FROM THE GROUND UP

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AGRONOMY NEWS

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RELEASE OF YUMA WHEAT

Colorado State University has released a new semidwarf height, hard red winter wheat variety named Yuma. Yuma has the yield potential and growth characteristics to compete with varieties such as Vona, TAM 107, and TAM 200. It has superior leaf rust resistance and grain quality. It is equal to TAM 107 and TAM 200 in grain yield. Yuma is very similar to Vona in plant height, maturity, and coleoptile length. Hence it is adapted to all the areas of eastern Colorado where semidwarf wheats are appropriate. It has excellent straw strength and resists lodging. It is equal to or superior to Vona and TAM 107 for bread making quality.

Yuma matures early and produces high test weight grain under adverse conditions. Yuma lacks resistance to the wheat curl mite, which is a vector for the wheat streak mosaic virus. Thus, this variety should not be planted in areas where this viral disease may be a problem. In this case, TAM 107 still represents a better choice because of its resistance to the wheat curl mite. Foundation seed was distributed to seed growers in August of 1991, who will produce registered seed for commercial wheat producers for 1992 planting. ▫Shanahan

FORAGE POSITION DROPPED

As of January 1, 1992, the Forage Extension position has been dropped. The loss of this position is the result of state fund reductions to Cooperative Extension.

Dr. John Shanahan previously served as Forage Specialist but has assumed the Variety Testing program duties after Jim Echol's retirement.

Any questions can be directed to Bob Croissant, 491-6201. ▫Croissant

SEED CONDITIONING

When planting crops, "clean" seed will improve planting ease, accuracy, varietal purity and freedom from undesirable weeds. Seed purchased from a seed company is normally clean and properly conditioned to plant. Seed purchased from a neighbor or seed saved from your own production usually will need additional conditioning. Seed properly conditioned must be processed with the proper equipment by a qualified operator.

It is important to remember that separation cannot be made when physical differences do not occur between seed and impurities.

The reason seed is conditioned is to remove contamination such as weed seed, inert material, or other crop seed. Upgrading, that is removing shrivelled, cracked, broken or insect damaged seed, is occasionally desired to improve seedling vigor. Seed sizing, a third reason to condition seed, will provide only the largest, most vigorous seeds to improve seed placement. Upgrading or seed sizing may require the use of additional conditioning equipment to achieve desired results.

Separation of undesirable materials is based on some type of physical difference between the seed and the impurity. Common physical characteristics that are used to separate seed include size, width, length, thickness, surface area, weight and specific gravity (weight per unit volume). It is important to remember that separation cannot be made when physical differences do not occur between seed and impurities.

In Colorado, all seed cleaning plants have the most basic seed conditioning equipment, the Air/Screen cleaner. The Air/Screen, as its name suggests, is a combination of an air separation (aspiration) and a series of screens. The aspiration sucks or blows light particles having a high surface area to weight ratio. Small machines have only one aspiration, but larger ones may have several air separations to clean as seed enters and leaves the machine. Screens are normally used in pairs, a top screen to scalp (remove large impurities) and a sifter which removes particles smaller than the seed. Two basic types of perforations are used in the screens, round hole to separate by width and slotted screens to separate by thickness. Length separations are not efficiently made on this machine. To get an idea of these three dimensions take a corn kernel and look at the top, front and side views. Differences such as these are used to separate, sort and size many crops.

The length grader, also used in Colorado, constructed as either a disc or an indented cylinder, separates specifically for length. It is used to separate jointed goatgrass from wheat.

The gravity table, also commonly used, will separate impurities similar in size but a different weight. It is used to remove shrivelled, unfilled or weather damaged seed or rocks from seedlots. The gravity table works best when all particles are the same size and therefore, it is necessary for the seed to have been cleaned through an Air/Screen cleaner first.

The most important part of any seed conditioning plant is the operator. A good operator knows the limitations of each machine and how to operate it. Don't assume that a plant can do a good job just because it has a lot of fancy equipment, but instead, be sure the operator has the ability to do a good job of cleaning.

The Colorado Seed Growers Association publishes in its seed directory, a list of conditioners who are trained and approved to condition seed. In addition, the CSGA will be conducting a conditioning training session in early April for anyone interested in learning more about seed conditioning. Watch for details. ▫Stanelle

NEW CORN RECOMMENDATIONS

Corn recommendations are being revised to more accurately assess nitrogen nitrate contamination of groundwater.

Corn recommendations are being revised to more accurately assess nitrogen requirements and reduce the possibility of nitrate contamination of groundwater. Current recommendations tend to overestimate the nitrogen requirements for corn, especially when yield goals are greater than 150 bushels per acre. Newer recommendations consider irrigation efficiency factors, nitrate in irrigation water, profile nitrogen, organic matter, manure application and whether or not the previous crop was a legume.

Irrigation efficiency factors were added to account for the capability of various irrigation methods and average amount of water needed to produce a bushel of grain. Efficiencies used in crop water use are shown in the following table.

Type of Irrigation	Factor
Furrow	.66
Center Pivot	.75
Surge	.85
Low Pressure CP	.75

The contribution of nitrate from irrigation water will also be considered. If a water sample is not supplied with the soil sample, then a background level off 2 to 3 ppm NO_3-N in the irrigation water will be assumed.

As has always been the case, profile N will enter into the final recommendations. Generally, 1 ppm NO_3-N equals 3.6 pounds N per acre foot of soil. Therefore, ppm NO_3-N times 3.6 equals NO_3-N per acre foot of soil. Examining the nitrate levels in subsoils of one to four feet deep will also help in reducing the need for additional fertilizer.

The contribution from organic matter is considered 30 pounds N per 1 percent organic matter. Legumes add 30 pounds N per acre foot for pinto beans and 50 pounds N per acre for alfalfa. The addition of manures will add approximately 5 pounds N per ton of manure. If manure analysis is available with application rates, this material will override the default calculations. The overall formula to be used follows:

N Pounds/Acre= Yield Goal X
0.9 Pound N per Bushel X
1/Efficiency Factor -
Irrigation water N -
Profile N -
30 PoundsN/1% OrganicMatter-
Legume N -
Manure N

The additional inputs into the nitrogen recommendations for corn will help reduce nitrate application rate and provide a fertilizer program that is safer for the environment. ▫Self

USE OF CHLOROPHYLL METER TO EVALUATE THE N STATUS OF DRYLAND WINTER WHEAT

Determining crop N status for the purpose of managing fertilizer applications can be a difficult task. Chlorophyll meters make it possible to quickly and reliably monitor leaf greenness and evaluate the need for additional N fertilizer. The chlorophyll meter has been used by various researchers as a N management tool for corn, sugar beet, and alfalfa production systems.

Measurement of chlorophyll content of wheat leaves by using a meter offers an opportunity to evaluate springtime crop-N status and thereby determine the need for additional N fertilizer application without costly delays. Research conducted in Colorado has shown that spring applied N is equal to, and in some cases superior to fall application for increasing winter wheat grain yield and protein content. The speed of data collection and ease of operation associated with chlorophyll meters makes them an ideal N-management tool if their output could be appropriately related to the need for N fertilizer.

In order to evaluate the chlorophyll meter, four existing replicated N rate studies in Colorado were used to compare yield, leaf N concentration and chlorophyll meter readings of dryland winter wheat. The four sites are designated as Akron 1, Akron 2, Punkin Center, and Willard. Meter readings were taken at the mid-point on the uppermost fully expanded leaf from approximately 20 randomly selected plants. The wheat plants were sampled on April 17 to 19 the late tillering stage (Feekes 5). Soil samples for profile N analysis were taken from each plot at the same time leaf samples were removed for meter readings and leaf N analysis.

Chlorophyll meter readings and yield responses for all four locations are shown in Figure 1 below. The Punkin Center and Willard locations had higher meter readings and apparently lower yield potential than did the two Akron sites.

Calibration of the chlorophyll meter against grain yield, leaf N or available soil nitrate + ammonium is possible. However, factors such as location, cultural practices, moisture availability, soil profile N and cultivar differences may have an effect on leaf greenness and the resulting chlorophyll meter readings. This research will be continued in the spring of 1992.

At the present time, chlorophyll meters are not recommended for use by farmers or consultants. A chlorophyll meter costs about $1,200. More calibration work is needed before the chlorophyll meter can be recommended as a management tool to evaluate the N status of crops. ▫Follett

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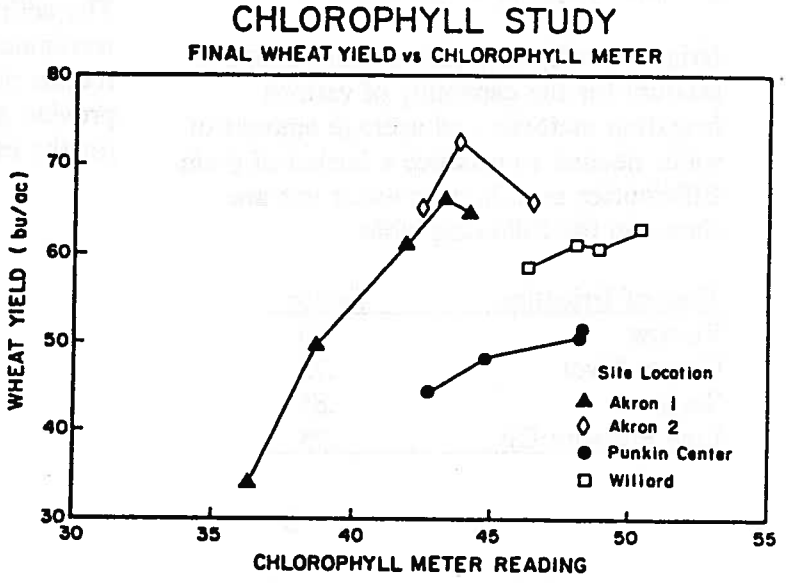

INTERAGENCY TEAM ADDRESSES GROUNDWATER QUALITY IN THE SAN LUIS VALLEY

A new office for the Water Quality Demonstration Project was opened October 1, 1991 in Monte Vista. Personnel located at this office are:

- *Steve Carcaterra - Agronomy/Water Quality Specialist CSU Cooperative Extension*
- *Alicia Ketchem - Project Engineer SCS*
- *L.G. Smith - Soil Conservationist SCS*
- *Larry Stark - Agronomist SCS*

A Water Quality Demonstration Project was funded by the United States Department of Agriculture in the San Luis Valley for the five-year period, 1991 to 1996. CSU Cooperative Extension is the lead agency in this interagency team effort between Extension, Soil Conservation Service and ASCS agencies in the San Luis Valley five county area.

Due to sandy soils, intensive use of agricultural chemicals, the greatest concentration of center pivot irrigation in the nation, and a vulnerable aquifer, the San Luis Valley was selected by USDA for one of sixteen nationwide demonstration projects.

Project personnel and resources for the project are funded by the President's Water Quality Initiative through participating USDA agencies: CSU Cooperative Extension, Soil Conservation Service and ASCS.

The goal of the San Luis Valley Water Quality Demonstration Project (SLVWQDP) team goal is to reduce the potential for agricultural chemical contamination of groundwater through the adoption of Best Management Practices. These BMP's will be developed with input from local producers, universities, state and federal agencies, and the agrichemical industry. Innovative practices will be demonstrated on cooperating farms throughout the Valley, with detailed records kept on inputs, yields and economic viability of the practice. Efforts will be made to fine tune farming practices currently in use, and to seek alternatives to traditional (and in some cases, possibly harmful) use of inputs.

There are documented nitrate contamination problems in the Valley and traces of pesticide have been found in thirty-four irrigation wells sampled in the summer of 1990. While the Project staff will not be directly involved in conducting a comprehensive groundwater monitoring program in the Valley, they will try to compile all groundwater studies that have been completed and assist in designing future monitoring activities as funding becomes available.

Specific objectives of the Project include working with thirty cooperators to demonstrate:

- Efficient nutrient management
- Efficient irrigation management
- Integrated pest management
- Pesticide applicator training
- Teamwork with local, state, and federal agencies who are involved in water quality activities
- Evaluate BMP adoption, economic success, and beneficial effects on groundwater.

Tours, Field Days, and media releases will distribute the information gained by the various demonstration projects to the general farming community which comprises over 1 million acres of potatoes, barley, wheat, hay and vegetables. Selection of cooperators will be done in conjunction with local soil conservation district boards, SCS personnel, Extension personnel, and local advisory committees.

More information about the SLVWQDP can be obtained by contacting Steve Carcaterra, Agronomy/Water Quality Specialist at (719) 852-0960 or by writing:

San Luis Valley Water Quality
Demonstration Project
923 First Avenue
Monte Vista, CO 81144

▫Carcaterra

UPDATE ON QUICK NITRATE TEST KITS

In the November, 1991 issue of the ***Agron-O-Gram***, I discussed the use of different Quick Nitrate Test Kits. In this issue, I will summarize the results of our research on three test kits which we evaluated.

I. N TRACK SOIL TEST KIT, HACH CO, LOVELAND COLORADO (PRICE $125.00 Regular Kit; $295.00 for a kit with pocket size color wheel)

With a variety of test kits and prices on the market, which ones work satisfactorily in Colorado?

This kit worked satisfactorily when used for Colorado soil and water samples. Test results of this kit agreed very well with the results of CSU Soil Testing Laboratory. Standard NO_3-N solutions must be used so the operator can accurately match the color of the wheel to that of the solution.

CAUTION: **Take proper soil and water samples (see your county agent for proper soil and water sampling)**

Dry soil samples in a microwave oven, dedicated to soil drying, for seven minutes, in an unused regular oven at 250 degrees Fahrenheit for 30 minutes or under a heat lamp for several hours. Do not expose the color wheel to sunlight or colors will fade. Cadmium (Cd) is used in measuring NO_3-N. Test solutions should be disposed of properly to avoid contamination of soils and waters.

II. NITRATE QUICK TEST, HAWK CREEK LABORATORY INC. GLENN ROCK, PA, AKA PENN STATE UNIVERSITY KIT (PRICE $299)

This kit also performed satisfactorily for Colorado soil when compared to the CSU Soil Testing Laboratory results. The reflectometer should be calibrated with a standard solution.

CAUTION: **Take proper samples and dry soil samples as explained previously. Do not expose the paper strips to sunlight.**

III. CARDY NITRATE METER, SPECTRUM TECHNOLOGIES, PLAINFIELD, ILL AKA HORIBA NITRATE ELECTRODE (PRICE $294)

This test kit did not perform satisfactorily on Colorado alkaline soil and water samples. However, it can be used for soil samples with pH values of less than 7 and water samples with pH values of less than 5.

▫Soltanpour

ALTERNATIVE AGRICULTURE THINGS YOU SHOULD KNOW

If you need additional income, are searching for or contemplating a change in your crop production and agricultural business, it is a good idea to develop a written plan. Included in this task is to record concerns and questions that come up, even the most minor ones. Alternate crops may help provide those needs.

There are many descriptions of alternate crops and hundreds of different things a person could venture into. Most alternative agricultural opportunities will require additional capital, labor, management skills and marketing know-how to be successful. For someone to plan a large enterprise is sure disaster.

Alternative agriculture opportunities can be grouped into different categories. They are:

PRODUCTS

New crops, at least new to each individual, may provide an excellent opportunity for added income. Be sure to evaluate product marketing first. These ventures may be livestock or business oriented.

ALTERNATIVE PRODUCTION SYSTEMS

Organic gardening or farming has provided additional markets for many individuals. A new system to you may be no-till or low input agriculture. A small greenhouse in the back yard may be used to provide vegetables for profit in the winter. Start small and solve production problems as you are developing markets. Ideas here are unlimited.

ALTERNATIVE MARKETS

Alternative markets may include a "Farmers Market", a roadside market, or developing a new use or method for processing a product on a small scale. Wild ideas such as selling "Pet Rocks" have been very successful. Other ideas include selling "Farm Wheat" or "Soup Mixes".

ALTERNATIVE LAND USE

Many individuals have established recreation and tourism as a source of income. Your ingenuity is the only limiting factor.

Alternative crops have limited markets, and most require marketing contracts. All alternate crops require additional labor, specialized equipment and special efforts in the production and marketing process. ▫Croissant

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

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Sincerely,

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