



Influence of Improved Maize Production Technologies in Field Demonstrations in Agniyar Sub-basin, Thanjavur District Tamil Nadu under TN-IAMWARM Project

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Field demonstrations on improved production technology (IPT) for maize were conducted in 75 hectares at farmers fields in seven blocks of Agniyar sub basin villages comprising Thanjavur and Pudukkottai District of Tamil Nadu from Feb' 2010 to May 2010 under Tamil Nadu-Irrigated Agriculture Modernization and Water Bodies Restoration and Management (TN-IAMWARM) Project. The improved production technologies were compared with farmer's practice in every location. The results revealed that adoption of improved production techniques for maize influenced growth and yield attributes of maize viz., plant height, cob length and number of grains cob⁻¹. There was a remarkable improvement in grain yield with an over all increase of 47.0 per cent over farmer's practice due to adoption of improved production techniques in maize. Higher net return and benefit cost ratio were also observed due to adoption of improved production techniques in maize in all the villages of demonstrations in agniyar sub basin. Out of twenty villages, wherein the demonstrations were carried out in the sub basin, higher mean grain yield (6370 kg ha⁻¹) was recorded at Odukkur village of Kunnandarkovil block in Pudukkottai District.

Key words: IPT, maize, yield attributes, grain yield, economics

Maize (*Zea mays* L.) is one of the important staple food crops of the world and ranks next only to wheat and rice in India, both in area and production. During 2009-10 in Tamil Nadu, maize occupied an area of 2.44 lakh ha with a production of 11.4 lakh tonnes and productivity of 4.6 t ha⁻¹ (Singh, 2008). Maize is called queen of cereals due to unparallel productivity among cereals. In recent years, maize emerged as leading crop in parts of Pudukkottai district of Tamil Nadu particularly in Karambakudi and Gandarva kottai blocks since it fetches higher prize in the poultry industry.

However, the productivity of maize is low in this area than its actual potential due to adoption of improper varieties and farmer's inadequate knowledge on production practices. Maize and maize based cropping systems are becoming important for food and nutritional security in Tamil Nadu (Malarvizhi *et al.*, 2009). The Productivity of maize could be substantially increased by adopting improved production technologies viz., use of hybrid variety, optimum spacing, balanced fertilization, use of weedicide and micronutrients. There is ample opportunity for maximising maize yields to meet the ever- increasing feed grain demand for the growing livestock industry in the state. In order to popularize the improved production technologies for maize in

non traditional areas of Agniyar Sub basin, field demonstration were conducted in five blocks of Pudukkottai and three blocks of Thanjavur Districts, Tamil Nadu under TN-IAMWARM project.

Materials and Methods

Agniya sub basin is one of the biggest sub-basins and extends irrigation facility to 12016 ha covering Pudukkottai and Thanjavur Districts of Tamil Nadu. With a view to popularize the improved production technologies for maize, field demonstrations were carried out in 75 ha under TN-IAMWARM project. The sub basin soil type ranged from sandy loam to sandy clay loam with low, medium and medium NPK availability. The demonstrations were carried out during February to May 2010 with the hybrid maize variety viz., M 900 adopting a seed rate of 20 kg ha⁻¹. The improved production technologies consisted of use of hybrid seeds, wider spacing (25x60 cm), fertilizer application at recommended levels (250:75:75 NPK ha⁻¹), boron nutrition for proper cob filling, use of azospirillum (2 kg ha⁻¹) and use of pre emergence herbicide (atrazine @ 500g ha⁻¹.) The demonstrations were conducted during 2009-10 in Pudukkottai (Varappur village), Kunnandarkovil (Odukkur village), Gandarvakkottai (Namburanpattu, Regunathapuram, Pisanathur, Mattangal and Athangaraividuthi villages) and Karambakkudi (Karambakkudi and

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Karambaviduthi villages) blocks of Pudukkottai district; Pattukkottai (Thokkalikadu, Ennanivayal and Kargavayal villages), Sethubhavachathiram (Pallathur and Chokkanatha puram villages) and Thiruvonam (Nambivayal, Akkaraivattam and Unjiyaviduthi villages) blocks of Thanjavur District. In all the villages, the demonstrations were conducted with due care adopting all improved practices recommended for maize. The biometric observations and grain yield were recorded for all the demonstrations and compared with neighbouring farmers practice.

Results and Discussion

The results obtained from the large scale field demonstrations in various soil types clearly indicated the superiority of improved maize production technologies viz., use of quality hybrid seeds, optimum spacing, use of pre-emergence herbicide, balanced and optimum fertilization and use of micronutrients especially boron. In Pudukkottai District, totally 39 demonstrations were conducted in 39 ha. In Karambakkudi blocks, 9 demonstrations were conducted covering Karambakkudi (4),

Table 1. Influence of improved production technologies on maize in Agniyar sub basin, Tamil Nadu

District / block village	Yield attributes						Grain Yield				Economics					
	Plant height at 60 DAS (cm)		Cob length (cm)		Grains cob ⁻¹		IPT (kg ha ⁻¹)			Conventional (kg ha ⁻¹)	Net return (Rs ha ⁻¹)		B:C ratio			
	No. of demo	IPT	Con.	IPT	Con.	IPT	Con.	Max	Min	Mean	Mean	% increase	IPT	Con	IPT	Con
I. Thanjavur district (Pattukkottai Block)																
Thokkalikadu	02	157	109	20.9	13.2	420	294	6,300	6,250	6,275	3,400	84	24,550	15,560	2.47	1.26
Ennanivayal	04	150	112	19.5	12.8	423	290	5,800	5,200	5,475	3,362	63	23,845	14,210	2.52	1.28
Karugavayal	04	152	116	20.5	13.1	420	301	6,100	5,500	5,800	3,200	81	21,405	13,000	2.39	1.25
Sethubhavachathiram Block																
Pallathur	03	147	102	19.5	12.0	423	295	5,800	5,200	5,466	3,400	61	20,060	12,900	2.08	1.20
Chockanathapuram	02	150	113	20.4	11.9	426	296	5,500	5,300	5,400	3,150	71	20,950	11,960	2.30	1.18
II. Pudukkottai district(Thiruvonam Block)																
Nambivayal	15	143	97	21.0	13.5	423	292	6,400	5,800	5,970	3,436	74	24,560	14,450	2.41	1.05
Akkaraivattam	04	155	108	21.4	13.7	421	289	6,500	5,900	6,187	3,750	65	21,050	12,750	2.29	1.21
Unjiyaviduthi	02	151	114	21.0	13.1	420	289	6,100	5,900	6,000	3,750	60	22,270	13,670	2.22	1.09
Karambakkudi block																
Karambaviduthi	01	155	111	20.5	13.0	421	286	6,300	6,300	6,300	3,650	69	22,075	13,835	2.19	1.16
Karambakkudi	04	150	109	22.0	13.4	425	295	6,500	6,100	6,275	3,762	67	21,090	12,900	2.28	1.23
Namburanpatti	01	156	110	19.6	12.7	426	282	5,850	5,850	5,850	3,850	51	21,690	13,660	2.09	1.11
Kunnandarkovil block																
Odukkur	05	149	99	20.5	12.3	419	290	6,550	6,200	6,370	3,650	74	19,995	11,095	2.26	1.21
Pudukkottai block																
Pulavankadu	05	152	115	21.6	10.4	424	298	6,200	5,800	6,000	3,714	61	22,900	11,800	2.19	1.22
Perungalur	08	155	98	19.4	12.1	423	309	5,900	5,200	5,550	3,562	54	21,845	11,750	2.35	1.28
Varappur	05	160	121	18.8	9.8	427	281	5,750	5,300	5,510	3,710	48	21,450	12,750	2.14	1.11
Gandarvakkottai block																
Pisanathur	03	149	113	18.0	11.0	426	311	5,450	5,300	5,383	3,650	47	23,025	12,890	2.17	1.17
Athankaraviduthi	02	157	122	21.4	11.1	420	299	6,100	5,600	5,850	3,650	60	23,245	12,375	2.18	1.18
Mattangal	02	150	119	21.6	12.0	422	303	6,150	6,000	6,075	3,420	77	20,065	10,995	2.27	1.16
Regunathapuram	03	148	101	18.5	12.1	427	309	5,900	5,450	5,583	3,666	52	19,950	12,900	2.14	1.30

IPT – Improved Production Technology; Con - Conventional

Karambaviduthi (1), Namburanpattu (1) and Regunathapuram (3) villages. In all the demonstrations, performance of maize was superior over farmers practices like use of local variety, reduced spacing, avoidance of herbicides, micronutrients and use of reduced quantity of NPK fertilizer and fertilization at improper stage. The earlier experimental results proved that a combination of N, P, K, Mg and micro nutrients viz., Fe, Cu and Zn registered a higher yield than the single application of N, P, K, and a combination of NP, NK, PK or NPK. (Kayode and Agboola, 1983). Enhanced maize grain due to use of micronutrients was earlier reported by Velayutham *et al.* (2003). The yield attributes viz., plant height, cob length, no. of grains cob⁻¹ were found to be higher due to improved package over farmer's practices which ultimately resulted in enhanced grain yield. The average grain yield ranged between 5400 and 6370 kg ha⁻¹ under improved package among the various villages of demonstrations. While in farmer's

practice, it was between 3150 and 3850 kg ha⁻¹ and the percent increase in grain yield ranged between 47 and 84 over farmer's practice. Similar yield enhancement due to adoption of improved maize production technology was earlier reported by Dhaka *et al.* (2010). Gandarvakkottai block is one of the potential blocks for maize cultivation in Pudukkottai district. Among 13 demonstrations conducted in four villages of this block viz., Pisanathur (3), Athankaraviduthi (2), Mattangal (2) and Regunathapuram (3), the average maize yield ranged from 5383 to 6075 kg ha⁻¹ and 3420 to 3666 kg ha⁻¹, respectively under improved maize production technology and farmers practices. The corresponding per cent increase ranged from 47 to 77 due to adoption of improved cultivation practices. Similarly, in Kunnandarkovil and Pudukkottai block, the average grain yield increase was 74 per cent out of 5 demonstrations conducted in Odukkur village and 61, 54 and 48 per cent in Pudukkottai, Pulavankadu, Perungalur and Varappur villages, respectively.

The net return and B: C was also worked out for all the demonstrations conducted in different villages of the sub-basin. The net return obtained under improved package ranged between Rs. 19,950/- and 34,560/-. While, it was between Rs. 10,995/- and 15560/- under farmer's practice among the 75 demonstrations conducted in different villages of the sub-basin. The B: C ratio of improved cultivation practices ranged from 2.08 to 2.52 and 1.08 to 1.30 under farmer's practice respectively. The economic analysis of yield under different management systems revealed that the IPT demonstration recorded higher net return with higher B: C ratio compared to farmer's practice irrespective of locations of demonstration. This result is in agreement with findings of Hiremath and Nagarajan (2009). The variation in maize grain yield among different villages of demonstration is mainly attributed to the variation in soil type, fertility, rainfall distribution and vagaries of weather condition prevailed in the demonstration areas. As a whole, the farmers of the demonstration and neighbouring villages were very much impressed and motivated by the results of improved packages adopted in demonstrations and this message was taken to the masses by field days conducted in demonstration plots at critical crop growth stages and farmers of the sub basin continue to adopt the improved package for better maize yield and return.

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