

## SHORT COMMUNICATION

## SUGARCANE WEED FLORA IN KRISHNA AGROCLIMATIC ZONE OF ANDHRA PRADESH

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### Abstract

A field survey was conducted during 2009-12 in sugarcane fields of Krishna zone of Andhra Pradesh to study the weed flora. A total of 86 weed species were recorded, of which 13 were grasses, one sedge and 72 broad leaf weeds belonging to 30 families. Among the weeds, *Panicum repens* is the most dominant with Importance Value Index (IVI) of 17.90 followed by *Cyperus rotundus* (17.37), *Echinochloa colona* (14.52) and *Dinebra retroflexa* (12.76). The survey also revealed that creepers like *Passiflora foetida*, *Ipomoea aquatica*, *Ipomoea hederacea*, *Hemidesmus indicus*, *Tinospora cardifolia*, etc. as recent introduction in this zone at maturity stage.

**Key words:** Sugarcane, weed flora, Importance Value Index

Sugarcane is an important commercial crop grown in Krishna Zone of Andhra Pradesh mostly under irrigated conditions. Among several problems faced in sugarcane cultivation, weeds are identified as one of the serious problems resulting in low yields in sugarcane. Slow germination of sugarcane setts, initial slow pace of growth, wider row spacing, frequent irrigations and excessive use of fertilizers and long duration of the crop are some of the reasons for severe weed problem which ultimately reduce growth and cane yield ranging from 38 to 76% (Phogat *et al.* 1990 and Chauhan and Singh 1993). Changes in the weed flora exposed to cultural, mechanical and chemical control make it necessary to study weed communities and determine their

composition to improve methods of their control. Keeping this in view, the present survey was undertaken in sugarcane crop in Krishna Zone of Andhra Pradesh.

Survey of weed flora in fields under sugarcane crop of Krishna Agroclimatic zone comprising Krishna, Guntur and Prakasam districts of Andhra Pradesh was conducted during 2009-12. The Krishna zone of Andhra Pradesh is geographically situated between 14° 57' to 17° 9' N latitude and 78° 45' to 81° 33' E longitude. The climate of the zone is subtropical with an annual average rainfall of 888 mm with bimodal distribution. For recording observations on the weed flora, a stop was made after every 10 km in the selected route in different districts of the Zone. The location for recording the composition and density of various weed species was selected about 200 meters away from the road. Species-wise weed counts were made from five spots in the crop field using a quadrat of 50 cm x 50 cm size. Data were analyzed to determine density (D), frequency (F), Relative density (Re.D), Relative frequency (Re.F) and Importance Value Index (IVI) as per the method used by Kim and Moody (1980); Raju *et al.* (1995); Behera *et al.* (1999). The data collected in the three years of survey from all the three districts were pooled and the mean was calculated.

The present weed survey indicated that sugarcane crop was infested with a total of 86 weed species, including 13 grasses, one sedge and 72 broad leaf weeds belonging to 30 families. A complete list of weeds along with density, frequency and IVI is given in Table 1 arranged in the decreasing order of IVI magnitude. Poaceae was the largest family representing 13 weed species followed by Asteraceae (10), Euphorbiaceae (9), Amaranthaceae (8) and the remaining 26 families representing from one to four weeds. Among all the

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**Table 1.** Dominant weed flora in sugarcane crop of Krishna zone, Andhra Pradesh (pooled data of 3 years)

S. No.	Name of the weed	Family	Density	Re.D	Frequency	Re.F	IVI
1	<i>Panicum repens</i> L.	Poaceae	2.06	20.32	0.49	15.49	17.90
2	<i>Cyperus rotundus</i> L.	Cyperaceae	1.56	19.40	0.46	15.34	17.37
3	<i>Echinochloa colona</i> (L.) Link	Poaceae	0.98	15.24	0.40	13.81	14.52
4	<i>Dinebra retroflexa</i> (Vahl) Panzer	Poaceae	0.77	11.70	0.42	13.81	12.76
5	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	0.89	12.36	0.35	11.49	11.93
6	<i>Convolvulus arvensis</i> L.	Convolvulaceae	0.68	11.67	0.35	11.09	11.38
7	<i>Merremia emarginata</i> (Burm.f.) Hall. f.	Convolvulaceae	1.91	11.45	0.39	11.00	11.22
8	<i>Nasturtium indicum</i> (L.) Hiern	Brassicaceae	0.82	12.17	0.25	8.48	10.33
9	<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	0.75	8.36	0.40	11.52	9.94
10	<i>Cyanotis axillaris</i> (L.) Sweet	Commelinaceae	0.88	9.14	0.35	10.14	9.64
11	<i>Phyllanthus niruri</i> Linn.	Euphorbiaceae	0.60	8.57	0.34	10.15	9.36
12	<i>Digera arvensis</i> Forsk.	Amaranthaceae	0.62	8.41	0.32	9.56	8.99
13	<i>Digitaria sanguinalis</i> (L.) Scop.	Poaceae	0.54	8.83	0.25	8.48	8.66
14	<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	0.37	6.98	0.30	9.54	8.26
15	<i>Parthenium hysterophorus</i> L.	Asteraceae	0.48	7.67	0.26	8.12	7.90
16	<i>Commelina benghalensis</i> L.	Commelinaceae	0.50	7.59	0.25	8.20	7.89
17	<i>Croton bonplandianum</i> Baill.	Euphorbiaceae	0.76	9.14	0.31	6.63	7.88
18	<i>Cucumis trigonus</i> Roxb.	Cucurbitaceae	0.75	8.48	0.26	7.11	7.80
19	<i>Trianthema portulacastrum</i> L.	Aizoaceae	0.68	7.13	0.26	8.29	7.71
20	<i>Marsilea quadrifolia</i> L.	Marsileaceae	1.71	10.23	0.16	5.08	7.65
21	<i>Achyranthes aspera</i> L.	Amaranthaceae	0.76	5.96	0.36	8.82	7.39
22	<i>Amaranthus viridis</i> L.	Amaranthaceae	0.45	6.46	0.29	8.21	7.33
23	<i>Xanthium strumarium</i> L. Cocklebur	Asteraceae	0.13	6.06	0.13	8.33	7.20
24	<i>Portulaca oleracea</i> L.	Portulacaceae	0.50	6.30	0.26	8.00	7.15
25	<i>Acalypha indica</i> L.	Euphorbiaceae	0.34	6.14	0.21	7.54	6.84
26	<i>Ageratum conyzoides</i> L.	Asteraceae	0.26	6.79	0.17	6.51	6.65
27	<i>Eclipta alba</i> (L.)	Asteraceae	0.47	6.52	0.20	6.38	6.45
28	<i>Cyanotis cucullata</i> (Roth) Kunth	Commelinaceae	0.25	5.86	0.19	7.02	6.44
29	<i>Panicum psilopodium</i> Trin.	Poaceae	2.45	7.74	0.20	4.43	6.09
30	<i>Imperata cylindrical</i> P.Beauv.	Poaceae	0.41	6.12	0.20	5.42	5.77
31	<i>Portulaca quadrifida</i> L.	Portulacaceae	1.20	5.92	0.22	5.60	5.76
32	<i>Dactyloctenium aegyptium</i> (L.) Beauv	Poaceae	0.38	5.88	0.21	5.61	5.74
33	<i>Ocimum canum</i> Sims	Lamiaceae	0.27	4.33	0.22	6.94	5.63
34	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	0.31	4.70	0.24	6.30	5.50
35	<i>Physalis minima</i> L.	Solanaceae	0.26	4.19	0.21	6.38	5.28
36	<i>Cleome viscosa</i> L.	Capparaceae	0.30	4.88	0.17	4.99	4.93
37	<i>Alternanthera sessilis</i> (L.) R. Br.	Amaranthaceae	0.35	4.21	0.18	5.58	4.90
38	<i>Leptochloa chinensis</i> (L.) Nees	Poaceae	0.25	4.33	0.18	5.36	4.84
39	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	0.29	4.77	0.15	4.67	4.72
40	<i>Paspalum conjugatum</i> Berg.	Poaceae	0.31	4.26	0.16	5.17	4.71

41	<i>Euphorbia microphylla</i> Heyne	Euphorbiaceae	0.16	4.23	0.14	5.02	4.63
42	<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	0.20	4.12	0.13	4.90	4.51
43	<i>Euphorbia hirta</i> L.	Euphorbiaceae	0.25	4.28	0.17	4.69	4.48
44	<i>Lippia nodiflora</i> (L.) Greene	Verbenaceae	0.20	4.42	0.17	4.40	4.41
45	<i>Corchorus trilocularis</i> L.	Tiliaceae	0.43	3.94	0.19	4.81	4.37
46	<i>Trianthema decandra</i> Linn.	Aizoaceae	0.30	3.65	0.18	4.98	4.32
47	<i>Ammannia baccifera</i> L.	Lythraceae	0.20	2.78	0.20	5.76	4.27
48	<i>Corchorus oltorius</i> L.	Tiliaceae	0.24	3.09	0.19	5.02	4.05
49	<i>Tragia involucrata</i> L.	Euphorbiaceae	0.11	4.22	0.07	3.86	4.04
50	<i>Passiflora foetida</i> L.	Passifloraceae	0.40	2.38	0.22	5.56	3.97
51	<i>Euphorbia virgata</i> Waldst. Et Kit.	Euphorbiaceae	0.34	2.77	0.21	4.90	3.83
52	<i>Cassia angustifolia</i> Vahl.	Fabaceae	0.20	2.62	0.17	4.72	3.67
53	<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	0.11	3.38	0.08	3.50	3.44
54	<i>Gnaphalium polycaulon</i> L.	Asteraceae	0.13	3.63	0.09	3.19	3.41
55	<i>Nicotiana plumbaginifolia</i> Viv.	Solanaceae	0.17	2.60	0.13	3.55	3.08
56	<i>Solanum xanthocarpum</i> Schrad. & Windl.	Solanaceae	0.16	2.06	0.16	4.01	3.03
57	<i>Chenopodium album</i> L.	Amaranthaceae	0.47	2.08	0.27	3.81	2.95
58	<i>Waltheria indica</i> L.	Sterculiaceae	0.13	1.93	0.13	3.93	2.93
59	<i>Phaseolus trilobus</i> Ait.	Fabaceae	0.10	2.26	0.10	3.60	2.93
60	<i>Biophytum sensitivum</i> (L.) DC.	Oxalidaceae	0.14	2.42	0.07	2.98	2.70
61	<i>Ipomoea hederacea</i> (L.) Jacq.	Convolvulaceae	0.12	1.69	0.10	3.36	2.52
62	<i>Sporobolus coromandelianus</i> (Retz.) Kunth	Poaceae	0.17	2.50	0.10	2.44	2.47
63	<i>Chloris barbata</i> F. Divaricata Kuntze Sw.	Poaceae	0.04	1.71	0.04	2.78	2.24
64	<i>Hemidesmus indicus</i> (Linn.) R.Br.	Asclepiadaceae	0.13	2.38	0.07	2.08	2.23
65	<i>Chrozophora rotleri</i> (Geisel) A. Juss.	Euphorbiaceae	0.16	1.77	0.07	1.96	1.86
66	<i>Ludwigia parviflora</i> L.	Onagraceae	0.08	1.89	0.06	1.83	1.86
67	<i>Cleome chelidonii</i> L.F.	Capparaceae	0.33	2.14	0.11	1.50	1.82
68	<i>Breynia retusa</i> (Dennst.) Alston.	Phyllanthaceae	0.07	1.49	0.07	2.10	1.80
69	<i>Celosia argentea</i> L.	Amaranthaceae	0.17	1.36	0.13	2.11	1.73
70	<i>Grangea maderaspatana</i> (L.) Poir.	Asteraceae	0.07	1.96	0.04	1.48	1.72
71	<i>Tridax procumbens</i> L.	Asteraceae	0.07	1.96	0.04	1.48	1.72
72	<i>Tinospora cardifolia</i> (Wild.) Hook. F. & Thamsom.	Menispermaceae	0.20	1.83	0.07	1.54	1.69
73	<i>Sphaeranthus indicus</i> L.	Asteraceae	0.09	1.01	0.07	1.96	1.49
74	<i>Rhynchosia minima</i> (L.) D.C.	Papilionaceae	0.07	1.33	0.04	1.59	1.46
75	<i>Stemodia viscosa</i> Roxb.	Scrophulariaceae	0.02	1.01	0.02	1.39	1.20
76	<i>Cleome gynandra</i> (L.) Briq.	Capparaceae	0.04	0.74	0.04	1.48	1.11
77	<i>Amaranthus spinosus</i> L.	Amaranthaceae	0.07	0.48	0.04	1.31	0.90
78	<i>Basilicum polystachyon</i> (L.) Moench	Lamiaceae	0.04	0.57	0.04	1.17	0.87
79	<i>Vicoa indica</i> L.	Asteraceae	0.07	0.43	0.04	0.89	0.66

S. No.	Name of the plant	Family	Density	Re.D	Frequency	Re.F	IVI
80	<i>Euphorbia geniculata</i> L.	Euphorbiaceae	0.03	0.53	0.02	0.77	0.65
81	<i>Barleria cristata</i> L.	Acanthaceae	0.02	0.53	0.02	0.69	0.61
82	<i>Sida acuta</i> Burm. F.	Malvaceae	0.02	0.43	0.02	0.65	0.54
83	<i>Diplocyclos palmatus</i> (L.) C. Jeffrey	Cucurbitaceae	0.02	0.43	0.02	0.48	0.46
84	<i>Hibiscus ficulneus</i> Linn.	Malvaceae	0.02	0.43	0.02	0.48	0.46
85	<i>Mollugo lotoides</i> (Linn.) C. B. Clarke	Aizoaceae	0.02	0.28	0.02	0.62	0.45
86	<i>Rungia repens</i> (L.) Nees	Acanthaceae	0.02	0.34	0.02	0.51	0.42

Note: Re.D = Relative Density, Re.F = Relative Frequency, IVI = Importance Value Index

weeds and grasses, *Panicum repens* was the most dominant weed with IVI of 17.90 followed by *Cyperus rotundus* (17.37), *Echinochloa colona* (14.52) and *Dinebra retroflexa* (12.76). Among the broad leaf weeds, *Convolvulus arvensis* (11.38) was the most dominant weed followed by *Merremia emarginata* (11.22), *Nasturtium indicum* (10.33) and *Coccinia grandis* (9.94). Further, new creeper weeds such as *Passiflora foetida*, *Hemidesmus indicus*, *Tinospora cardifolia*, *Basilicum polystachyon*, *Diplocyclos palmatus*, etc. were observed at certain places during maturity stage of sugarcane.

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