

Flathead Reservation Extension Newsletter

Agriculture

Feed Your Crop Not the Weeds

If you have weed problems in your cropping system, will adding nutrients just feed the weeds? Not necessarily, if you fertilize a weed-infested crop, then the weeds often benefit more than the crop. However, cultivation practices and select timing and placement of nitrogen and phosphorus fertilizer can be used to control weed populations and reduce the inputs required to control weeds.

Minimizing soil disturbance helps reduce germination of some weed species, but encourages others, so repeated years of minimal or no till practices with the same crop can cause a gradual increase in weeds. Crop rotations help reduce weed populations as do planting the crop at high seed density and close row spacing to promote higher crop yields at the expense of weeds. The trick is to find the density and spacing pattern that optimizes yield without the crop competing too much with itself.

One way to feed the crop and not the weeds is to place nutrients where the crop has better access. Side-banding, seed-placing or injecting liquid fertilizer gets the nutrient to the crop roots, so the crop has first access. These are much better options than broadcast fertilization to help with weed control. In-soil bands of nitrogen generally decreased the competitive advantage of cheatgrass, foxtail barley and wild oat in spring wheat. This may be even more important with phosphorus than nitrogen. One study found that many weed species responded more to increases in available phosphorus than nitrogen. The results vary with the crop and weed species. The key is to get a "pop-up" effect by supplying nutrients at seeding in the crop root zone so the crop seedling gets a head start and can out-compete the weeds. New slow-release fertilizers may be another tool in weed control, as they can be placed with the seed at much higher rates than conventional fertilizers.

Timing of fertilization also influences weed populations. Applying nitrogen in the fall rather than spring sometimes increases opportunistic weeds, such as winter annuals, and can also favor perennial weeds if there is sufficient rain to move that nitrogen deeper in the soil profile. However, that does not mean you should only apply fertilizer in the spring. It means that it helps to know the feeding habits of your specific weeds and crops. Spring applications are best done right before the

beginning of the crop's period of high demand. In wheat, this suggests fertilizing before tilling. Later applications benefit weeds such as annual rye, which feeds heavily throughout the growing season. Cultivation, crop rotation, and timing and placement of fertilizer all offer options to nurture crops rather than weeds in an integrated weed management system that increases crop yields and decreases costs of weed control.

This complete story can be found on the MSU Web at <http://www.montana.edu/cpa/news/nwview.php?article=7282>



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Long Term Pesticide Exposure on the Farm:

Pesticides are a valuable tool for Montana farmers and ranchers to manage weeds, insects, plant pathogens, predators, and rodents. Many applicators have used pesticides throughout their lifetime, learning which pesticides are 'dangerous' and which ones are 'safe'. This perspective is often biased towards the acute (short term) toxicity of a pesticide and may not consider the chronic (long term) consequences of unsafe practices. One such unsafe practice is the failure to follow the product label which in turn may result in:

1. not wearing personal protective equipment (PPE)
2. improperly storing pesticides
3. inadequate cleaning of used PPE, equipment, or the applicator following a spray application.

Repeated exposures over long durations of time (chronic) may cause health problems that are not readily visible. The Agricultural Health Study was initiated in 1993 to determine the long term consequences of using various pesticides and agricultural practices. This investigation, which assessed over 90,000 certified pesticide applicators and their spouses, found a relationship between the use of certain pesticides and prostate cancer, wheezing, retinal degeneration, and female reproductive health.

Prostate Cancer This study found applicators over age 50 who used methyl bromide fumigants, aldrin, chlordane, DDT, dieldrin, endrin, hexachlor, toxophene, to be associated with higher rates of prostate cancer. Applicators who had a family history of prostate cancer who used chlorpyrifos (Lorsban®), coumaphos (Co-Ral), fonofos Dyfonate®), and permethrin (with animal uses) also were associated with higher rates of prostate cancer.

Wheezing was associated with private applicators who used many organophosphates including parathion, malathion, and chlorpyrifos. Chlorpyrifos was *strongly* associated with wheezing in applicators using chlorpyrifos for at least 20 days per year.

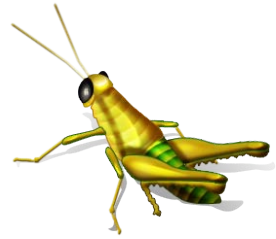
Retinal Degeneration Applicators and applicator's wives who used fungicides including benomyl, captan, chlorothanil, copper ammonia carbonate, ferbam, maneb, etaxyl, PCNB, and sulfur were associated with

degeneration of the retina. These findings suggest that exposure to many fungicides may increase the

risk of retinal degeneration.

Female Reproductive Health Women aged 21 – 40 who use pesticides have longer menstrual cycles and an increased probability of missing periods. This was based on testing more than 3,100 women living on farms.

Conclusion: Chronic toxicity testing of pesticides is currently required by law, and the results are used to establish several protective thresholds for both applicators and the general public. Chronic health findings are also reported in warning statements on the product label. Some argue that current chronic testing procedures are unsatisfactory because they consider only active ingredients of pesticides. This argument maintains that the testing of inert and active ingredients is needed to adequately assess chronic toxicity in humans. The results from this study have also drawn debate from within the scientific community. This study relies primarily on the memory of participants to determine their exposures. Hindsight investigations based on surveys are prone to personal bias as memory recall is subjective and may influence the conclusions that are drawn from this investigation. An association does not necessarily imply cause and effect. Further studies are needed to implicate whether many of these associations are incidental or causal in the increased incidence of these health problems. Pesticides are an invaluable tool for agriculture that must continue in supporting our planets rising populations, fighting pest outbreaks, and minimizing insect vectored diseases. The take home message should be to minimize pesticide exposure by wearing proper personal protective equipment, cleaning pesticide contaminated clothing, and using pesticides only when necessary. Reading and following the product label will help minimize any detrimental effects that may occur years later through long term misuse of pesticides.



Article by Cecil Tharp, MSU Pesticide Educational Specialist. For further information on these findings go to <http://www.pesticides.montana.edu>

Weeds

Managing Agricultural Weeds

Currently, most strategies aimed at reducing agricultural weeds involve herbicide applications and/or mechanical disturbance (i.e. tillage). Although these approaches have been successful, concerns regarding the impact of these weed controls and the development of herbicide resistance have generated interest in alternative weed management approaches. An integrated approach to weed management (Integrated Weed Management) can be used to develop agricultural systems that are less

St Johnswort Photo by Carol DiSalvo, USDI National Park

Orange Hawkweed by Anna Dupuis, MSU Flathead Reservation Extension Office



dependent on herbicides and tillage. This article discusses shifting the focus from **weed control** to **weed management**.

It is important to know that there is a difference between weed

control and weed management. **Weed control** refers to actions used to achieve the immediate elimination of an existing weed population. **Weed management** goes beyond control of existing weeds and focuses on reducing weed invasion, preventing weed reproduction, and minimizing weed competition with crops. Thus, while weed control reacts to problems after they occur, weed management emphasizes the goal of preventing weeds from becoming problematic in the first place.

Integrated weed management (IWM) combines the use of biological, cultural, mechanical, and chemical practices, so that reliance on any one weed management technique is reduced. The main goals of an IWM program are to 1) use preventive tools to control weed density, 2) prevent a shift towards difficult to control weeds, and 3) develop agricultural systems that maintain or improve crop productivity, revenues, and environmental quality. Thus, designing a successful IWM program requires understanding the different biological and ecological factors that influence the dynamics of weeds in agricultural settings.

The following five principles should be kept in mind when designing IWM programs.

1) Prevention is key. Limit seed introduction, production and dispersal Preventing weeds from establishing in the first place is, perhaps, the most effective way to minimize weed problems. Using certified seeds and cleaning farm equipment after use in an infested field are two simple sanitation practices that prevent weeds from entering or spreading through fields.

2) Increase natural weed mortality. Enhance the abundance and effectiveness of natural enemies of weeds During the life cycle of a weed, many mortality factors threaten its survivorship. Since it is unlikely that *ALL* weeds can be prevented, it is important to maximize the effectiveness of the mortality factors that exist naturally.

3) Don't feed the weeds. Maximize resource use by crops. Crops and weeds compete for the same resources: sunlight, nutrients, water, and space. A key component in the design of a successful IWM program is to make sure that these resources are captured by the crop and not by the weeds. Here are just a few practices that can give your crop the advantage:

• Apply fertilizer appropriately. Banding fertilizer near the crop row and applying it at the appropriate time enhances the ability of a crop to

compete with weeds.

• Adjust planting densities and row widths. Decreasing row spacing and/or increasing seeding rates enhances the competitiveness of the crop relative to the weeds.

• Utilize competitive crops and cultivars. Crops differ in their ability to compete against weeds. Crop and variety selection should be based on balancing weed suppression needs with the potential for high grain yields.

• Use high quality seeds. The use of higher seeding rates and larger seed size has been shown to improve competitive ability and increased economic returns of crops vs. weeds.

4) Keep weeds off balance-don't let the weeds adapt to your weed management practices. Using the same crop rotation over and over again generates predictable conditions that are exploited by weeds. Growers can decrease weed establishment and ensure that their cropping systems are unpredictable and inhospitable for weeds. Crop rotation is a powerful tool for disrupting weed life-cycles and helps delay the development of herbicide resistance. Rotating crops means that different resources are utilized at different times during the season and over the course of several years. This makes it difficult for weeds to adapt to all of the different conditions likely encountered over the entire rotation.

5) Use as many "little hammers" as possible to achieve maximum long-term weed management

Conventional cropping systems tend to rely on one or two "large hammers", such as herbicides and tillage. These practices provide short-term control of weeds. Unfortunately, over the longer-term these "large hammers" are not entirely effective because weeds are able to adapt to their predictability. Instead of a few large hammers, growers can employ multiple management practices (many little hammers), such as adjusting seeding rates, directed nutrient placement, crop rotation, and enhancement of natural weed mortality factors.

An integrated approach to weed management focuses on making cropping systems less favorable to weeds through the use of biological, cultural, mechanical, and chemical practices. A well planned rotation will incorporate many management practices and create the opportunity to increase the diversity and effectiveness of stress and mortality factors that impact weed colonization and establishment. By incorporating an integrated approach to weed management you can achieve effective long-term weed suppression with decreased reliance on herbicides and tillage. For more information on weed control contact your local Flathead Reservation Extension Office at (406) 675-2700 ext 1247 or send an email to flatheadreservation@montana.edu.



Perennial Pepperweed by Steve Dewey, Utah State University, Bugwood.org



Purple Loosetrife by USDA APHIS archives



Canadian Thistle Image by Steve Dewey, Utah State University, Bugwood.org

Community



Food Preservation through Home-canning

The guidelines presented here will help prevent botulism, a potentially deadly foodborne illness caused by a toxin of the bacteria *Clostridium botulinum* as well as foodborne illnesses caused by other bacteria, molds and yeast. These guidelines will also help prevent food spoilage in your home-processed foods. Before beginning your home-canning, ask yourself:

1. What is my altitude?

You must determine the correct home-canning processing times and pressures for your altitude. Water boils at 212°F at sea level, it boils at a much lower temperature at higher altitudes. Consequently, at higher altitudes home-canned foods must be processed for longer times or at higher pressures. ***Polson, MT has a altitude of 2,930 feet.

2. Is the food I am home-canning a high-acid or low-acid food?

Low-acid foods include vegetables (except most tomatoes), meats, poultry and fish. Acidity helps protect foods from poison-causing bacteria and food spoilage, and because these foods have little natural acidity, they must be processed at higher temperatures and pressures that can only be achieved by pressure canners. On the other hand, high acid foods used for canning include fruits (naturally high in acid) and properly acidified tomatoes and properly acidified pickled products can be processed in either a boiling water or pressure canner.

Safe Equipment

- Jar lifters, canning funnels, and nonmetallic spatulas
- Canning jars, two piece lids, and magnetic wand to lift jars lids
- Boiling water canner for high acid foods equipped with lid and rack. Pot must be large enough to fully surround and completely immerse jars with 1 inch of water. Water must be able to boil rapidly over jars.



- Pressure canner for low and high acid foods. A pressure canner is a specially made heavy pot with a tightly fitted lid. The lid is fitted with a vent and dial or weighted pressure gauge.

Packing

Style of pack:

- *Raw-packing* is the practice of filling jars with freshly prepared, but unheated foods. Raw-packing works best for vegetables processed in a pressure canner. ***Pressure dials should be calibrated each year. This can be done at the Flathead Reservation Extension Office.
- *Hot-packing* is the practice of heating freshly prepared food to boiling, simmering it 2 to 5 minutes, and promptly filling jars with boiled food. This is the preferred pack style for foods processed in a boiling water canner.



Jar size: Follow directions for packing in either ½ pint, pint or quart jars. (NOTE: Not all foods can be safely processed in quart jars. Therefore,

not all foods will designate quart directions.)

Head space & Lids: Follow H.S. directions for specific foods. Follow manufacturer's directions for lids.

For more information on home canning contact the Flathead Reservation Extension Office at (406) 675-2700 ext 1247 or email to flatheadreservation@montana.edu.



Revised Montguide Publications

MT200902HR	Canning Pickles and Sauerkraut
MT200903HR	Home Canning Meat, Poultry, and Fish
MT200904HR	Making Jams, Jellies, and Syrups
MT200905HR	Home Canning Pressures & Processing Times
MT200906HR	Processing Fruit, Tomatoes & Mixtures in a Pressure Canner
MT200907HR	Drying Vegetables
MT200908HR	Freezing Vegetables
MT200909HR	Drying Fruits
MT200910HR	Freezing Fruits

All Montguides are free and can be accessed by going to www.msuextension.org/publications





Summer Time Food Safety

Sometimes you just have to get out and walk around in the solitude and beauty of Montana but whether you

are in your kitchen or enjoying the great outdoors, here are some General Rules for Outdoor Food Safety:

●**Pack safely:** Use a cooler if camping or boating, or pack foods in the frozen state with a cold source if hiking or backpacking. If you are using a cooler, remember that most bacteria do not grow rapidly at temperatures below 40 degrees Fahrenheit or above 140 Fahrenheit. The temperature range in between is known as the "Danger Zone." Bacteria multiply rapidly in the "Danger Zone" and can reach threatening levels after only 2 hours. Above 90 °F, food can become dangerous after only 1 hour. So bring along plenty of ice and keep the cooler shaded or covered with a blanket. Leftover food is safe only if the cooler still has ice in it. Otherwise, discard ALL leftover food.

●**Bring lightweight staples that don't need refrigeration.** For Example: Peanut butter in plastic jars, concentrated juice boxes; canned or dried meats; dried soups, fruits and nuts, powdered milk and fruit drinks. Powdered mixes for biscuits or pancakes are easy to carry and prepare, as is dried pasta. There are plenty of powdered, sauce mixes that can be used over pasta.

●**Keep raw foods separate from other foods.**

●**Never bring meat or poultry products without a cold source to keep them safe.** Another important piece of camping equipment is a food thermometer. Color is not a reliable indicator of doneness, and it can be especially tricky to tell the color of a food if you are cooking in a wooded area in the evening. Cook all meat and poultry to safe minimum internal temperatures:

⇒Beef, veal, and lamb steaks, roasts, and chops may be cooked to 145 °F.

⇒All cuts of pork to 160°F.

⇒Ground beef, veal and lamb to 160 °F.

⇒All poultry should reach 165 °F

●Heat hot dogs and any leftover food to 165 °F.

***Be sure to clean the thermometer between uses.

●**Plan on carrying bottled water for drinking.** Otherwise, boil water or use water purification tablets. It is not a good idea to depend on fresh water from a lake or stream for drinking, no matter how clean it appears.

Some pathogens thrive in remote mountain lakes or streams and there is no way to know what might have fallen into the water upstream.

●**Do not leave trash in the wild.** Always bring extra trash bags.

●**Wash your hands.** Protect yourself and your family by washing your hands before and after handling food. Bring disposable wipes or biodegradable soap for hand- and dishwashing in case clean water is not available.

For more information please contact your local Flathead Reservation Extension Office at (406) 675-2700 ext 1247 or send an email to flatheadreservation@montana.edu



Summer Fruit Salsa with Cinnamon Chips

Yield: 8 servings •

Serving: 8 chips with ½ cup salsa

- 1 apple, cored and chopped into small pieces
- 1 cup fresh strawberries, chopped **OR**
 - 1- 10 ounce package frozen strawberries
- 2 kiwi, peeled and chopped
- ½ cup crushed pineapple, drained (save 2 Tablespoons pineapple juice)
- 8- 8 inch flour tortillas
- 2 teaspoons water
- 2 teaspoons cinnamon mixed with ¾ cup sugar (add more cinnamon if desired)

1. Finely chop all fruit. (Use food processor, if desired, but do not puree.)
2. Combine fruit with pineapple juice. Chill.
3. Preheat oven to 350°F.
4. Sprinkle tortillas with approximately 2 teaspoons water (or spray with water).
5. Sprinkle each tortilla with cinnamon and sugar mixture.
6. Cut each tortilla into eight wedges and place on baking sheet.
7. Bake at 350°F for 6 minutes.
8. Cool on rack. Store in airtight container. Serve tortilla chips with salsa.

PER SERVING:
CALORIES 256
FAT 3 G
PROTEIN 5 G
CARBOHYDRATE 53 G
FIBER 2 G
GOOD SOURCE OF VITAMIN C
LOW IN CHOLESTEROL AND SATURATED FAT





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Extreme Heat: Effects on Children and Pregnant Women

Heat-related illnesses are common, yet preventable on hot days. Children and pregnant women need to take extra precautions to avoid overheating on days of extreme heat. Dehydration, heat stroke, and other heat illnesses may affect a child or pregnant woman more severely than the average adult.

Why are children more susceptible to extreme heat?

Physical characteristics – Children have a smaller body mass to surface area ratio than adults, making them more vulnerable to heat-related morbidity and mortality. Children are more likely to become dehydrated than adults because they can lose more fluid quickly.

Behaviors – Children play outside more than adults, and they may be at greater risk of heat stroke and exhaustion because they may lack the judgment to limit exertion during hot weather and to rehydrate themselves after long periods of time in the heat. There are also regular reports of infants dying when left in unattended vehicles, which suggests a low awareness of the dangers of heat events.

How do I know if my child is dehydrated?

Decreased physical activity
Lack of tears when crying
Dry mouth
Irritability and fussiness

What should I do if my child has become dehydrated?

Have the child or infant drink fluid replacement products
Allow for rehydration to take a few hours, over which children should stay in a cool, shaded area and sip fluids periodically
Call your doctor if symptoms do not improve or if they worsen

How do I know if my child has suffered a heat stroke?

Heat stroke, a condition in which the body becomes overheated in a relatively short span of time, can be life-threatening and requires immediate medical attention.

Skin is flushed, red and dry
Little or no sweating
Deep breathing
Dizziness, headache, and/or fatigue
Less urine is produced, of a dark yellowish color
Loss of consciousness





How can children be protected from the effects of extreme heat?

Hydration – Make sure children are drinking plenty of fluids while playing outside, especially if they are participating in sports or rigorous physical activity. Fluids should be drunk before, during and after periods of time in extreme heat.

Staying indoors – Ideally, children should avoid spending time outdoors during periods of extreme heat. Playing outside in the morning or evenings can protect children from dehydration or heat exhaustion. Never leave a child in a parked car, even if the windows are open.

Light clothing – Children should be dressed in light, loose-fitting clothes on extremely hot days. Breathable fabrics such as cotton are ideal because sweat can evaporate and cool down the child's body.

How do I care for my infant during hot weather?

Check your baby's diaper for concentrated urine, which can be a sign of dehydration.

If your infant is sweating, he or she is too warm. Remove him or her from the sun immediately and find a place for the baby to cool down.

Avoid using a fan on or near your baby; it dehydrates them faster.

A hat traps an infant's body heat and should only be worn in the sun to avoid sunburn.

Never leave an infant in a parked car, even if the windows are open.

Why are pregnant woman especially at risk during periods of extreme heat?

An increase in the core body temperature of a pregnant woman may affect the fetus, especially during the first trimester.

How can pregnant women protect themselves from the effects of extreme heat?

Wear light loose fitting clothing

Stay hydrated by drinking six to eight glasses of water a day

Avoid caffeine, salt, and alcohol

Balance fluids by drinking beverages with sodium and other electrolytes

Limit midday excursions when temperatures are at their highest

Call doctor or go to emergency room if woman feels dizzy, short of breath, or lightheaded

This article has been brought to you by the US EPA. For an online copy of this article or more information on emergency preparedness please call your local Flathead Reservation Extension Office at 406-675-2700 ext 1247 or go to <http://www.msuextensionhousing.org/emergency1.html>





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Making a Difference on the Flathead Indian Reservation

MSU Extension is an equal opportunity/affirmative action provider of educational outreach.

August 2009						
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Looking ahead:

More Food Preservation Classes Coming Up—For more details call 675-2700 ext 1246

Aquatic Pesticide Training—September 9 & 10

Food & Fitness Celebration 2009—September 23 & 24

MSU's Resource on the Flathead Indian Reservation