FROM THE GROUND UP

Cooperative Extension
Colorado State University
Department of Agronomy
Fort Collins, Colorado 80523
(303) 491-6201
FAX: (303) 491-0564

AGRONOMY NEWS

Volume 13, Number 11

November 1993

TABLE OF CONTENTS

OCTOBER 1993 DRY BEAN PRODUCTION AND PRICE OUTLOOK

Dry bean production in the U. S. is projected to be up 5 percent from 1992 according to the September USDA Crop Reporting Service report. The Colorado Agricultural Statistics Service reports that dry bean production in Colorado is also up in 1993, to approximately 2.8 million cwt compared to 2.6 million in 1992. These figures reflect slightly more acres harvested but lower unit production. These figures must be carefully viewed because much has happened since the September data was collected. The early freeze in the High Plains region coupled with untimely rain during harvest has reduced yields in many areas, but more importantly, reduced seed quality dramatically. The average yield in Colorado was forecast at 1,550 lbs/A, down from last year's 1,640 lbs/A. The reduced yields reflect the relatively cool growing conditions and disease problems associated with the 1993 crop. The cool summer delayed maturity and provided an optimum environment for several disease pathogens. The bean crop in western Colorado was somewhat lower than last year, also due to cool temperatures. The non-irrigated areas of southwestern Colorado were damaged by dry conditions since there was little or no precipitation from planting time to early August in most areas of the San Juan Basin.

Furthermore, many areas of Yuma county were destroyed by hail storms. Severe rust outbreaks were observed in many regions of the state. Bacterial brown spot, a foliar pathogen, was also widespread in the Great Plains region.

Bean yields were also lower in North Dakota due to poor growing conditions. Many of the navy beans were severely damaged by the early frost and pinto yields were reduced by low rainfall during critical periods. In general, I believe the USDA forecast will be adjusted downward from the September report. Today's bean prices in the low $30 range suggest that there is a shortage of good quality beans. Keep your ear to the ground on prices, but it looks like prices should remain firm for the near future. ¤Brick

We now have a nutritionally sound cereal that requires no pearling (it is hulless) and comes premalted.

WAXY HULLESS BARLEY

The October 1993 issue of the Saturday Evening Post contains an article about waxy hulless barley. That may seem strange in a fast-paced urban world but the audience that this magazine is appealing to is a health conscious one and barley is rapidly catching on as a nutritionally sound food. Barley has as much or more soluble fiber than oats.

Barley has an attached lemma and palea which adds insoluble fiber to the human diet. This seed cover is useful in malting to preserve the integrity of the seed but otherwise must be removed to make barley edible. Removing the hull is known as "pearling". Pearled barley is a common ingredient in soups in Middle Eastern, Asian, and African foods. Mechanical abrasion needed to remove the hull also reduces the vitamin content of the barley.

Naked barley, a product developed in Nepal and Ethiopia, does not have the attached hull, and has been preferred for human use. This hulless trait was discovered resulting in a barley kernel very similar to that of wheat. Naked hulless barley never achieved success as a feed grain where animal operators chose the higher yielding, higher fiber hulled barley. Nor did it achieve success in the malting industry.

The waxy gene recently discovered in hulless barley is so-called because of its waxy appearance. The grain contains an abnormally high content of maltodextrin, the natural product of malting. Now, we have a nutritionally sound cereal that requires no pearling and it comes premalted. Sound too good to be true? It gets better.

Montana State University Professors Eslick and Neumann have promoted the possibilities of waxy naked barley for industrial malts and starch extracts for years. The industry never arrived because of extreme competition from corn by-products for the same markets. Eslick and Neumann were ahead of their time. The USDA Cereal Research Laboratory in Albany, California initiated research into waxy, naked barley's high beta glycan content, suspected of nutritional value. The USDA laboratory in Peoria, Illinois developed a diet product which functions as artificial fat from barley starch - a product called "B-Trim". The starch is being developed into a cosmetic base by a fledgling company in Montana. In Japan, naked barley has the same reverence as oats in the U.S. In Colorado, a state funded economic development grant has been issued to look into puffing waxy, naked barley as a cereal and development of a commercial starch extraction facility in Bent County. What does it take to grow this new food grade barley? The same

conditions as any two-row barley. Trials at CSU have indicated a 0 to 10% yield loss. Any yield loss is easily offset by a 50 to 100% increase in price per bushel. Before we all plant waxy, naked barley, be careful to identify the market and as with all new crops, get a contract or marketing agreement. The product is too new to be widely distributed or known. Also, excessive rain at maturity can darken the grain, limiting markets as a whole grain, especially in Asia. The darkened grain can, however, still be used in other applications. There may be a new barley in our future and hopefully Colorado will have a place for it.
▫Johnson

The American Society of Agronomy meetings will be held this year from November 7-14 in Cincinnati, Ohio. Most of the Extension Agronomists will be in attendance.

CROP PRODUCTION AND PEST MANAGEMENT FIELD RECORDS

Crop Production and Pest Management record sheets are now available through the Bulletin Room, 171 Aylesworth Hall, Colorado State University, Fort Collins, CO 80523. These record sheets are designed for use when applying restricted use pesticide (RUP). Information must be kept on file after May 9, 1993 according to the 1990 Farm Bill and be available for inspection on demand.

Corn, sunflower, and bean harvests are nearly complete. Bulletins containing results will be available by the end of the year.

The four page layout is designed to permit the user to record, as necessary, items for multi-use purposes (crop rotations, crop insurance, pesticide programs, water quality monitoring, conservation tillage, and restricted use pesticides). All requested data may not be available or necessary for the designated crop in each field; however, requested information as indicated for RUPs must be recorded.

Record sheets are grouped in a plastic wrap, one instruction and map form with twelve individual field/year forms. These individual field/year forms consist of one large page (17 X 11 inches) folded to represent 4 (8½ X 11) pages. Each form is punched to fit in a standard notebook. Each set sells for $1.50.

A limited number of training meetings can be scheduled throughout the state, if requested. For more information, call Bob Croissant, Extension Agronomist, at 491-6201.
▫Croissant

PLANT ANALYSIS

Plant analysis has been used as a diagnostic tool since the early 1800's when work on the composition of plant ash demonstrated a relationship between yield and nutrient concentrations in plant tissues. Commercial uses of plant analysis data include:

1. Diagnosis of nutrient deficiencies, toxicities, or mineral imbalances.
2. Prediction of nutrient deficiencies in current or succeeding crops.
3. Establishment of fertilizer recommendations.
4. Monitoring the effectiveness of current fertilizer practices.
5. Assessing the amounts of key minerals removed in crop residues so that they may be replaced to maintain soil fertility.

6. Estimation of the overall nutritional status of regions, districts, or soil types.

7. Prediction of crop yields.

8. Estimation of nutrient levels in diets available to livestock.

Plant analysis may be used at critical stages of plant growth such as vegetative stages prior to flowering, at flowering, or just prior to seed development and filling to determine nutrient deficiencies. Very often nutrient deficiencies are not visible until plant growth is severely limited. In experiments with several levels of nutrient supply, symptoms only appear when plants are producing less that 70% of their maximum growth. Other deficiencies such as copper in subterranean clover may not produce visible symptoms until the plants are producing only 30% of maximum growth. In some cases, no foliar symptoms may be present but seed production may fail.

Plant analysis can be a useful tool for diagnosing nutrient problems, but utilizing the results depends on incorporating soil tests, past cropping histories, and visual symptoms, as well as obtaining proper samples.

Plant analysis should be used in conjunction with soil tests, foliar symptoms, and experience so that all information can be combined to assess deficiencies or toxicities. Correcting nutrient deficiencies can be accomplished more quickly after plant analysis with foliar sprays (discussed in the "Guide to Fertilizer Recommendations", XCM-37) since soil application of nutrients may not correct a nutrient deficiency in a timely manner.

When sampling plants for analysis, it is best to obtain a composite sample of the plant part which best represents plant growth (see also SIA No. .116). With diagnostic samples, the collection must be confined within the area of the affected crop. To minimize the effects of natural variability, each composite sample should be collected from a small uniform area. Diagnostic sampling is best undertaken when symptoms of the disorder are first observed.

Sampling for monitoring purposes may involve obtaining four separate composite samples taken from each field. The field is divided into four equal parts and a systematic sampling transect is undertaken in each quadrant and preferably at right angles to the crop rows. Each sample comprises from 25 to 50 plants or plant parts.

For areas where there is substantial variation in soil or topographical features or where differences in crop growth are obvious, it may be necessary to obtain separate and more elaborate monitoring transects within small defined areas of the crop. Each traverse provides a separate sample representing one of the observed variations.

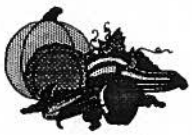
When sampling trees, it is important to sample all sides of the plant. Select a uniform area of orchard and within this area, select 20 trees along an X or zigzag passage through the orchard. Collect four (4) leaves per tree at shoulder height; one leaf from each of the north, south, east, and west quarters of the tree. In vineyards, a "U" or "W" type of traverse through the planting may be used where samples can be taken at systematic intervals along each inter-row space from left and right alternately.

Samples should be handled with clean hands, placed in open paper bags, and kept cool at 5°C. Soil should be removed with deionized water and the plant parts should be blotted dry to remove excess water. The samples can be analyzed using a plant analysis

kit [the Illinois nitrogen, phosphate, potassium tissue test from NASCO (800/558-9595); cat no. C8981N; about $21.55] or sent to a laboratory. Sending the samples through the mail involves leaving the samples in paper bags for packing and sending immediately by priority mail.

Plant analysis can be a useful tool for diagnosing nutrient problems, but utilizing the results depends on incorporating soil tests, past cropping histories, and visual symptoms as well as obtaining proper samples. ¤Self

Happy



Thanksgiving

WELCOME

Colorado Seed Growers is happy to announce that Gretchen Hopley has joined our organization as Assistant to the Manager. Gretchen is a 1991 graduate of CSU with a degree in Agronomy and has previously worked for CSGA as a field inspector. Most recently, Gretchen was on assignment with the Peace Corps in Sengal, West Africa working in seed storage and extension.

Gretchen will be performing most of the in-office seed certification activities for us and will also be doing some of our promotion work and some field inspections. ¤Stanelle

Where trade names are used, no discrimination is intended, and no endorsement by the Cooperative Extension Service is implied.

CONTRIBUTING AUTHORS

Brick, Mark A.,
Extension Agronomist - Bean Breeding,
Colorado State University
Croissant, Robert L.,
Extension Agronomist - Crops,
Colorado State University
Johnson, Duane,
Extension Agronomist - Alternate Crops,
Colorado State University
Self, James R.,
Manager,
Colorado State University
Soil Testing Laboratory
Stanelle, James R.,
Manager,
Colorado Seed Growers Association
Colorado State University

Sincerely,

Robert L Croissant

Robert L. Croissant
Editor
Extension Agronomist - Crops