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SCREENING OF COTTON GENOTYPES FOR SEED OIL, PROTEIN, GOSSYPOL CONTENTS

H.R. Ramani*, V.K. Vekariya, D.M. Patel, G.O. Faldu and M.C. Patel
Main Cotton Research Station, Navsari Agriculture University, Surat-395007, Gujarat
E-mail: hrramani@nau.in (**Corresponding Author*)

Abstract: The seeds of 34 genotypes were analyzed for oil, gossypol and protein content. Experiment was conducted at Main Cotton Research Station, Navsari Agriculture University, Surat during 2017-18. The results showed significant variations amongst the genotypes. Significantly higher oil content was observed in cotton genotypes ARBH 1701 (18.12%) followed by PBH 116 (18.04%) and RAH 0603 (18.00%). Gossypol content ranges from 37.47 to 156.49 (mg/100g of tissue) in different entries. Lowest gossypol content was observed in CPD 1701 (37.47 mg/100g of tissue) followed by F 2662 & GISV 319 (39.3726 mg/100g of tissue) and PBH 139 (44.47 mg/100g of tissue). Higher gossypol content was found in PBH 116 and RB 607 (156.49 and 153.26 mg/100g of tissue) respectively. Highest protein content was observed in SHJ 23 (23.72 mg/g of tissue) which was followed by HS 300 and F 2596 (23.08 and 21.94 mg/g of tissue) respectively.
Keyword: Oil, Gossypol and Protein.

Introduction

Cottonseed oil (*Gossypium hirsutum* L.) has long been considered to be a good vegetable oil for frying, in part because it tends to impart a toasted aroma to fried products. Cottonseed oil also has disadvantages that have resulted in some food companies limiting their use of the oil. Specifically, the oxidative stability of cottonseed oil can be lower than other vegetable oils because of its high concentration of linoleic acid (18:2). When used for frying, this instability accelerates the formation of off-flavors (rancidity) and shortens oil life. Although the level of these acids is significantly reduced by oil deodorization, they would be fully present in whole seed or kernel feeding of cottonseed to animals, a practice that would increase if current efforts to reduce seed gossypol levels prove successful [1]. Protein content and Fatty acid profile of cottonseed oil were varies from genotypes to genotypes. However, considerable background information is needed to study the degree of compositional variation that exists in the seed oil, gossypol and protein content of cotton genotypes. In viewing this experiment was conducted.

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Materials and Methods

The seeds of 34 genotypes were analyzed for oil, gossypol and protein content. Experiment was conducted at Main Cotton Research Station, Navsari Agriculture University, Surat during 2017-18.

1. **Oil Analysis:** Cotton seed of 38 genotypes were collected from Indo American section of Main Cotton Research Station, NAU, Surat. Seeds of 34 cotton genotypes were crushed to make a powder for Oil analysis by Near Infra Red spectroscopy (Table 1).
2. **Protein analysis:** Protein was estimated from cotton seed by standard methods of Lowry [2].
3. **Gossypol estimation:** Gossypol content was estimated from cotton seed by standard methods [3].

Results and Discussion

The seeds of thirty four genotypes were analyzed for oil, gossypol and protein content. The results (Table 2) showed significant variations amongst the genotypes. Significantly higher oil content was observed in PBH 21(17.18%) followed by CCH 15-2(17.07%), SHM-55(17.01%), RAH 1069(17.01%). Gossypol content ranges from 36.46 to 171.70 mg % in different entries. Lowest gossypol content was observed in RAH 1069(36.46 mg %) followed by ARBH-1501(39.81 mg %), TSH 321(44.71 mg %) and CNH 147-1(45.76 mg %). Free gossypol content across Bt varieties ranged from 115-414 mg% while it reported to be ranging from 199-414 mg [4]. Processing of cottonseed was reduced the gossypol content. Highest protein content was observed in CNH 126(25.34%) which was followed by RB-602(22.85%) and Local Check (G.Cot-20) (22.7%). Our results of Cotton seed oil, Protein and gossypol were revealed the similarity with the early year report [5].

References

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Table1: List of entry used for evaluation

Entry code	Name of entry
701	RS 2906
702	BS 2-17
703	GJHV-520
704	ARBH 1701
705	RAH 0603
706	BGDS 0607
707	GSHV 199
708	PBH 139
709	F 2662
710	CPD 1702
711	RB 607
712	ZC
713	RS 2913
714	GISV 319
715	CSH 3419
716	F 2596
717	HS 300
718	LC
719	SHJ 23
720	RB 608
721	GJHV-523
722	TSH 325
723	H 1488
724	CPD 1701
725	RAH 0604

726	PBH 116
727	QC (Suraj
728	TCH 1828
729	TVH 001
730	RHC 1346
731	H 1508
732	BS 3-17
733	CSH 1604
734	TSH 332

Table 2. Evaluation of cotton genotypes for seed oil, gossypol and protein

Genotypes (Entry code)	Oil content (%)	Protein content (mg/g of tissue)	Total Gossypol (mg/100g of tissue)
701	17.50	17.18	72.36
702	16.53	15.35	64.51
703	17.87	15.10	118.13
704	18.12	17.30	95.10
705	18.00	14.61	64.51
706	17.56	15.55	64.37
707	17.85	21.41	68.05
708	17.32	20.51	44.47
709	17.45	17.47	39.37
710	17.29	15.48	45.99
711	17.31	18.14	153.26
712	16.80	21.61	71.09
713	17.14	16.14	151.26
714	17.50	12.39	39.37
715	17.51	12.67	44.86
716	17.34	21.94	58.36
717	17.26	23.08	45.35
718	17.24	21.78	48.51
719	17.02	23.72	61.04
720	17.22	19.63	57.86

721	16.82	13.57	61.73
722	17.25	16.54	125.26
723	17.23	13.70	46.89
724	17.66	17.52	37.47
725	16.72	16.28	113.71
726	18.04	16.83	156.49
727	17.21	16.42	49.32
728	17.28	15.24	57.93
729	17.22	18.29	61.76
730	16.76	18.12	126.84
731	17.41	13.68	131.40
732	17.33	20.46	115.66
733	17.12	14.07	134.05
734	17.38	12.13	139.26
SE.d	0.043	0.273	1.65
CD@5%	0.086	0.546	3.30