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Lakeland Agricultural Research Association

The Verdant Element

Out of Control?

Inside this issue:

With the great growing conditions this year it seems that weeds are worse (or better) than ever. Heavy rains have allowed for species such as tall buttercup to flourish in places you may not have seen before, and the usual culprits such as white cockle and Canada thistle blanket entire areas. So what happens when we don't control them? The cost to the environment is unmeasurable. The destruction of native ecosystems with introduced species, may in some cases, be irreparable. Then there is the economics. Yields can be suppressed, and resistance can create limited control options in the future. As seen in the background photo, when you are growing more oats than your planted crop this indicates a huge problem.

Changing the name of the chemical is not enough, you need to be changing your herbicide group.

The only way to prevent resistance is crop rotation, and changing your herbicide mode of action with utilization of various herbicide groups. This area does have group 1 resistant wild oats, so why are people continually relying on group 1 herbicides? Nor does tank mixes guarantee success, as some tank mixes use herbicides from the same group, targeting the same mode of action. With certain weeds it does seem hopeless. Canada thistle has been on the weed act since 1907 and has over 280 registered chemicals for control. Obviously it has been a long standing problem that needs a different management approach. LARA has been working with Canada thistle weevils since 2012, and over the past few years of monitoring has seen suppression of Canada thistle populations in sites. Trying new things and being proactive with monitoring, and innovative integrated management has the potential for getting you back in control.

The Cost of Water

It is hard to think about drought in a year where it seems to be raining every day. But planning for the future can be an investment well spent. This area is blessed with an abundance of both surface water and groundwater, but these resources can be depleted, contaminated and unusable in a short amount of time. It is easy to take our water resources for granted, unlike other areas of the province. Take the Peace Country for example; the majority of the area is surface water dependent. Dugouts are primarily used for household and livestock use, and an average dugout is built to supply quantity for only two years. Dugouts are wonderful sources of water with proper siting and maintenance; but are limited to how much precipitation an area receives and are susceptible to many quality concerns. Groundwater is also limited by flow rates and aquifer recharge from surface sources. Many groundwater recharge areas are lakes and wetlands, so protecting those areas is very important.

Aside from the fact that we all need water to survive, we must also think about farm safety and having water for emergencies. The wildfires this spring were rampant and incredibly destructive. Having an emergency water supply is imperative. Well water may not always be accessible in the case of a power outage so having not only a backup power supply, but also having a surface source such as a dugout may be useful.

Funding is available to agricultural producers through the On-Farm Water Management Program with Growing Forward. Through the completion of a Long Term Water Management Plan eligible projects include:

- *Standard Incentive projects* include construction of water sources such as wells, dugouts, spring developments, dams and pipelines. These projects are eligible for reimbursement of up to one-third of expenses, to a maximum of $5,000 per applicant.
- *Special Incentive projects* include well decommissioning, well pit conversions, water meters, water well depth measurement equipment, and connections to multi-user water supply pipelines. These projects are eligible for reimbursement of up to 50% of expenses, to a specified maximum per applicant or project.

The On-Farm Water Management Program must be applied for before completing your project. If you require assistance filling out the application form please contact Kellie at LARA.

Research has shown that when cows have the option to drink from a trough or from an un-fenced creek, 80% of the cattle will use the trough. Access to clean water increases animal performance, and has shown improved growth in yearlings by up to 23%

Invasive Species

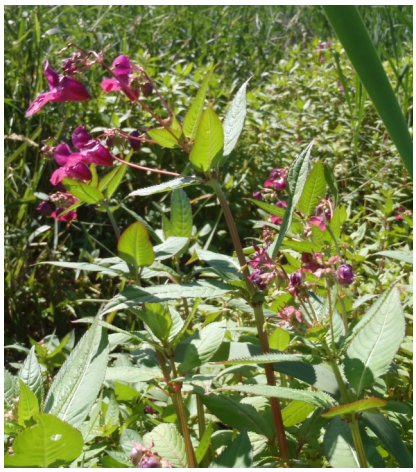
It is that time of year again, when the rains have come, wonderful sunny days, and Mother Nature's showing of colours and splendor. But not all of what is on our landscape is what Mother Nature intended to be there. In our quest for beautiful gardens as well as our exploration into new lands we have introduced species that harm rather than help our ecosystems. Some of our introduced species have become aggressively invasive and cause concern for our native species as well as an economic costs associated with control methods and reduced yield. We have been trying to control weeds since the early 1900s, with Canada thistle being on the act since 1907. In the past few years the act has been modified to include several aquatic species as well as wild boar.

Himalayan Balsam

Himalayan Balsam is a prohibited noxious weed, which means that you must eradicate them. They have the potential to take over native vegetation, forming a monoculture and destroying wildlife habitat and waterfowl breeding grounds. They can outcompete cattails, rushes and sedges in riparian areas and due to shallow roots allow for erosion and destruction of shorelines.

Himalayan Balsam is an annual, which grows at an impressive rate, achieving heights of 1 to 3 meters. It has a hollow bamboo-like stem with prominent ridges. When under stress, it can grow in a spindly grass-like fashion, flowering close to the ground. The leaves and stem are tinged reddish purple colour, with whorls of three leaves twirling up the stem. Leaves are lance shaped and have prominent veins and serrated edges. The flowers can come in a multitude of shades from white to pink to dark purple. Flowers are heavy with nectar and can attract bees away from native species. Seed capsules can contain up to 16 seeds and explode, shooting seeds up to 10 meters away, and can stay viable for seven years. An average sized plant can produce 700-800 seeds in total.

Control: Hand pulling works best but needs to be done early in the season before seeds form. Disposal by bagging and burning is recommended however for large patches this is ineffective. At Pigeon Lake they have used the "pick, break and drop" method which is pulling out the plant and breaking it apart a few inches above the roots and dropping them on drier lands where they dry out and die. After August, you should bag the tops to prevent seed dispersal. Some herbicides are effective, however sprayed flowering plants can still produce viable seed.



This is a species that was sold in greenhouses and can be found in many peoples gardens. If you see this weed it can be reported to your local Agricultural Fieldmen as it is listed in the Alberta Provincial Weed Act or phone the Alberta Pest Surveillance System at: 310-APSS (2777).

Example of how Himalayan Balsam can outcompete native riparian vegetation.

Riparian Health Assessment

The riparian zone is the interface between the upland and a water course. A healthy riparian area: traps and stores sediment; builds and maintains banks and shorelines; stores water; recharges aquifers; filters and buffers water; creates primary production and much more!

A riparian health assessment is a tool designed to evaluate the site and can provide a foundation to build an action plan and identify priorities.

If you would like a FREE Riparian Health Assessment conducted on your property or more information please call Kellie at 780-826-7260 or email sustainag.lara@mcsnet.ca

Prohibited Noxious Weeds

Prohibited Noxious weeds are a threat to Alberta's environment, economy and society. They have the potential to degrade habitats, reduce biodiversity, increase erosion, cause wildfires, reduce property values, create obstacles to international trade and cause reduction in productivity of agricultural land. Under the Alberta Weed Control Act, Prohibited Noxious weeds need to be destroyed. Eradication of these Prohibited Noxious weeds from Alberta is possible, if found and removed as early as possible.

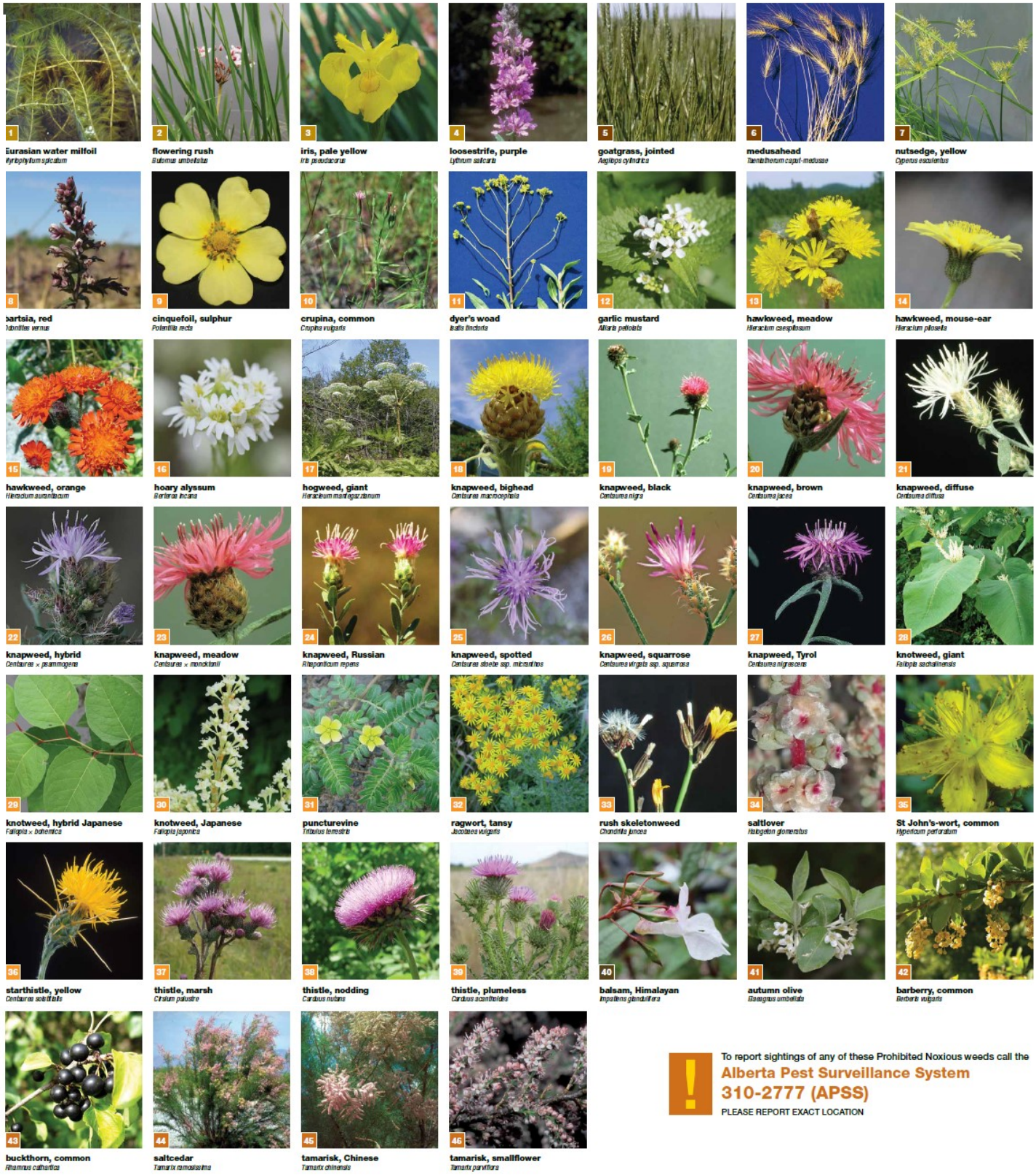
WEED CATEGORIES: AQUATIC | GRASS/GRASS-LIKE | HERBS/FORBS | ORNAMENTAL | TREE/SHRUB

Alberta Government

ALBERTA Invasive species COUNCIL

To access the *Alberta Weed Control Act*, scan this code with your smartphone or visit www.agriculture.alberta.ca/weedcontrol-act

To access more weed information, scan this code with your smartphone or visit www.agriculture.alberta.ca/weeds



1 **Eurasian water milfoil** *Myriophyllum spicatum*
2 **flowering rush** *Butomus umbellatus*
3 **iris, pale yellow** *Iris pseudacorus*
4 **loosestrife, purple** *Lythrum salicaria*
5 **goatgrass, jointed** *Aegilops cylindrica*
6 **medusahead** *Taeniatherum caput-medusae*
7 **nutsedge, yellow** *Cyperus esculentus*
8 **bartsia, red** *Odontites vernus*
9 **cinquefoil, sulphur** *Potentilla recta*
10 **crupina, common** *Crupina vulgaris*
11 **dyer's woad** *Isatis tinctoria*
12 **garlic mustard** *Alliaria petiolata*
13 **hawkweed, meadow** *Hieracium caespitosum*
14 **hawkweed, mouse-ear** *Hieracium pilosella*
15 **hawkweed, orange** *Hieracium aurantiacum*
16 **hoary alyssum** *Berteroa incana*
17 **hogweed, giant** *Heracleum mantegazzianum*
18 **knapweed, bighead** *Centaurea macrocephala*
19 **knapweed, black** *Centaurea nigra*
20 **knapweed, brown** *Centaurea jacea*
21 **knapweed, diffuse** *Centaurea diffusa*
22 **knapweed, hybrid** *Centaurea × psammogena*
23 **knapweed, meadow** *Centaurea × moncktonii*
24 **knapweed, Russian** *Rhaponticum repens*
25 **knapweed, spotted** *Centaurea stoebe ssp. micranthos*
26 **knapweed, squarrose** *Centaurea virgata ssp. squarrosa*
27 **knapweed, Tyrol** *Centaurea nigrescens*
28 **knotweed, giant** *Fallopia sachalinensis*
29 **knotweed, hybrid Japanese** *Fallopia × bohemica*
30 **knotweed, Japanese** *Fallopia japonica*
31 **puncturevine** *Tribulus terrestris*
32 **ragwort, tansy** *Jacobaea vulgaris*
33 **rush skeletonweed** *Chondrilla juncea*
34 **saltlover** *Halogeton glomeratus*
35 **St John's-wort, common** *Hypericum perforatum*
36 **starthistle, yellow** *Centaurea solstitialis*
37 **thistle, marsh** *Cirsium palustre*
38 **thistle, nodding** *Carduus nutans*
39 **thistle, plumeless** *Carduus acanthoides*
40 **balsam, Himalayan** *Impatiens glandulifera*
41 **autumn olive** *Elaeagnus umbellata*
42 **barberry, common** *Berberis vulgaris*
43 **buckthorn, common** *Rhamnus cathartica*
44 **saltcedar** *Tamarix ramosissima*
45 **tamarisk, Chinese** *Tamarix chinensis*
46 **tamarisk, smallflower** *Tamarix parviflora*

To report sightings of any of these Prohibited Noxious weeds call the
Alberta Pest Surveillance System
310-2777 (APSS)
PLEASE REPORT EXACT LOCATION

Growing Forward

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.

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): • 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

Environmental Farm Plans

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.

White Cockle

White cockle is commonly found in hay fields, fence lines and orchards. Leaves are opposite, hairy with prominent veins on mature leaves. There can be several stems per plant growing up to 120 centimeters tall, turning purplish when flowering. The plants are diecious with the flowers having five white notched petals. The male flowers have 10 veins at the base, whereas the female has 20 veins which inflate when the seeds are ripe. White cockle produces large quantities of small seeds that are similar to clover and often are found to be in forage seed.

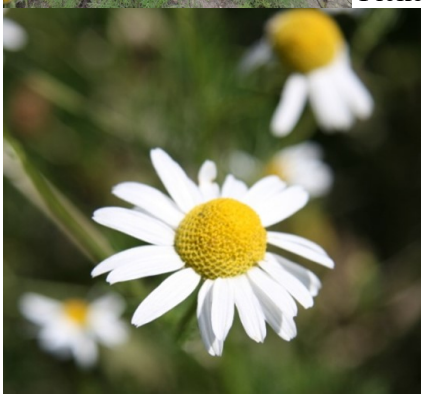
White cockle is commonly mistaken for night-flowering catchfly (which is sticky to touch and hairy) and bladder campion (hairless and smooth).

Control: cultivation is not recommended as white cockle can re-sprout from root pieces. Frequent mowing will prevent the plants from producing seed, but white cockle is a perennial, so will continue to grow from the root system. Herbicide options are usually limited due to occurrence in pastures and hay fields. There is some herbicide resistance with white cockle. Cutting and fertilizing to get grass and other species to compete is another possible control method.

Scentless Chamomile

Scentless Chamomile is easily confused with pineapple weed and German chamomile, both of which have distinct scents. Scentless chamomile has very fine smooth leaves, which are scentless when crushed. Flowers are daisy-like, yellow disk centered flowers with white ray petals. It reproduces by seed, and can have one million seeds per plant per year. The seeds can remain viable and dormant for 7—10 years. These plants can grow quite tall and without competition can cover a 1 meter squared area. Scentless Chamomile grows indeterminately which means it will continue to flower and go to seed continually over the growing season. It is a poor competitor, but can establish quickly on disturbed sites.

Control: DO NOT mow. These plants will adjust to mower height and flower closer to the ground and can re-sprout from the crown. Hand pulling small patches can provide effective control. Picked plants should either be burned or double bagged and sent to the landfill. Several chemical control methods are available. Biological control methods are available and include a seed-head feeding weevil (*Omphalapion hookeri*), and a gall midge (*Rhopalomyia tripleurospermi*).



Tall Buttercup

Tall Buttercup is a perennial that spreads by seed. It produces an oil called protoanemonin that is toxic to cattle and grazing animals. Most poisonings occur when the plant is juvenile and the young leaves and stems are consumed; but is mostly avoided by grazing livestock. Dried plants pose no harm as the oil is not present. Symptoms of poisoning can include: blistering of the skin, mouth and digestive tract; paralysis; convulsions; and death.

Tall Buttercup prefers wet soils, so the population may recede in dryer years, but then repopulate in wet years. It can grow to almost a meter in height, with an erect hollow stem. Leaves on the lower stem are 3-8 cm long and are deeply divided into 3 -5 lobes. The upper leaves are smaller and hairy, divided into 3-4 narrow segments. Flowers are bright yellow on long stalks with 5 petals that are 10-14 mm long. The flowers can appear shiny. Each plant can produce about 250 seeds that remain viable in the soil for up to 4 years. The seeds are easily transported by water.

Control: the best way to control tall buttercup is outcompeting it with a good stand of grass or forage. New buttercup plants germinate in the bare patches as they have a hard time in established tall vegetation. Buttercup seeds germinate in the late fall, so go into winter with a healthy pasture (ensure adequate carryover). In severely infested pastures, cultivation for several years with an annual crop planted can reduce the stand. Mowing prior to the seed set will help to reduce the infestation. If found in small patches, hand picking is an option but wear gloves and long sleeves as the oils can cause skin blisters. The best control is early spring spraying (when the average daily temperature is above 15ºC) with a herbicide combination including 2,4-D.

Pest Watch

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

310-APSS (2777)

Ox Eye Daisy

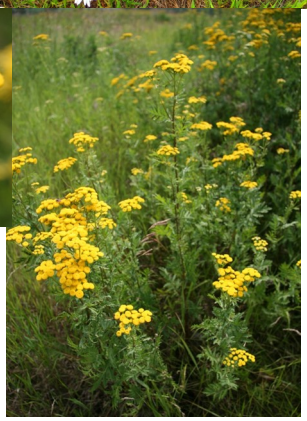
Ox-eye daisy is similar to scentless chamomile. It tends to have larger flowers than scentless chamomile and spoon -shaped lobed basal leaves, with its upper leaves being linear (narrow and long). It reproduces by rhizomes and seeds. Each plant produces hundreds of seeds. Ox-eye daisy has an unpleasant odour.

Greenhouses and nurseries may sell Shasta daisy, which originated from ox-eye and are supposed to be sterile but can revert back to ox-eye parentage and become invasive.

Control: Do not mow as it can spread the seed, and can cause the stems to re-sprout. Cultivation can be used as ox-eye has shallow roots. Several herbicides are registered to control ox-eye daisy. In small quantities, hand pulling and double bagging for disposal or burning is an option.

Tansy

Tansy is a creeping perennial that reproduces by both seeds and short rhizomes. Leaves are fern-like and tend to be aromatic. Flowers occur in dense yellow button-like clusters. It grows in a variety of conditions, from pastures, fence lines and riparian areas with full sun.



Control Options: cultivation is not recommended as re-growth can occur from severed roots. Regular mowing can reduce the amount of seed produced, but works best with the inclusion of a chemical control method. Encourage competitive growth from native species.

This plant contains pyrrolizidine alkaloids which are poisonous to humans and livestock. It can cause liver damage and reproductive issues in cattle.

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.

LARA
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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

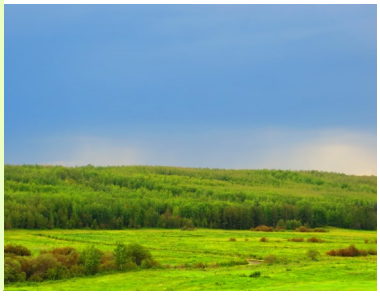
There is no blanket solution or one size fits all approach to management. This course allows you to consider your own goals and what would work best for you and help you to get to where you want to go. If you are interested in this please let me know.

Food For Thought...

**There are more than 100 species of Cyanobacteria in Alberta (blue green algae)*

**Cyanobacteria form different toxins, some can be deadly within minutes to others that can cause long term damage to vital organs*

Estimated annual costs of an invasive (zebra and quagga) mussel infestation to Alberta is over* *$75,500,000.00***



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