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Sugarcane weed flora in Chittoor district of Southern agro-climatic zone of Andhra Pradesh

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Abstract

A field survey was conducted during 2019-2020 in sugarcane fields of Chittoor district of southern agro climatic zone of Andhra Pradesh to study the weed flora. Field surveys at random sugarcane fields have been well explored covering all the geographical areas of Chittoor district for weed survey. The weeds encountered in the field sites of the crop fields were carefully collected and identified. The location for recording the composition and density of various weed species selected was 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 analysed to determine density (D), frequency (F), Relative density (Re.D), Relative frequency (Re.F) and Importance Value Index (IVI). Study on weed survey indicated that sugarcane crop both plant and ratoon was infested with a total of 42 weed species, which included 08 grasses, one sedge and 33 broad leaf weeds of different families. In sugarcane plant crop the important value index revealed that most important grassy weeds with in the community, *Cynodon dactylon*, *Digitaria sanguinalis*, *Chloris barbata*, *Dactyloctenium aegyptium*, *Panicum repens* and *Echinochloa colona*. Under broad leaved weeds; *Coccinia grandis*, *Cleome viscosa*, *Convolvulus arvensis*, *Alternanthera sessilis* and *Commelina benghalensis* were dominated. Where as In ratoon sugarcane, *Cynodon dactylon*, *Digitaria sanguinalis*, *Chloris barbata*, *Soprobolus sp* were dominated grassy weeds. *Trianthema portulacastrum*, *Phyllanthus niruri*, *Parthenium hysterophorus*, *Digeria arvensis*, *Clitoria ternatea* and *Ipomoea aquatic* dominated broad leaved weeds. *Cyperus rotundus* is major dominated sedge in both plant and ratoon crop.

Keywords: Sugarcane, weed flora, important value index

Introduction

Sugarcane is the one of major commercial crop cultivated in Chittoor district for jaggery and for sugar factory. Presently only one sugar factory is servicing for farming community. Due to labour shortage and increased cost for labour and closing of sugar factories may decrease the area under sugarcane. Around 10,000 ha including plant and ratoon crop was cultivated during the year 2019-2020. Under different crop management practices, unchecked weed growth in sugarcane has caused yield losses to the extent of 15-70 per cent depending upon the nature, density and time of weed infestation. Even if the yield reduction due to weeds say 10 per cent the loss in cane and sugar yield in the country per annum may be around 25 million and 2.5 million tons respectively. Poor growth of cane resulting from weed infestation also affects quality. Weeds that is present in the furrows *i.e.*, along the cane rows causes more harm than those present in the inter- row spaces during early crop growth sub periods. Sugarcane is an important commercial crop grown in Chittoor district of southern agro-climatic 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) [5, 4]. 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. Identification and quantification of weed species present in different crop cultures and cropping systems helps to provide strategies for weed control methods in important crops that can be adapted by marginal farmers (Rao and Kiran 2012) [6] (Nagaraju *et al* 2014) [4]. Since not all the weed species are important to determine the nature of weed communities, it will be desirable to know the quantitative characters like density, frequency and importance value of individual species.

Keeping this in view, the present survey was undertaken in sugarcane crop in Chittoor district of Southern agro climatic zone of Andhra Pradesh.

Materials and Methods

Survey of weed flora in sugarcane fields of chittoor district was conducted during 2019-2020. The Chittoor district of Andhra Pradesh is geographically situated between 12° 37' to 14° 08' N latitude and 78°33' to 79° 55'E longitude with an annual average rainfall of 934 mm with both south west and north east monsoon periods. Sugarcane is one of the commercial crop cultivated in this area, and popular varieties grown are Bharani (2003V46), 86 V 96, 2005T16 Co 86032. The sugarcane fields with these varieties were selected for the weeds inventory survey in selected field sites. The studies were conducted before weeding during 2019-2020. Field surveys at random sugarcane fields have been well explored covering all the geographical areas of Chittoor district for weed survey. The weeds encountered in the field sites of the above crop fields were carefully collected and identified. The location for recording the composition and density of various weed species selected was 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 analysed to determine density (D), frequency (F), Relative density (Re.D), Relative frequency (Re.F) and Importance Value Index (IVI), applying the following principles, Misra (1968) [1] and Muller, Dombois and Ellenberg (1974) [2]. The present weed survey indicated that sugarcane crop was infested with different weed species at different stages of sugarcane viz., from planting to maturity in both plant and ratoon crop.

Weed density: Total amount of weeds per unit area as determined by counting or weighing.

Density:

$$\frac{\text{The number of individuals of species in all quadrates}}{\text{Total number of quadrates studied}}$$

Relative density:

$$\frac{\text{Density of a individual of species}}{\text{Total density of all species}} \times 100$$

Weed Frequency: Number of times the species occur in the sampling unit.

Frequency

$$\frac{\text{Total number of quadrates in which the species occur}}{\text{total number of quadrates studied}} \times 100$$

Relative frequency

$$\frac{\text{Frequency of individuals of species}}{\text{Total frequency of all species}} \times 100$$

Weed Abundance: Is a measure of individual weeds in a given area

Abundance

$$\frac{\text{Total number of individuals of a species in all quadrates}}{\text{Total number of quadrates in which the species occurred}}$$

Relative abundance

$$\frac{\text{Abundance of individual of a species}}{\text{Total abundance of all species}} \times 100$$

Importance value Index

Relative density + Relative frequency+ Relative abundance

Results and Discussion

During the period of study, a total of 42 weeds belonging different families identified as sugarcane crop weeds in the study area . Among the identified 42 weed species, including 08 grasses, one sedge and 33 broad leaf weeds of different families. Poaceae is the largest family representing with 08 species, Asteraceae occupies the second position with 06 species, The weeds like *Cyperus rotundus* and *Parthenium hysterophorus*, *Coccinia grandis*, *Convolvulus arvensis* show maximum infestation. However some of the weeds reported from the study area having positive aspects i.e., *Abutilon indicum*, *Tridax procumbens*, *Leucas aspera*, *Mimosa pudica*, etc. are of medicinal importance, used in traditional medicines by local people to treat their health problems. The weeds like *Acalypha indica*, *Amaranthus viridis*, *Boerhaavia diffusa*, *Eclipta alba*, *Coccinia grandis*, *Trianthema portulacastrum*, etc. are used in some cooking recipes of the study area. The data pertaining to abundance, density, frequency of weeds are presented in table Table-1.

In sugarcane plant crop based on data on important value index under grassy weeds, *Cynodon dactylon*, *Digitaria sanguinalis*, *Chloris barbata*, *Dactyloctenium aegyptium*, *Panicum repens* and *Echinochloa colona* under broad leaved weeds; *Coccinia grandis*, *Cleome viscosa* , *Convolvulus arvensis* , *Alternanthera sessilis* and *Commelina benghalensis* In ratoon sugarcane, *Cynodon dactylon*, *Digitaria sanguinalis*, *Chloris barbata*, *Soprobolas sp* were dominated grassy weeds. *Trianthema portulacastrum*, *Phyllanthus niruri*, *Parthenium hysterophorus*, *Digeria arvensis*, *Clitoria ternatea* and *Ipomoea aquatic* dominated broad leaved weeds. *Cyperus rotundus* is major dominated sedge in both plant and ratoon crop.

Table 1: Shows in weed's and Family

S. No	Name of the weed	Family
<i>Sedges</i>		
1	<i>Cyperus rotundus</i>	<i>Cyperaceae</i>
<i>Grassy weeds</i>		
1	<i>Cynodon dactylon</i>	<i>Poaceae</i>
2	<i>Digitaria sanguinalis</i>	<i>Poaceae</i>
3	<i>Dactyloctenium aegyptium</i> (L.)	<i>Poaceae</i>
4	<i>Chloris barbata</i>	<i>Poaceae</i>

5	<i>Panicum repens</i>	Poaceae
6	<i>Echinochloa colona (L.) Link</i>	Poaceae
7	<i>Sporobolus coromandelianus</i>	Poaceae
8	<i>Schizachyrium scoparium</i>	Poaceae
Broad leaved weeds		
1	<i>Trianthema portulacastrum</i>	Aizoaceae
2	<i>Vernonia cinerea</i>	Asteraceae
3	<i>Parthenium hysterophorus</i>	Asteraceae
4	<i>Commelina benghalensis</i>	Commelinaceae
5	<i>Physalis minima</i>	Solanaceae
6	<i>Cleome viscosa</i>	Capparaceae
7	<i>Alternanthera sessilis</i>	Amaranthaceae
8	<i>Euphorbia geniculata</i>	Euphorbiaceae
9	<i>Coccinia grandis</i>	Cucurbitaceae
10	<i>Convolvulus arvensis</i>	Convolvulaceae
11	<i>Alternanthera sessilis</i>	Amaranthaceae
12	<i>Commelina benghalensis</i>	Commelinaceae
13	<i>Clitoria ternatea</i>	Fabaceae
14	<i>Rhynchosia minima</i>	Papilionaceae
15	<i>Chenopodium album</i>	Amaranthaceae
16	<i>Euphorbia hirta</i>	Euphorbiaceae
17	<i>Ipomoea aquatica</i>	Convolvulaceae
18	<i>Ocimum canum</i>	Lamiaceae
19	<i>Abutilon indicum</i>	Malvaceae
20	<i>Celosia argentea</i>	Amaranthaceae
21	<i>Tridax procumbens</i>	Asteraceae
22	<i>Boerhavia diffusa</i>	Nyctaginaceae
23	<i>Acalypha indica</i>	Euphorbiaceae
24	<i>Leucas aspera</i>	Lamiaceae
25	<i>Tridax procumbens</i>	Asteraceae
26	<i>Tribulus terrestris</i>	Zygophyllaceae
27	<i>Achyranthes aspera</i>	Amaranthaceae
28	<i>Amaranthus viridis</i>	Amaranthaceae
29	<i>Cassia angustifolia</i>	Fabaceae
30	<i>Euphorbia geniculata</i>	Euphorbiaceae
31	<i>Corchorus olitorius</i>	Tiliaceae
32	<i>Ageratum conyzoides</i>	Asteraceae
33	<i>Eclipta alba</i>	Asteraceae

Table 2: Dominated Grassy weed in sugarcane plant crop

S. No	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Dactyloctenium aegyptium</i>	21	0.4	1.9	1.2	1.2	1.2	3.5
2	<i>Chloris barbata</i>	24	0.4	1.7	1.3	1.2	1.1	3.6
3	<i>Panicum repens</i>	14	0.3	2.1	0.8	0.9	1.3	2.9
4	<i>Cynodon dactylon</i>	32	0.7	2.0	1.8	1.9	1.3	5.0
5	<i>Echinochloa colona</i>	13	0.3	2.0	0.7	0.8	1.2	2.7
6	<i>Digitaria sanguinalis</i>	21	0.4	1.9	1.2	1.2	1.2	3.6

Dominated broad leaved weeds in sugarcane plant crop

S.NO	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Cleome viscosa</i>	29	0.6	2.1	1.6	1.8	1.3	4.7
2	<i>Coccinia grandis</i>	29	0.6	2.1	1.6	1.8	1.3	4.7
3	<i>Alternanthera sessilis</i>	29	0.5	1.6	1.6	1.3	1.0	3.9
4	<i>Convolvulus arvensis</i>	29	0.5	1.6	1.6	1.3	1.0	3.9
5	<i>Commelina benghalensis</i>	25	0.5	1.8	1.4	1.3	1.1	3.8

Sedges

S. No	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Cyperus rotundus</i>	42	0.9	2.0	2.3	2.5	1.2	6.1

Table 3: Dominated Grassy weed in sugarcane ratoon crop

S. No	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Digitaria sanguinalis</i>	21	0.4	1.9	1.2	1.2	1.2	3.5
2	<i>Chloris barbata</i>	14	0.3	2.1	0.8	0.9	1.3	2.9
3	<i>Soprobolas sp</i>	13	0.3	2.0	0.7	0.8	1.2	2.7
4	<i>Cynodon dactylon</i>	21	0.4	1.9	1.2	1.2	1.2	3.6
5	<i>Panicum repens</i>	13	0.3	2.0	0.7	0.8	1.2	2.7

Dominated broad leaved weeds in sugarcane plant crop

S. No	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Parthenium hysterophorus.</i>	35	0.8	2.1	1.9	2.2	1.3	5.5
2	<i>Clitoria ternatea (creeper)</i>	17	0.3	1.6	1.1	0.8	1.0	2.8
3	<i>Digeria arvensis</i>	19	0.3	1.6	1.1	0.9	1.0	3.0
4	<i>Ipomoea aquatica</i>	25	0.5	1.8	1.4	1.3	1.1	3.8
5	<i>Phyllanthus niruri Linn.</i>	32	0.7	2.3	1.8	2.1	1.4	5.3
6	<i>Trianthema portulacastrum</i>	35	0.7	2.1	1.7	2.0	1.3	5.0

Sedges

S. No	Weed	Density	Frequency	Abundance	Relative density	Relative Frequency	Relative abundance	Important value index
1	<i>Cyperus rotundus</i>	29	0.6	2.1	1.6	1.8	1.3	4.7

Conclusion

The weed survey indicated that identification of the weeds in sugarcane fields will help the farmers and agriculturists of the study area to identify the different types of weeds with different families, and thus help in planning a suitable strategy for their control as these weeds compete with sugarcane crop at different stages for resources and hence reduce its yield. They also affect the quality of the crop and cause enormous loss to the farmers. A detailed study on the weeds of sugarcane crop fields in chittoor district has clearly established the fact that the weed diversity in this region is high and significant. Diversity of weeds in the region is perhaps attributed to the availability of wide range of ecological conditions. The knowledge and information regarding weed type and phyto-sociological attributes of the weeds of sugarcane crop in Chittoor district will be communicated to farmers for effective weed management and for better crop yielding. It is also helpful in designing suitable weed management for this area.

References

- Misra R. Ecology work book. Oxford and IBH publishing company Ltd., New Delhi 1968.
- Muller Dombois, Ellenberg H. Aims and Methods of Vegetation Ecology. John Wiley and Sons, New York 1974.
- Pragada PM, Venkaiah M. Phyto- Sociological attributes of weed flora in major crops of north coastal Andhra Pradesh, India. Pakistan Journal of Weed Science 2012;18(1):107-126
- Chauhan RS, Singh GB. Chemical weed control in spring planted sugarcane. Indian Journal of Weed Science 1993;25(1, 2):47-50.
- Phogat BS, Bhan VM, Dhawan RS. Studies on the completing ability of sugarcane with weeds. Indian Journal of Weed Science 1990;22(1, 2):37-41.

- Rao AS, Kiran GGR. Sugarcane Weed Flora In Krishna agro-climatic Zone of Andhra Pradesh. Journal of Sugarcane Research 2012;2(2):66-69
- Nagaraju N, Bandaru V, Rao, Tarakeswara Naidu M. Phyto-Sociological Studies on Weed Species of Sugarcane Fields in Visakhapatnam District, Andhra Pradesh, India. International Journal of Advanced Research in Science and Technology 2014. ISSN 2319 – 1783 (Print) ISSN 2320 – 1126 (Online)