

Compositional grain quality of sorghum varieties and hybrids evaluated under advanced trial

CV Ratnavathi, R. Venkateswarlu, V. Sailaja and B. Sreenu

Introduction

Sorghum and millets have been important staples in the semi-arid tropics of Asia and Africa acting as principal sources of energy, protein, vitamins and minerals. Sorghum is considered as a nutritious coarse cereal grain that is almost on par or richer than rice and wheat for many nutritional components, especially dietary fiber, vitamins and minerals. Sorghum is also rich in Magnesium. Sorghum grain starch is slow digestible and is important attribute for recommending the cereal in the diet for diabetic population. The grains produced during rainy season attract low market value because of physical quality deterioration due to mold, but chemical quality does not always get affected significantly. Hence, grain quality evaluation of new sorghum varieties and hybrids assume significance apart from superiority for grain yield. Slow starch digestibility is correlated to amylose content in the grain. Grain samples from varieties and hybrids evaluated under the advanced trial of AICSIP were analyzed for chemical quality parameters. The percent starch, fat and protein are the three major constituents of grain affecting the quality in sorghum. Starch, fat and protein were determined in the randomly collected replicated grain samples from the entries evaluated during *khariif* 2016 at three locations *viz.*, Akola, Udaipur and Coimbatore. The results of advanced hybrid trial are presented in Table 1 and advanced varietal trial is presented in Table 2.

Advanced Hybrid Trial (Table-1A):

The data on percent starch, fat and protein in 7 test hybrids along with 3 check hybrids and one local check genotype from Akola, Udaipur and Coimbatore locations is presented in Table 1. The data on percent starch, fat and protein in 11 genotypes which include 7 test genotypes from the above three locations is presented in Table 1. Eleven grain sorghum hybrids were compared for all three grain quality parameters with four checks including one local check.

Fat: The mean fat content varied from 3.03% (SPH 1817) to 3.73% (SPH 1778). There is no difference between the locations for fat content. At location Akola, the range of fat was 3.20%

(SPH 1789, SPH 1813) to 3.90% (SPH 1779). In Location Udaipur the fat content ranged from 2.90% (SPH 1817) to 4.13% (SPH 1778). At location Coimbatore the fat content ranged from 2.73% (SPH 1817) to 3.83 (SPH 1778) In three locations there is no significant difference for fat content. Very minor difference exists among the seven test entries and SPH 1778 has showed higher fat content (Table-1).

Protein: The mean protein content varied from 9.25% (SPH 1817) to 10.96% (SPH 1779). At location Akola, the range of protein was 7.88% (CSH 30) to 10.65 (CSH 25). In Location Udaipur the protein content ranged from 7.37% (SPH 1816) to 13.40 (CSH 30).in location Coimbatore protein content ranges from 8.81% (SPH 1817) to 12.57 (CSH 25). In Coimbatore most of the samples showed more protein as compared to the other locations. Among the seven test entries SPH 1779 and SPH 1813 are having protein content above 10.00%, on par with some checks, but not superior to check genotypes. Remaining five entries recorded above 9.00% protein content (Table-1).

Starch: The mean starch content of the three locations varied from 60.03% (Local check) to 67.6 % (SPH 1789).The starch content significantly varied across locations. The starch content in Akola ranges from 54.5% (local check) to 77.5% (CSH 25) and in Udaipur the range was 64.5% (SPH 1779) to 72.4% (SPH 1789). In location Coimbatore the starch content ranges from 56.0% (CSH 16) to 67.8% (CSH 30) Out of seven test hybrids two test hybrids (SPH 1778, and SPH 1789) are superior to 3 check genotypes with mean starch content (Table-1)

Advanced Varietal Trial (Table-2):

The data on percent starch, fat and protein in 14 test hybrids along with 4 check varieties and one local check genotype from Akola, Udaipur and Coimbatore locations is presented in Table 2. The data on percent starch fat and protein in 19 genotypes from the above three locations is presented in Table 2. Fourteen grain sorghums were compared for all three grain quality parameters with five checks including one local check.

Fat: The mean fat content varied from 2.88% (SPV 2293) to 3.50% (SPV 2364). There is no difference between the locations for fat content. At location Akola, the range of fat was 2.63% (SPV 2358.) to 4.10% (CSV 17). In Location Udaipur the fat content ranged from 2.83% (SPV 2293) to 4.10% (SPV 2372). At Coimbatore the fat content ranges from 2.47% (SPV 2372) to

3.57(SPV 9366) In three locations there is no significant difference for fat content. Very minor difference exists among the test entries and CSV 17 and SPV 2364 has showed higher fat content (Table-2).

Protein: The mean protein content varied from 10.83% (SPV 2364) to 14.10% (CSV 17). At location Akola, all samples showed very low protein and it ranged from 9.79% (CSV 27) to 15.03 (CSV 17). In Location Udaipur the protein content ranged from 11.82 (CSV 27) to 15.13 (SPV 2362). At location Coimbatore protein content ranges from 8.49% (SPV 2366) to 14.50 (CSV 17). One test entry SPV 2362 showed protein content above 15.0% and on par with check genotypes.

Starch: The mean starch content of the three locations varied from 60.4 (CSV 23) to 69.4 % (SPV 2308). The starch content in Akola ranges from 56.3% (SPV 2362) to 68.4% (SPV 2370) and in Udaipur the range was 61.6% (SPV 2372, CSV 23 & local check)) to 69.7(SPV 2298 & SPV 2364). At Coimbatore location the starch content ranges from 55.3% (local check) to 74.5 (SPV 2308). The test variety (SPV 2308) is superior to local check with mean starch content higher than the local check (60.5%) and on par with other check genotypes.

Major observations:

- Protein content in the samples from Udaipur is high.
- Starch % in all the grain samples is good.
- Check hybrids CSV 17 & CSH 30 are good for protein and CSH 25 & test hybrids SPH 1789, are good for starch content.
- Test variety SPV 2307 is good for protein and varieties SPV 2308 ,SPV 2296 & SPV 2364 are good for starch content.