showed significant positive associations (Table 2). The present finding is in agreement with Lim (1982) who has reported that relative humidity ranging from 70 and 80 per cent was more favourable for multiplication of **A. plutellae**

None of the weather parameters exhibited significant influence on the population of predatory coccinellid beetle during winter season (Table 2).

The simple correlation drawn between the incidence of black rot and weather showed the existence of significant positive association with maximum and minimum temperatures during winter season (Table 3).

The simple correlation made between incidence of the ring spot and weather parameters indicated the existence of significant positive association only with minimum temperature. In the above two cases, the multiple regression analysis showed no significant influence of weather factors and the incidence of diseases (Table 3).

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EFFECT OF PREMONSOON SOWING ON THE YIELD OF SORGHUM UNDER DIFFERENT METHODS OF SOWING IN VERTISOL OF SOUTHERN DISTRICTS

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ABSTRACT

An experiment to study the effect of various time of sowing and method of sowing on sorghum K-tall was conducted during Rabi at Agricultural Research Station, Kovilpatti.

Sowing two weeks before the onset of monsoon recorded higher grain yield and was most ideal time of sowing. Among the method of sowing, sowing behind the country plough, recorded higher grain yield.

INTRODUCTION

Low and erratic distribution of rainfall makes dryland agriculture a risk proposition in the vertisol of southern districts. Time and method of sowing during the monsoon season decides the yield prosperity. It was reported that sowing in anticipation of rainfall resulted in better utilisation of precipitation (Anon.,1971). Sankaran and Pothiraj (1982) also reported that premonsoon sowing of cotton resulted in maximum yield with cent per cent utilisation of rainfall. In this region some farmers practice premonsoon sowing without the knowledge of actual time of receipt of monsoonic rain. Most of ryots follow the practice of sowing on or after the receipt of rainfall. As a result the plants could not utilise the soil moisture to the extent possible leading to poor yields. Further this creates demand for labour at the time of sowing and animal power. With an aim to get a solution to these problems, a study was undertaken at Agricultural Research Station, Kovilpatti.

MATERIALS AND METHODS

Time and method of sowing under rainfed condition were studied with an object of the effective utilisation of moisture. The details of materials used and methods adopted for the study are given below.

MAIN PLOT

M_1 - Sowing four weeks before the onset of monsoon.

M_2 - Sowing three weeks before the onset of monsoon.

M_3 - Sowing two weeks before the onset of monsoon.

M_4 - Sowing one week before the onset of monsoon.

M_5 - Sowing on the receipt of monsoon.

M_6 - Sowing one week after the onset of monsoon.

SUB PLOT

S_1 - Sowing behind the country plough

S_2 - Sowing with Gorru seed drill

S_3 - Sowing with multipurpose implement

S_4 - Sowing by hand dibbling of seeds.

The experiment was laid out in split plot design with three replications. The test crop was K-Tall sorghum. Fertiliser was applied at the rate of 40 kg N and 20 kg P_2O_5 ha^{-1}; Broadbed and furrow system(150 cm width) was followed. The treatment for time of sowing was

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fixed based on the normal onset of monsoon which was found to be 15th October. This was arrived at based on the 30 years mean rainfall data of this station (Balasubramanian et al.1983). The rainfall recorded during the crop period is given in Table. I.

RESULTS AND DISCUSSION

EFFECT OF TIME OF SOWING

The results of three years on sorghum grain yield was given in Table II. During the first year, sowing three weeks before the onset of monsoon recorded the highest grain yield of 2091 kg ha^{-1} and this was on par with sowing on the onset of monsoon (2082 kg ha^{-1}) and sowing two weeks before the onset of monsoon (1949 kg ha^{-1}) and significantly superior to other treatments studied. During second year grain yield differences were markedly influenced due to time of sowing. Sowing on the commencement of monsoon recorded the highest grain yield of 2455 kg ha^{-1} and it was on par with sowing one week before the onset of monsoon (2068 kg ha^{-1}).

During third year,sowing two weeks before the onset of monsoon registered the highest grain yield of 2779 kg ha^{-1} which was significantly superior to other treatments. By perusal of pooled mean data, it is apparent that sowing two weeks before the onset of monsoon and sowing three weeks before the onset of monsoon increased the grain yield over other time of sowing, whereas sowing one week after the onset of monsoon revealed the sharp decline of the grain yield. This corroborates with findings of Periathambi and Palaniappan (1981), who had reported that highest sorghum grain yield could be obtained under premonsoon sowing i.e. 20 days earlier than the onset of monsoon under Coimbatore condition. The reduction in yield due to delayed sowing could be attributed to nonutilisation of early rains by the plants which affected initial stand of this crop.

In the case of straw yield (Table III),sowing one week after the onset of monsoon recorded the highest straw yield and this might be due to optimum plant population. With regard to plant population (Table IV) it was observed that the plant population was high in the treatment sowing one week after the onset of monsoon and on the receipt of rain. Though the plant population was high in these treatment, the grain yield was less due to coincidence of dry spell during grain setting stage.

EFFECT OF METHOD OF SOWING

During first year the grain yield differences due to methods of sowing were not influenced. During second year, sowing by dibbling increased the grain yield (1548 kg ha^{-1}) and it was on par with sowing behind the country plough. During third year, sowing behind the country plough recorded the highest yield (1718 kg ha^{-1}), It would be evident from the pooled mean data that sowing behind the country plough method increased the yield and this might be due to less loss of moisture than other methods.

TABLE 1. RAINFALL DATA DURING CROP PERIOD

Standard Week No.	Month	Date	Rainfall mm		
			First year	Second Year	Third year
37	September	10-16	-	4.9	2.2
38		17-23	1.3	-	52.9
39		24-30	9.3	-	121.7
40	October	1-7	5.2	-	-
41		8-14	107.4	14.4	-
42		15-21	3.0	108.3	-
43		22-28	92.6	78.5	73.5
44	November	29-4	71.9	80.2	21.5
45		5-11	15.2	79.7	23.8
46		12-18	24.3	-	35.6
47		19-25	5.9	3.0	-
48	December	26-2	3.8	6.9	20.6
49		3-9	51.8	5.9	0.5
50		10-16	4.0	11.0	-
51		17-23	0.3	16.9	-
52		24-31	-	26.5	-
1	January	1-7	-	16.0	135.6
2		8-14	-	3.3	-
3		15-21	-	34.2	44.5
4		22-28	-	-	-
5	February	29-4	-	-	2.0
6		5-11	-	43-9	-
7		12-18	-	38-7	-
8		19-25	-	3.0	-
9	March	26-4	-	71.9	-

TABLE 2. GRAIN YIELD DATA ($kgha^{-1}$)

Treatments	First Year	Second Year	Third Year	Pooled Mean
M1	1502	1121	2451	1691
M2	2091	1603	2399	2031
M3	1949	1370	2779	2033
M4	1458	2068	1273	1599
M5	2082	2455	1006	1848
M6	1524	228	129	627
SEm	128	32	43	395
CD (P=0.05)	387	97	129	NS
S1	1896	1524	1718	1713
S2	1814	1422	1697	1644
S3	1657	1404	1711	1591
S4	1703	1548	1565	1605
SEm	85	32	30	56
CD(P=0.05)	NS	91	85	NS
Main plots at any one level of sub plot SEm	224	81	77	413
CD(P=0.05)	NS	234	222	NS
Sub plots at any one level of Main plot SEm	211	84	74	138
CD(P=0.05)	NS	240	208	NS

TABLE III STRAW YIELD DATA ($kgha^{-1}$)

Treatments	First Year	Second Year	Third Year
M1	3689	7657	4756
M2	4548	7561	4178
M3	4681	8184	5181
M4	3069	8469	6779
M5	5175	9808	7981
M6	6913	10047	8190
SEm	413	346	451
CD (P = 0.05)	1245	1122	1358
S1	4692	8850	5846
S2	5188	8474	6173
S3	4485	8586	6353
S4	4526	8576	6338
SEm	273	325	266
CD (P. = 0.05)	NS	NS	NS
Main plots at any one level of sub plot SEm	715	611	722
CD(p=0.05)	NS	1781	NS
Sub plots at any one level of main plot SEm	672	559	651
CD(p=0.05)	NS	1583	NS

TABLE IV PLANT POPULATION AT HARVEST

Treatments	First Year	Second Year	Third Year
M1	1118	476	515
M2	1034	726	479
M3	1075	617	491
M4	638	768	517
M5	1130	947	618
M6	1254	979	592
SEm	57	6	26
CD (P=0.05)	173	19	79
S1	1106	755	562
S2	1053	755	525
S3	972	732	521
S4	1036	767	534
SEm	24	5	14
CD (P = 0.05)	67	14	NS
Main plots at any one level of sub plot SEm	76	12	39
CD(P = 0.05)	224	36	NS
Sub plots at any one level of mainplot SEm	58	12	34
CD (P=0.05)	165	35	NS

It is clearly indicated from the study that premonsoon sowing comparatively enhanced the grain yield than the sowing on the onset of monsoon. Among the premonsoon sowing, two weeks before the onset of monsoon was considered to be the best for obtaining higher yield and for effective utilisation of soil moisture.

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