

Contents

<i>S. No</i>	<i>Title</i>	<i>Page. No</i>
	Contents	i
	List of Tables	iii
	List of Figures	v
	List of Appendices	vi
	List of Acronyms	viii
	Acknowledgements	ix
	Abstract	xi
1	INTRODUCTION	1
2	REVIEW OF LITERATURE	4
2.1	General Aspects of Irradiation on Plants	4
2.2	Effects of Irradiation on Germination of Plants	5
2.3	Effects of Irradiation on Tillering of Plants	7
2.4	Effects of Irradiation on Plant Heights	8
2.5	Effects of Irradiation on Seedling Heights of Plant	11
2.6	Effect of Irradiation on Root length/Shoot length, Root-Shoot Ratio, Number of leaves, Leaf Area and Flowering of Plants	11
2.7	Effects of Irradiation on Green matter weight and Yield of Different Plants	14
2.8	Effects of Irradiation on Dry matter weight of Plants	17
2.9	Effects of Irradiation on Growth of Different Crop Plants	18
2.10	Effect of Irradiation on Certain Other Growth Characters of Plants	19
2.11	Effect of Irradiation on HYDROCYANIC ACID (HCN) contents of plants	23
2.12	Effect of Irradiation on Proximate composition and Nutritive value of plants	28
2.13	Effect of Irradiation on Genetic Diversity of Different plants	33
2.14	Effect of Irradiation on Genetic Relationship in Sudan grass based on SDS-PAGE	35
2.15	Application of Random Amplified Polymorphic DNA (RAPD) Technique for Identification of Markers Linked to Genetic Diversity in Crop Plants	41
3	MATERIALS AND METHODS	52
3.1	Detection of HCN contents	52
3.1.1	Cyanide standards	54
3.1.2.	Sampling Sudan grass leaf and sample size experiment	54
3.1.3.	Picrate assay	55
3.1.4.	Color imagery	55
3.1.5.	Statistical models for calibration curves	56
3.2.	Proximate analysis	56
3.2.1.	Moisture	56
3.2.2.	Crude Protein	57
3.2.3.	Ether Extract	58

3.2.4. Crude Fiber	58
3.2.5. Ash	58
3.2.6. Nitrogen Free Extract (NFE)	59
3.2.7. Total Digestible Nutrients (TDN) for sheep and Goat /Small Ruminants (S.R)	59
3.2.8. Total Digestible Nutrients (TDN) for Cattle/ Large Ruminants (L.R)	59
3.3. Genetic Diversity Evaluation By SDS-PAGE Technique	59
3.3.1. Data analysis	60
3.4. Application of Random Amplified Polymorphic DNA (RAPD) technique for the identification of markers linked to genetic diversity in Sudan grass.	60
3.4.1. Extraction of DNA.	60
3.4.2. Quantification of DNA	61
3.4.3. PCR amplification of extracted DNA.	63
4. RESULTS AND DISCUSSION	65
4.1. Effect of Gamma Irradiation on Morphological Traits/Agronomic traits in Sudan grass.	65
4.1.1. Effect of Gamma Irradiation on Germination percentage under Laboratory conditions	65
4.1.2. Effect of Gamma Irradiation on Quantitative traits under Field conditions	72
4.1.2.1. Effect of Gamma Irradiation on Quantitative traits of M-1 generation	72
4.1.2.2. Effect of Gamma Irradiation on Quantitative traits of M-2 generation	79
4.1.2.3. Effect of Gamma Irradiation on Quantitative traits of M-3 generation	84
4.1.2.4. Effect of Gamma Irradiation on Quantitative traits of M-4 generation	89
4.1.2.5. Effect of Gamma Irradiation on Quantitative traits of M-5 generation	98
4.2. Effect of Gamma Irradiation on Qualitative traits	109
4.2.1. Effect of Gamma Irradiation on Proximate composition in Sudan grass	109
4.2.2. Effect of Gamma Irradiation on HCN concentration in Sudan grass	112
4.3. Effect of Gamma Irradiation on SDS-PAGE Diversity	120
4.3.1. Cluster analysis based on SDS-PAGE	123
4.4. Diversity based on PCR Analysis	129
4.4.1. Cluster analysis based on PCR analysis	130
5. CONCLUSION	149
6. LITERATURE CITED	151
7. APPENDICES	197