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PROJECT TITLE: Winter and Spring Wheat Variety Performance Evaluation Under Northern Montana Conditions on the Basis of Gross Production Value as Influenced by Yield, Protein, and Market.

PROJECT LEADER: Gregg R. Carlson, Agronomist - Havre

PROJECT PERSONNEL: Jim Christianson, Executive VP, MWBC - Great Falls
Cheryl Tuck, Information Officer, MWBC - Great Falls
T.L. Allen, Research Specialist - Havre
P.L. Bruckner, Breeder/Geneticist (WW) - Bozeman
L.E. Talbert, Breeder/Geneticist (SW) - Bozeman
J.E. Berg, Research Associate (WW) - Bozeman
S.P. Lanning, Research Associate (SW) - Bozeman
Cooperating County Extension Agents
Individual Cooperating Landowners

OBJECTIVES:

It is the objective of this project to bring quality and quantity together to allow the forces of market value to influence evaluation of winter and spring wheat varieties under varying cropping conditions in northern Montana.

RESULTS:

1995 changes in deadline schedules for MWBC research reports presented a dilemma for this project as needed annual averages for daily PNW wheat market quotes cannot be obtained and calculated until after the final market day of the calendar year (a week after this report is due). MWBC has been annually providing us with the immediate past years' data as soon after year close as was feasible. We then incorporated the information into our on-going agronomic data matrices and analyzed numerous "location by year by variety yield & protein" scenarios. Once the market data was available, it took several days at a minimum to put all the analyses together. Resulting graphic outputs were first provided to MWBC via the annual report in late January - then subsequently utilized in printed and 35mm format for various producer seminars throughout the winter.

We considered calculating the annual averages with less than a full years' market data in order to prepare a December report - having then to re-analzye everything later when we had all the data. That wasn't deemed feasible in view of the time it would take to do the entire job twice. The dilemma has caused us to rethink how we might best conduct these analyses in the future on the assumption that the change of deadline into December will likely be ongoing. Our thoughts on this are discussed in the "Future Plans" section of this report.

For those possibly not familiar with the general content of this report for the past six years, some excerpts from the 1994 report are included here.

Average annual PNW quotes for Hard Red Winter wheat at 10, 11, 12, and 13 percent protein for the 10-year period 1985-1994 are graphed in Figure 1. The PNW annual market averages for the same period for Dark Northern Spring wheat at 13, 14, and 15 percent protein (plus values for 12 percent protein first available in 1994),

are graphed in Figure 2. Both graphs include values along the top axis reflecting the average annual $/bu price spread between minimum and maximum protein levels for which quotes are consistently given. Similar HRW and DNS market summaries extended for the 15-year period 1980-1994 are graphed in Figures 1a and 2a, respectively.

Sample `Gross Dollar Return' comparisons from 1994 are graphically presented in Figures 3 and 3a. Traditionally, we have presented up to 20 different scenarios for locations and variety sets annually - each spanning from 5-10 years of actual yield, protein and market performance. Scenarios have included on-station research trials in addition to those located off-station in 5 northern Montana counties.

Analyses span the maximum number of calendar years, up to 10, for which data exists for a specific location. A reduced number of data years is used in the analyses for purposes of including new or otherwise popular variety releases having fewer data years available. In contrast to the `Comparable Average' method of comparing varietal performance, these economic analyses have been limited to situations where each variety included actually grown at the location in question during all years involved.

SUMMARY:

Producers are well aware of the impact protein premiums can have on overall market value, but are troubled by the fact that the market has generally not been consistent in terms of rewarding growers for producing high quality wheat. The potential for discount associated with low quality has likely had more bearing on production management than have positive incentives in the form of premiums for quality above average. In the past decade, average annual premiums for 10-13 percent protein winter wheat and 13-15 percent protein spring wheat have varied from as little as 1 cent to as much as 59 cents per point increase per bushel.

Producers have encouraged researchers to evaluate potential new practices in terms of dollars and cents. Such is never easy; and this particular effort toward quantifying wheat variety performance on the basis of total dollar return was no exception.

Working with MWBC, the Research Center initiated development of a `Gross Dollar Return' database in 1988 utilizing a limited approach involving Wednesday markets only. By 1989, daily market spreadsheets were made available by MWBC with some file development assistance for previous years provided by NARC. At present, full market data for the years 1980-1994 have been made available to the Research Center.

For each research location a multi-year, average gross market value per acre was determined for each selected variety. Such values were based on gross return for actual yield at the lowest consistently quoted protein level plus added gross return for protein premium, if any. The sum of the two values then represents the gross return per acre in a given market year. Calculations were made for each year the varieties were under evaluation at a particular location. The values were then tested via simple analysis of variance with data years as replications.

It should be noted that the current procedure affords no mechanism for appropriate adjustment of gross return where protein content is either below that termed as "minimum quoted" (10 percent for winter wheat and 13 percent for spring wheat, 12 percent for spring wheat beginning with 1994) or above that termed as "maximum quoted" (13 percent for winter wheat and 15 percent for spring wheat). Thus, discounts for protein below the minimum quoted - or added premiums sometimes available for protein above normal quote maximums, cannot be reflected in these data. Due to fertilization, situations where protein levels were below minimum are extremely rare in these research databases. However, situations where protein exceeded the maximum level for which market quotes were available are common in these data. Thus, in cases where proteins for standard protein performance varieties in a particular trial are at the maximum level for which a market quote exists; entries with higher protein are not benefitted by additional premium as they may have been in a commercial marketing situation.

One must also remain aware that the marketing periods chosen for these analyses can have pronounced effects on the results due to obvious year differences in overall market price and premium spreads. Not unlike most crop evaluation procedures, but perhaps even more important in this case, data reliability increases with additional years of observation. At present, it would appear that a minimum of four to five years should be involved for meaningful comparison via this system.

In 1994, Carlson initiated a new "paired" trial series at Turner whereby 20 varieties each of wheat and barley will be evaluated for five years under both low and optimum nitrogen fertility.

FUTURE PLANS:

The Research Center plans to continue work with MWBC and wheat breeders in further developing and refining the use of these data with agricultural producers. Regression or other more sophisticated means of analysis could be introduced in work with these data. Use of additional data sets representing conditions of lower fertility will also be important to refine the assessment of economic benefits associated with production of high quality varieties.

We are currently considering and entire revamping of our market matrices to reflect a more logical market year than is represented by the current CY arrangement. Very little new production year wheat is marketed in northern Montana until at least mid-August. Thus it may be more logical to associate a years' agronomic data with 12 market months following harvest - perhaps beginning September 1. Such would be a bit frustrating as agronomic data for a year could not be economcially compared until nearly a year later. However, such would more accurately represent the real world. If we take this approach, we would now be able to analyze only up through the 1994 crop. We wouldn't be incorporating the 1995 crop data into the system until summer 1996. Furthermore, it may be sensible to weight months within the annual average on the basis of traditional market volume during those months.

We will pursue these matters this winter with MWBC personnel, growers and commodity representatives.

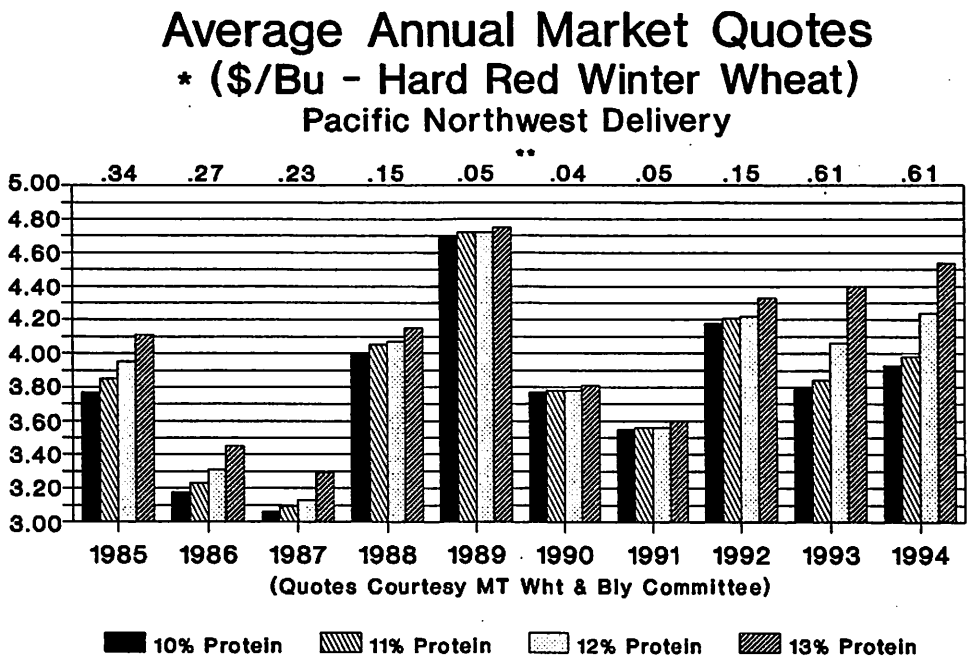

Figure 1.
MSU/AES/NARC-Havre

* Average of All Market Days/Market Year
** $/Bu Difference Between 10 & 13% Prot

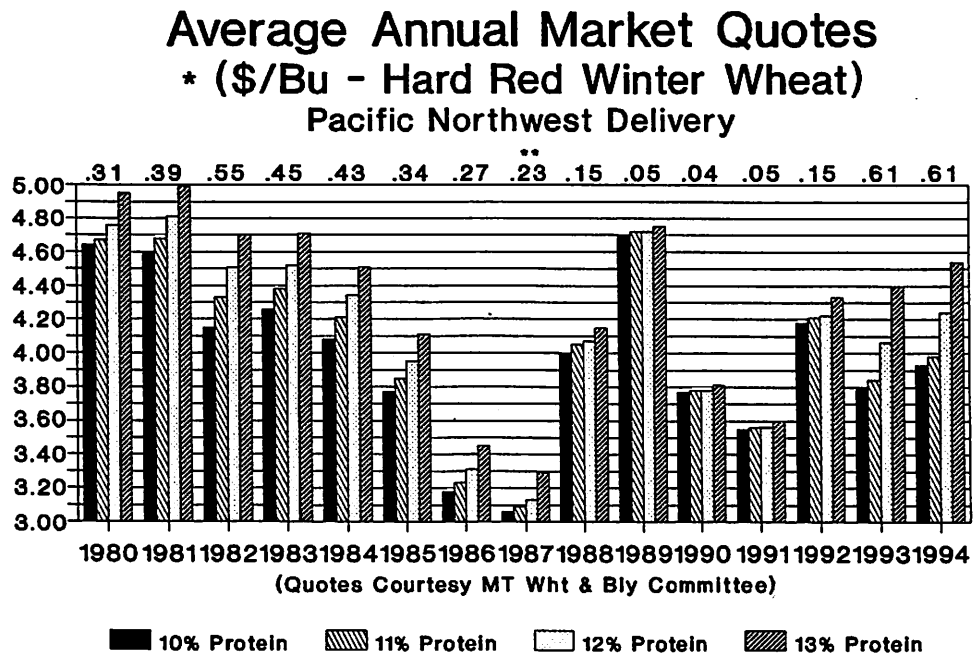

Figure 1a.
MSU/AES/NARC-Havre

* Average of All Market Days/Market Year
** $/Bu Difference Between 10 & 13% Prot

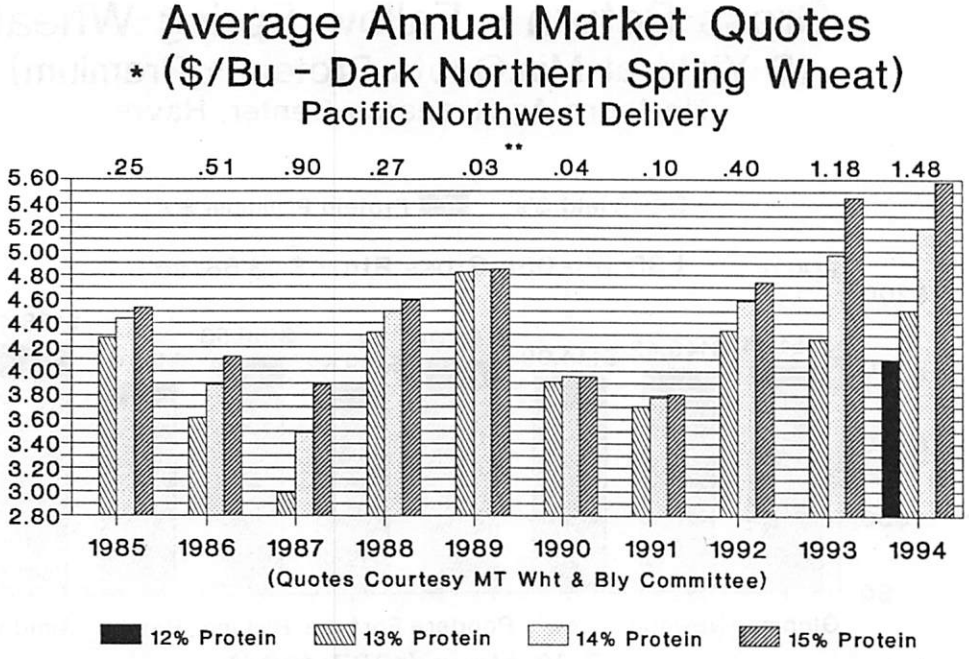

Figure 2.
MSU/AES/NARC-Havre

* Average of All Market Days/Market Year
** $/Bu Diff Between Min & Max Pro Quote

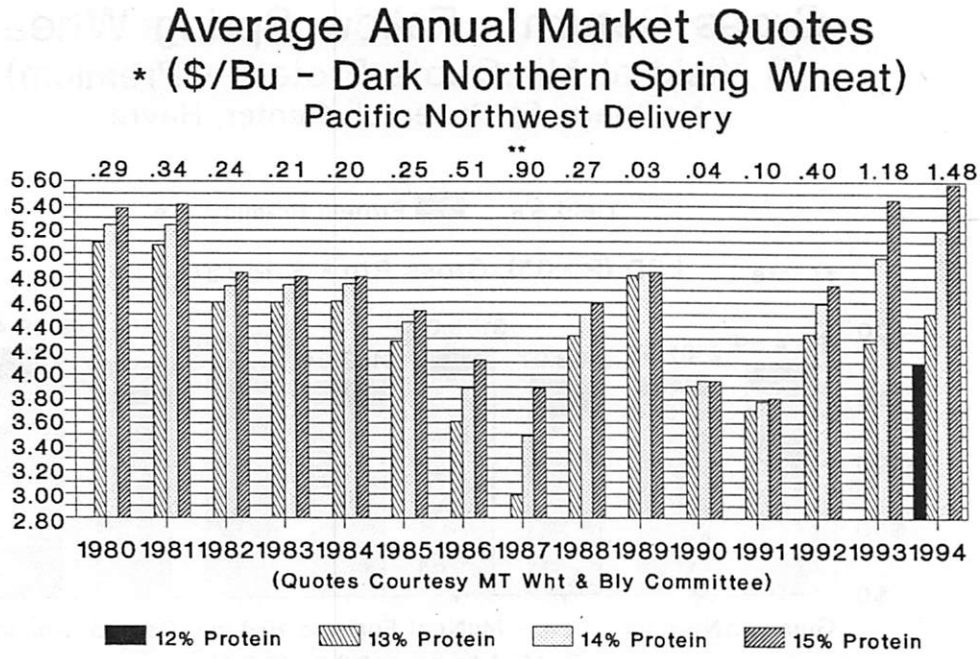

Figure 2a.
MSU/AES/NARC-Havre

* Average of All Market Days/Market Year
** $/Bu Diff Between Min & Max Pro Quote

Gross Return - Fallow Spring Wheat
($ Yield at Min.Quote Protein + Premium)
Northern Ag Research Center, Havre

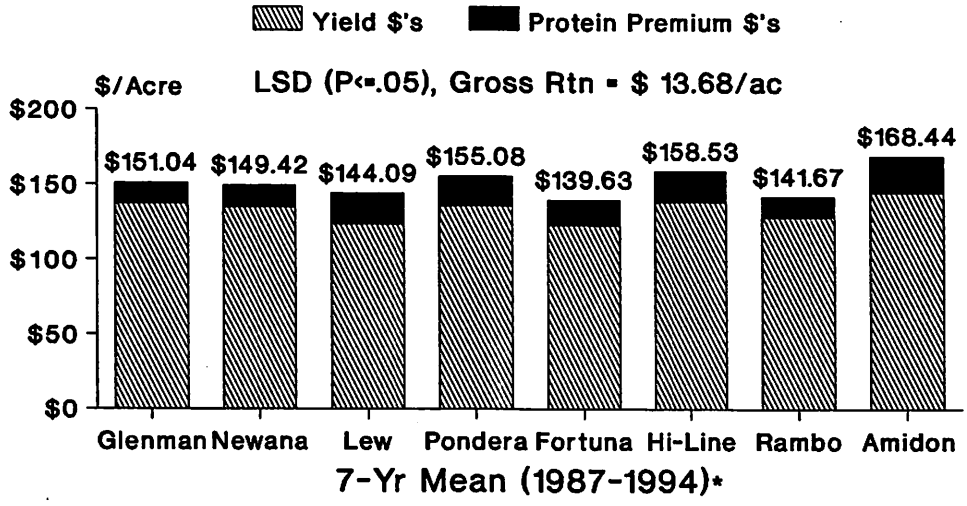

Figure 3.
MSU/AES/NARC-Havre

*1992 nursery lost to hail
Basis = PNW Average Annual Market/Year
Min.Quote@12%Pro.(1994),13%(1987-93)

Gross Return - Fallow Spring Wheat
($ Yield at Min.Quote Protein + Premium)
Northern Ag Research Center, Havre

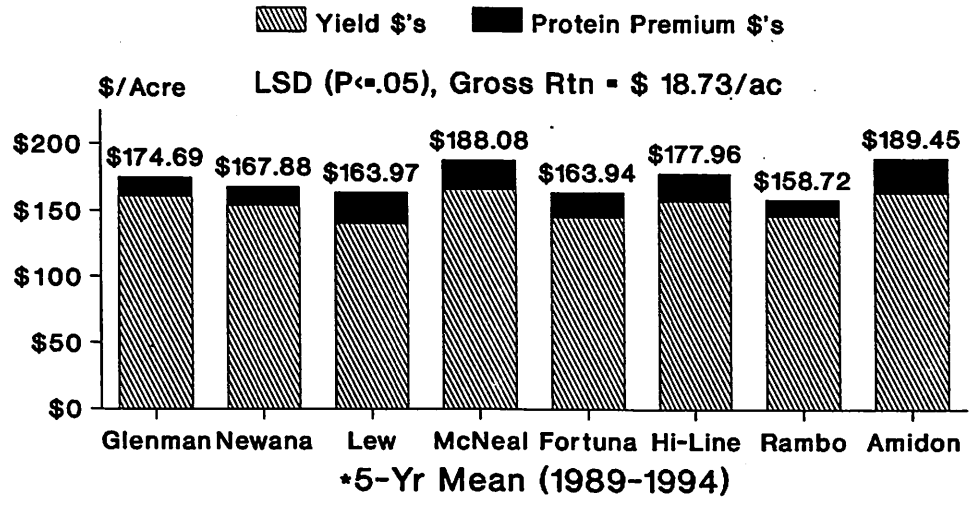

Figure 3a.
MSU/AES/NARC-Havre

*1992 nursery lost to hail
Basis = PNW Average Annual Market/Year
Min.Quote@12%Pro.(1994),13%(1989-93)