AU
e ISSN-0976-6847
Agriculture Update
Volume **12** | TECHSEAR-10 | 2017 | 2763-2766
Visit us : *www.researchjournal.co.in*

RESEARCH ARTICLE :

Evaluation of foxtail millet (*Setariaitalica* L.) based intercropping systemsunder late sown conditions

B. HIMASREE, V. CHANDRIKA, N.V. SARALA AND A. PRASANTHI

ARTICLE CHRONICLE :
Received :
11.07.2017;
Accepted :
25.08.2017

SUMMARY : In order to investigate the influence of nature of scion on graft success, subsequent growth of scion shoot and development of the successful grafts in guava, a field experiment was carried out in Nursery unit of Dr. P.D.K.V, Akola during the year 2015-16.The results were obtained for the correlation co-efficient. The correlation co-efficient indicates the presence of inherent association between various characters.The final survival of guava grafts were positively and significantly correlated with days required for bud sprouting (r=0.845**),graft take percentage(r=0.970**),scion length (r=0.956**)number of leaves (r=0.984**) and leaf area(r=0.809*)in relation with green quadrangular terminal shoot used as scion, while final survival was negatively associated with days required for sprouting when the brown corky shoot concerned.

How to cite this article : B. Himasree, V. Chandrika, N.V. Sarala and A. Prasanthi (2017). Evaluation of foxtail millet (*Setariaitalica* L.) based intercropping systemsunder late sown conditions. *Agric. Update*, **12** (TECHSEAR-10) : 2763-2766.

KEY WORDS :
Foxtail millet, Times of sowing, Intercropping system, Growth, Yield

Author for correspondence :
B. HIMASREE
Department of Agronomy, S.V. Agricultural College, TIRUPATI (A.P.) INDIA
Email : himasreereddyb@gmail.com
See end of the article for authors' affiliations

BACKGROUND AND OBJECTIVES

Millets have been called ¨Nutri grains¨ since they are rich in micro nutrients like minerals and B complex vitamins.Small millets have gained their attention owing to their inherent capacity of early maturity, higher yields due to C_4 plant type, capacity to yield even in poor soil under low rainfall and poor management conditions; hence they are popularly known as ¨climate resilient¨ crops in Indian agriculture. Small millets provide much needed food and fodder security of the nation. Among minor millets, foxtail millet and barnyard millet have low glycemic index. Consumption of these grains has demonstrated positive health benefits among the diabetics and they are known as ¨wonder grains¨.

Foxtail millet can be planted when it is too late to plant most other crops. It keeps growing at 300 – 400 mm annual rainfall also in semi arid areas. As it is a climate resilient crop because of the potential abiotic stress tolerance, it can ensure ecological security also. To stabilize crop production and to provide insurance against aberrant weather situations in rainfed agriculture, intercropping of millets with pulses such as pigeonpea could be a viable risk minimizing agronomic means of sustainable venture. Especially the information on promising intercropping systems under

delayed monsoon conditions has been lacking which is required for contingency planning.Hence, promising foxtail millet based intercropping systems were tested for their response to different times of sowingto evaluate their yield potentiality.

RESOURCES AND METHODS

A field experiment was carried out during late*kharif*, 2016 at S.V. Agricultural College Farm, Tirupati. The experimental soil was sandyloam in texture, slightly acidicin reaction (pH 6.1), medium in organic carbon (0.52 %) and low in available nitrogen (185 kg ha^{-1}), high in available phosphorus (28 kg ha^{-1}) and medium in potassium (204 kg ha^{-1}). The experiment was laid out in split-plot design with twelve treatment combinations and replicated thrice.The treatments comprised of three times of sowing (first fortnight of August, second fortnight of August and first fortnight of September) and four intercropping systems (foxtail millet + pigeonpea (5 : 1), foxtail millet + castor (5 : 1), foxtail millet + black gram (3 : 3) and foxtail millet + cowpea (3 : 3)). Foxtail millet as well as intercrops were sown in lines, 30 cm apart by adopting all the standard package of practices. Recommended dose of fertilizer (50 kg N 30 kg P_2O_5 and 20 kg K_2O)was applied to foxtail millet only in all the treatments. The scheduled nitrogen was applied in two equal splits *viz.*, first half at the time of sowing as basal and remaining half as top dressing at 30 DAS.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads :

Effect of times of sowing on growth and yield of foxtail millet :

Among the three differenttimes of sowing evaluated, taller plants, maximum leaf area and higher total number of tillers $hill^{-1}$and drymatter production of foxtail millet were noticed with first fortnight of August sowing and was significantly superior to rest of the two times of sowing, which were comparable with each other. Lower values of these growth parameters were registered when the sowing was done during first fortnight of September(Table 1).

The yield attributing characters of foxtail millet *viz.*, number of productive tillers $hill^{-1}$, number of panicles m^{-2},panicle length, panicle weight and grain weight panicle-

Table 1 : Growth parameters of foxtail millet at harvest as influenced by times of sowing and intercropping systems

Treatments	Plant height (cm)	Leaf area index	Number of tillers m^{-2}	Drymatter production (kg ha^{-1})
Times of sowing				
T_1 : I Fortnight of August	102.8	1.43	3.8	2975
T_2 : II Fortnight of August	93.5	1.15	3.0	2787
T_3 : I Fortnight of September	88.7	1.11	2.5	2723
S.E. ±	2.19	0.033	0.10	46.9
CD (P=0.05)	8.6	0.13	0.4	183
Intercropping systems				
C_1 : Foxtail millet + pigeonpea(5 : 1)	106.3	1.52	3.4	3119
C_2 : Foxtail millet + castor (5 : 1)	103.0	1.38	3.4	3090
C_3 : Foxtail millet + black gram (3 : 3)	88.7	1.11	2.9	2560
C_4 : Foxtail millet + cowpea (3 : 3)	81.9	0.90	2.7	2544
S.E. ±	3.67	0.079	0.16	44.3
CD (P=0.05)	10.9	0.23	0.4	132
Interaction				
C at T				
S.E. ±	4.39	0.066	0.20	93.7
CD (P=0.05)	NS	NS	NS	NS
T at C				
S.E. ±	5.93	0.123	0.28	81.3
CD (P=0.05)	NS	NS	NS	NS

NS=Non-significant

[1] were found to be significantly higher with the first fortnight of August sowing and was having significant disparity with that of other two times of sowing, which were on par with each other.Lower values of these yield attributes were produced when sowing was done during first fortnight of September (Table 2).Thousand grain weight of foxtail millet was not significantly influenced by different times of sowing.

First fortnight of August sowings produced significantly higher grain and straw yields of foxtail millet which was significantly superior to that of other two times of sowing, which were on par with each other.While grain and straw yields of foxtail millet were at their lower value with first fortnight of September sowing (Table2).Superiority of early sown foxtail millet crop in plant height, number of tillers, leaf area has resulted in higher dry matter accumulation which has contributed to higher values of yield attributes and was reflected in higher grain and straw yields. The results were in conformity with the findings of Rao *et. al.* (1991), Jadhav*et. al.* (1995) and Ramachandrappa*et. al.* (2016).

Effect of intercropping on growth and yield of foxtail millet :

Higher expression of all the growth parameters and yield attributes of foxtail millet were observed with the intercropping system of foxtail millet + pigeonpea (5 : 1), which was in parity with foxtail millet + castor (5 : 1) intercropping system. While all these parameters were at their lower value with the intercropping system of foxtail millet + cowpea (3 : 3)(Table 1& 2).

Significantlyhigher grain and straw yieldsof foxtail millet were observed with the intercropping system of foxtail millet + pigeonpea (5 : 1), which was comparable with foxtail millet + castor (5 : 1) intercropping system. While lower grain and straw yields were registered with foxtail millet + cowpea (3 : 3) intercropping system(Table 2)

Higher grain and straw yields with the intercropping of foxtail millet + pigeonpea (5 : 1) might be due to significantly higher plant population of foxtail millet, productive tillers per hill, panicles per m^2, panicle length and grain weight per panicle at 5 : 1 row ratio than that

Table 2 : Yield attributes and yield of foxtail millet as influenced by times of sowing and intercropping systems

Treatments	Panicle length (cm)	Panicle weight (g)	Grain weight panicle^{-1} (g)	1000 grain weight (g)	Grain yield (kg ha^{-1})	Straw yield (kg ha^{-1})
Times of sowing						
T_1 : I Fortnight of August	12.6	3.60	2.04	2.60	823	1565
T_2 : II Fortnight of August	10.9	3.35	1.71	2.58	767	1227
T_3 : I Fortnight of September	10.5	3.25	1.56	2.54	753	1063
S.E. ±	0.39	0.062	0.04	0.03	12.3	69.3
CD (P=0.05)	1.5	0.24	0.2	NS	48	271
Intercropping systems						
C_1 : Foxtail millet + pigeonpea (5 : 1)	12.4	3.79	2.16	2.70	974	1553
C_2 : Foxtail millet + castor (5 :1)	11.8	3.51	1.93	2.60	966	1539
C_3 : Foxtail millet + black gram (3 : 3)	10.8	3.13	1.62	2.50	599	1036
C_4 : Foxtail millet + cowpea (3 : 3)	10.2	3.10	1.52	2.49	587	1012
S.E. ±	0.32	0.121	0.12	0.04	23.8	66.7
CD (P=0.05)	0.9	0.36	0.3	0.1	71	198
Interaction						
C at T						
S.E. ±	0.78	0.12	0.09	0.06	24.7	138.6
CD (P=0.05)	NS	NS	NS	NS	NS	NS
T at C						
S.E. ±	0.63	0.19	0.17	0.07	37.8	121.7
CD (P=0.05)	NS	NS	NS	NS	NS	NS

NS=Non-significant

at 3 : 3 row ratio coupled with the better complementary relationship with the intercrop in the system. As pigeonpea and castor are long duration crops, their initial growth was slow providing foxtail millet enough time to grow, establish and achieve higher grain and straw yields. But the growth of cowpea and blackgram crops was vigorous in the early stages leading to smothering effect which resulted in lower grain and straw yields of foxtail millet. Similar results were obtained by Shashidhara*et. al.* (2000), Basavarajappa*et. al.* (2003) and Padhi *et. al.* (2010).

Higher productivity of foxtail millet could be obtained with intercropping system of foxtail millet + pigeonpea (5 : 1) sown during first fortnight of August during *kharif* season, indicating its suitability for cultivation under late sownconditions.

Authors' affiliations :

V. CHANDRIKA, N.V. SARALA AND A. PRASANTHI, Department of Agronomy, S.V. Agricultural College, TIRUPATI (A.P.) INDIA

REFERENCES

Basavarajappa, R and Prabhakar, A.S. 2002. Effect of planting geometry and plant density on yield performance of foxtail millet based intercropping systems under red soils of transitional tract.*Karnataka Journal of Agricultural Sciences*. 15(3): 450-458.

Jadhav, A.S., Bhargava, S.S., Yadav, M.V., Verma, O.P.S and Shaikh, A.A. 1995. Influence of sowing time and nitrogen fertilization on yield of rainfed pearl millet (*Penniset umglaucum*). *Indian Journal of Agronomy*. 40(2): 212-216.

Padhi, A.K., Panigrahi, R.K and Jena, B.K. 2010.Effect of planting geometry and duration of intercrops on performance of pigeonpea – finger millet intercropping systems.*Indian Journal of Agricultural Research*. 44(1): 43-47.

Ramachandrappa, B.K., Thimmegowda, M.N., Sathish, A., Jagadeesh, B.N., Devaraja, K., Srikanth Babu, P.N and Savitha, M.S. 2016. Real time contingency measures to cope with rainfall variability in Southern Karnataka. *Indian Journal of Dryland Agriculture Research and Development*. 31(1): 37-43.

Rao, K.L., Raju, D.V.N and Rao, C.P. 1991. Effect of planting time and plant population on growth and yield of finger millet (*Eleusinecoracana*) varieties.*Annals of Agricultural Research.*12(1): 14-19.

Shashidhara, G.B., Basavarajappa, R and Nadagouda, V.B. 2000.Studies on pigeonpea intercropping systems in small millets under shallow red soils.*Karnataka Journal of Agricultural Sciences*. 13(1): 7-10.