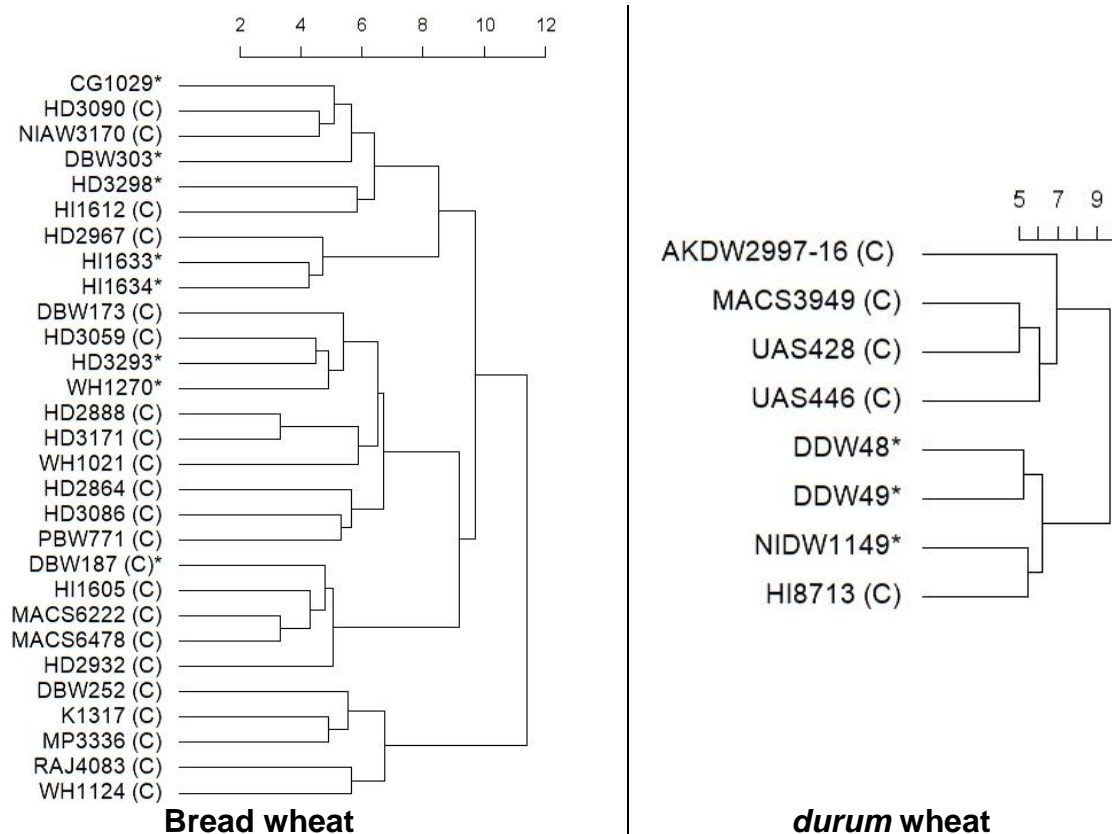


## Marker assisted gene prospecting in AVT entries of wheat

The future of wheat production program demands improvement in crop management practices and genetic improvement of cultivars for better yield. The foundation for such an improvement can be found in genetic diversity since it is crucial for successful adaptation and sustained improvement. For instance, genetic diversity is must for acquiring defensive characteristics in wheat varieties against biotic stress. India is bestowed with diverse agro-climatic conditions which make it rich in wheat germplasm adapted to various niches. Screening of advanced varietal trial entries and checks using molecular markers generate a vast amount of information. In an effort to utilize some of the available molecular markers, Molecular Biology Program at ICAR-IIWBR screened the final year (2018-19) AVT test entries and checks using various STS/ AS-PCR markers linked to the gene(s) of Waxiness (*WxB1*), abiotic (drought) stress related (*DREB*), vivipary (*Vp1B3*), leaf rust resistance (*Lr*), Photoperiod response (*PD1*) and vernalization (*Vrn*). The dendrogram constructed using these STS and more than 40 SSR markers depicted the genetic relationships among genotypes. Two separate clusters one for durum wheat varieties and the other for bread wheat was constructed. It is evident from the similarity clusters that among the bread wheat HI1633 and HI1644 are quite close to each other. Similarly, CG1029, DBW 303 and HD3298 are falling in the same broader group. As far as durum wheat is concerned, all the three test entries viz., DDW48, DDW49 and NIDW 1149 were found in the same group, distinct from the group consisting of checks. The allele distribution by using STS /AS-PCR markers is shown in the table below.



**Figure 1.** Dendrogram using SSR and STS markers showing diversity among final year AVT entries and check varieties

Table 1. STS marker based screening of final year AVT entries (2019-20) and checks

	Genotype	WxB1		DREB	Vp1B3		Lr10	Lr34		Ppd-D1		VrnA 1bR2
		425	690	700	569	652	300	150	230	228	414	1068
1	HI1634	+	+	+	-	+	-	+	-	+	-	-
2	DBW303	+	+	+	-	+	-	-	+	+	-	-
3	DDW49	+	+	+	+	-	-	-	-	+	-	+
4	DDW48	+	+	+	-	-	-	-	-	+	-	+
5	CG1029	+	+	+	+	-	-	-	+	+	-	-
6	HI1633	+	+	+	+	-	-	-	-	+	-	-
7	HD3293	+	+	+	-	+	-	-	+	+	-	+
8	HD3298	+	+	+	-	+	+	-	+	+	-	-
9	WH1270	+	+	-	+	-	-	-	+	+	-	-
10	NIDW1149	+	+	+	+	-	-	-	-	-	-	+
11	HD2967	+	+	-	+	-	-	+	-	+	-	-
12	HI8713	+	+	+	+	-	-	-	-	-	-	+
13	HD3086	+	+	+	+	-	+	-	+	+	-	-
14	DBW187	+	+	+	+	-	+	-	+	+	-	-
15	MACS6478	+	+	+	+	-	+	-	+	+	-	+
16	MACS6222	+	+	+	+	-	+	-	+	+	-	+
17	HD2932	+	+	+	+	-	-	-	+	+	-	-
18	RAJ4083	+	+	+	+	-	-	-	-	-	-	+
19	WH1021	+	+	+	-	-	-	-	+	+	-	-
20	HI1612	+	+	+	-	-	-	-	+	+	-	-
21	MP3336	+	+	+	+	-	-	-	-	+	-	+
22	HD3059	+	+	+	-	+	-	-	+	+	-	+
23	K1317	+	+	+	+	-	-	-	-	+	-	+
24	WH1124	+	+	+	+	-	-	-	-	-	-	-
25	HD2888	+	+	+	-	+	+	-	+	+	-	-
26	HD3171	+	+	+	-	+	+	-	+	+	-	-
27	UAS446	+	+	+	+	-	+	-	+	+	-	-
28	MACS3949	+	+	+	+	-	-	-	+	+	-	-
29	HI1605	+	+	+	+	-	+	-	+	+	-	+
30	UAS428	-	+	+	-	+	-	-	+	+	-	+
31	HD2864	+	+	+	+	-	-	-	+	+	-	+
32	DBW252	+	+	+	+	-	-	-	-	+	-	+
33	PBW771	+	+	+	+	-	-	-	+	+	-	+
34	AKDW2997-16	+	+	+	+	-	+	+	-	+	-	-
35	NIAW3170	+	+	+	+	-	-	-	+	+	-	-
36	HD3090	+	+	+	-	+	-	-	+	+	-	+
37	DBW173	+	+	+	-	+	+	-	+	+	-	+