FROM THE GROUND UP

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AGRONOMY NEWS

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PESTICIDE RECORD KEEPING - EFFECTIVE MAY 10, 1993

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restricted use pesticide was applied. The location may be described as legal land terms, or any id system which accurately identifies the property, systems used by ASCS or SCS are approved.

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All producers should keep complete records of field operations. Private applicators applying restricted use chemicals must keep records according to the 1990 Farm Bill.

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All private applicators (farmers who apply restricted-use chemicals) are in this category and must keep the data mentioned above. Commercial applicators must continue to maintain records as previously required. State pesticide regulatory agencies are in charge of enforcing the record keeping regulations. Penalties of up to $500 will be imposed for the first violation and a minimum of $1,000 for any additional violations.
▫Croissant

SOYBEANS FROM A DIFFERENT PERSPECTIVE

Soybeans, a mainstay of American agriculture, have had only minor impact on Colorado's producers. Soybeans require intensive management and water. They also require a processing plant within 300 miles of production and enough acreage for economic stability. This combination has been lethal to oilseed soybean production on the High Plains. For growers with limited acreage and adequate water, there are some interesting "new" soybeans you should look at.

The first is edible soy. Edible soybeans have been selected for low oil and high protein content. The seed size is larger than the oil type, having 900 to 1,200 seeds/pound versus the 2,400 to 2,600 seeds/pound of oil types. Edible soybeans are used in soynuts, miso, tofu, soy sauce, and soymilk products. Oilseed soybeans tend to be too harsh in flavor and too tough for these edible uses. Oilseed soybeans are processed into everything from plastics to cattlefeed and artificial bacon. Edible soy

generally has a value of $1/bu over regular soybeans.

The second type of soy is the vegetable soybean. In Japan and the Orient, these are referred to as "edamame" (ED-a-mommy). The beans are the largest and mildest of the soybeans. Edamame research has been initiated in Minnesota, Iowa, and Indiana and now, in Colorado. The beans are harvested as a green bean at the peak of physiological maturity before drydown. They are used as a fresh green bean (in Japan, you would buy them on the beanstock; hence, edamame means "branched bean"). In Colorado we have very limited experience with edamame but this appears well suited to our climate. Currently, we will produce edamame at the Arkansas Valley Research Center and hope to process the beans into a frozen product aimed at U.S., Canadian, Japanese, and Korean markets. Why are we so interested? Currently edamame has a value at the farmgate of $0.06 per pound ($2.40/bu) and we should be looking at 10,000 to 20,000 lbs/acre.

Tofu burger with a side of edamame and a dash of mustard, anyone?

With the Asian markets ready to go, you might ask why pursue U.S. markets? The answer may be cancer prevention. Recently in the Proceedings of the National Academy of Sciences, a German team of scientists recovered a protein called genistein from the urine of people on a traditional Japanese diet. The levels of genistein were thirty times higher in Asians than the urine of typical Westerners. What does this protein do? It appears that we produce microtumors of one to two millimeters (400ths to 800ths of an inch). These microtumors foster the development of new blood vessels called capillaries which surround the tumor and allow it to grow and spread. Genistein appears to inhibit the capillaries from growing, turning tumors into harmless cell clumps which can be excreted. Such treatment should be useful in solid cancers of the prostate, breast, and brain. Genistein is found in soybeans and crucifers. Tofu burger with a side of edamame and a dash of mustard, anyone?
▫Duane Johnson

IRRIGATED FARMERS USE OF INFORMATION PROVIDED BY SATELLITE

Improved irrigation technology, advanced management practices and communication systems offer an opportunity to use water more efficiently. During the 1993 irrigation season, Colorado State University Cooperative Extension implemented a model program to disseminate information daily to assist agricultural irrigators with improved water use practices. Every day throughout the growing season, irrigators could receive weather data summaries, crop water use, and heat unit accumulation information for wheat, corn, and beans via a Kansas University band satellite system. More than 500 farmers in northeast Colorado have the ag information satellite system already in place on their farms and ranches. In addition, the systems can be found in many county extension offices, grain elevators, vo-ag classrooms, banks, and local restaurants.

The project utilized information collected from remote sensing weather stations located at 18 different sites along or near the South Platte. The USDA Agricultural Research Service, Colorado Agricultural Meteorological System, and the Northern Colorado Water Conservancy District (NCWCD) provided the real-time data, which

CSU Cooperative Extension accessed and calculated evapotranspiration rates daily and accumulated heat units for crops at each of the sites being monitored in northeast Colorado.

Satellite users get information "on time".

Irrigation related information in the past had not been widely disseminated, and had limited access provided by radio stations and local newspapers, or accessed by modem from a bulletin board at the Northern Colorado Water Conservancy District (NCWCD) office in Loveland. Less than 100 irrigators utilized the modem to obtain the information in 1992. This model project has great potential for disseminating real-time data, in addition to providing educational information to irrigators along the South Platte at a relatively low cost. ▫Steve Johnson

HOW TO TAKE SOIL TEMPERATURES

Official methods to take soil temperatures have not been developed. However, most official weather stations, agricultural research units, and others reporting data use the same methods. Deviation from these methods may or may not be significant depending of the use of the data.

Soil temperatures should be taken at 7:00 AM and 7:00 PM at a 4 inch depth in locations representative of the temperature use.

Depth

Usually soil temperatures are taken at 10, 20, 50, or 100 cm deep (4, 8, 20, or 40 inches), depending on the use. It is most important that methods are consistent when comparing values over a period of time. For agricultural use, 10 cm depth (4 inches) is used most often; however, on occasion, readings are taken at 5 and 15 cm depths and then averaged.

Soil Surface

Soil surface preparation, at the thermometer location, should be the same as the intended use of the data. For example, if temperatures are intended for corn emergence, the thermometer should be placed in a field prepared for planting corn. If the field is no-till, then the thermometer should be placed in no-till conditions. Temperatures vary considerably depending on soil color, soil moisture, vegetative cover, kind of thermometer used, and effects from the sun. A thermometer receptacle designed to be sensitive on the bottom half of the probe will take an average over that region. That thermometer placed vertically in the soil would indicate a different temperature than if it was placed horizontally at the recommended depth.

Time of Day

Readings taken at 7:00 AM and 7:00 PM are most common. However, readings taken a few minutes in either direction from 7:00 should not vary much. Probes set at the 2 inch depth would respond faster to warming during the day than probes at the 4 inch level.

Thermometer

A continuous recording thermometer with a thermocouple placed horizontally at the 4 inch depth is desired. When thermocouples are placed at the 2 inch level, they work upward. Hand-held thermometers are acceptable but must be placed so that the sensitive region of the thermometer is at the proper depth and in contact with the soil. The sun can cause warm areas on the probe which may result in inaccurately high readings. Therefore, it is recommended that above-ground parts of the thermometer be temporarily shaded. Thermometers are usually left in the ground for 3 minutes before temperatures are read. ▫Croissant

DRY BEAN OUTLOOK FOR 1993

The area planted to dry beans for 1993 is projected to be up approximately 6% nationally and 25% in Colorado based on March intentions. These figures represent a modest increase in total production, considering production was over 30% lower in 1992 than the previous year. How does this information influence your cropping strategy for 1993? I think a cautiously optimistic view would be the best approach. I suggest to maintain the area planted to beans at or slightly above that needed to fulfill the needs of your rotation. Pinto prices are generally better than great northern or navy beans at this time. I look for this trend to continue since pintos are the largest export dry bean class. Further, since Colorado produces higher quality pintos than our eastern neighbors, many buyers still prefer Colorado pintos over other states. If we are to continue to maintain a price advantage, we must be quality conscious during the entire growing season.

To bean or not to bean, that is the question.

Production of quality beans starts with the selection of the variety. Choose a variety that has good seed size, color, and shape, and is resistant to the prevalent diseases on your farm. Most of the varieties which have had good performance in Colorado also have excellent seed quality. Consult the **CSU Crop Testing Program Dry Bean Variety Test Results** for comparisons of seed size among varieties. Seed quality is also influenced by cultural practices such as soil fertility, irrigation frequency and timing, harvest management, and seed storage conditions. Soil fertility should be adequate to produce the yield goal that you hope to obtain. Refer to the **Colorado Dry Bean Production and IPM Bulletin or the Colorado Fertility Guideline Handbook.** Soil moisture stress can cause a reduction in yield and/or seed size, if it occurs at the flowering or pod fill stages. Make sure the crop has adequate soil moisture during these growth stages. The most critical time for seed quality is during the harvest operations and in the subsequent storage conditions. Harvest procedures must be conducted to minimize mechanical seed coat damage and staining due to weathering. This can be done by conducting harvest operations at proper seed moisture and having a properly adjusted combine. We will discuss these issues further in the August newsletter. ¤Brick

ALFALFA FERTILITY MANAGEMENT

Alfalfa is the most important cultivated forage crop in Colorado. Because of its value, fertilizer management is an important consideration.

Soil test

Fertilizer is an important factor for successful stand establishment and the subsequent maintenance of stands. The basis for proper fertilizer use is the soil test. Soil nutrients are depleted with every alfalfa harvest. Each ton of alfalfa contains about 50 pounds of nitrogen, 10 pounds of phosphorous, and 40 pounds of potassium. Fields should be tested prior to planting and then retested in the fall of each year following the year of establishment.

Nitrogen (N)

Until nodulation occurs, alfalfa seedlings are dependent on available soil nitrogen for growth. If the soil test indicates very low N availability (< 4 ppm as determined by CSU AB-DTPA soil test), a preplant application

of 20 lb N per acre is advisable to get the alfalfa started.

Inoculation of alfalfa seed is recommended. Most certified seed is preinoculated. However, if the seed has been stored for more than one year without being reinoculated, packaged inoculum should be added to the seed at planting time by following label instructions on the inoculum packet. With good nodulation, there is no need for supplementary application of nitrogen fertilizer. Effective nodules possess a pink to reddish-brown center and are usually elongated in shape. Ineffective nodules are small and rounded with a white to pale green center.

Phosphorous (P)

Because alfalfa is the most important cultivated crop in Colorado, fertilizer management must be considered.

Phosphorous is the most critical nutrient for alfalfa production in Colorado. Alfalfa needs about 10 to 12 pounds of P_2O_5 per ton of air-dried hay. CSU research indicates that you can plow down a 3-year supply before planting and that this single preplant application is equally or more effective than the same amount of P applied over a 3-year period of time.

Fertilizer Placement

After establishment, soils should be tested at the end of each growing season to determine their phosphorous status. Broadcasting P on established stands is effective on soils low in P because the alfalfa plant has feeder roots near the surface. However, timing and placement in relation to fertilizer formulation are important factors to consider. Little difference exists between liquids or solids, or ortho or poly-phosphate materials as a phosphorous source for alfalfa.

Recent research by Kansas State University scientists in southwest Kansas compared broadcast applications of liquid phosphate with dribble and deep-band applications of P. The dribble (surface-banded) and deep-banded P produced from .5 to 2.5 tons more hay per acre than plots where the same amount of P was broadcast. The machine used for the deep-banded placement was a modified anhydrous ammonia applicator equipped with coulters rather than standard shanks. A high-pressure nozzle mounted low and close behind each coulter injects liquid 10-34-0 into the soil under 30 to 80 pound pressure. The fertilizer is carried in saddle tanks on tractors and a tender towed behind the applicator.

Potassium (K)

Colorado soils generally have adequate potassium for alfalfa. However, certain coarse-textured, shallow soils may be low in potassium. A soil test is a valuable guide to determine the need and rate of application for K.

Other Nutrients

Calcium, magnesium, zinc, manganese, copper, boron, molybdenum, and sulfur (S) are usually not limiting factors for alfalfa in Colorado. However, S deficiencies may exist in alfalfa on sandy soils low in organic matter. Most irrigation waters in Colorado contain enough sulfates to meet the S needs for alfalfa. Therefore, S deficiencies on irrigated soils are rather infrequent. However, if you suspect a S deficiency, it is advisable to have your irrigation water analyzed for sulfates. ▫Follett

- - ATTENTION - -

Please use page 8 to update the Crop Production and Pest Management Field Record form that you presently have.

COLORADO STATE UNIVERSITY
1993 EASTERN COLORADO WINTER WHEAT AND CROP MANAGEMENT FIELD DAYS

The schedule for Winter Wheat Field Days in eastern Colorado follows. We are in the process of developing an agenda that will be of great interest to all wheat producers. The agenda will include potential new winter wheat and feed grain varieties, soil fertility recommendations, Russian wheat aphid control, as well as the wheat production factors. A representative from the Soil Conservation Service will be on the program to address issues pertaining to the SCS conservation tillage requirements for compliance in farm programs.

▫Shanahan

DATE	TIME	COOPERATOR	COUNTY	DIRECTIONS TO THE FARM
June 14	5:30 p.m.	Research Center	Baca	WALSH - ⅛ W, 4 N, 1 W
June 15	8:00 a.m.	John Stulp	Prowers	LAMAR - 6 S on Hwy 287
June 15	5:00 p.m.	Eugene Splitter	Kiowa	SHERIDAN LAKE - ¾ W on 385, 3 S
June 16	8:00 a.m.	Barry Hinkhouse	Kit Carson	BURLINGTON (DRY) - East exit I-70, ½ W on FrontageRd
June 16	4:30 p.m.	Gary Mulch	Kit Carson	BURLINGTON (IRR) - Peconic 7 S on Rd 55 to Rd N, ½ S
June 17	8:00 a.m.	Roy Andersen	Lincoln	GENOA - 9 N, 3¾ E
June 17*	5:00 p.m.	Miltenberger Bros.	Kit Carson	STRATTON - 4 E on Hwy 24
June 21	9:00 a.m.	Stan Cass	Weld	BRIGGSDALE - 2 ½ S on 392, ½ E on 84
June 21	5:00 p.m.	Kevin Helzer	Adams	BENNETT - N on 79 to Rd 144, ¼ E
June 22	8:00 a.m.	Research Center	Washington	AKRON - 4 E, ¼ S, ⅛ W
June 22*	5:00 p.m.	Gilbert Lindstrom	Logan	STERLING - ¼ S of Intersec. of Co. Rd 6 & 59
June 23	8:00 a.m.	Jim Carlson	Sedgwick	OVID - 3 S of I-76
June 25	9:00 a.m.	Univ of Neb Research Center		SIDNEY, NEBRASKA 5 N on 385, 2 W, ½ N

*Gary Peterson's and Dwayne Westfall's Crop Management Study

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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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