

READ ME FILE

1. Description of the Illinois long-term selection experiment for oil and protein in corn (*Zea mays* L.).

The history of this experiment was reviewed extensively in the proceedings of a symposium on long term selection (Dudley and Lambert, 2004). Details of selection intensity, breeding procedure, and methods of chemical analysis are found in those proceedings. Briefly, the experiment was started by C.G. Hopkins in 1896 (Hopkins, 1899). The open-pollinated corn cultivar Burr's White was the founder population. Four selected strains were established: Illinois High Oil (IHO), Illinois Low Oil (ILO), Illinois High Protein (IHP), and Illinois Low Protein (ILP). Selection in each strain was in the direction indicated by the name of the strain (i.e., IHO was selected for high oil concentration in the kernel). Mass selection was used with a selection intensity of approximately 1 out of 5 for most of the experiment (Dudley and Lambert, 2004). After 48 generations, reverse selection was started in each strain to establish the Reverse High Oil (RHO), Reverse Low Oil (RLO), Reverse High Protein (RHP), and Reverse Low Protein (RLP) strains (Leng, 1962, Woodworth et al., 1952). After seven generations of selection in RHO, selection was again reversed to create the Switchback High Oil strain (SHO). A second reverse selection strain (RLP2) was started in generation 91 of ILP.

The user of these files is referred to the publications cited above and listed below for details of the selection experiment and major results.

Dudley, J. W. and R.J. Lambert. 2004. 100 generations of selection for oil and protein in corn. *Plant Breeding Reviews* 24:(part 1)79-110.

Hopkins, C.G. 1899. Improvement in the chemical composition of the corn kernel. P. 205-240. *Ill. Agr. Exp. Sta. Bull.* 55.

Leng, E.R. 1962. Selection reversal in strains of corn previously long-term selected for chemical composition. *Crop Sci.* 2:167-170.

Woodworth, C.M., E.R. Leng, and R.W. Jugenheimer. 1952. Fifty generations of selection for oil and protein in corn. *Agron. J.* 44:60-65.

2. Description of files in this folder.

GENMEANS&GEN.SAS. This file contains the means by year and generation of the oil and protein concentration measured each year during the experiment. Also included are the generation numbers for each strain. The contents of the file are described in a header to the data.

LTINDIVIDUAL EAR DATA 1896-2004A.SAS. This file contains the data from each ear analyzed each year of the experiment. These are the raw data from the experiment.

N&SLDREGULARSTRAINS.SAS. This file contains the number of ears analyzed, the number of ears saved, and the selection differentials for the forward selection strains (IHP, ILP, IHO, and ILO).

N&SLDREVERSESTRAINS.SAS. This file contains the number of ears analyzed, the number of ears saved, and the selection differentials for the reverse strains (RHP, RLP, RLP2, RHO, RLO, and SHO).

PROTVALOILSTRAINS&OILVALPROTSTRAINS.SAS. This file contains values obtained for protein in the strains selected for oil (IHO, ILO, etc.) and the values for oil obtained for the strains selected for protein (IHP, ILP, etc.) each generation.

PUBLICATIONS FROM LONG TERM SELECTION EXPERIMENT.DOC. This file contains a list of all refereed publications, which could be found by an extensive search, in which materials from the long-term selection experiment were an important part of the experiments described. Non-refereed publications and abstracts were not included in the list.