FROM THE GROUND UP

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AGRONOMY NEWS

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SPRING GRAIN OPTIONS

The combination of late fall planting with reduced fall growth, and the lack of winter moisture and extreme cold temperature followed by high winds have resulted in the loss of winter wheat stands in portions of many wheat fields in eastern Colorado this year. This situation is currently motivating many wheat producers to consider the possibility of inter-seeding spring crops into damaged portions of their winter wheat fields.

One of the key agronomic factors to producing a successful spring grain crop in eastern Colorado, especially for high grain yield and quality, is to manage the crop so that it matures as early as possible. This means planting as soon as possible. Planting before March 15 allows the crop to mature before the onset of summer heat, and increases the likelihood of producing high grain yields and quality grain with high test weight. Planting after this date may necessitate harvesting the crop for forage.

Variety choice is another management consideration for spring grain production. Regarding spring wheat, the varieties Butte 86 (taller type) and Oslo (semidwarf) would be the best choices, with both varieties being of early maturity. Butte 86 would have greater potential than Oslo for dual harvest as either a grain or forage. Other spring wheat varieties to consider are Kulm, Sharp, Russ, and 2375. Otis would be the best adapted spring barley. Keep in mind that none of these varieties have resistance to the Russian Wheat Aphid, so one should be prepared to scout and control this pest problem if the need arises.

One of the key agronomic factors to producing a successful spring grain crop in eastern Colorado, especially for high grain yield and quality, is to manage the crop so that it matures as early as possible.

The recommended seeding rates for spring wheat and barley are approximately 45-60 lbs/ac for dryland production and 75-90 lbs/ac for irrigated conditions. Regarding nitrogen fertilizer management for spring grains, a rule of thumb is that about 2 lbs. of nitrogen are required for each bushel of grain produced. Thus, if one is aiming for a yield goal of 30 bu/ac, this would require 60 lbs/ac of available soil nitrogen. Care should be taken to not over-fertilize with nitrogen if the crop is to be harvested for forage. Drought conditions and high levels of available soil nitrogen can contribute to high levels of forage nitrates and potential livestock poisoning.

Regarding marketing, it is best to not mix spring and winter wheat grain. All of your wheat could be declared "Mixed Grain", where it would be sold for feed value only (roughly equivalent to corn prices). If you are planting spring wheat and want to market it separately as grain, it would still be good to let your elevator know ahead of time. If they have inadequate storage to keep it segregated, they may suggest you store it in your bins. Later, you may market it directly to a flour miller, or your elevator may be able to put together enough from individual producers to market it for you later.

Small grain crops are potentially an important source of high-quality forage. Harvesting small grains for hay or silage rather than as grain may mean increased dollar returns per acre. Small grains are commonly harvested for silage in the boot, milk or dough stages, at 65 to 70% moisture, with 60 to 65% being optimum. The dough stage of kernel maturity has been shown to be the optimal stage for cutting small grains for hay purposes. Cutting at this stage results in the best compromise of maximum dry matter yield and maximum hay quality. Little difference exists among barley, wheat, or oats forage when used as hay. Quality differences are more likely due to differences in maturity when harvesting, handling, rain damage, and degree of protection during storage. Always test forage for nitrates before feeding. If rough-awned varieties are to be grown, preference should definitely be given to ensiling over harvest for hay.
▫Shanahan, Pilcher, Nitchie, Gilmore, and Zizz

SOIL SAMPLE NOW TO PREVENT ZINC AND IRON DEFICIENCY THIS SPRING

Take this soil survey. Are your soils a) low in organic matter, b) sandy, c) have pH greater than 7.0, d) contain high soil P levels, or e) include free calcium carbonate? If you answered yes three or more times, you may be finding chlorotic plants this spring. If the spring is cold and wet, the chances of developing chlorosis due to zinc and iron deficiency are even greater.

Crops that are sensitive to these deficiencies include corn, sorghum, sudan, pinto beans, and potatoes. Wheat and alfalfa are the least sensitive. Iron deficiency can also develop in lawns, shrubs, ornamentals, and orchards. However, you do have options. If you know that zinc and iron deficiency may threaten your crops, you can:

1) change to a less susceptible crop (wheat or alfalfa),
2) grow a more tolerant variety of the same crop,
3) apply fertilizer Zn to your soil pre-plant,
4) decrease soil pH with sulfur applications (only economically feasible for lawn and garden), OR

If the spring is cold and wet, the chances of developing chlorosis due to zinc and iron deficiency are greater.

5) plan to make foliar applications when the symptoms become evident.

The first step is to know your field history. Were there chlorotic spots in the field last year? If so, you can pull soil samples from those areas known to be problematic. Otherwise, soil samples should be pulled from the entire field. Be sure not to use anything galvanized or made of rubber for sample collection. After you get your soil test results, compare them to the following tables.

those developed in the Midwest or Northeast.

Soil applied Fe fertilizer is not economically feasible, although Zn fertilizer can be beneficial (applied according to rates given in the table above). The most effective application method is to broadcast and plowdown, but banding may be preferred under reduced tillage conditions. Zinc sulfate is the most common fertilizer source and can be applied as a granular material in a bulk

AB-DTPA extractable Zn (ppm)	Rating	Fertilizer Recommendation (lb Zn/A) - Irrigated	Fertilizer Recommendation (lb Zn/A) - Dryland
0-0.9	Low	10	5
1.0-1.5	Marginal	5	0
> 1.5	Adequate	0	0

AB-DTPA extractable Fe (ppm)	Rating
0-3.0	Low
3.1-5.0	Marginal
> 5.0	Adequate

If soil Zn or Fe levels are low or marginal, you may want to consider changing crop species or variety to avoid chlorosis problems. Wheat and alfalfa are less susceptible to zinc and iron deficiency than corn, sorghum, beans, and potatoes. In addition, ICI recently released two corn varieties with high soil pH tolerance (ICI 8751 with 97 day maturity and ICI 8681 with 103 day maturity), and other tolerant varieties are under development. Bean and potato varieties developed in western states tend to be more pH tolerant than

blend or incorporated into solid or liquid fertilizers. Zinc oxide has low solubility in calcareous soils, and should, therefore, be avoided. Zinc chelates are also available which are more effective than zinc sulfate and can be applied at one-third the rate recommended for zinc sulfate (divide rates given in the table above by three).

If chlorosis is going to be treated with foliar applications, it is of critical

importance to identify the symptoms as early as possible to minimize yield decline. Both zinc and iron deficiency symptoms show up early in the growing season. In corn and sorghum, zinc deficiency is exhibited by a broad band of white to translucent color on both sides of the leaf midrib. The chlorosis starts near the base of the leaf but usually the midrib and outer margin remain green. Both zinc and iron deficiency appear on the new growth first, but iron deficiency is characterized by yellow leaves with dark green veins which results in striping in corn and sorghum. Iron deficiency in beans and potatoes is similar but doesn't look striped due to the different leaf shapes. Under extreme iron deficiency, the whole plant may turn light yellow or even white. However, zinc deficiency in beans also results in bronzing of lower leaves along with yellowing of the upper foliage. Beans also become stunted, and the leaves get crinkled and curl downward when zinc is deficient.

Foliar applications of zinc can be made by spraying 20-30 gal/acre of a 0.5 % zinc sulfate solution (4.5 lbs zinc sulfate in 100 gal water); use a 1.0 % solution for potatoes. Iron sprays of ferrous sulfate or iron chelates are most effective when applied to young plants (10-15 days after emergence) and when repeated at 10 to 14 day intervals if yellowing persists. Foliar applications of iron can be made by spraying 15-30 gal/acre of a 2 % ferrous sulfate solution (16 lbs ferrous sulfate in 100 gal water); use a 1.0 % solution for potatoes. Be sure to use a wetting agent for zinc and ferrous sulfate applications! Chelates should be applied at lower rates (7-10 lbs/100 gal) because they can burn the leaves if applied at excessive rates. Foliar applications do not significantly increase soil test levels; therefore, if foliar treatment is utilized, application will have to be repeated from year to year. ¤Davis

Are you interested in receiving the newsletter by e-mail transmission? This would be in the form of a WordPerfect attachment. We are investigating ways to cut down on paper use. If you think that this might work for you, please e-mail Jeri Dreher in response at jdreher@ceres.agsci.colostate.edu

CSU ADOPTS THE NO-PUNT OFFENSE For a New Forage Research and Extension Team

Forageball has traditionally compared the performance of alfalfa varieties. Good forageball has been played in Colorado at Fruita, Rocky Ford, and in the San Luis Valley for several years by teams headed by Calvin Pearson, Frank Schweissing, and Merle Dillon, respectively. In 1995, a new franchise at Yellow Jacket, under the direction of Abdel Berrada, fielded a young team that had a difficult but respectable first season. In the past, Dan Smith provided support to the fledgling state forageball organization from his Ft. Collins headquarters and coordinated contacts with alfalfa seed companies anxious to sponsor players in Colorado competition. He now figures that the Colorado organization is well-rooted and can be reorganized under new direction. Shanahan and Johnson, in Crop Extension, forever gluttons for more work, have volunteered to lead the organization. Crops Testing is expected to open a new franchise in NE Colorado this season, probably near Sterling.

New state organizer, Jerry Johnson, moonlighting from regular duties with wheatball, cornball, beanball, and sunflowerball, says that the real motivation for reformulation of state forageball strategy is because forageball is an enormously important and popular sport in Colorado and that concerted research and Extension involvement in this popular sport is long overdue. As player/coach, Johnson hopes that his tenure as coach will only be temporary. Strong performances by new and old teams can be expected to result in improved recruiting, and even better records. Hopefully, recognition by the Colora

Hay and Forage Association, and support from Cooperative Extension and the Agricultural Experiment Station, will result in hiring of a full-time forageball coach.

Shanahan and Johnson contend that successful forageball involves Extension as much as research, animal sciences as much as crop sciences, as well as entomology, pathology, weed science, and even ag economics. Former state organizer, Dan Smith, warns Colorado forageball players that good forageball is not alfalfa variety testing alone. As the new head scout, he will search for exciting exotic species of grasses. He remains convinced that a balanced attack, using both grasses and alfalfa, will ultimately redefine Colorado's forageball game plan. However, time, resources, and cooperation will be needed to put the new strategy into action. "We have great sports fans in Colorado," he says, "and forageball is no exception. With hard work and refusal to punt, we could challenge forageball powerhouses like Wisconsin and California within five years."

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The new Colorado 'no-punt' offense is firmly rooted in hallowed principles of farming systems research and Extension. Experienced players, like Rocky Ford's Frank Schweissing, can be counted on to rush for 1,000 yards a season, year in and year out. Merle Dillon, blessed with the perfect combination of research and Extension, is well known for his fearless 'no holds barred' defensive tactics. And Fruita's experienced quarterback, Calvin Pearson, will remain the real brains behind the new state organization. He is expected to unveil a manual for hay and pasture management on the Western Slope this coming season.

New special teams coach, and former Nebraska forageball great, Dr. 'Surfin' John Shanahan, has agreed to lead the Colorado team into the new information age by connecting us to the World Wide Web. Recruiting for the new state organization will be handled through a private e-mail listserver. Participants will automatically receive all group mail and can contribute advice, comments, or answers to the group in return. Experienced and inexperienced forageball players are welcome to join by sending an e-mail message to Jerry Johnson at: jjj@lamar.colostate.edu
▫Johnson

PLANNING TIPS FOR THE 1996 DRY BEAN CROP

It's not too early to start planning for the 1996 bean crop. Several production decisions can be made now, including the choice of market class and variety as well as plans for your soil fertility program.

The choice of market class represents the most important decision you can make regarding the value of your crop at harvest. It is difficult to speculate what the prices will be at harvest, but today's prices of the market classes grown in Colorado are very different. Colorado grower prices were $18.00/cwt for navy, $27 to 29 for great northern, $17 to 18 for pinto, $20 to 22 for light red kidney, and $16 to 18 for blacks on March 3, 1996. The high demand for large white beans in the international market, especially northern Europe, and the relatively small 1995 crop, has kept the price of great northern high. A large 1995 crop and moderate international sales levels for most other classes have prevented prices in these classes from increasing. The largest factor that will determine the 1996 bean crop price will again be total U.S. production. If North Dakota and Michigan have a large crop in 1996, we will not see

an increase in price for navy, pintos, or blacks. However, today's high corn and wheat prices will likely reduce the acreage planted to beans in 1996, especially in the High Plains and northern states. These events would surely reduce production and cause an increase in grower prices. I suggest that you maintain the bean crop base that fits your rotation, and discuss diversifying your bean crop into pinto, great northern and/or light red kidney beans with your local elevator or bean buyer.

The largest factor that will determine the 1996 bean crop price will again be total U.S. production. If North Dakota and Michigan have a large crop in 1996, we will not see an increase in prices for navy, pintos, or blacks.

Varietal selection should be based on your yield goals and adaptation to Colorado growing conditions. For information on varietal performance of dry beans in Colorado during 1995, refer to Cooperative Extension Bulletin TR96-3. For a summary of variety performance over years refer to previous editions of the same publication. Also consult with local elevator or bean buyers for experience in your area. Certified seed should be readily available for most varieties because the seed crops in western Colorado and Idaho are adequate to meet the needs in 1996.

Soil fertility is another important consideration for a successful bean crop. If you haven't taken a soil sample on your 1995 bean ground, you still have time to obtain a sample and get it tested. Fertilize your dry bean crop according to your yield goals and soil test results. A 2,400 lb. dry bean crop will require approximately 60 lbs of actual N to be extracted by the roots. Considering that roots are not 100% efficient at extracting N, you will need at least 80 to 100 lbs/acre of available N to supply the crop. The N application rate should be reduced by the amount of residual N indicated in the soil test and the amount fixed by the nodules; however, this amount is difficult to determine. In heavy soils, N-fixation may be insignificant, while in light textured soils inoculated with *Rhizobium*, fixation can account for up to 20 to 30 lbs of N. Be careful not to apply excess nitrogen, as it will stimulate vegetative plant growth, delay crop maturity, and increase disease pressure. Phosphorous fertilization should also be based on the soil test results. Soils that test very low should have 20 to 40 lbs of P applied to achieve a 2,400 lb./acre yield goal. Potassium is usually not needed on our soils. Use the soil test results to determine potassium and micronutrient needs and refer to SIA No. 0.539 for more information regarding specific fertilizer suggestions for dry beans.

While you are sampling the soil for nutrients, evaluate your fields for soil compaction. Soil compaction can significantly reduce bean yields by reducing root growth in the soil profile, preventing water from infiltrating through the soil profile, and increasing the incidence of root rot and white mold disease. Evaluation of soil compaction can be made with a home fabricated soil probe. A ½-inch diameter solid steel rod, 36 inches long with a T-handle welded on it can be used to probe your soil. The rod should be able to penetrate the soil profile down to 18 to 24 inches without a great deal of resistance. More importantly, the resistance should not change greatly as you penetrate the profile. Compacted layers can be detected by resistance to penetration of the rod. If resistance to penetration is encountered, the field has a compaction problem. Either deep chisel down through the compacted layer to break it or plant a crop that is less sensitive to compaction, such as corn or wheat. Deep chiseling should only be done when the soil is relatively dry because chiseling wet soil does not break the compacted layer. ▫Bric

Colorado State University is currently involved in testing a new formulation of a biodegradable, non-toxic engine oil. It is made from Colorado-grown canola, safflower, and sunflower oils.

Contact Duane Johnson for more information (970/491-6438).

SOILS INTERNSHIPS NEEDED

The new environmental soil science major will be graduating its first students soon. The agronomy internship program provides students with practical experience working within the industry for credit. However, internships are lacking for the soils majors. Ideally, all soils majors should be placed in internships prior to graduation. If you know of an opportunity for a soils major to work this summer in the areas of fertilizer and manure management, mining and reclamation, water quality, or other environmentally related areas, please contact Jessica Davis (970/491-1913) or Jack Fenwick (970/491-6907).
▫Davis

MARILYN KAY CAMPBELL JOINS CSGA STAFF

The Colorado Seed Growers Association is pleased to announce the addition of Marilyn Kay Campbell to our staff as Administrative Assistant.

Ms. Campbell has a long history with Colorado State University. She received a B.S. in Occupational Therapy from CSU in 1959. In 1988, she began work in CSU's Equine Sciences Program as a receptionist and personal secretary. Her experience includes work for three professors in that program as typist, word processor, office manager, travel arranger, and tour guide. She has seven years administrative experience working with professors, staff, students, and visitors.

Kay began work at the Colorado Seed Growers office on February 5, 1996. CSGA is pleased to add her expertise to our staff. ▫Stanelle

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

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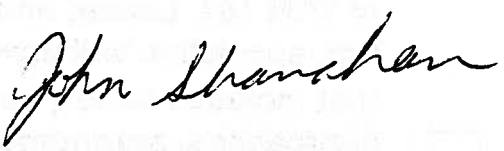
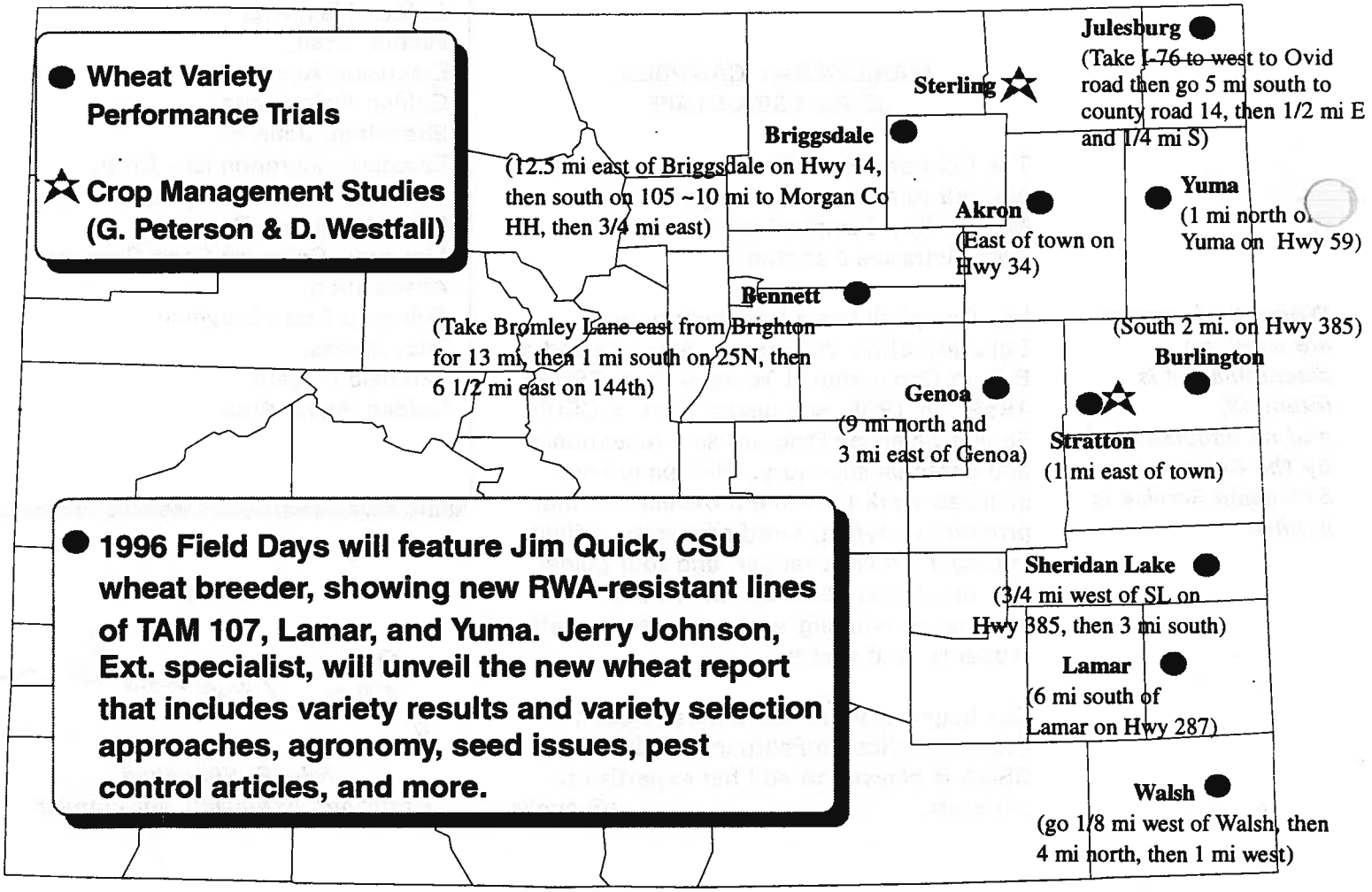
Sincerely,



John F. Shanahan
Editor and Extension Agronomist

Wheat Field Days 1996

☆ Stratton	June 10 (Mon)	5:00 p.m. at Miltenberger Bros. farm, Kit Carson County (STRATTON - 4 E on Hwy 24)
☆ Sterling	June 11 (Tue)	5:00 p.m. at Gilbert Lindstrom farm, Logan County (STERLING -1/4 S of Intersec. of Co. Rd 6 & 59)
Walsh	June 17 (Mon)	9:00 a.m. at Research Center in Baca County
Lamar	June 17 (Mon)	1:00 p.m. at John Stulp's in Prowers County
Sheridan Lake	June 17 (Mon)	5:00 p.m. at Eugene Splitter's in Kiowa County
Akron	June 18 (Tue)	8:00 a.m. at Research Station in Washington County
Yuma	June 18 (Tue)	5:00 p.m. at Irrigation Research Foundation Farm
Burlington	June 19 (Wed)	8:00 a.m. at Barry Hinkhouse's in Kit Carson County
Stratton	June 19 (Wed)	10:00 a.m. at Kenny Pottoroff's in Kit Carson County
Genoa	June 19 (Wed)	5:00 p.m. at Roy Anderson's in Lincoln County
Briggsdale	June 20 (Thur)	9:00 a.m. at Cary Wickstrom's in NW Morgan County
Ovid	June 20 (Thur)	5:00 p.m. at Jim Carlson's in Sedgwick County
Bennett	June 21 (Fri)	5:00 p.m. at John Sauter's in Adams County
Sidney, NE	June 26 (Wed)	9:00 a.m. at Univ. Nebraska Research Center



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