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Lakeland Agricultural Research Association



The Verdant Element

DO YOU PLAN FOR A PROFIT?

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It seems that there is always more work to do, but what are you working for? Farming is a tough business that is challenged by many factors out of our control such as weather, pests, foreign markets and fluctuating input options and costs. But at the end of the day what are you working for? Do you have goals? Are you balancing your family time with farming? Is there money for all that you want to do? Have you planned for a profit?

These were all questions that were presented in our introduction to Holistic Management in January. Holistic Management is probably not what you think. It is a decision making process that takes into account social, environmental and economic aspects. It is a management tool, not about organics versus traditional farming methods. It assists you in setting goals that help you define the quality of life that you desire, thinking about where you want to be with your relationships, and what you need to do to feel more secure and in control, especially to mitigate all that things that are not within our control.

The definition of insanity is doing the same thing every time and expecting different results.

If we have a problem or things are not working we can do one of three things: do nothing; do the same thing harder; or stop, assess, and make a change.





Cocktail Cover Crops

Talk of soil health has been steadily on the rise, especially after 2015 was the international year of soil. Soil health is being considered more carefully and is a vital component to any one's operation. Profit margins are becoming slimmer with rising input costs and many operations are looking at ways to reduce those costs and instead of adding more fertilizers to have the same yield, they are integrating the use of cover crops to improve soil health and add nutrients into the cash crop, and for the next years crops.

What are cover crops and why would you utilize them? The goal of cover cropping is to have plants growing for as long as possible, increasing biodiversity throughout the growing season within your rotation, and increase production while improving the soil and not just maintaining it. The goals of cover cropping can be as diverse as the crops that you plant. These can include: producing more forage; soil cover (soil armor); address soil physical issues (such as compaction); address soil chemical issues (access nutrients in different soil profiles); feed the microbes and earthworms; replace chemical or summer fallow; cover for winter cereals; reduce erosion and weed control.

The basis for cover crops and improving soil health is feeding *The Soil Food Web*. Checking soil health involves nothing more complex than a shovel. Go and step out onto your land. Look at what is beneath your feet. Take note of the texture, colour, and smell. Feel the soil between your fingers. Soil is complex and wonderful, and we should be doing our best to take care of it and improve it. Use the shovel to dig down 15cm, look for earthworms. If you find them, your soil is doing well. Take note of the temperature and the moisture. The earthworms' greatest enemy is recreational tillage, especially in the summer when the soil will then heat up and dry out. Also look at the aggregation and structure of your soil.

It is all about the roots. Go and pull a plant, if the roots are clean that plant is not communicating with the soil.

The fungi of the soil, especially *mycorrhizal fungi*, are important for plant health. These fungi act as extra roots for the plant and actively transport nutrients to the plant from further locations than the plant roots can access. They can link grasses and legumes and exchange phosphorous and nitrogen between the species.

Organic matter is not all created equal. The carbon to nitrogen (C:N) ratio is very important in



Diagram source: www.soilfoodweb.ca

determining nutrient availability, and bacterial and fungi populations. The C:N ratio will indicate how quickly something will rot. Tight C:N ratios will rot quickly, cycling nutrients and promoting the populations of bacteria. Wide C:N ratios, from materials such as straw, decompose slowly providing soil armor, and feeds the fungus in the soil.

With cover crops, it is the integration of grasses, broadleaf, forbes and legumes with species selection based on the goals that you set. Grasses produce high amounts of biomass, with a fibrous root system that supports mycorrhizae. Broadleaves are typically nutrient scavengers that tend to rot quickly. Some broadleaf species such as *brassicas* do not support mycorrhizae. Legumes add protein and fix nitrogen and have a strong relationship with mycorrhizae.

Often cover crops require a lot of ingenuity and thought as to when and how you will plant them. This can provide some producers with challenges, however most are able to find solutions and create a cocktail cover crop that works for them.



Examples of equipment to plant cover crops photos courtesy of Kevin Elmy, Friendly Acres Seed Farm.
 Photo above left: modifies sprayer. Photo above right: Herd Spreader. Photo below left: 1986 8800 Bourgault airseeder.
 Photo below right: modified “retired” detasseler.



Farm Safety

Farm safety has been under the microscope of late. It is my belief that farms want all their family members, neighbors and friends to be able to help on the operation and that we all can finish the tasks at hand in a safe manner, so that no one is injured and we can all go home at the end of the day with a job well done. However accidents happen, it is the fact of life, but we should be doing all that we can to prevent them. As of January 1st 2016, Occupational Health and Safety legislation is applicable to all farms. At this point there is still much to be discussed, decided and enforced, but the truth is that safety and the OH&S rules are a very real aspect of how we farm.



Farming is one of the only industries where we work and live in the same location. We encourage our children to take part in chores, often riding in the tractor from a very young age, amongst other farm operations. Our children and grandchildren want to be with us, bonding, and helping and we need to recognize the need for their safety. Chores help children learn responsibility, taking care of livestock and equipment; but they also need to recognize the hazards that can be associated with those tasks. Family members and friends that live off-farm often want to come out and help, too often we assume that they understand and know what they are doing and can apply common sense. Having a set of ground rules, going over safe operation of equipment and handling of livestock can mitigate some risk. We need to ensure that everyone knows what they are doing and how to conduct themselves in a manner that is safe for them and for others working around them.

Creating a safety plan is an easy way to learn how to apply the OH&S regulations to your operation. To be honest the OH&S is a daunting document with close to 500 pages; but every journey starts with a single step. It can be as simple as ensuring that you have an adequately stocked first aid kit, blankets, fire extinguishers and a contact page with emergency numbers and locations. From there having a “coffee” or “breakfast” meeting before setting out to complete tasks to discuss what everyone will be doing, where they will be working and ensuring clear and continual communication throughout the day.

Letting everyone know where the operating manuals are for equipment so they can become familiar with the standard operating procedures, and ensuring they are comfortable with the piece of equipment. On a dairy farm that I worked on I was very comfortable with all the tractors except the Claas. That tractor had a panel of controls that would rival a space control station, and if something started beeping I had no clue what to do. Aside from the fact that the manual came in Danish and my translation left a lot to be desired so the manual was about as useful as kindling; I had to rely on the guidance and instruction of others and needed to be comfortable enough to ask for help.



Safety is a mentality that has to be embraced. Create your safety plan so it is practical and useable. Do not create a mountainous policy and procedure manual if no one will read it or use it. There is no expectation that you will have an understanding of the legislation, because it is currently being developed, however not doing anything in preparation is not an option. Start with simple steps, use the ample resources that are available, and if you do not know where to find them don't be afraid to ask.



- ◆ *Farm Safe Alberta* [http://www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/all/aet14540](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/aet14540)
- ◆ *Farm and Ranch Workplace Regulation* <http://www.alberta.ca/farm-and-ranch.cfm>
- ◆ *Canadian Agricultural Safety Association* <http://casa-acsa.ca/>

Growing Forward 2 provides programs and services to achieve a profitable, sustainable, competitive and innovative agriculture, agri-food and agri-products industry that is market-responsive, and that anticipates and adapts to changing circumstances and is a major contributor to the well-being of Canadians.

GROWING FORWARD

For assistance with any of the Growing Forward 2 programs please contact Kellie at LARA. For a complete list of available programs go online to: <http://www.growingforward.alberta.ca> Growing Forward can also assist with funding for things like succession planning, safety planning and holistic management under the Business Opportunity program.

Recently released is the On-Farm Solar Photovoltaics program. This program covers solar energy systems (includes solar panels/modules, racking, inverters and/or micro-inverters) which are: grid-tied; approved under the Alberta Micro-Generation legislation; have manufactures warranty; and purchased from April 1, 2013 to March 31, 2018.

Install Type	Without an Energy Assessment	With an Energy Assessment
Solar PV Contractor-Installed	\$0.45/W to maximum 20% of project costs	\$0.60/W to maximum 25% of project costs
Self-Installed	\$0.15/W to maximum 10% of project costs	\$0.30/W to maximum 20% of project costs
Grant Maximum	\$50,000	\$50,000

Growing Forward Stewardship Programs

Program Area	Eligible Costs	Cost Share
Riparian Area Fencing and Management	Permanent fencing (controlled access or exclusion): <ul style="list-style-type: none"> • Permanent barbed/electric fencing systems • Construction materials and supplies. NOTE: all materials must be new materials and not materials on hand • Labour and equipment will be paid at a 1:1 ratio to materials expenses. (NOTE: refer to section 7.4 in the Terms and Conditions); Purchase and planting of native trees and shrubs and/or native or non-invasive introduced species of grass and legumes; Seed and seeding operation for revegetation; Cultural weed control systems and mulch	70% to a funding maximum of \$50,000
Year Round / Summer Watering Systems	Deeply buried, shallow buried, or surface pipeline installation used to distribute water within a pasture and protect a water body/water source; Portable watering systems; Year-round watering systems; Troughs, stock tanks, plastic tanks (or similar water storage); Frost free nose pumps; Pumping systems; Power sources such as solar panels, windmills etc. And other electrical supplies; Plumbing materials	50% to a funding maximum of \$30,000
Wetland Restoration	Earthwork related to construction or plugging of old drains; Engineering consultant fees for design and construction; Re-vegetation costs (seed plantings etc.); Applicant's equipment use at custom rates; In-kind labour at set program rates (\$25/hour)	70% at funding maximum of \$50,000
Livestock Facility and Permanent Wintering Site Relocation	Construction costs to rebuild an equivalent facility or adequately sized facility in a more suitable location; Plumbing, electrical, fence lines, feeding areas, shelter/wind protection; Earthwork; Engineering design and fees (if applicable); Tear down and removal costs of the old livestock facility; Re-vegetation costs of the old site; Applicant's equipment use and in-kind labour	50% at funding maximum of \$50,000
Used Oil and Lubricant Storage	Double wall steel storage tank design expressly for the temporary storage of used oil and lubricants that have a ULC or CSA approved stamp or plate indicating it is for that purpose (ULC-652)	50% at a funding maximum of \$2,000
On-Farm Water Management	Wells (including test drilling, new pump and well casing, electroseismology test, disinfection of new well); Dugouts (including aeration, fencing and floating intakes); Dams (including intake and fencing); Spring Development; Water tanks/storage/cisterns for low producing wells or as part of a permanent water supply; Buried pipelines Special projects include: Specified water conservation measures (purchase and installation of water use meters, well depth meters for agricultural use of water, well decommissioning by a certified contractor, well pit conversions by a certified contractor; Tie-ins	Various funding levels, refer to the terms of reference

The environment is becoming a more prominent issue. It is a large factor in marketing agriculture and food products in today's global markets. Consumers are demanding more transparency and are demanding high quality and safe products. Reputation of food safety is critical to retain and gain access to domestic and international markets.

Environmental Farm Plans (EFP) provide a tool for producers to self analyze their operation and identify environmental risks, current standards, areas for improvement and also highlight what they are doing well.

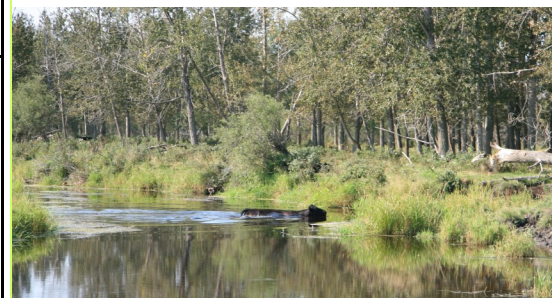
Having a completed EFP allows producers to access different funding opportunities, such as the Growing Forward Stewardship Program. It is also useful in product branding that demonstrates specific environmental standards.

The EFP Process

An EFP can be completed through workshops or one-on-one session(s). The EFP first identifies the soil and farm site characteristics. Following this, the producer completes only the relevant chapters that apply to their operation; such as wintering sites, fertilizer, pesticides, crop management etc. Upon completion the EFP is submitted to a Technical Assistant for review. Once reviewed the EFP will be returned along with a letter of completion.

The EFP is a living document and should be reviewed and updated periodically.

If you wish to complete an EFP or have any questions regarding EFP please contact the LARA office at 780-826-7260



Stuck in the mud? Consider an offsite watering system.

ENVIRONMENTAL FARM PLANS

Crop	Species Benefits	Crop	Species Benefits
Oat	<ul style="list-style-type: none"> * Cool season grass * Tolerates dryer conditions * Nitrogen scavenger * Good erosion control * Good grazing and hay characteristics * Large seed size 	Sweet Clover	<ul style="list-style-type: none"> * Cool season biennial legume * Drought and salinity tolerant * Bloating hazard * Can reseed itself in the second year * Small seed size * Aggressive tap root * Excellent for pollinators
Fall Rye	<ul style="list-style-type: none"> * Cool season winter cereal * Drought and saline tolerant * Nitrogen scavenger * Excellent erosion control * Good grazing characteristics * Large seed size 	Sun-flowers	<ul style="list-style-type: none"> * Warm season broadleaf * Some drought and salinity tolerance * Better for stockpiled grazing and green feed * Good snow catch potential * Large seed size
Proso Millet	<ul style="list-style-type: none"> * Warm season grass * Tolerates some drought * Ready to cut in 60 days good for hay or swath grazing * Small seed size 	Sorghum Sudan-grass	<ul style="list-style-type: none"> * Warm season grass * Tolerates some drought * Better for hay or swath grazing * Very fast growth in July/August * Small seed size
Lentil	<ul style="list-style-type: none"> * Cool and warm season legume * More drought tolerant than peas * Large seed size 	Peas	<ul style="list-style-type: none"> * Cool season vining legume * Best for stockpile grazing or green feed * Prefers cool conditions, no flooding
Faba Bean	<ul style="list-style-type: none"> * Cool season legume * Tall plant * Tolerates wet conditions * High nitrogen fixation * Very large seed size 	Hairy Vetch	<ul style="list-style-type: none"> * Cool season vining legume * Quite winter hardy * Slow early season growth * Small hardy seeds (will volunteer)
Kale	<ul style="list-style-type: none"> * Cool season broadleaf will winterkill * Tallest canopy of <i>Brassica</i> species * High RFV, good grazing potential * Nitrogen scavenger * Small seed size 	Forage Brassica	<ul style="list-style-type: none"> * Cool season broadleaf * Good regrowth after grazing (high RFV) * Nitrogen scavenger * Small seed size * Lots of leaf vegetation
Forage Radish	<ul style="list-style-type: none"> * Cool season broadleaf, frost tolerant * Large tuber, small seed size * Aggressive growth, early maturity * N, P, K and S scavenger * High grazing potential 	Turnip	<ul style="list-style-type: none"> * Cool season broadleaf * Large round bulb, small seed size * Aggressive growth, later maturity * N, P, K and S scavenger * Grazing potential, high RFV
Phacelia	<ul style="list-style-type: none"> * Cool season broadleaf * Fairly drought tolerant * Flowering forb, excellent for pollinators produces very high quality honey * Production of glomulin, improves soil aggregates 	Crimson Clover	<ul style="list-style-type: none"> * Cool season legume, small seed size * Not winter hardy * Fine stems and medium height
		Buck-wheat	<ul style="list-style-type: none"> * Cool season broadleaf, small seed size * Aggressive growth, early maturing

COVER CROPS TO CONSIDER BUT THERE ARE SO MANY MORE



abinvasives.ca
info@abinvasives.ca



Last Updated January 2014

Cleavers/False Cleavers

Galium aparine/*G. spurium* (Aka Bedstraw, Goose Grass, Sticky-Willy, Catch Weed)

Provincial Designation:
Not Regulated



Photo: Courtesy Mount Allison University website (www.its.its.ca)



Seed nutlets

Photo: Courtesy of www.invasive.org



Overview:

Cleavers is an annual or winter annual that reproduces by seed only. Native to Europe, this plant has been used by herbalists and its seeds are similar to coffee when roasted. Cleavers can cause significant crop loss by out shading and interfering with harvesting equipment. It has a simple tap root. Cleavers and false cleavers are nearly identical in appearance, except that false cleavers (*G. spurium*) has smaller flowers and seed nutlets.

Habitat:

Cleavers prefers damp to moist soils, but can tolerate dry soils with shade. It grows in sandy, loam or clay soils.

Identification:

Stems: Stems are square, trailing, and covered with short, bristly spines giving them a "sticky" feel. They can grow 1 to 2 m in length and climb other plants for support. The stems will climb or twine around other plants to reach sunlight. They are usually profusely branched.

Leaves: Leaves are lance shaped, have smooth edges and pointed tips, and grow 1 to 4 cm long. Leaves occur in whorls of 6-8 and have short bristly spines along their edges and midribs.

Flowers: Flowers are very small and plain, white to greenish, and have 4 petals. They are borne on short stalks emerging from the upper leaf axils. Flowers are hermaphroditic – having both male and female organs – and are self pollinating.

Seed: Seed are gray-brown nutlets, about 2 mm long, covered with short, bristly spines, and are produced in pairs. Seeds must be covered by soil to germinate and viability is limited to about 2-3 years.

Prevention:

Seeds are similar size to some crop seeds, such canola, and difficult to separate, therefore contaminated crop seed is one method of spread. A single plant can produce over 1000 seeds which can survive ingestion by livestock and birds. Seeds will float on water and can also be spread in manure.

Control:

Grazing: Not a control option as the sticky seeds are easily spread by animals.

Mechanical: Mowing is not effective. Small infestations can be hand pulled and left in the sun to dry. Plant debris can then be burned, or bagged and put in landfill-bound garbage.

Cultivation: Tillage can promote germination by burying surface seed to depths more suitable for germination, and seed can be transported on equipment. Repeated, shallow tillage followed by herbicide application on new plants could exhaust the seed bank – equipment must be cleaned after.

Chemical: Bentazon, Bromoxynil, Dicamba, Ethalfuralin, Florasulam, Fluroxypyr, Glufosinate ammonium, Glyphosate, Imazamox, Linuron, MCPA, Mecoprop-p, Pyroxsulam, Quinclorac and Tribenuron-methyl (in a product mix with thifensulfuron-methyl) are registered for use on cleavers. Always check product labels to ensure the herbicide is registered for use on the target plant in Canada by the Pest Management Regulatory Agen-

cy. Always read and follow label directions. Consult your local Agricultural Fieldman or Certified Pesticide Dispenser for more information.

Biological: A European gall mite has been screened and approved for release in Canada. No overwintering survival of the agents was observed during field trials in Alberta. (McClay, Alec. 2005)

Pest Watch

To report prohibited noxious weeds call the Alberta Pest Surveillance System at :

310-APSS (2777)



Adding biodiversity and plants that attract pollinators is always beneficial. Photo right: soybeans.

Lakeland Agricultural Research Association

Kellie Nichiporik
Box 7068
Bonnyville Alberta
T9N 2H4

Phone: 780-826-7260
Cell: 780-812-1036
Kellie Nichiporik
E-mail: sustainag.lara@mcsnet.ca



Sustainable farming encompasses a wide range of practices and principles; combining environmental stewardship with profitability and ensuring that the family farm will be there for generations to come.



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HOLISTIC MANAGEMENT

We are interested in hosting a Holistic Management Course in the Fall (October/November). The Course runs 6 days and will either be divided into two 3 day sessions or three 2 day sessions. Most likely over the weekend to accommodate producers who work off-farm. The course is in three modules.

Module 1

- Introduction to HM
- Paradigm shifts
- Making improved decisions through analytics
- Developing holistic goals for higher quality of life, more profit and healthier land
- Secrets of effective communication

Module 2

- Review principles of analytical testing questions
- Learn about using tools and their effects
- Grazing principles
- Develop a biological plan

Module 3

- Principles of holistic financial planning
- Definition of wealth
- Enterprise analysis
- Plan a profit
- Develop your operations annual financial plan
- Create a learning (support) group

There is no blanket solution or one size fits all approach to management. This course allows you to consider your own goals and what would work best for you and help you to get to where you want to go. If you are interested in this please let me know.



Food For Thought...

**Healthy soils equate to healthier plants and animals meaning healthier profits for your operation.*

**85-90% of plant nutrient acquisition is microbially mediated.*

**The world's most productive ecosystems, such as rainforests and native prairies, receive no synthetic fertilizers. Instead rely on biodiversity to achieve productivity.*



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