FROM THE GROUND UP

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AGRONOMY NEWS

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1992 DRY BEAN PRODUCTION AND PRICE OUTLOOK

Dry bean production declined both statewide and nationally during 1992 according to the USDA Crop Reporting Service and the Colorado Agricultural Statistics Service. The U.S. and Colorado crop is forecast at 22 and 2.5 million cwt in 1992, respectively. This represents a 25% drop in production in Colorado, and a 33% drop nationally from 1991. These figures reflect both fewer acres harvested and lower yield levels than in 1991. Colorado harvested 150,000 acres in 1992, compared to 170,000 acres in 1991. The average yield in Colorado is forecast at 1,479 lbs/A, down 291 pounds from last year's record high of 1,770 lbs/A. The reduced yields reflect the relatively poor growing conditions for dry beans in Colorado. The cool wet summer delayed maturity and provided an optimum environment for several disease pathogens. Severe rust outbreaks were observed in many regions of the state. The previously resistant pinto variety 'Bill Z' was damaged by a new race of rust first seen in Colorado in 1991. Bacterial brown spot (BBS), a foliar pathogen, was widespread in the Great Plains region. In the panhandle of Nebraska, this pathogen caused severe damage to most pinto varieties, and reduced yields dramatically. It is

difficult to say how BBS will influence production in the future, but we know pinto varieties differ in their reactions to BBS. Bill Z appears to have a high tolerance to this pathogen compared to most pintos.

Bean yields during 1992 were lower in North Dakota, Michigan and Canada due to the cool wet weather. Total production in Michigan is projected at 3.7 million cwt in 1992 compared to 6.2 million cwt in 1991. The reduced U.S. production, coupled with a devastating early frost in Mexico, should keep bean prices strong through next year. The 1992 Mexico bean crop is about half of normal (according to the Rocky Mountain Bean Dealers Assn. Mexican Bean survey). Another unknown in the pricing equation is the effect the North American Free Trade Agreement will have on bean prices in the U.S. Upon signature of that agreement, Mexico will allow 50,000 metric tons (1.12 million cwt) of dry beans into the country duty free. After that amount, a tariff will be applied to all beans entering the country. However, since there is a good likelihood that Mexico will be short of beans for domestic consumption, many beans will flow across the border by Mexican Nationals that live along the border who purchase their groceries in the U.S. Some estimates suggest that as much as 75% of the food consumed by Mexican Nationals living in or near border towns is purchased in the U.S. Since none of the foodstuffs are counted in the U.S.-Mexico trade, many undocumented beans are likely to flow into Mexico.

"I believe that the best advice for producers is to keep the production area devoted to beans fairly constant from year to year to take advantage of the up cycles when they occur, and hold your beans in the down cycles if you can afford to store them."

Bean prices should remain strong. Be careful when planning next year's bean crop, since every time we see strong bean prices, the area planted always increases. That response, coupled with a good production year in 1993, will cause a turn in the down cycle for prices again. I believe that the best advice for producers is to keep the production area devoted to beans fairly constant from year to year to take advantage of the up cycles when they occur, and hold your beans in the down cycles if you can afford to store them. ▫Brick

VARIETY TRIALS RESULTS FINALIZED

Results from the corn, bean, and sunflower variety trials have been finalized. Preliminary results have been approved by the seed companies and have been mailed to seed dealers, Extension personnel, and farmer cooperators. We have finalized the bulletins for these results and they are currently being mailed. The bulletins will contain the performance results as well as yield summaries, climatic data, and other pertinent information. ▫Shanahan

SEED DORMANCY

Seed that will be planted this spring should be tested for germination prior to planting. Some seed tests will indicate percent germination and hard or dormant seed. Seed buyers may be skeptical of buying this seed, but if we consider only germination, seed with a dormancy mechanism may be the best buy.

The presence of hard seed indicates the inability of the seed coat to be penetrated by water, while other types of dormancy involve a viable but metabolically inactive embryo. Both of these features aid in the survival of the species by retarding, delaying or

dispersing germination, or by sensitizing seed to respond to specific environmental conditions. Seed dormancy was necessary in undomesticated plants so that seed would only germinate when conditions were best for plant survival. To this day, all of this "wildness" has not been removed from more domesticated kinds by plant breeders.

Limited research does not explain what stimulates seed dormancy, or for that matter, what causes the dormant seed to respond to the germination process. There is some evidence that seed dormancy intensifies with favorable seed maturation environments. If this is true, then seed that is highly dormant would have had the best growing conditions and therefore be the most mature and vigorous. Hence, the argument that a seedlot that exhibits some dormancy is the most favorable to plant.

For crops such as millet, corn, beans, and small grains, a seed tag that indicates some dormancy at test time will probably indicate a very high germinating and vigorous seedlot at planting time.

There are disadvantages to seed dormancy when common crop needs are involved. It may prevent prompt and uniform emergence of seedlings, interfere with planting schedules, and contribute to volunteer plant emergence. To minimize these problems, it is best to have the dormancy broken by planting time. Hardseeds can be broken by scarification or impaction. For some species, the hard seed condition will be improved by storing the seed for a few months with periodic monitoring, then subjecting it to a normal seed conditioning process. Anything that can cause a crack, weak spot, or scratch in the seed coat will allow water to be imbibed and germination to begin. Other types of dormancy can be a little more complicated to understand, but in the case of most common agronomic crops, time, temperature, or light may break the dormancy and allow the seed to germinate. Most common crops will break dormancy naturally by planting time.

Even though the seed tag may report a few percent of dormant or hard seeds, the test may be 5 to 6 months old by planting time and most of the dormancy may already be gone. So, for crops such as millet, corn, beans, and small grains, a seed tag that indicates some dormancy at test time will probably indicate a very high germinating and vigorous seedlot at planting time. ▫Stanelle

CALENDAR OF EVENTS

January 11-24
National Western Stock Show
Denver

January 12
Experiment Station-Agronomy Department Conference
University Park Holiday Inn
Fort Collins

January 13-15
Corn Management Clinic
Colorado State University

January 26-28
Colorado Farm Show
Greeley

February 8-9
Ag Water Quality Management Issues Conference
Colorado State University

SUMMARY OF N AND P DRYLAND WHEAT FERTILIZER TRIALS

Colorado State University has conducted dryland winter wheat fertilizer experiments in eastern Colorado since 1981 which were integrated into cultivar performance trials. This has provided excellent educational opportunities to demonstrate the need for N and P fertilizer. Integration of these experiments with variety trials enables Extension personnel to conduct broader educational programs during field days because farmers can observe fertilizer trials along with the cultivar performance tests. In addition, soil tests are taken at each location and the resulting yield data have helped to calibrate the available N and P test for the Soil Testing Laboratory.

Integrating fertilizer experiments with cultivar performance trials provides excellent, broader-based educational opportunities.

The data shown in Table 1 represents the locations and fertilizer treatments put out for the 1991-92 growing season. There were two locations out of seven (Bennett and Walsh) that gave a significant response to N. Only one location (Walsh) gave a significant yield increase to N and P fertilizer and a significant increase in protein content. Past research has shown that yields may be significantly limited if the protein content is less than 11.1%.

Tables 2 and 3 summarize the response of N and P fertilizer over the period of 1981-82 to 1991-92 for dryland winter wheat. When we first started the trials, we got a significant N response for 71% of the locations (Table 2) and a P response for 67% of the locations (Table 3). Since that time, there has been a decrease in the number of locations giving a response to N and P fertilizer. This indicates that farmers have been doing a better job of fertilizing and the fertility level of the soils is building up. ▫Follett

Table 1. The effect of N and P fertilizer on yield and protein content of dryland winter wheat (1991-92).

Treatment	Bennett		Burlington		Genoa		Lamar		Ovid		Walsh		Willard		Avg All Sites	
N-P Rate	Yield	Prot.	Yield	Prot.	Yield	Prot.	Yield	Prot.	Yield	Prot.	Yield	Prot.	Yield	Prot.	Yield	Prot.
lb/A	bu/A	%	bu/A	%	bu/A	%	bu/A	%	bu/A	%	bu/A	%	bu/A	%	bu/A	%
0 - 0	37.8	7.8	42.2	12.9	39.7	11.3	39.1	7.8	27.3	13.5	23.6	8.3	61.7	7.9	38.7	9.9
30 - 0	40.9	7.7	44.3	13.1	42.9	12.8	41.9	7.8	27.9	13.7	30.6	9.1	55.4	7.8	40.6	10.3
60 - 0	34.6	7.8	43.9	13.0	43.0	11.7	42.2	7.8	27.6	13.6	33.5	10.5	60.7	7.8	40.8	10.3
60- 30	41.3	7.7	42.9	13.2	42.3	12.1	41.0	7.7	29.5	13.8	32.9	10.1	56.6	7.8	40.9	10.3
Stat. Sig.	*		N.S.		N.S.		N.S.		N.S.		**		**		N.S.	
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* = significant at 5 percent level, ** = significant at 1% level, N.S. = nonsignificant

Table 2. The occurrence and magnitude of yield response of dryland winter wheat to N fertilizer in Colorado.

Year	Number of Locations	Sites Response to N No.	Sites Response to N %	Yield Increase-bu/A Range	Yield Increase-bu/A Avg.
81-82	17	12	71	5-28	14
82-83	19	10	53	6-19	12
83-84*	--	--	--	---	--
84-85	18	12	67	6-21	12
85-86	12	8	67	5-12	10
86-87	15	8	53	5-36	16
87-88	27	10	37	3-17	9
89-90	12	5	42	4-10	6
90-91	11	2	18	6-8	7
91-92	7	2	29	6-9	7
Summary	138	69	49	5-18	12

*The N fertilizer experiments were lost because all of the cooperating farmers applied N to the test locations.

Since 1981, at the CSU test locations, there has been a decrease in the number of locations giving a response to N and P fertilizer. This indicates that farmers have been doing a better job of fertilizing and the fertility level of the soils is building up.

Table 3. The occurrence and magnitude of yield response of dryland winter wheat to P fertilizer in Colorado.

Year	Number of Locations	Sites Response to P No.	Sites Response to P %	Yield Increase-bu/A Range	Yield Increase-bu/A Avg.
81-82	3	2	67	5-6	5
82-83	19	6	32	2-8	5
83-84	17	2	12	3-4	3
84-85	18	7	39	3-16	5
85-86	7	4	57	5-12	8
86-87	7	5	71	4-18	9
87-88	13	4	31	4-8	6
89-90	12	6	50	6-13	7
90-91	11	3	27	5-8	6
91-92	1	1	9	9	9
Summary	108	40	37	4-9	6

MUNGBEANS, AN ALTERNATIVE CROP

Mungbean is a crop that will produce well under dryland production in eastern Colorado. Mungbean (Vigna radiata (L.) Wilczek is a short season annual legume. Mungbean is a drought tolerant species with two to three irrigations adequate for irrigated yields. Mungbean requires minimum soil temperatures of 60° for germination but needs heat (80° -95°) to mature normally in 85 to 110 days. Soils for mungbean can vary in pH from 5.5 to 8.0 and it has moderate requirements for fertility, much like a pinto bean. It does well when planted on sandy loam to loam or clay loam soil. One thing mungbean will not tolerate is excessive irrigation. Mungbean is salt sensitive but we have observed no damage in our Rocky Ford trials using irrigation water. Mungbean is killed by frost but hard frost (20° -30°) generally does not affect quality. Mungbean has a remarkable shelf-life of 900 days when kept at temperatures of 20° to 85°+. This compares to pintos which have a shelf-life of 60 days at 85°+.

Mungbean has a remarkable shelf life of 900 days when kept at temperatures of 20° to 85°+.

The primary product of mungbean is a small green bean slightly larger than a wheat kernel. The bean is used in soups, stews, and is the bean sprout found in oriental cooking. Secondary uses include animal feed, forage, cover cropping, and green manure. Mungbean does not have the trypsin-inhibitor found in soybean and can be fed without processing. Recorded toxicity has not been reported in mungbean. If bean quality does not meet sprouting requirements, it can be used as a protein source for cattle, hogs, and other livestock. Mungbean is high in protein, starch, and vitamin B, having moderate amounts of vitamins C, E, and beta-carotene as well as sugar, iron, and other minerals. Mungbean is low in fats and oils. Production conditions will affect seed composition.

Harvest is a major concern to mungbean production. The bean pods are borne above the leaves and blackened when ripe. While many research areas report shatter, we have never seen it in Colorado. Under certain conditions, pods may break from the vine and are then lost. Generally harvest is done between early and late October and the crop is direct combined but can be swathed. The beans are delicate and cracked beans will discount quality. To meet specifications for sprouting, you must produce beans which are well filled and capable of 95% germination. Sprouting companies will want a hundred pound sample and will expect beans to be cleaned and sacked. Yields in Colorado trials have averaged 1,200 lbs/dryland and 2,400 lbs/irrigated. If you meet sprouting quality, prices may vary from $20/cwt to $50/cwt. Average price has been $35/cwt. Most processors will not forward contract. Price variation depends on production primarily in central and southeast Asia. All of the irrigated beans we have grown have met sprouting quality. Axial-flow combines work best to assure quality. ▫Johnson

The next two pages provide the summary index by topic of all newsletter articles that were written by Extension agronomists during 1992.

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

Sincerely,

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