

EFFECT OF PLANT POPULATION AND N LEVELS ON SUNFLOWER

P. MUTHUVELI¹, T. S. MANICKAM², T. L. SUBRAMANIAN³ and K. RAJUKKANNU⁴

Three field experiments involving six spacings (60 x 60, 60 x 45, 60 x 30, 60 x 20, 45 x 30 and 30 x 20 cm) and four levels of nitrogen (0, 40, 80 and 120 Kg/ha) were conducted at the Agricultural Research Station, Bhavanisagar during rabi seasons of 1977-78 and 1978-79 and kharif 1979. In all the three seasons there was no response in the seed as well as oil yield for the applied nitrogen and plant population maintained.

Sunflower is the second most important oil seed crop in the world. In view of the shortage in edible oil, attempts are being made to popularise this crop. Favourable response of sunflower to major nutrient application has been reported by several workers (Srinivas and Patil 1977, Krishnarajan *et al* 1978). However, adequate information on the combined effect of plant population and nitrogen levels are not available under Tamil Nadu conditions. Hence, to study the effect of these two factors on sunflower, field experiments were conducted for three seasons at the Agricultural Research Station, Bhavanisagar during rabi seasons of 1977-78 & 78-79 and kharif, 1979.

MATERIAL AND METHODS :

The experiments were conducted in the Bagaduthurai block of the research station farm under irrigated condition. The soil is of red sandy loam with a neutral pH, low in its available

N and P contents and medium in available potassium. Sunflower variety EC. 68414 was grown as the test crop. Split plot design with nitrogen levels as main plot treatments and spacings as sub plot treatments was employed. Each treatment was replicated thrice and there were 72 plots of 5.4x3.6m in all. The six spacings tried were 1. 60 x 60 (S1), 2. 60 x 45 (S2), 3. 60 x 30 (S3), 4. 60 x 20 (S4), 5. 45 x 30 (S5) and 6. 30 x 20 cm (S6). The four levels of N were 0 (N0), 40 (N1), 80 (N2) and 120 (N3) kg/ha. All the plots received a basal application of uniform dose of P₂O₅ and K₂O at the rate of 90 and 60 Kg/ha in the form of super phosphate and muriate of potash respectively. Nitrogen was applied in the form of urea in two equal split doses one at the time of sowing and the other on 25th day after sowing. Seeds were sown at the rate of 3-4 per hill adopting the spacings as per the treatments and later thinned to single plants at third leaf

stage. Plant protection and irrigation were given as and seed yield under each treatment, was recorded on moisture free basis. Seed samples drawn from each treatment were evaluated for their oil content as per the conventional methods. From the oil content the per hectare oil yield under each treatment was computed.

RESULTS AND DISCUSSION:

The details regarding the seed yield, oil content and oil yield are furnished in the table. Even though the seed yield as well as oil yield were numerically higher under S4 in the first season, S3 in the second season and S5 in the third season, the differences could not attain the levels of significance. As in the case of spacing the levels of added N upto 120 Kg/ha failed to produce any significant increase in the seed yield in all the three seasons. In the case of oil content and oil yield also significant differences could not be observed either due to the spacings or to the levels of N. In general, the seed yield, oil content and oil yield were reduced in the kharif season as compared to rabi

season crop. Mukundan (1972) studying the influence of N and P on sunflower reported the non responsiveness of sunflower to applied N under Tamil Nadu conditions and the present finding is also in similar line. Small and Sims (1978) also could not observe any significant variation in the oil content due to nitrogen fertilisation.

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Treatment.	Seed yield kg/ha			Oil content Percent			Oil yield kg/ha		
	1977-78 rabi	78-79 rabi	79 kharif	77-78 rabi	78-79 rabi	79 kharif	77-78 rabi	78-79 rabi	79 kharif
S1	1284	1482	1100	35.5	41.4	36.4	462	611	403
S2	1469	1557	1367	36.6	41.2	36.2	544	640	496
No S3	1568	1676	1283	38.9	41.9	35.7	613	700	457
S4	2009	1491	1108	36.6	42.3	34.8	752	633	387
S5	1696	1231	1350	38.9	40.0	36.6	664	464	492
S6	1622	1389	1183	35.5	40.6	35.4	575	571	423
S1	1595	1331	1200	37.8	39.2	33.5	625	523	401
S2	1759	1479	1000	33.3	40.0	34.2	598	592	347
N1 S3	1757	1464	1275	38.9	37.7	35.2	684	552	450
S4	2019	1542	1317	35.5	40.2	37.0	751	620	488
S5	1864	1471	1342	30.1	40.7	37.1	530	596	498
S6	1680	1223	1300	35.5	37.7	34.7	598	480	449
S1	1373	1401	1067	36.6	42.4	32.1	503	594	343
S2	1448	1388	1108	34.4	40.5	34.8	509	561	384
N2 S3	1700	1466	1142	33.3	42.5	35.8	566	624	409
S4	1922	1369	1300	36.6	41.5	36.3	704	567	472
S5	1652	1580	1383	35.5	35.5	35.8	599	629	493
S6	1430	1232	1200	36.6	41.6	36.8	543	513	443
S1	1415	1332	900	34.4	41.1	36.5	488	551	329
S2	1565	1227	1167	31.1	40.1	34.6	495	493	404
N3 S3	1568	1607	1375	38.8	40.5	35.7	603	654	490
S4	2083	1270	1150	35.5	38.5	35.9	733	488	419
S5	1910	1349	1192	33.3	39.1	35.4	645	531	422
L6	2110	1641	1358	37.7	41.3	36.3	593	677	494
NS	NS	NS	NS	NS	NS	NS	NS	NS	NS