

MARKET REPORT 2020

Purpose

Developing new crop markets can help add diversity to the crop rotation, with the potential to improve economic and soil health. The market development strategy seeks a balance of higher values for specialty crops and a volume of demand that suits broadacre production. Boulder County, Front Range, and Colorado citizens can eat more food produced in Boulder county, but connecting the farm's crops to the regional market is complex, and requires an ecosystem of participants.

This Market Report describes the strategic approach and progress made in 2020 towards the development of regional food system channels that serve broadacre production of medium to high-volume staple crops.

The basic sequence of growing and marketing a crop is:

Planning → Planting & Growing → Harvest → Cleaning → Storage → Delivery/Trucking

With operational and financial considerations for a supply agreement:

Scale - Contracting Terms - Certifications - Product Tracking - Transaction Fees

Planning Ahead

Matching supply and demand is the first step, but the crop must be processed and transported to the buyer for the whole venture to work. The infrastructure and supply systems that connect crops to consumers have largely bifurcated over the past several decades to serve commodity volumes and pricing or small niche volumes and pricing. Regional food markets can serve the middle tier of volume and pricing, creating a higher return on volume while being viable within the productive systems (large equipment, big fields) that many Boulder County farmers operate within.

Crop varieties are an important factor of demand in regional/specialty markets.

<u>Volume ← [COMMODITY - WHOLESALE - RETAIL] → Value</u>
<p>For Conventional Pinto Beans in 2020:</p> <p><u>Commodity [Not sold here, price too low]</u> Price: .20-.25/pound (Northern Feed and Bean) Volume: Indefinite</p> <p><u>Wholesale [Current Optimal Range]</u> Price /lb: .65 (Aramark) .80 (East Denver Food Hub) .85 Boulder Valley School District (BVSD) 1.00 Boulder County Farmers Market (BCFM) Volume: 100,000 pounds Total for 2020, Demand is higher for 2021+</p> <p><u>Retail [Not sold here, yet. Too many logistics issues/ not available yet]</u> Price: \$1.80-2.00 (King Soopers Bulk) \$2.00-4.00 (Direct sale, 1 pound bags w/branding) Volume: No access to market, yet. Would require significant planning and investment.</p> <p>For Conventional Spring Wheat in 2020:</p> <p><u>Commodity [Not sold here, price too low]</u> Price: .04-.08/pound (Arden Mills) Volume: Indefinite</p> <p><u>Heritage Berries (Rogue du Bordeaux, Khorasan, Red Fife) - Wholesale [Current Sweet Spot]</u> Price /lb: .35 (Hearth Bakery) Harvest weight purchase rate and price for all varieties Volume: 18,000 lbs Total for 2020; Demand from Hearth for 2021 is 25,000 lbs (RdB only)</p> <p><u>Heritage Variety - Flour - Retail [Not sold here, yet. Too many logistics/ not available yet]</u> Price: \$4.54/lb (Dry Storage Blend, Organic Rogue du Bordeaux w/ Other varieties) \$2.00-4.00 (Moxie Bread Co., 1 pound milled bags w/branding, not certified organic) Volume: No access to flour market, yet. Exploring tolling fee for milling grain to sell as flour. Creating specialty flour mixes likely out of scope.</p>

Planting & Growing

The growing practices of crops sold into food markets tend to have an increased level of diligence and monitoring. Certified Organic and/or Biodynamic crop markets involve the highest level of rigor and associated price premiums, but market opportunities are available with smaller shifts in management.

Several local markets, including several local heritage grain markets, have growing preferences but do not require specific certifications. These markets desire crops that are not terminated with herbicide (desiccated) and grown without in-season pesticides, but can be tolerant of pre-season herbicide applications and synthetic fertilizers.

Beans are considered a specialty crop by USDA and therefore involve a higher level of recordkeeping and practice parameters, including Good Agricultural Practices (GAP) certification. The requirements for that certification are already generally met with current practices; the key is to gain certification from GAP.

GAP Certification

To gain GAP certification, set up a visit with CDA Fruit & Vegetable Inspection Service at time of planting and time of harvest. As CDA's offices are in Monte Vista, CO, advanced planning is required. The certification requires a flat fee plus an hourly rate for the certifier. There are cost share programs available, consult certifier during set up for details. Total costs for GAP certification (Growing Certification and Harvest Certification) range from \$600-\$1000 per crop, including the cost of drive time from MonteVista to Boulder County. The expense per crop can be reduced if certifying several crops at once or if several producers certify at the same time.

Detailed information and audit checklist can be found online through the USDA Ag marketing service website at: <https://www.ams.usda.gov/services/auditing/gap-ghp>

Local Contact: Brian Pauley, Program Manager
Colorado Department of Agriculture
Fruit & Vegetable Inspection Service
office: 719-852-4749 fax: 719-852-4319
email: brian.pauley@state.co.us

Harvesting

For harvesting beans, GAP auditing and certification may be required by the purchaser. See Planting & Growing section for GAP details. A GAP checklist is provided at the end of this document.

Many buyers prefer beans that have not been desiccated. Non-desiccated bean plants either complete their life cycle naturally or are mechanically cut at the stem. These methods then leave the plant and beans in the field to dry down. This increases the risk of losses due to uneven drying and weather and possibly requires an investment in additional equipment.

Non-pesticide wheat markets also prohibit the use of desiccation for specialty wheat crops.

Harvesting logistics vary based upon scale of production. In 2020 field-scale variety trials, the grains (beans and wheat) were harvested via combine and transferred into 1 ton totes. These totes provided a manageable storage option for the trials, but are ultimately too cumbersome to be relied upon for production scales. Totes are best reserved for trial plots.

For production scale (10+ acres/25,000+ pounds), harvested grains and beans can be loaded directly into trucks. All farmers involved in the GE Transition project own their own production scale trucks or have familiar resources. Corn, barley, wheat, and other small grains are transported in these trucks, there is no additional investment required. Grains produced at this scale can be processed at industrial cleaning facilities. (listed in Cleaning, Storage, and Transportation section below).

Cleaning

Commodity crops are generally sold in their entirety in bulk at a grain elevator. All of the tenant farmers participating in the GE transition programs have many years of experience working at this large scale. Smaller regional markets require processing, transportation, and storage at a smaller scale and using different facilities. Often regional markets require a producer to deliver the crop in bagged smaller units and to store the remaining product until purchasers can take delivery. Not all participating producers are interested in shifting their business model to one that involves product storage and delivery.

Crops are primarily bagged into 20 or 50 lb bags or 1 ton totes at a processing center after being cleaned. An additional step to create 1 or 5 pound bags could occur at a location like BVSD culinary center. Prices vary depending on bag size. Limiting handling of the crop reduces the risk of damage and the resulting downgrading of quality. It is important to maintain consistent bag size for a given customer and include product size/format in supply agreement.

Cleaning options

Northern Feed and Bean (Lucerne, CO)

Adequate option for production scale, but is typically a commodity offtake. Successfully cleaned and packaged 100,000 lbs of beans in 2020.

Crop: Dry Beans

Scale: 50,000 lbs +

Proximity: ~ 40 miles from Longmont to Lucerne

Cost: \$0.125/pound 20 pound bag // \$0.08/pound 50 pound bag (2020 pinto bean costs)

Storage: No

Cleaning Losses: Minimal, less than 5% (No pre-cleaning weighing occurred)

Contact: Ken (970) 381-5998

Twin Peaks Seed & Grain LLC (Longmont, CO)

Located in Longmont and can serve midscale and above.

Crop: Dry beans, wheat, lentils, hemp grain, mung beans, popcorn, oats, triticale, barley

Scale: 25,000 lbs + (\$500.00 Cleaning fee for loads under 50,000 lbs)

Proximity: 2060 County Road 28 Longmont, CO, United States, 80504

Cost: \$5.00 cwt (1000 lb tote) // \$6.00 cwt (50lb bag) // \$9.00 cwt (25lb bag)

Contact: Jim Hergenreder // jimh@twinpeakstrading.com

Trial Scale Hand-Cleaning

Adequate for small trials, not intended to be a long term solution for all growers.

Bags can be purchased from C & L Container Co. Monte Vista, CO (719)-852-3575

Storage

The ability to store grains relatively inexpensively for long durations is an advantage over fresh vegetables and animal products.. Wheat or beans stored out of direct sun and under 70 degrees fahrenheit can last for years with little detriment.

There are two phases of storage: between harvest and processing, then between processing and distribution. Optimally, the crop would be transported to the cleaner directly from the field and sold/distributed immediately after cleaning and processing.

This still requires a location for short term storage and handling to compile and separate the specific amount of product that the various purchasers desire.

Establishing delivery timing upfront reduces storage costs. It is valuable to include those terms in the supply agreement. See details in the Elements of a Supply Agreement section.

Storage Options

On-Farm - Grain Bin or Truck (Pre-Processing)

Satisfactory option, when immediate transportation to processing facility unavailable Prolonged on-farm storage can jeopardize GAP certifications.

Crops: Any grain crops

Cost: Trucks - Opportunity cost of removing truck availability

Grain Bins - Varies by size. \$5,000-\$100,000 + Site prep and possible permitting for large bin

East Denver Food Hub (Post Processing)

Decent option for regional food markets; certified location.

Crops: Any grain crops

Storage type: Post-processing, Totes or bags (preferred)

Scale: Large (New location)

System: 2020 had UV-Protected Shipping Containers, 2021 Full facility with loading docks

Location: (2020) Bennet, CO // (2021) North Denver, CO

Cost: \$0.02/pound per month

On-Farm - UV Sanitized Shipping Container (Post Processing)

Requires space on farm, convenient location, high oversight, higher involvement in logistics

Crops: Any grain crops

Storage type: Bags or totes

Scale: Flexible (Up to 100,000 per shipping container unit)

System: Shipping Container - UV System Anti-Bio

Location: On Farm or in Shared Space on other land to be identified

Cost: ~\$5,000-7,500 UV Ship container system, Single Unit, Up to 100,000 bagged pounds

Sample Product Info at: <https://www.mageesigns.com/product/uv-sanitizer>

Trucking, Transportation, and Delivery

Trucking refers to the movement of a harvested product from the farm to the grain processor. This is already a standard procedure for most crops grown by farmers participating in the GE Transition project. Current markets for grains often require delivery of the field grade crop to the elevator or transfer location. Trucking the harvested crop may be considered to be no additional cost from current practices, given that the processing location is the same distance from the farm as current market offtake.

Transportation refers to the movement of the processed product from the processor to the storage facility, or if possible, directly to the product purchaser. The processing facilities typically require the cleaned and bagged product to be moved from the location within a few days. The purpose is to move the product en masse to a longer term storage and handling location. This involves large scale transportation, like flatbed tractor trailers.

Delivery refers to the movement of the processed product from the storage location to the purchaser. This phase of product movement can occur at large (25,000+ pounds) medium (5-25,000 pounds) or small (less than 5,000 pounds) scales, each with different per pound costs and options. In 2020, medium scale deliveries were performed by a farmer and another member of the community. Small scale deliveries were performed by the farmer or Tanner Starbard of Mad Agriculture. Continuing to perform these deliveries is an option for farmers, but is not preferable for all situations.

Delivery to the purchaser location is a cost term to specify within the Supply Agreement.

<u>Trucking, Transportation, and Delivery Options</u>
<u>Trucking to Cleaner</u> Farmers can use their own vehicles. Proximity reduces cost. Cost: \$0.01/pound (https://www.extension.iastate.edu/agdm/crops/html/a3-41.html)
<u>Transportation of Processed Crop (to Storage and/or purchaser)</u> This phase is typically contracted to a transportation service. Cost: \$.02/pound 2020 experience: \$1200 to Trevino & Sons Trucking Inc. to haul 100,000 pounds of bagged beans from Lucerne to Bennet. This was 2.5 full loads (3 trips) with a flatbed tractor-trailer. Contact: 970-284-6147 Volume: Large (20,000+ Pounds)
<u>Delivery to Markets (Smaller Scale)</u> This is an area in need of further development for 2021 and beyond. Options are lacking in the area. Some purchasing partners, like East Denver Food Hub, will purchase higher volumes then handle delivery to smaller locations.

Elements of a Supply Agreement

Purpose

To create a mutually beneficial agreement amongst farmers and offtake markets that equitably shares risk and value for all involved.

To outline and agree upon the particulars of a crop sale for financial and logistical clarity.

Volume

The quantity of product sold and in what format. (e.g. 20,000 pounds in 50 lb bags)

Price

The amount to pay for a given product variety that meets quality standards.

If price is determined before product testing, Include any caveats for price reduction or improvement relative to expected characteristics.

Quality Characteristics

Variety of the crop: (e.g. Rogue du Bordeaux or Pinto)

Cleanliness: (e.g. acceptable levels of chaffe, or Unacceptable objects like rocks)

Disease: (e.g. disqualification for presence of fungus or weevils)

Usability: (e.g Protein, Ash, Moisture, etc)

Size and/or Shape: (e.g. acceptability of split beans, small kernels)

Certifications

Examples include: GAP - Growing, GAP - Harvest, GAP - Storage, USDA-Organic

Preferred practices include: Non-Desiccated, No pesticides

Chemical residue: (e.g. lab tests verifying residue-free product)

Delivery

Timing: Date and Time of product delivery

Coordination: Primary points of contact, drop off location, on-site equipment for receiving

Costs: Which party is responsible for the costs of delivery from storage location?

Storage

Location: Where will the product be stored after harvest?

Format: The form of storage upon delivery to market (bag, pallets, tote, truckload, etc)

Inventory management and transparency

Transaction Fees

Will there be an arbiter of a product exchange, will they charge a transaction fee?

Does the producer wish to charge transaction fees to recoup labor and management costs?

Product Insurance

Does the producer wish to insure the product during its time in storage or in transit?

Product Tracking/ Chain of Custody

Maintain a record of product location, transit, and custody from time of harvest until delivery to purchaser.

Payment Terms

Timing: Pre-delivery, Upon Deliver, Net-15, Net-30

Format: Mailed check, printed check, direct deposit

Provision of W-9: Several markets will require W-9 information from farmer or farm business

Good Agricultural Practices (GAP)

Operational Procedures and Protocols

This is a guide to prepare for GAP audit in the following categories:

- Pre & Post production water analysis
- Soil and Crop amendments
- Adjacent land use and history
- Food handler hygiene and sanitation training
- Harvesting Practices

Pre & Post Production Water Analysis

Annual Documents Required

- Water Quality Assessment for Irrigation Water
- Water Quality Assessment for Chemical or Fertigation Water

Standard Operating Procedures (Check box & write date when action is taken)

- Assess water quality for Irrigation and Chemical/Fertigation Applications
(Maintain Assessment Documents for your Records)
- If necessary, take steps to protect irrigation water from contamination.
- Ensure farm sewage treatment/ septic is not leaking into fields or water source
- Confirm there is no municipal/commercial sewage treatment adjacent to farm
- Confirm that any adjacent livestock production facilities have adequate barriers to protect fields and water sources from contamination
- Confirm any adjacent manure lagoons are maintained to prevent leaking or runoff into fields or water sources
- Confirm manure stored near field is properly contained to prevent field and source water contamination
- Confirm that barriers are in place to prevent livestock from contaminating water source and/or delivery system
- Monitor crop production areas for presence or signs of wild or domestic animals entering the land
 - Monitoring Date _____ Observations _____
 - Monitoring Date _____ Observations _____
 - Monitoring Date _____ Observations _____
- Address any points of opportunity for wild and/or domestic animals from entering the land
 - Action Taken (if any) _____

- Describe any action taken to fix potential water contamination issues (if any)
-

Soil & Crop Amendments

Manure and Municipal Biosolids

Please choose one of the following options as it relates to the farm operations:

- Option A. Raw manure or a combination of raw and composed manure is used as a soil amendment.
- Option B. Only composted manure/treated municipal biosolids are used as soil amendments.
- Option C. No manure or municipal biosolids of any kind are used as soil amendments.

IF raw manure is used, confirm and document the following:

- Raw manure Application Date _____
- Planting Date (at least 2 weeks later) _____
- Harvest Date (at least 120 Days later) _____
- Manure was properly stored prior to use. Location: _____

IF composted manure/ treated municipal biosolids are used, confirm and document:

- Only composted and/or treated materials have been used
 - Material Source: _____
 - Obtain treatment specification documents from material source
 - Obtain nutrient and composition document from material source
- Composted/Treated material was properly stored prior to use. Location _____

Adjacent land use and history

- Maintain a map with named and/or coded production areas
- Confirm a land use risk assessment has been performed
 - Obtain record from the risk assessment
- Confirm soil contaminant testing has been performed
 - Obtain record from the soil test
- (if necessary) Preventative measures have been taken to address or mitigate potential contamination of soils
 - Steps taken _____
- If any production areas have been flooded, obtain a test for potential microbial contamination (maintain record)

Food Handler Safety Training Confirmation

- All persons directly involved in field harvest have completed the CO food handlers safety training program (if applicable)

Harvesting Practices & Procedures

- Perform pre-harvest risk assessment in the crop production area
 - Date Performed _____ Performed by _____
 - Risk/Potential Contaminant: _____

 - Mitigation Performed (if needed) _____

 - Risk/Potential Contaminant: _____

 - Mitigation Performed (if needed) _____

- Select One:
 - Portable sanitation units are available for use and are in adequate condition
 - These units are placed on a location that reduces contamination risk
 - A response plan is in place in the event of a spill or leak *****
 - A toilet facility is otherwise available for all workers
- All harvesting and bulk hauling equipment that comes in direct contact with product are kept as clean as is practical
- Any and all hand harvesting equipment is kept as clean and disinfected as practical
- Damaged containers are repaired or disposed of
- Harvesting Equipment is in good repair
- Light bulbs and other glass is protected from contaminating harvested product if broken
 - A response plan is in place if glass is broken into harvested product *****
- A response plan is in place if chemicals, petroleum or other contaminants come into contact with harvested product *****
- Harvesting equipment
 - Has been inspected for foreign objects like glass or metal
 - Inspected by _____ on Date _____
 - Is in good condition
 - Inspected by _____ on Date _____
 - Has been cleaned of excess dirt and mud
 - Cleaned by _____ on Date _____
- Harvesting containers are not used to haul anything but harvested product
- If water is applied to harvested product, attach a record confirming cleanliness

- A plan is in place to move harvested product to storage area or processing plant only in covered fashion *****
- If packed on site
 - Only new or sanitized packaging is used
 - These packing materials have been properly stored
- The product harvested from this field is identifiable and traceable