



Pedigrees of Hard Red Winter Wheat Varieties

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With the introduction of the wheat variety Turkey into Kansas in the 1870's, the foundation for hard red winter wheat breeding programs was established. The diagram on the following pages traces the development of hard red winter wheat varieties from the turn of the century to the present.

Several points are obvious in the diagram. First, all hard red winter wheats have the variety Turkey in their pedigrees. This is to be expected since Turkey was the source of the winter hardiness, kernel characteristics and general adaptation which made a hard red winter wheat industry possible in the Great Plains. Second, other ancestral lines contributed very important genes to improve Turkey's genetic background. Marquillo and Illinois No. 1 (Hessian fly resistance), *Agropyron elongatum* (parent of Agent with leaf rust resistance), Atlas 66 (high

kernel protein) and Norin 10 (semidwarfism) are examples. Finally, the pedigrees are complex but not chaotic. Each cross was made with a specific purpose in mind, the goal being to improve certain traits without disrupting the adaptedness and productivity of the breeding material.

A comparison of modern varieties with Turkey shows that hard red winter wheat breeders have made tremendous improvements in grain yield, milling and baking quality, disease and insect resistance, lodging resistance and other traits. Some of these improvements are apparent in the results from a set of yield trials conducted over many locations across the Great Plains (Table 1). Arkan showed a yield advantage of roughly 50% over Kharkof (a variety similar to Turkey) and a 70% reduction in lodging.

Table 1. Grain yield, lodging percentage, heading date and plant height of Kharkof (introduced circa 1900), Scout 66 (released 1967) and Arkan (released 1982).¹

Variety	Grain Yield ²	Lodging ³	Heading Date ⁴	Plant Height ⁵
	bu/a	%		in.
Kharkof	39	43	June 7	43
Scout 66	48	40	May 31	39
Arkan	58	10	May 28	33

¹From 1983 Southern Regional Performance Nursery

²Mean of 27 locations

³Mean of 7 locations

⁴Mean of 24 locations

⁵Mean of 29 locations

The fact that much progress continues to be made from crosses tracing primarily to Turkey or selections from it (e.g. Cheyenne) indicates that Turkey was not a uniform variety but a population of many genetic types--a "land race." Breeders have concentrated the best of Turkey's genes in modern varieties, along with significant contributions from other wheats from around the world.

Using the diagram

The origins of each variety may be found by following all paths leading to that variety. If a variety has only one parent, it was a direct selection from that parent (e.g. Eagle is a selection from Scout). A dashed line indicates that some of the parentage

has been omitted because of limited space. Some important varieties appear more than once; if the parentage of a major variety is not given in one place, look for it higher in the diagram. The years of release of recent or important older varieties appear under or after variety names. All varieties are of the hard red winter class unless another designation is given (HRS = hard red spring; HWS = hard white spring; SRW = soft red winter; SWS = soft white spring).

The authors acknowledge the assistance of Dr. E. G. Heyne, who provided valuable advice and whose earlier pedigree diagram formed a basis for this one.



COOPERATIVE EXTENSION SERVICE. MANHATTAN. KANSAS

AF-124

September 1984

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9-84-10M

File Code: Crops & Soils 1-1