3. Is a wildflower blend more effective than single species planted in monoculture for attracting beneficial insects, while at the same time successful at suppressing crop weeds?

In 2005 small test plots, the Palouse Prairie mix attracted the greatest amount of beneficial insects when compared to an alfalfa/clover mix, a “western wildflower” mix, and indigenous prairie flowers planted in monoculture. A commercially available “western wildflower” blend that had been established in 2002 was able to best displace weeds, though we cannot determine if this was due to it being in its third year of establishment. We will be able to determine in successive years if the Palouse Prairie mix increases in its ability to suppress weeds.

Can Dry Bean be Grown in Marginal Soil?

AN. N. HANG, DEPT. OF CROP AND SOIL SCIENCES, WSU-PROSSER

An experiment was conducted using cv. ‘Othello’ pinto and cv. ‘Merlot’ small red dry bean to study the effect of inoculants on dry bean production on Shano silt loam soil. Soil analysis was done to get the base line fertilizer and organic matter in the soil. Field was pre-irrigated, Eptam (2 qt/a) and Sonalan (1 qt/a) were pre-plant incorporated into the top 4” to control weed. Field was low in organic matter (1.24%) and nitrogen (15 ppm nitrate N). No fertilizers of any kind were added to the soil at seed bed preparation. Seven inoculation products and a control were applied to the seed at planting prior to seeding. All plots were managed as used in a standard procedure for bean production in the area. The purpose of this study is to define the effect of rhizobium on plant population at 6 weeks after planting, plant vigor at 6 weeks after planting and at mid season, nodule count at early and mid flowering, disease incidence and yield.

There is no difference in plant populations and plant vigor. Nodule count is somewhat higher at mid bloom and there is higher number when bean was inoculated at planting. Pinto and small red bean responded to inoculant by increase the yield. Merlot is slightly produced higher yield than Othello pinto. Highest yields were 3500 lbs/a for Othello and 3,800 lbs/a for Merlot. Hundred seed weight did not change with different inoculant. With less N growers can lower their input while reducing nitrate contamination to the environment.

Part 5. Economics and Sustainability

*Economics of No-Till Annual Cropping Rotations at Ritzville, 1997-2004

DOUGLAS YOUNG, ELIZABETH NAIL, AND WILLIAM SCHILLINGER, SCHOOL OF ECONOMIC SCIENCES AND DEPT. OF CROP AND SOIL SCIENCES, WSU

During 2005 the economic analysis of the full 8-year no-till annual cropping experiment at Ritzville was completed. This experiment compared several no-till annual cropping rotations to the region’s dominant rotation of tilled winter wheat-fallow (WW-SF).

No-till annual rotations are clearly an environmental success. Engineers’ have predicted that no-till continuous spring grains can reduce dust emissions by 94% during severe wind events compared to tilled WW-SF. But the full 1997-2004 experimental results at Ritzville have shown that the continuous no-till annual cropping systems significantly lagged conventional tillage winter wheat/fallow in profitability. Continuous no-till soft white spring wheat (SWS) and SWS-spring barley (SB) were compared economically to the results of growers within a five-mile radius of the experiment who grew winter wheat after fallow under conventional tillage. Eight-year average net returns for the two no-till systems lagged conventional WW/SF net returns by $24 to $29 per rotational acre. Furthermore, the spring cropping systems exhibited significantly more economic downside risk in dry years. During the drought years of 2001 to 2004, the no-till rotations incurred substantial losses every year, but WW-SF did so only in 2001.

Some farmers might be able to trim the cost of production for no-till annual cropping, but closing the entire profitability gap is not likely. Other research has shown significant public valuation for higher levels of air...
quality provided by soil conserving cropping systems. No-till cropping systems might provide a cost effective alternative to large government conservation programs like the Conservation Reserve Program (CRP). However, political support for CRP could continue as growers might perceive it to provide a higher and completely stable return relative to cropping.

Comparing Plateau and Conventional Nitrogen Response Functions for Crop Yield and Quality

Raphael N. Karuaihe and Douglas L. Young, School of Economic Sciences, WSU

Comparison of nitrogen response statistical functions with maximum yield horizontal plateaus to conventional non-plateau functions showed mixed results. The plateau functions had better goodness of fit for hard red spring wheat protein and yield data in eastern Washington and for yield in Coastal Bermuda Grass hay in Alabama. However non-plateau functions provided a better fit for Alberta, Canada hard red spring wheat yield and protein. These and earlier results suggest that some crops may conform to a plateau pattern for a considerable range. There was also statistical support that protein response to nitrogen in hard red spring wheat may exhibit a finite-plateau in one data set.

These results, which introduce fertilizer response plateau properties for crop quality, as well as crop yield, justify exploration of these functions for a broader set of crops and regions. The findings that plateau functions, when ranked higher, imply lower nitrogen rates has important implications for both private and public decision makers. If these plateau functions accurately describe the nitrogen response process for some crops, decreased fertilizer rates will also help protect water from nitrogen leaching and runoff.

Future research should extend comparisons of plateau and non-plateau yield and quality nitrogen response functions to other crops and regions. These analyses could also broaden the scope of mathematical functional forms utilized. Finally, future work should seek formal statistical tests including possible generalized log likelihood ratios for comparing the type of functions used in this study.

Broadleaf Incorporation into an Intense Direct Seeded Cereal Rotation

Aaron Esser, WSU Lincoln-Adams Area Extension, Mark Sheffels, Lincoln County Producer Cooperator

A series of on-farm tests were carried out over a 4-year period near Wilbur, Washington in a 12-inch precipitation zone. Tests were designed to better understand the value of mustard as an alternative crop in an intense cereal grain cropping rotation under direct seed conditions in the dryland cropping region of eastern Washington. The two treatments: spring barley and yellow mustard, were seeded with a Flexi-Coil 5000 direct seed drill on 12-inch row spacing on ground that had an intense cereal grain history. The treatments were harvested and the yield and market price was collected. Subsequent spring cereal crops (wheat or barley) in the study were direct seeded with the same drill. Cereal crops following each treatment were harvested and the yield; grain quality, and market price were collected. The trial is a randomized complete block design with 4 replications.

Mustard yielded less than barley averaging 647 lb/ac compared to 1,640 lb/ac. Mustard as the previous crop had 82% less weeds, and had greater amounts of nitrogen remained in the top 1-foot. Little difference was detected in the subsequent cereal crop production following either barley or mustard. Cereal following barley produced the greatest yield at 1,854 lb/ac compared to 1,625 lb/ac following mustard. However, the yield differential varied over duration of the study. Mustard followed by cereal had the highest 2-year total return at $186/ac compared to