



Parks & Open Space

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TO: BOCC and Jana Petersen
FROM: Mike Foster, Agricultural Resource Manager
Cc: Therese Glowacki, Natalie Springett
MEMO DATE: October 1, 2021
PUBLIC HEARING DATE: October 19, 2021
RE: Public Hearing on Cropland Policy Update

CROPLAND POLICY UPDATE

The 2017 Cropland Policy requires an annual public meeting and report on the progress and status of the Transition Policy for Phasing Out Genetically Engineered (GE) Crops and Neonicotinoids on Boulder County Parks & Open Space (BCPOS) Properties. There was no update in 2020 due to the pandemic. Highlights of this annual update include:

- 1) **Monitoring:** BCPOS currently has 3,246 acres (21%) in certified organic or transitioning to organic acres. BCPOS has 1,503 (9%) acres in GE crops. The county will continue monitoring the number of organic acres, GE acres, and soil health practices on BCPOS agricultural lands.
- 2) **Reporting:** This memo, public presentation, and hearing summarizes BCPOS actions according to our Cropland Policy progress. These are also reported via the BCPOS website in the Agricultural and Water Division Annual Report.

RECOMMENDATIONS

Based on BCPOS experience since adopting the Cropland Policy (2012 and revised in 2017), staff are recommending the following updates to the Cropland Policy:

1. **Neonicotinoid Phaseout:** The county will phase out neonicotinoid pesticides, effective 12/31/2021.
2. **Soil Health:** Boulder County will expand work with tenants to focus on improving soil health including carbon sequestration.
3. **Genetically Engineered (GE) Crops:** The GE sugar beet and corn varieties authorized in Section 6 of the 2012 Cropland Policy can be grown on BCPOS agricultural land.
4. **Update the Cropland Policy:** Incorporate BOCC direction on any policy changes and streamline language to remove inconsistent or conflicting language and to remove non-policy information from the body of the document.

BACKGROUND

The purpose of this memo is to provide context and background information for the staff recommendations and to fulfill the annual public hearing requirement outlined in the Cropland Policy.

There are approximately 25,000 acres of agricultural land owned and managed by Boulder County Parks & Open Space (BCPOS), 16,000 of which are cropland acres.

As of 2021, approximately 1,500 acres, or 9% of BCPOS croplands, are used to grow genetically engineered crops. Of those acres, 278 are sugar beets and 1,225 are corn.

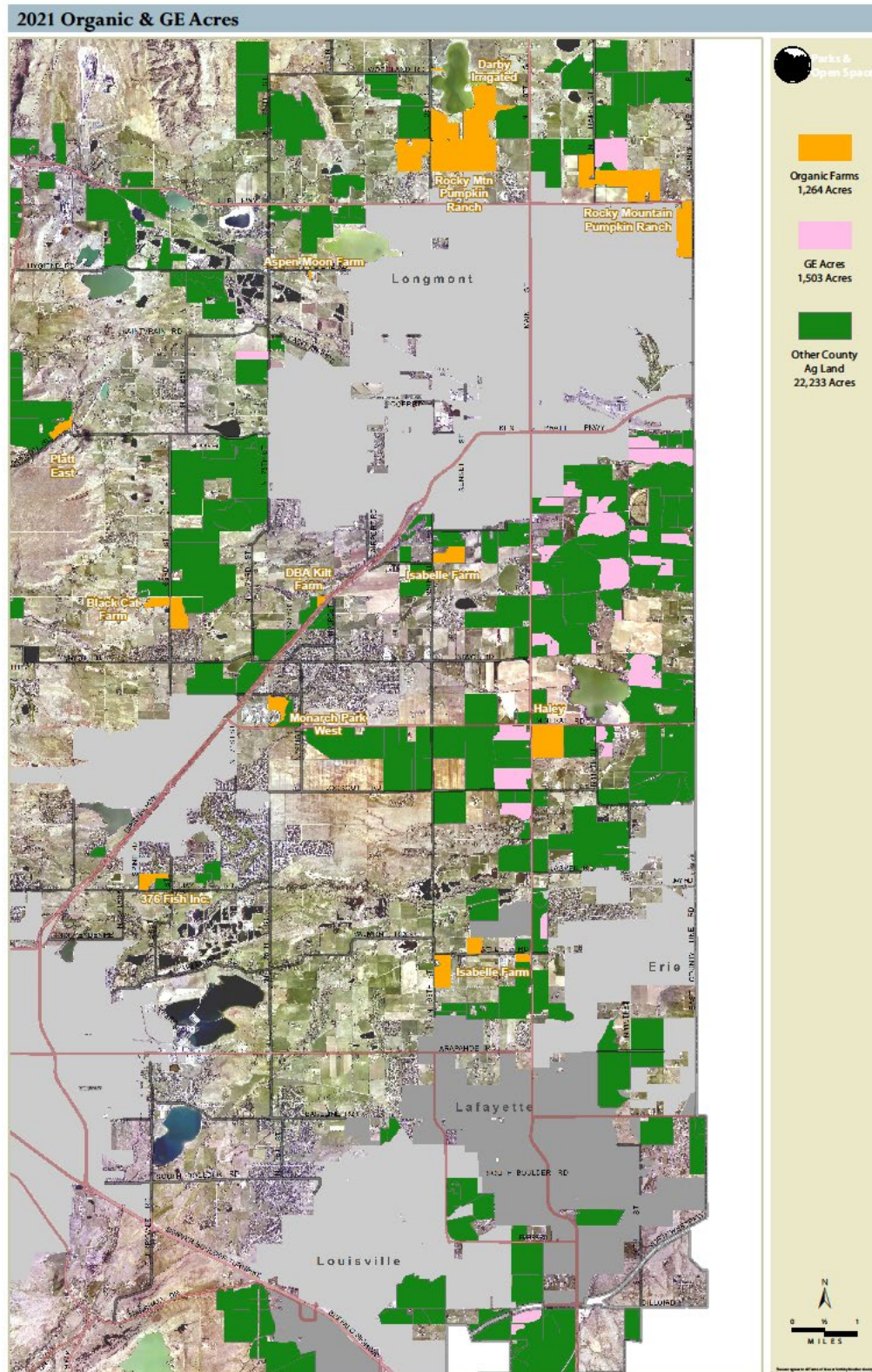
BCPOS Agricultural Rangeland and Cropland (ac)	BCPOS Cropland Total (ac)	GE Crops Grown on BCPOS Lands (ac)	Percent of BCPOS Lands Growing GE Crops
25,000	16,000	~1,500	9%

Figure 1 below provides location of the GE corn and sugar beets acres grown on BCPOS lands in 2021 as well as the certified organic acres.

Over the past 10 years, consideration of genetically engineered crops has played a pivotal role in how Boulder County Parks & Open Space agricultural lands are managed. The timeline below provides an overview of events that have shaped these staff recommendations.

Neonicotinoid pesticides (neonics) are a class of pesticides that target specific neuroreceptors in insects and are used to combat corn root worm and other insects. They can be applied to plants as a leaf spray, sprayed on soil, or used as a seed coating. Neonics are water soluble and can thus travel through plant tissue and soil. They have been shown to impact native and beneficial pollinators. For this reason, it is important to eliminate their use.

Figure 1: Map of 2021 Organic and GE Acres



Abbreviated Timeline of Boulder County Genetically Engineered Crops Phase Out

- January 12, 2012** County adoption of the Cropland Policy which approved the use of two genetically engineered (GE) crops, sugar beets and corn, for a period of five years.
- February 2016** Parks & Open Space Advisory Committee (POSAC) held public hearings to get input on what the county should do related to GE crops.
- March 15, 2016** POSAC recommended that the county continue to allow growing GE crops, but to closely monitor soil health and impact to pollinators and water quality.
- March 17, 2016** Commissioners directed staff to do three things:
- 1) Develop a transition plan to phase out the use of GE corn and sugar beets on county owned agricultural land;
 - 2) Phase out the use of neonicotinoid pesticides; and
 - 3) Greatly reduce the use of herbicides and pesticides on county owned open space lands.
- November 30, 2016** BCPOS staff briefed the commissioners on the concerns that had been raised through the public input process and reported that POSAC was not in support of the GE phase out. Ultimately, the commissioners approved the phase out of GE corn by the end of 2019 and GE sugar beets by the end of 2021.
- April 13, 2017** Commissioners updated the Cropland Policy to include the GE transition plan, which outlines the following performance criteria:
- Assist tenants with GE Leases.
 - Support agriculture in Boulder County.
 - Enhance data collection and monitoring.
 - Launch a new sustainable ag research initiative.
 - Conduct annual public hearings and review the transition progress.
- May 2019** Staff returned to the commissioners in a public hearing to provide an update on the transition plan and recommended a four-year extension for corn, a new deadline of 12/31/2023, and a variable extension for sugar beets in order to give farmers more time to find alternatives and adjust their growing practices.
- June 3, 2019** Commissioners approved a two-year extension for GE Corn to 12/31/21, added neonicotinoid pesticides to the 12/31/21 phase out and set a 12/31/2025 timeline for sugar beets.

Please see this webpage for the GE transition documents and timeline:
boco.org/CroplandPolicy

ANALYSIS

Since 2016, BCPOS ag staff have been working with farmers to identify economically viable crop alternatives to GE corn and sugar beets. The county has invested over \$1 million in research, economic incentives, and consultants to assist in the transition efforts.

While there have been some successes, overall, the scale of the issue has been difficult to overcome in the window of time provided. There are many complex aspects to growing crops, and farmers generally harvest one cash crop per year, so the amount of time needed to adapt to new approaches and develop new markets for those crops can take several years to fully implement. The first year of on-farm field trial saw some successful harvests but also some crop failures due to poor germination, weather, and weed pressure. The two-year transition window allowed for little experience with new crops to be gained and did not allow for the long-term effects of management changes to be seen. For example, if a farmer decides to stop using a particular herbicide in year 1, the full effects of that decision may not be known for three to five years because of the existing weed seeds in the soil. Additionally, regional infrastructure for processing and selling alternative crops at a scale that matches the amount of acreage under cultivation is not fully developed. These constraints would need to be addressed with new infrastructure and new markets, which are out of Boulder County's or the tenants' control.

In order for crop alternatives to be successful, end markets and supply chains must be in place. Without having a viable market to sell crops, the economics of farming quickly evaporate.

Farming is about identifying and weighing trade-offs. Benefits in one area may result in disadvantages in another. Removing GE crops from the storehouse of tools available to tenant farmers may alleviate some popular concerns about the impacts of new technology but may also result in a different set of economic and environmental concerns. BCPOS tenants, BCPOS staff, the county's consultant Mad Agriculture, and the community have all engaged in the effort to transition our tenants from the use of GE crops. Despite this effort, at this time there is no clear alternative crop and market that can replace the GE corn planted by tenant farmers.

In the future, there may be alternative crop options. Changing market forces, including a 2022 requirement for foods in the U.S. to be labeled if they contain more than 5% genetically modified ingredients, may create conditions in which the discontinued use of GE crops on county land is a choice with more straightforward and acceptable trade-offs.

GE Corn

In 2021, there are 1,225 acres of GE corn being grown on BCPOS ag lands. One of the lessons learned over the past several years is that finding an economically viable alternative to broad acre crops like GE corn is very difficult. In one example, a BCPOS tenant grew 40

acres of heritage wheat as a crop alternative to GE corn, only to discover that the wheat yield was greater than the entire demand for heritage wheat in the State of Colorado. Additionally, markets for other crop alternatives like buckwheat are also immature and there is almost no interest from local processing mills. Until significant demand for alternatives to GE corn are identified locally, it will be very challenging for farmers to transition away from this crop.

GE Sugar Beets

In 2021, there are 278 acres of sugar beets being grown on BCPOS ag lands. Since 2019, BCPOS staff have been researching alternatives to sugar beets. At this point, there are no apparent replacements since beet growers do not have a non-GE seed option or a marketplace, and ceasing cultivation of sugar beets is not an option since they are obligated to fulfill their shares under contract with Western Sugar Co-op. Farmers are not able to retire their shares, and selling them, or giving them away, is not an option given the current depressed value of beet shares. Lastly, the tenant growers that own a high number of beet shares and depend solely on access to county land would be disproportionately affected by the phaseout and put at significant financial risk.

Herbicide/Pesticide Use

A method called the Environmental Impact Quotient (EIQ) was devised to determine the environmental impact of most commonly used pesticides (insecticides, fungicides, and herbicides) in agriculture and horticulture. The EIQ formula was created by Cornell University in 1992 in an effort to help producers compare pesticides. Factors such as toxicity, soil half-life, leaching potential, plant surface half-life, farm worker, consumer, and ecological effects are all considered when calculating an EIQ for a particular pesticide.

Once an EIQ value has been established for the active ingredient of a pesticide, Field EIQ numbers can be calculated. Field EIQ is calculated by multiplying the EIQ value for the pesticide by the percent active ingredient in the formulation and by the rate used. Field EIQ numbers can then be used to compare each pesticide’s potential environmental impact to help make management decisions. All pesticides differ in efficacy, mode of action, potential for causing resistance, cost, and EIQ. Consideration of all these differences should be taken when selecting a pesticide and an overall management strategy. Below is a general guide for potential environmental impact.

Field EIQ Rating	Potential Environmental Impact
<25	Very Low
25 – 50	Low
50 – 100	Moderate
>100	High
>150	Very High

Since 2014, Boulder County Parks & Open Space has been recording the Field EIQ for each crop grown. Field EIQ numbers were calculated based on data that each tenant provided on their Strategic Integrated Pest Management (SIPM) forms. SIPM forms ask each tenant to provide data about each farm including farming practices, education, record keeping, cultural controls, and pest control.

Each farm’s total Field EIQ is added up to give a value of all pesticides applied to a field in an entire year. Since 2014 the highest total Field EIQ was 59.7 with most farms ranging between 20 and 40 (very low to low).

Cropland Policy Performance Criteria

Appendix 13 of the Cropland Policy approved by the commissioners in 2017 outlined five key performance criteria that staff were directed to report out on annually during a Public Hearing. This memo and today’s public hearing are intended to fulfill that requirement for 2021.

Below is a summary of the key metrics of each performance criteria and its progress to date. Italicized wording on the left is an excerpt from the Cropland Policy Appendix 13, on the right is staff’s description of progress made to date.

1. Assist tenants with GE leases	
<p><i>BCPOS staff will work with each tenant to determine the financial implications of this transition (e.g., farm viability, lender support, crop loss, etc.) and identify a variety of tools and incentives to help minimize the potential economic impact and make tenants whole.</i></p> <p><i>This effort includes, but may not be limited to, assisting in the development of new farm operating plans that are GE-free, identifying and promoting training opportunities and best management practices, and developing incentives for GE crop acreage reductions that occur before deadlines.</i></p>	<p>Mad Agriculture (Mad Ag) was contracted in late 2019 to assist the tenants by assessing resources, designing and executing field trials, and identifying and developing markets for alternative crops.</p> <p>GMO and non-GMO crops can have very different suppliers, costs, markets, and management requirements. We are in year two field trials, and tenants have planted non-GMO crops, including silage and grain corns, heritage wheat, and forages to trial against GMO corn.</p> <p>Following harvest this year, Mad Ag will assess costs, yield, and revenue differences and share that information with the tenants and county.</p>
<p><i>If tenants choose not to renew leases that have had GE crops within the last two years, BCPOS will work to purchase irrigation equipment that should stay on county agricultural properties.</i></p>	<p>This situation has not arisen during the transition period</p>

2. Support agriculture in Boulder County	
<p><i>Continue and expand delivery of programs that support agricultural viability in Boulder County by providing transitioning tenants with alternative agricultural opportunities</i></p> <p><i>Specifically, staff will continue to research and develop value-added products and new markets, deliver county capital improvement programs for irrigation</i></p>	<p>Collaborating with Boulder County Public Health and a tenant farmer, BCPOS established BoCo Beans, a project bringing locally grown beans to local institutional consumers including hospitals, jails, food banks, farmer’s markets, and schools. In 2020, 98,000lbs of pinto beans were delivered to local institutions.</p>

<p><i>infrastructure and other facility improvements, and offer organic incentives by staffing an organic weed crew, reducing rent during organic transitions, and introducing a new staff position to assist with organic certification.</i></p>	<p>Contractor Mad Ag has been working with the tenants in the transition program to develop markets for alternative farm products including heritage grains.</p> <p>The Ag Division has provided discounted rent for tenants that are transitioning properties to certified organic production and has been willing to cover half the expense of certification. While several tenants are currently interested in certification, there is a lack of certifiers in the region delaying opportunities for tenants to officially be organic producers. Ag Division counts those acres as ‘pesticide free’.</p> <p>From 2013 to the end of 2020, the county discounted approximately \$285,000 from leases as incentive to transition to organic production. In that time, organic and “in transition” acreage increased from 10% to 21% of BCPOS cropland acres.</p> <p>There has been considerable staff turnover since 2019. A new position assisting with organic certification was not created during this time.</p>
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<h3>3. Enhance data collection and monitoring</h3>	
<p><i>Since the adoption of the Cropland Policy in 2011, BCPOS staff has tracked acreage in GE and organic cropping systems as well as detailed revenue and costs for crop share leases.</i></p> <p><i>BCPOS has also monitored key natural resource characteristics on farm properties, including soil health and fertility, water quality/quantity, and the presence of pollinators and pesticide residues.</i></p> <p><i>However, the department recognizes that this program can be improved upon and be more effective by engaging additional technical review and support.</i></p> <p><i>We are committed to thoroughly reviewing our existing data collection and monitoring efforts and adopting new metrics and protocols that will capture and deliver more relevant information to both tenants and the public.</i></p>	<p>As part of its ongoing routine work, Ag Division staff regularly tracks organic acreage, pest management activities, and crop share expenses and revenues.</p> <p>In 2020 Boulder County co-sponsored the fifth annual Soil Revolution Conference dedicated to discussing and disseminating information concerning soil health and regenerative agriculture.</p> <p>The volunteer soil health monitoring program was put on hold in 2020 and 2021 due to the pandemic.</p> <p>A link to the Ag Division’s 2020 Annual Report, which contains much of this information, can be found here: https://assets.bouldercounty.org/wp-content/uploads/2019/06/ag-annual-report.pdf</p>

	<p>In 2021, Ag Division staff began implementing some new key projects to help expand data collection and monitoring including:</p> <ol style="list-style-type: none"> 1) Beginning installation of 38 irrigation and soil moisture monitoring systems to track water use accuracy and efficiency at the AHI, Rock Creek Farm, Stromquist, and Longmont United properties. 2) Examining grazing management effects on grassland health at Rock Creek Grasslands. 3) Developing a Soil Health program to assist tenants in identifying practices to increase carbon sequestration and improve soil health. 4) Working in collaboration with CSU Natural Resource Ecology Lab and CSU Extension to help quantify the benefits of carbon sequestration through agriculture.
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4. Launch a new sustainable agriculture research initiative	
<p><i>Staff proposed creating the Boulder County Sustainable Agriculture Research and Innovation Initiative to explore key questions to help sustain Boulder County agriculture and advance our goal to be a national leader in sustainable agriculture.</i></p>	<p>In 2017, Boulder County proposed the development of a research farm to investigate questions related to local agriculture production (including GE crops) that balanced environmental sensitivity with farm economics, known as the Sustainable Agriculture Research and Innovation Initiative (SARII). The county pursued this by soliciting bids by researchers to create a “research center”. After projects costs were reviewed, the county decided in October 2017 that establishing such a center on county open space was not economically viable.</p>
<p><i>While BCPOS is positioned to provide land/water resources and limited staff time to support this initiative, Boulder County will release an RFP that solicits institutional partners that can effectively collaborate with the county to launch and advance this ambitious research initiative</i></p>	<p>In 2019, CSU was contracted to study compost application on grazing properties and cover crop and forage blends on trial cropland properties. The study is currently in year two of a three-year study.</p> <p>Additionally, Rock Creek grasslands property began a study in 2021 to determine how grazing can be used to help return degraded grasslands back to more native plant species.</p>

5. Annual Public Hearing and Review of Transition Policy progress.	
<i>Beginning in January 2018, BCPOS will produce an annual report on its progress to implement the GE Transition Policy</i>	The revised Cropland Policy was adopted in late 2017, and because it took a complex effort to determine the practical applications of the policy, no public hearings were held in 2018.
<i>A public hearing will be scheduled with the BOCC for review of the report and of the progress of the transition policy to date.</i>	Public hearings occurred in May and June of 2019, but the annual public hearing was not held in 2020 due to the COVID-19 pandemic and significant staff turnover. The public hearing on October 19, 2021, will fulfill this year's requirement.
<i>This review will include updates on the existing acreage totals in GE crops; any changes to leases with GE crops; most recent environmental and soil health monitoring data; progress of the Research Initiative; county, tenant, and stakeholder efforts to support agriculture; and an economic summary of the "state of agriculture" within BCPOS.</i>	These updates are included in this report – except the 'state of agriculture' economic summary.
<i>Based upon each review, the BOCC may choose to make adjustments to the Transition Policy</i>	The purpose of this memo and public hearing is to make such adjustments.

Organic Acres

In addition to the five performance criteria outlined above, Section 1.8 of the Cropland Policy also sets a target of reaching or exceeding 20% of cropland certified organic or in transition by 2020. Currently certified organic acres currently stand at 1,264. An additional 601 acres were in some stage of transition to organic and another 1,459 acres were being used for organic practices but are not certified. If these acres were included, then the county would have been at 3,324 acres, or approximately 21% of all open space croplands at the end of 2020. It should be noted that land itself cannot be certified organic. Land must have a record of three years of allowed practices before a potential certifiable organic crop can be planted. If the crop is grown in accordance with all qualifications, then it can be certified as organic. The table below summarizes the results:

Total BCPOS Cropland Acres	Certified Organic Acres	% Certified Organic	Total In Transition Acres	Total Certified and In Transition Acres	Total % Certified and In Transition Acres
16,000	1,264	7.8	2,060	3,324	21

ALTERNATIVES CONSIDERED

Over the past several months, staff have been evaluating different possibilities to amend the Cropland Policy and short listed the following three concepts. Please note, in all three options, staff considered keeping the 12/31/21 neonicotinoid phaseout deadline in place.

- 1) Extend the phaseout of GE corn by three more years (new phaseout date of 12/31/2024).
- 2) Repeal the phaseout all together.
- 3) Keep the existing phaseout in place.

RECOMMENDED CHANGES

Based on BCPOS experience and tenant input, staff is recommending the following actions be approved by the BOCC:

1. Neonicotinoid Phaseout

Staff recommends keeping the neonicotinoid (neonic) pesticide phaseout date of 12/31/21 in place for these reasons:

- 1) It is widely accepted that neonicotinoids affect pollinators and ecosystems.¹
- 2) Use of neonicotinoid-coated seeds is a prophylactic measure intended to add a layer of protection before insect presence or damage is detected. Neonicotinoids are very effective; however, pesticide residues from the seed coatings have been found in water, soil, and field-adjacent plants.²
- 3) Non-neonic coated seeds are readily available in the marketplace today, they just need to be ordered in December/January prior to the spring planting;
- 4) There is no significant price differential between neonic and non-neonic coated seeds;
- 5) Use of crop rotations can interrupt the multi-year lifecycles many of the insect pests that neonicotinoids target.
- 6) Farmers required to change practices away from neonic seed coatings will be encouraged to address pest issues with integrated pest management methods in collaboration with Colorado State University Extension.

2. Soil Health Focus

County staff recommend that the county focus on soil health outcomes. One approach to help with this is to embrace the “Five Best Practices of Soil Health” described by the United States Department of Agriculture (USDA). Staff currently work with tenants on developing

¹ <https://www.nrcs.usda.gov/wps/portal/nrcs/mt/newsroom/events/nrcseprd1322060/>

² https://www.usgs.gov/centers/ca-water/science/neonicotinoid-seed-treatment-study?qt-science_center_objects=0#qt-science_center_objects
<https://pubs.acs.org/doi/pdf/10.1021/acs.est.7b06388>

operating plans for each property. The soil health practices would become a specific goal in each operating plan with staff and tenants identifying appropriate measures for each property.

- 1) Reduce tillage: minimizes soil disturbance and helps to maintain the soil structure which reduces erosion and reduces the amount of carbon dioxide released into the atmosphere.
- 2) Crop rotation: reduces pesticide and fertilizer inputs and adds biological diversity to the soil.
- 3) Use of cover crops: a seasonal cover to reduce soil erosion. Improves soil health by sequestering nutrients, reducing weed competition, increasing water infiltration and providing for livestock grazing.
- 4) Use of buffer strips: strips of grasses planted along the edge of fields to reduce wind erosion.
- 5) Addition of compost and/or manure: helps to provide soil nutrients, increases water holding capacity of soil, and sequesters carbon.

Ag staff will be designing a soil health program in 2022 to be incorporated into operating plans for leased lands. The program will include a grading system for current soil health practices and recommendations for management changes. Depending on the severity of soil health concerns, some improvements in management practices may be required for continuation of the lease.

As the program is developed, the county will also evaluate offering incentives for trainings, conference registrations, cover crop seed, and compost/manure application to encourage soil health practices.

An additional strategy could be to get all BCPOS ag tenants to commit to using three of these practices immediately and have them commit to at least two over the next three years. Based on conversations staff have had with these nine tenants, most are already incorporating crop rotation and use of cover crops into their farming practices, so the transition for some will be minimal.

3. GE Crops

Staff is recommending that the GE sugar beet and corn varieties authorized in Section 6 of the 2012 Cropland Policy can be grown on BCPOS agricultural land.

- Consistent with the Cropland Policy and Boulder County agricultural leases, tenant requests to grow these crops will be incorporated into annual written agricultural operating plans.
- Any other GE crop type will need to be reviewed and approved by BCPOS prior to planting as outlined in the Cropland Policy.

The 2012 Cropland Policy involved more than 18 months of conversation and consideration by a broad stakeholder group including the Cropland Policy Advisory Group, county staff, county commissioners, other county advisory groups and members of the public.

The process developed in a series of stages: internal scoping, public outreach, policy development, and public review. There were opportunities for the public to participate in farm tours, forums, panel discussions, and online information. Nine Boulder County residents were appointed to the Cropland Policy Advisory Group. They wrote the policy and submitted it for public review and comment.

Appendices and amendments have been added to the Cropland Policy over time making for a lengthy and unwieldy document. Particularly with regards to the GE crop phase out, assorted documents and deadlines are housed in various places on the county website separate from the Cropland Policy, making it difficult to track down and understand which portions and deadlines are currently in place.

Staff proposes that the Cropland Policy be updated to include any 2021 decisions by the Board of County Commissioners and include streamlining language so as to remove inconsistent or conflicting language.

BCPOS staff will present proposed Cropland Policy amendments and clarifications to the BOCC in December 2021.

4. Pursue administrative clean-up of the Cropland Policy

Staff will incorporate BOCC direction on any policy changes and streamline language so as to remove inconsistent or conflicting language. The Cropland Policy contains a number of inconsistencies and language this can make it unclear of its ultimate intent. The goal of the administrative clean-up would be to remove language that appears to contradict each other and remove items, such as draft Standard Operating Procedures, that aren't typically found in a public policy document. Staff would also streamline and consolidate background information that is currently distributed throughout the document into a primer to help provide context for the policy itself.

Redline versions of the proposed amendments would be made available for public review and comment prior to a public meeting. Staff would propose bringing these changes back to the BOCC in December 2021.

MONITORING AND REPORTING

1. Continue monitoring the number of the organic acres, GE acres, and soil health practices. Staff recommends:

1. Continue to track acres of certified organic crops and genetically modified crops grown on county open space annually.
2. Begin to track soil health practices on county-owned agricultural properties.
3. These efforts would all be reported in the BCPOS Agricultural and Water Division Annual Report.

2. **Reporting**

Staff will report the prior year's activities annually in March through the Agricultural and Water Division Annual Report via the BCPOS website. Additionally, a public meeting will be scheduled after the report is published to update the BOCC and the community.

NEXT STEPS

After the October 19, 2021, public hearing, the Parks & Open Space Advisory Committee will deliberate and make a recommendation at their October 28, 2021, meeting. That recommendation, along with public testimony and staff recommendations will be considered by the BOCC at the November 4, 2021, public meeting. Based on BOCC direction, staff will make amendments to the Cropland Policy and present them for public review and comment prior to a December BOCC meeting.