ml/ Lit	30 days after sowing
		T ₄	Patwari @ 3 ml/ Lit	30 days after sowing
		T ₅	Percept @ 3 gm/ Lit	30 days after sowing
		T ₆	Oxfen @ 3 ml/ Lit	30 days after

			sowing
	T ₇	Skype @ 1 ml/ Lit	30 days after sowing
	T ₈	Topik 15 wp @ 1.2 gm/ Lit	30 days after sowing
	T ₉	Broxtra @ 2 ml/ Lit	30 days after sowing
	T ₁₀	Sonak @ 1.5 gm/ Lit	30 days after sowing
	T ₁₁	Water only	30 days after sowing
	T ₁₂	Manual Hoeing	30 days after sowing
METHODOLOGY	 Replica Plot Siz Applica sowing Weedic 	tion $= 3$ we $= 2 \times 5$ m ation of all weedicides treatments will ide effect on weed control along with crop counts after 30 and 45 days after spray	safety will be recorded.
PREVIOUS YEAR'S	e	ferent weedicides treatments Axial @ 3m ed by Topik @1.2 gm/Lit and Skype @ 1r	
RESULTS			

11.	TITLE	Evaluation of different fungicides against stem phylium leaf blight garlic under field condition
	Objectives	To find out the most effective fungicide against the disease.
	RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist)

DURATION	Two year				
LOCATION	Vegetable Researc	ch Area			
TREATMENTS/	Lay Out RCB		RCB	D	
PLAN OF WORK	Plot Size		1 x3r	n (Each Treatments))
	Replications		3		
	Rating Scalekarthik, 1980				
	Treatments:				
	Treatments	Common nai	me	Active ingredients	Doses
	T1	Thrill		Bismerthiazole	3g/lit
	T2	Antracol		Propineb	5g/lit
	T3	Curzate M8		cymoxanil Mencozeb	6g/ lit
	T4	Alliette		Fosetyl Aluminium	3g/ lit
	T5	Cabrio Top		Pyraclostrobin Metiram	5g/lit
	Т6	Success		Chlorothalonil Metalaxyl	3g/lit
	T7	Ridomil G MZ	fold	Metalaxyl-m, Mencozeb	3g/lit
	Т8	Cytrol		Thiophanate Methyl Chlorothaloni	5g/lit
	Т9	Co prides		Copper Oxychloride	10g/lit
	T10	Melody Duo		Propineb, Iprovalicarb	3g/lit
	T11	Rally		Myclobutanil	1g/ lit
	T12	Chlorostrabin	L	Azoxystrobin Chlorothalonil	5ml/lit
	T13	Score		Difenoconazole	2 ml/lit
	T14	Nanok		Azoxystrobim Flutrifol	3ml/lit
	T15	Evito		Fluoxastrobin	1ml/lit
	T16	Shincar		Carbendazim	3ml/lit
	T17	Jalwa		Azoxystrobin Difenoconazole	2ml/lit
	T18	Flumax		Fluazinam Metalaxal-M	2 ml/lit

	T19	Tilt	Propiconazol	2ml/ lit
	T20	Topas	Penconazole	1ml/ lit
	T21	Nativo 75 EG	Trifloxystrobin	1gm/Lit
			+ tebuconazole)	
	T22	Emistar Top	Azoxystrobin +	2ml/Lit
			difenoconazole	
METHODOLOGY	October, Design=I P × P R × R Disease w Water w developm Application Data of in	RCBD = 4 Inches = 9 Inches vill be created artificial will be sprayed to cr	ly by applying fresh sp eate humidity, condu be repeated twice at	pore suspension acive for the diseas 7 days interval afte
PREVIOUS YEAR'S RESULTS	by rally and flu give control ov	erent fungicides thr max respectively. S er diseases but the ned fungicides. Th	Similarly nanok ,shi ir performance are	ncar,chlorostrobi e similar with th
	,	te M, success, Ride as, alliete and cabri		•

12.	TITLE	CHEMICAL CONTROL OF LA PHYTOPHTHORA INFESTANS.	ATE BLIGHT OF TOMATO CAUSED BY
	Objectives	To find out the most effective fur	ngicide against late blight of tomato.
	RESEARCH	Waseem Abbas (Assistant Plant Pat	hologist)
	WORKER (S)		
	DURATION	one year	
	LOCATION	Vegetable Research Institute, Faisal	abad
	TREATMENTS/	Lay Out	RCBD

PLAN OF WORK	Replication		3		
	Treatments		5		
	Rating Scale		Shuto	ong et al. (2007).	
	Treatments:				
	Treatments	Common nar	ne	Active ingredients	Doses
	T1	Thrill		Bismerthiazole	3g/lit
	T2	Antracol		Propineb	5g/lit
	T3	Curzate M8		cymoxanil Mencozeb	6g/ lit
	T4	Alliette		Fosetyl Aluminium	3g/ lit
	Т5	Cabrio Top		Pyraclostrobin Metiram	5g/lit
	Т6	Success		Chlorothalonil Metalaxyl	3g/lit
	Τ7	Ridomil G MZ	fold	Metalaxyl-m, Mencozeb	3g/lit
	Т8	Cytrol		Thiophanate Methyl Chlorothaloni	5g/lit
	Т9	Co prides		Copper Oxychloride	10g/lit
	T10	Melody Duo		Propineb, Iprovalicarb	3g/lit
	T11	Rally		Myclobutanil	1g/ lit
	T12	Chlorostrabin		Azoxystrobin Chlorothalonil	5ml/lit
	T13	Score		Difenoconazole	2 ml/lit
	T14	Nanok		Azoxystrobim Flutrifol	3ml/lit
	T15	Evito		Fluoxastrobin	1ml/lit
	T16	Shincar		Carbendazim	3ml/lit
	T17	Jalwa		Azoxystrobin Difenoconazole	2ml/lit
	T18	Flumax		Fluazinam Metalaxal-M	2 ml/lit
	T19	Tilt		Propiconazol	2ml/ lit
	T20	Topas		Penconazole	1ml/ lit

	T21	Nativo 75 EG	Trifloxystrobin	1gm/Lit
			+ tebuconazole)	
	T22	Emistar Top	Azoxystrobin +	2ml/Lit
			difenoconazole	
PREVIOUS YEAR'S RESULTS	initiation of t Disease seve of Shutong e Fungicides showed pathogen against late spraying Chlorostrot Ridomil Gold (80%) i.e Antracol (70%) at the treatments menti- (50%), Score (40%),	he disease. rity data will be reco t al. (2007). different response blight of tomato. Mi bin (100%), Cabrio t , Jalva (80%) and N nd Co-pride (70%) a oned above. Rest of Success 40 WSP (0	orded and analyzed ad in regards to minin inimum disease incide op (90%), followed b anok (80%) respectiv re also effective but r	nizing the effect of ence was recorded by by Curzate M (80%), wely. Often treatment not compareable with umax (50%), Alliette), Rally (0%), Cytrol

13.	TITLE	Evaluation of different fungicide	s against downy mildew and stem phylium leaf
		blight of onion under field condit	tion
	Objectives	To find out the most effective fu	ngicide against the disease.
	RESEARCH	Waseem Abbas (Assistant Plant Pa	thologist)
	WORKER (S)		
	DURATION	Two year	
	LOCATION	Vegetable Research Area	
	TREATMENTS/	Check Variety	Phulkara Punjab
	PLAN OF WORK	Lay Out	RCBD
		Plot Size	1.5 x3m (Each Treatments)
		Replications	3
		Treatments	20

Rating Scale	Irzha	ansky & cohen 2006	
reatments:			
Treatments	Common name	Active ingredients	Doses
T1	Thrill	Bismerthiazole	3g/lit
Г2	Antracol	Propineb	5g/lit
Г3	Curzate M8	cymoxanil Mencozeb	6g/ lit
Γ4	Alliette	Fosetyl Aluminium	3g/ lit
Γ5	Cabrio Top	Pyraclostrobin Metiram	5g/lit
Γ6	Success	Chlorothalonil Metalaxyl	3g/lit
Γ7	Ridomil Gold MZ	Metalaxyl-m, Mencozeb	3g/lit
Г8	Cytrol	Thiophanate Methyl Chlorothaloni	5g/lit
Г9	Co prides	Copper Oxychloride	10g/lit
Γ10	Melody Duo	Propineb, Iprovalicarb	3g/lit
Г11	Rally	Myclobutanil	1g/lit
Г12	Chlorostrabin	Azoxystrobin Chlorothalonil	5ml/lit
Г13	Score	Difenoconazole	2 ml/lit
Γ14	Nanok	Azoxystrobim Flutrifol	3ml/lit
Г15	Evito	Fluoxastrobin	1ml/lit
Г16	Shincar	Carbendazim	3ml/lit
Γ17	Jalwa	Azoxystrobin Difenoconazole	2ml/lit
T18	Flumax	Fluazinam Metalaxal-M	2 ml/lit
Т19	Tilt	Propiconazol	2ml/lit
Г20	Topas	Penconazole	1ml/lit
Т21	Nativo 75 EG	Trifloxystrobin + tebuconazole)	1gm/Lit
T22	Emistar Top	Azoxystrobin + difenoconazole	2ml/Lit

MET	HODOLOGY	 Disease will be created artificially by applying fresh spore suspension Water will be sprayed to create humidity, conducive for the disease development. Application of fungicides will be repeated twice at 7 days interval after initiation of the disease. Data of incidence/ severity will be recorded one day before spraying and seven days after spraying
PREV RESU	VIOUS YEAR'S JLTS	New Experiment

14.	TITLE	EFFICACY OF F MILDEW OF PEAS				L OF POWDERY iphae polygoni).
	Objectives	To find out the mos	st effective fung	gicide	e against the diseas	e.
	RESEARCH	Waseem Abbas (Ass	istant Plant Path	ologis	st)	
	WORKER (S)					
	DURATION	Two years				
	LOCATION	Vegetable Research	Area			
	TREATMENTS/					
	PLAN OF WORK	Check Variety		Sarsa	bz	
		Lay Out		RCBI)	
		Plot Size		1.5 x3	3m (Each Treatment	5)
		Replications		3		
		Treatments		6		
		Rating Scale		Jayar	aj and Pukja, 2007	
		 Application of after appeara 	l be conducted in of fungicides wi nce of disease.	ll be		interval of 7-10 days a last spray.
		Treatments	Common nai	ne	Active ingredients	Doses

	T1	Thrill	Bismerthiazole	3g/lit
	T2	Antracol	Propineb	5g/lit
	T3	Curzate M8	_	6g/ lit
	15	Cuizate Mio	cymoxanil Mencozeb	og/ m
	T4	Alliette	Fosetyl	3g/ lit
		Ametic	Aluminium	Jg/ m
	T5	Cabrio Top	Pyraclostrobin	5g/lit
	15	Cabillo Top	Metiram	Jg/m
	T6	Success	Chlorothalonil	3g/lit
	10	Success		5g/m
	T7	Ridomil Gold	Metalaxyl	2~/1:+
	1/	MZ Gold	Metalaxyl-m, Mencozeb	3g/lit
	T8			5~/1:4
	18	Cytrol	Thiophanate	5g/lit
			Methyl	
	T9	Comidea	Chlorothaloni	10~/lit
	19	Co prides	Copper	10g/lit
	T10	Melody Duo	Oxychloride	2 a/lit
	110	Melody Duo	Propineb, Iprovalicarb	3g/lit
	T11	Dolly	Myclobutanil	$1 \alpha / 1$
	T12	Rally Chlorostrabin	•	1g/ lit 5ml/lit
		Chiorostradin	Azoxystrobin Chlorothalonil	Jiii/iit
	T13	Score	Difenoconazole	2 ml/lit
	T14	Nanok		3ml/lit
		INATION	Azoxystrobim Flutrifol	JIII/IIt
	T15	Evito	Fluoxastrobin	1ml/lit
	T16	Shincar	Carbendazim	3ml/lit
	T17	Jalwa	Azoxystrobin	2ml/lit
		Jaiwa	Difenoconazole	21111/ 11t
	T18	Flumax	Fluazinam	2 ml/lit
	110	ι ιμπαλ	Metalaxal-M	∠ 1111/11t
	T19	Tilt	Propiconazol	2ml/ lit
	T20	Topas	Penconazole	1ml/ lit
	T20	Nativo 75 EG		
		INALIVO / J EU	Trifloxystrobin + tebuconazole)	1gm/Lit
	T22	Emistar Top	Azoxystrobin +	2ml/Lit
		Emisiai rop	difenoconazole	21111/ LIL
			unenocondzoie	
PREVIOUS	1 st year experiment			
YEAR'S				
RESULTS				

TITLE		UATION OF DIFFERENT PRE- E CONTROL OF WEEDS IN GARLIC		
Objectives	To investigate the most practicable package of weed management in Garlic			
RESEARCH WORKER (S)	Waseem Abbas (Assistant Plant Pathologist) Muhammad Ashia Hussain (Assistant Agronomist)			
	Muhan	nmad Ashiq Hussain (Assistant Agrono	mist)	
DURATION	Two ye	ears		
LOCATION	Vegeta	ble Research Area		
TREATMENTS/				
PLAN OF WORK	Sr No.	Treatment	Time of application	
	T ₁	Dual gold @ 8ml/Lit	24 hours after sowing	
	T ₂	Dual gold @ 6 ml/ Lit	24 hours after sowing	
	T ₃	Dual gold @ 4 ml/ Lit	24 hours after sowing	
	T_4	Stomp @ 10 ml/ Lit	24 hours after sowing	
	T ₅	Stomp @ 8 ml/ Lit	24 hours after sowing	
	T ₆	Stomp @ 6 ml/ Lit	24 hours after sowing	
	T ₇	Pre act @ 9 ml/ Lit	24 hours after sowing	
	T ₈	Pre act @ 7 ml/ Lit	24 hours after sowing	
	T ₉	Top Max @ 9 ml/ Lit	24 hours after sowing	
	T ₁₀	Top Max @ 7 ml/ Lit	24 hours after sowing	
	T ₁₁	Relax @ 3 ml/ Lit	24 hours after sowing	
	T ₁₂	Relax @ 5 ml/ Lit	24 hours after sowing	
	T ₁₃	Oxyfen @ 3ml/ Lit	24 hours after sowing	
	T ₁₄	Recall @ 8 ml/ Lit	24 hours after sowing	
	T ₁₅	Recall @ 10 ml/ Lit	24 hours after sowing	
	T ₁₆	Pert Plus @ 3 ml/ Lit	24 hours after sowing	

	T17Pert Plus	@ 4 ml/ Lit	2	4 hours after sowing
	T18Pert Plus @ 5 ml/ Lit			4 hours after sowing
	T ₁₉ Manual H	Hoeing	2	4 hours after sowing
	T ₂₀ Water on	ly (Control)	2	4 hours after sowing
METHODOLOGY	 Weedicide be recorded 	= 3 = 2 × 5 m of all weedicides tree effect on germinatio	n, weed control al	ed 24 hour after sowi ong with crop safety
	Trial will be	e ploughed after 50 d	lays	eedicides will be reco
PREVIOUS	-		-	3, 6, 4ml/Lit found t
YEAR'S		owed by Stomp @	8, 6ml/Lit and	Top Max @ 7, 9m
RESULTS	respectively			
	Treatments	Germination counts %	Total weed counts/m2	Crop Safety level %
	T1= Dual gold	90	10	80
	11 Duui golu	20	- •	00
	@ 8 ml/ Lit			00
	@ 8 ml/ Lit T2= Dual gold	92	15	90
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit 	92	15	90
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold 			
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit 	92 92 92	15 25	90 95
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 	92	15	90
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 	92 92 92	15 25	90 95
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit T6= Stomp @ 6 	92 92 95	15 25 10	90 95 90
	 @ 8 ml/ Lit T2= Dual gold @ 6 ml/ Lit T3= Dual gold @ 4 ml/ Lit T4= Stomp @ 10 ml/ Lit T5= Stomp @ 8 ml/ Lit 	92 92 95 95	15 25 10 15	90 95 90 90 95