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Research Article

Quantification of Weather Relationship with Yield of Pigeonpea Varieties through Different Phenological Stages under Different Sowing Windows in Western Maharashtra

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ABSTRACT

The weather parameters play an important role in growth and development of the pigeonpea crop, finally yield was affected. Hence, quantification of weather impact on yield through different phonological stages can be highly beneficial for management weather parameters. In this aspect, an experiment was laid out in split plot design with three replications. The treatment comprised of four varieties *viz.,* Vipula, Rajeshwari (Phule T 0012), BDN 711 and ICPH 2740 as main plot and four sowing windows *viz*., 24th, 26th MW, 28th and 30th MW as sub plot treatments. Correlation analysis of yield with weather parameters revealed that the maximum temperature is significantly negatively impacted the yields for all the varieties,. From branching to flower initiation, maximum temperature for Vipula (0.973* and 0.979*) and Rajeshwari (0.974* and 0.988**) was significantly negative correlated with yields during 2017-18 and 2018-19, respectively. In var. BDN 711 and ICPH 2740 also maximum temperature (0.969* and 0.976**) and (0.958* and0.981**) was significantly negative correlated with yield, during 2017-18 and 2018-19.

Key words: Pigeonpea, Weather, Correlations, Branching to flower initiation, Temperature, Yield

Introduction

Pigeonpea (*Cajanus cajan* (L.) Millspaugh) is one of the major pulse crops of the tropics and subtropics. It is the second most important pulse crop of India, after chickpea (Nene *et al.,* 1990). Pigeonpea is grown on an area of 4.43 m ha and production of 4.25 m tonnes the productivity is 960 kg ha^{-1} in India (Anonymous, 2019). All of these cultivated types of pigeonpea fall into two group's *viz*., *Cajanus cajan* (L.) var. Bicolour and *C. indicus* (L.) var. flavus.Pigeonpea can be grown with a temperature ranging from 26°C to 30°C in the rainy season (June to October) and 17°C to 22°C in the post rainy (November to March) season. Pigeonpea is very sensitive to low radiation at pod development, therefore flowering during the monsoon and cloudy weather, leads to poor pod formation (Saniya *et al.,* 2019). Low day and night temperature during reproductive phase favoured higher crop production (Nanda *et al*., 2010).

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Crop phenology is one of the important aspects since the biomass production and phenological development of crops is known to be closely influenced by the changes in weather conditions occurring during crop growth season. Since the yield of crop is closely related to fluctuation of weather parameters, a detailed correlation study of crop phenological events in pigeonpea would provide a base for understanding different growth and developmental processes as related to weather parameters.

Materials and methods

Location of the experimental site

The field experiment was conducted for two consecutive years at Department of Agricultural Meteorology farm, College of Agriculture, Pune during *kharif,* 2017 and 2018. The geographical location of the site (Pune) was 18°32′ N, latitude; 73°51′ E, longitude and 559 m above mean sea level (MSL). The soil is medium black having depth of about 1m. The average annual rainfall of Pune is 675mm.

Weather conditions during experimental period

Weekly mean meteorological data during the crop growth period (24th to 2nd MW) of *Kharif* 2017-18 and 2018-19 recorded in class 'A' observatory situated in the adjoining field are presented in Tables 1 and 2.

Table 1. Weekly weather parameters during experimental period (2017-18)

Month	MW No.	Tmax (°C)	Tmin (°C)	RHI (%)	RH ll (%)	WS (kmh^{-1})	Rainfall (mm)	Rainy Days	Epan (mm)	BSS (hr)
June	24	32.1	23.1	82	67	6.3	116.4	4.0	3.7	3.4
	25	32.1	23.9	81	67	9.7	45.0	1.0	6.7	9.3
	26	28.2	22.6	88	79	7.6	47.1	6.0	4.4	2.5
July	27	28.4	22.9	83	67	10.3	13.4	2.0	4.9	4.0
	28	28.7	22.5	83	70	10.1	52.3	2.0	5.6	5.8
	29	28.9	22.5	89	82	8.4	85.5	7.0	2.2	0.9
	30	27.7	22.4	88	76	9.8	35.4	5.0	3.1	1.9
	31	28.1	21.8	86	75	7.9	6.5	0.0	4.1	3.3
Aug	32	28.9	22.1	86	67	7.8	2.4	0.0	3.3	4.8
	33	28.0	21.9	85	71	7.3	3.6	1.0	4.3	4.1
	34	27.1	20.8	91	73	6.7	94.7	3.0	3.4	3.4
	35	27.9	21.5	88	78	6.6	57.6	4.0	3.7	3.9
Sept	36	30.5	21.6	89	58	4.3	23.0	1.0	4.5	6.2
	37	31.8	22.6	91	65	2.7	33.6	3.0	4.2	4.9
	38	27.4	21.6	91	82	5.8	69.6	4.0	3.7	2.5
	39	32.0	21.5	90	66	2.9	25.4	2.0	4.3	6.9
	40	33.4	21.9	87	51	2.1	2.2	0.0	4.2	7.0
Oct	41	30.5	22.1	94	80	2.1	135.1	6.0	3.3	3.3
	42	32.0	20.2	92	49	1.6	24.1	2.0	3.9	6.0
	43	31.6	18.7	92	40	2.4	19.5	1.0	3.6	7.4
	44	30.8	14.8	93	31	2.7	0.0	0.0	4.3	8.4
Nov	45	30.3	14.1	93	38	4.3	0.0	0.0	4.2	9.1
	46	29.9	12.5	92	35	2.7	0.0	0.0	3.7	7.6
	47	30.9	17.0	91	53	2.1	13.9	1.0	3.4	5.7
	48	30.1	12.4	96	48	2.3	0.0	0.0	3.7	7.7
Dec	49	28.4	17.9	89	58	4.2	2.8	1.0	3.2	5.0
	50	30.2	14.6	95	48	3.1	0.0	0.0	3.5	7.8
	51	29.0	11.8	88	38	3.6	0.0	0.0	4.0	7.1
	52	29.2	10.3	94	30	2.0	0.0	0.0	3.2	8.3
Jan	1	29.1	11.5	97	36	1.7	0.0	0.0	3.2	7.0
	2	29.1	13.4	94	52	2.4	0.0	0.0	3.5	7.1

Table 2. Weekly weather parameters during experimental period (2018-19)

Month	MW No.	Tmax (°C)	Tmin (°C)	RHI (%)	RH ll (%)	WS (kmh^{-1})	Rainfall (mm)	Rainy Days	Epan (mm)	BSS (hr)
June	24	32.3	24.6	80	62	12.2	2.2	0.0	6.9	6.4
	25	31.2	22.8	83	63	7.1	73.1	2.0	5.3	4.1
	26	29.3	22.2	83	67	8.0	12.2	2.0	4.9	3.7
July	27	28.5	22.2	88	80	7.8	49.2	3.0	3.5	2.5
	28	27.0	22.7	89	80	8.9	27.1	4.0	2.2	0.6
	29	26.2	22.0	88	82	7.0	90.8	4.0	2.5	0.7
	30	26.4	22.3	85	75	9.1	8.1	1.0	3.0	0.8
	31	28.2	22.4	82	71	9.2	8.5	2.0	4.5	3.3
Aug	32	27.7	22.1	88	76	10.1	6.6	1.0	3.6	2.7
	33	26.2	21.8	90	85	9.7	24.6	4.0	3.1	0.7
	34	26.5	21.3	94	84	6.7	39.1	6.0	3.0	1.9
	35	27.4	21.0	90	77	6.3	11.6	3.0	3.1	3.8
Sept	36	27.8	19.8	88	66	6.1	8.2	1.0	4.1	5.9
	37	30.2	18.8	87	52	3.4	0.3	0.0	4.6	8.5
	38	30.2	20.8	87	56	3.2	15.0	1.0	4.3	4.3
	39	33.0	21.5	87	45	2.9	3.7	0.0	4.7	7.7
	40	32.6	20.4	92	53	2.4	23.4	2.0	4.8	5.7
Oct	41	33.8	20.7	87	29	3.0	0.0	0.0	4.9	7.6
	42	33.0	20.0	88.7	36	2.3	12.7	2.0	4.6	7.3
	43	33.6	17.9	87.1	25	2.3	0.0	0.0	5.3	8.8
	44	32.0	15.8	81.0	33	3.2	0.0	0.0	5.0	9.7
Nov	45	33.4	18.0	91	34	1.7	3.9	1.0	4.7	8.0
	46	32.6	13.4	90	26	1.8	0.0	0.0	4.5	9.5
	47	31.2	17.1	85	41	2.7	0.0	0.0	4.5	7.3
	48	30.2	12.3	94	30	2.2	0.0	0.0	4.5	7.9
Dec	49	30.9	15.3	90	41	1.8	0.0	0.0	3.5	6.5
	50	29.3	12.5	89	35	2.5	0.0	0.0	3.8	8.1
	51	27.6	10.6	93	38	1.9	0.0	0.0	3.2	8.5
	52	29.0	10.2	91	30	2.3	0.0	0.0	3.3	8.9
Jan	1	30.6	8.7	93	23	1.3	0.0	0.0	3.0	8.8
	2	30.6	9.6	93	25	1.4	0.0	0.0	3.3	8.8

The weekly maximum temperature experienced during 2017-18 was 33.4°C and lowest maximum temperature was 27.1°C. The highest minimum temperature experienced was 23.9°C and the lowest was 10.3°C. The maximum morning and evening relative humidity ranged between 81.1% to 97.0% and 31.1-82.1%, respectively. The total rainfall was 909.1 mm was recorded during the crop growing period.

The weekly maximum temperature experienced during 2018-19 was 33.8°C and lowest maximum temperature was 26.2°C. The highest minimum temperature experienced was 24.6°C and the lowest was 8.7°C. The maximum morning relative humidity was 94.3 per cent and the minimum was 77.9 per cent. The maximum evening relative humidity was 85.4 per cent and the minimum was 22.6 per cent. The total rainfall was 420.3 mm and maximum amount of rainfall 90.8 mm in a week.

Experimental details

The experiment was conducted in a split plot

design with three replications and sixteen treatment combinations of different varieties and sowing windows. The treatment comprised of four varieties *viz.,* Vipula, Rajeshwari (Phule T 0012), BDN 711 and ICPH 2740 (*Mannem Konda Kandi*) as main plot and four sowing windows *viz*., 24th, 26th MW, 28th and 30th MW as sub plot treatments. Inter row spacing was 45 cm and plant to plant spacing was 20 cm. Gross plot size was 4.0 × 4.5 square metres and net plot size was 3.6 × 4.0 square metres. Seeds were treated with Thiram @ 4 g per kg of seed followed by Rhizobium and PSB @ 10 g per kg of seed. The seed rate @ 18 kg ha^{-1} for all varieties. Urea and DAP were used as source of N and P, and applied as per recommended dose i.e., 25 kg N and 50 kg per hectare.

Correlation of weather parameters on yield through different phonological stages

The weather parameters *viz.,* maximum and minimum temperatures (°C), relative humidity (%) (morning and evening), bright sunshine hours, rainfall (mm) and rainy days, wind speed, evaporation rate on growth and yield were recorded from meteorological weeks 24th to 2nd during 2017-18 and 2018-19. Correlation (Snedecor and Cochron, 1968) and regression analysis were done between weather parameters and yield through different phonological stages with the weekly mean/total values of rainfall, maximum and minimum temperature, relative humidity, Bright sunshine hours, wind speed and evaporation to quantify the effect of weather elements on yield of pigeonpea.

The statistical software's like Microsoft - excel and SPSS8.0 was used in the study for various statistical analyses.

Results and Discussion

Crop weather correlation studies

The influence of different weather parameters *viz.,* maximum and minimum temperature, morning and evening relative humidity, wind speed, evaporation, rainfall and BSH on grain yield of pigeonpea was observed by working out through correlation coefficient (r) for 2017-18 to 2018-19.

Correlation between weather parameters and yield through different phonological stages

(a) var. Vipula

The correlation analysis for pigeonpea var. Vipula (Table 3) showed that maximum temperature was significantly negatively correlated (-0.973*) and (-0.979*) at branching to flower initiation during 2017-18 and 2018-19; Pod initiation to physiological maturity (0.981**) significantly positively correlated during 2018-19. Minimum temperature was significantly positively correlated (0.967*) at

Table 3. Correlation between weather parameters and yield of Vipula through different phonological stages during 2017-18 and 2018-19

Weather	Vipula									
	2017-18					2018-19				
	P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
T_{max}	0.646	-0.973*	0.877	0.851	0.865	0.853	-0.979*	0.930	0.816	0.981**
T_{min}	0.967*	0.912	0.712	0.603	0.055	0.784	0.955*	0.907	0.860	0.969*
RH- I	-0.988*	-0.996**	0.368	0.012	0.603	-0.699	0.190	0.907	-0.935	-0.852
RH- II	0.760	0.942	0.414	-0.858	-0.065	-0.793	0.978*	-0.571	-0.408	-0.812
Wind Speed	0.969*	0.970*	-0.162	-0.293	-0.873	-0.546	0.983*	-0.488	0.463	-0.420
Rainfall	0.193	0.259	0.632	0.592	0.663	0.874	0.849	0.852	0.141	0.843
Pan evaporation	0.587	-0.908	0.001	0.909	0.408	0.263	-0.959*	-0.148	0.799	0.904
BSH	-0.030	-0.944	-0.207	0.988*	0.242	0.152	-0.975*	-0.925	0.995**	0.935

Note: P_1: Seedling to branching, P_2: Branching to flower initiation, P_3: Flower initiation to 50% flowering, P_4: 50% flowering to pod initiation, P_5: Pod initiation to maturity, * Significance at 0.05 level, **Significance at 0.01 level

germination to branching during 2017-18; positively correlated (0.955*) and (0.969*) at branching to flower initiation and pod initiation to physiological maturity, during 2018-19.

Morning relative humidity (-0.988* and -0.996**) was significantly negative correlation germination to flower initiation during 2017-18; evening relative humidity (0.978*) significantly positively correlated at branching to flower initiation, during 2018-19.

From germination to flower initiation, wind speed also (0.969* and 0.970*) and (0.983*) was significantly positively correlated during 2017-18 and 2018-19. From 50% flowering to pod initiation, bright sun hours significantly positively correlated (0.988* and 0.995*) for both years; significantly negatively correlated (-0.975*) during 2018-19. Rainfall was positively correlated from seedling to physiological maturity for both the years.

(b) var. Rajeshwari

The correlation analysis for pigeonpea var. Rajeshwari (Table 4) showed from germination to physiological maturity; maximum temperature was significantly negatively correlated (-0.974*) and (-0.988**) at branching to flower initiation during 2017-18 and 2018-19; from flower initiation to 50% flowering significantly positively correlated (0.966* and 0.957**) for both years. Minimum temperature was significantly positively correlated (0.968* and 0.977*) and (0.957*) at branching to flower initiation during 2017-18 and 2018-19, respectively.

Morning relative humidity was significantly negatively correlated (-0.954* and -0.982*) germination to flower initiation during 2017-18; evening relative humidity (0.963* and 0.987**) and (0.972**) significantly positively correlated at germination to flower initiation, during 2017-18 and 2018-19.

From germination to flower initiation, wind speed (0.985**) and (0.904**) was significantly positively correlated during 2017-18 and 2018-19. From branching to flower initiation, bright sun hours significantly negatively correlated (-0.986**) and (-0.975**) for both years and significantly positively correlated (0.984*) at pod initiation to physiological maturity during 2018-19. Rainfall was significantly positively correlated (0.989* and 0.982**) at flower initiation to 50% flowering during 2017-18 and 2018-19.

(c) var. BDN 711

The correlation analysis for pigeonpea var. BDN 711 (Table 5) showed from germination to physiological maturity; Maximum temperature was significantly negatively correlated (-0.969*) and (-0.976**) at branching to flower initiation during 2017-18 and 2018-19; from pod initiation to

Table 4. Correlation between weather parameters and yield of Rajeshwari through different phonological stages during 2017-18 and 2018-19

Weather	Rajeshwari									
	2017-18					2018-19				
	P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
T_{max}	0.572	-0.974*	0.966*	0.878	0.913	0.678	-0.988**	0.957*	0.937	0.946
T_{min}	0.968*	0.977*	0.853	0.463	0.190	0.878	0.957**	0.853	0.943	0.885
RH- I	-0.954*	-0.982*	-0.397	-0.239	0.719	-0.751	0.384	-0.397	-0.839	-0.625
RH- II	0.963*	0.987**	-0.621	-0.880	0.145	-0.673	0.972**	-0.621	-0.273	-0.884
Wind Speed	0.985**	0.937	0.884	-0.128	-0.883	-0.476	0.904**	0.884	0.309	-0.439
Rainfall	0.493	0.213	0.989**	-0.345	0.887	0.847	0.931	0.982**	0.896	0.305
Pan Evaporation	0.515	-0.777	0.787	0.824	0.191	0.002	-0.894	0.787	0.568	0.949
BSH	-0.508	-0.986**	-0.054	0.790	0.131	-0.282	-0.975**	-0.054	0.932	0.984*

Note: P_1: Seedling to branching, P_2: Branching to flower initiation, P_3: Flower initiation to 50% flowering, P_4: 50% flowering to pod initiation, P_5: Pod initiation to maturity, * Significance at 0.05 level, **Significance at 0.01 level

Table 5. Correlation between weather parameters and yield of BDN 711 through different phonological stages during 2017-18 and 2018-19

Weather	BDN 711									
	2017-18					2018-19				
	P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
T_{max}	0.639	-0.969*	0.888	0.748	0.983**	0.760	-0.976**	0.515	0.785	0.954*
T_{min}	0.980*	0.944	0.772	0.562	0.173	0.890	0.982**	0.890	0.797	0.905
RH- I	-0.965**	-0.974**	0.589	0.191	0.486	-0.782	0.550	-0.402	-0.821	-0.842
RH- II	0.814	0.972**	0.499	-0.937	-0.083	-0.748	0.984**	0.518	-0.823	-0.755
Wind Speed	0.973*	0.970*	-0.423	-0.025	-0.653	-0.424	0.987*	0.770	0.273	-0.398
Rainfall	0.405	0.128	0.723	0.428	0.870	0.804	0.949	0.920	0.253	0.737
Pan Evaporation	0.627	-0.890	0.272	0.739	0.587	0.206	-0.976**	0.618	0.633	0.915
BSH	-0.292	-0.972*	-0.126	0.541	0.413	0.220	-0.989**	-0.937	0.936	0.778

Note: P_1: Seedling to branching, P_2: Branching to flower initiation, P_3: Flower initiation to 50% flowering, P_4: 50% flowering to pod initiation, P_5: Pod initiation to maturity, * Significance at 0.05 level, **Significance at 0.01 level

physiological maturity was significantly positively correlated (0.983** and 0.954*) for both years. Minimum temperature was significantly positively correlated (0.968*) at germination to branching and (0.982**) at branching to flower initiation during 2017-18 and 2018-19, respectively.

Morning relative humidity was significantly negatively correlated (-0.965** and -0.974**) at germination to flower initiation during 2017-18; evening relative humidity (0.972** and 0.984**) significantly positively correlated at germination to flower initiation, during 2017-18 and 2018-19.

From germination to flower initiation, wind speed also (0.973* and 0.970*) and (0.987*) was significantly positively correlated during 2017-18 and 2018-19, respectively. From branching to flower initiation, bright sun hours significantly negatively correlated (-0.972* and -0.989**) for both years. Rainfall was positively correlated, during 2017-18 and 2018-19.

(d) var. ICPH 2740

The correlation analysis for pigeonpea var. ICPH 2740 (Table 6) showed from germination to physiological maturity; Maximum temperature was significantly negatively correlated (-0.958*) and (-0.981**) at branching to flower initiation during 2017-18 and 2018-19; from pod initiation to physiological maturity was significantly positively correlated (0.980*) during 2018-19. Minimum temperature was significantly positively correlated (0.964*, 0.988* and 0.961*) at germination to branching and pod initiation to pod maturity during 2017-18; and significantly positively correlated (0.981**, 0.992** and 0.961*) at branching to pod maturity during 2018-19.

Evening relative humidity (0.987* and 0.978**) significantly positively correlated at branching to flower initiation during 2017-18 and 2018-19.

From germination to flower initiation, wind speed also (0.987* and 0.968*) and (0.980*) was significantly positively correlated during 2017-18 and 2018-19 respectively. From branching to flower initiation and pod initiation to pod maturity, bright sun hours significantly negatively correlated (-0.987* and -0.977*) at branching to flower initiation and pod initiation to physiological maturity for both years respectively; significantly negatively correlated (-0.974*). Rainfall was positively correlated during 2017-18 and 2018-19.

Avinash *et al.* (2018) revealed that there was positive correlation between pigeonpea yield and rainfall during flowering & podding stage and during its flowering phase & podding stage there is strongly negative correlation with maximum temperature and negative correlation with bright sunshine hours (Raju *et al.,* 2014). While during podding stage in pigeonpea there is significantly positive relationship

Table 6. Correlation between weather parameters and yield of ICPH 2740 through different phonological stages during 2017-18 and 2018-19

Weather	ICPH 2740									
	2017-18					2018-19				
	P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
T_{max}	0.673	-0.958*	0.721	0.803	0.924	0.696	-0.981**	0.861	0.908	0.980*
T_{min}	0.964*	0.988*	0.800	-0.942	0.961*	0.915	0.981**	0.801	0.992**	0.965*
RH- I	-0.986**	-0.990**	-0.513	0.373	-0.498	-0.816	0.844	-0.231	-0.775	-0.737
RH- II	0.915	0.987*	-0.723	-0.914	0.946	-0.847	0.978**	-0.680	-0.920	0.471
Wind Speed	0.987*	0.968*	0.103	-0.133	0.578	-0.296	0.980*	0.334	-0.143	0.317
Rainfall	0.657	0.737	0.681	-0.101	0.790	0.805	0.936	0.815	0.652	0.423
Pan evaporation	0.540	-0.948	0.762	0.812	0.279	0.055	-0.966**	0.812	0.926	0.920
BSH	-0.433	-0.987*	0.541	0.801	-0.976*	-0.458	-0.974**	0.554	0.930	-0.903

Note: P_1: Seedling to branching, P_2: Branching to flower initiation, P_3: Flower initiation to 50% flowering, P_4: 50% flowering to pod initiation, P_5: Pod initiation to maturity, * Significance at 0.05 level, **Significance at 0.01 level

Table 7. Regression equations developed for different varieties

S. No.	Variety	Year	Equation	R^2 value
1.	Vipula	2017-18	Yield = 246.38 – 7.356 (T_{max})	0.947
		2018-19	Yield = 111.30 – 3.08 (T_{max})	0.972
2.	Rajeshwari	2017-18	Yield = 239.43 – 7.19 (T_{max})	0.948
		2018-19	Yield = 121.52 – 3.34 (T_{max})	0.956
3.	BDN 711	2017-18	Yield = 215.30 – 6.54 (T_{max})	0.977
		2018-19	Yield = - 81.60 + 3.17 (T_{max})	0.909
4.	ICPH 2740	2017-18	Yield = 242.23 – 7.32 (T_{max})	0.918
		2018-19	Yield = 113.67 – 3.09 (T_{max})	0.989

between pigeonpea yield and minimum temperature & relative humidity. The similar results were reported by Kandiannan *et al*. (2002) and Birthal *et al.* (2014). Our observations were in better agreement with the previously reported findings.

Development of regression equations

Stepwise regression analysis was carried out to select the critical variables, which contributed to yield during 2016-17 and 2017-18, respectively. Among all the weather parameters, maximum temperature has greatest influence in determining the yield in different varieties. Thus, the stepwise regression equations were developed based on grain yield of different varieties and maximum temperature during 2017-18 & 2018-19; the prediction equation was depicted in Table 7.

An increase of one unit of maximum temperature decreased the yield of var. Vipula 7.356 units to an extent of 94.7 % during 2017-18 and an increase of one unit of maximum temperature decreased the yield of var. Vipula 3.08 units to an extent of 97.2 % during 2018-19, respectively. An increase of one unit of maximum temperature decreased the yield of var. Rajeshwari 7.19 units to an extent of 94.8 % during 2017-18 and an increase of one unit of maximum temperature decreased the yield of var. Rajeshwari 3.34 units to an extent of 95.6 % during 2018-19, respectively. An increase of one unit of maximum temperature decreased the yield of var. BDN 711 6.54 units to an extent of 97.7 % during 2017-18 and an increase of one unit of maximum temperature increased the yield of var. BDN 711 3.17 units to an extent of 90.9% during 2018-19, respectively. An increase of one unit of maximum temperature

decreased the yield of var. ICPH 2740 7.32 units to an extent of 91.8 % during 2017-18 and an increase of one unit of maximum temperature decreased the yield of var. ICPH 2740 3.09 units to an extent of 98.9% during 2018-19, respectively.

Conclusion

Correlation analysis with weather parameters during the growth stages of pigeonpea revealed that, maximum temperature and bright sunshine hours is significantly negatively impacting the yield in all the varieties. Whereas, most of the cases minimum temperature, rainfall and evening relative humidity significantly positively impacted the yield in all varieties.

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