

# AGRICULTURE NEWS

## AGRICULTURE & NATURAL RESOURCES



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## ACT NOW TO CONTROL POISON HEMLOCK

*Dr. J. D. Green, Extension Weed Scientist, Dr. Megan Romano, UKVDL Toxicologist, Dr. Michelle Arnold, Ruminant Extension Veterinarian*

During the early summer, the presence of poison hemlock (*Conium maculatum*) is more evident. Although this plant is often seen along roadways, abandoned lots, fencerows, and other non-cropland sites, in recent years it has expanded out into grazed pasture lands and hay fields. Poison hemlock is toxic to a wide variety of animals including man, birds, wildlife, cattle, sheep, goats, pigs, and horses. It contains several neurotoxic piperidine alkaloids; the two major ones are coniine (major alkaloid in the mature plant and seed) and the more toxic gamma-coniceine (predominate in green, vegetative growth). These alkaloids cause muscle paralysis by acting as a neuromuscular blocking agent, resulting in two major effects: 1) rapid, sometimes fatal effects on the nervous system and 2) they are teratogenic agents, meaning they are known to cause birth defects when consumed during certain times of gestation. Cattle seldom choose to eat poison hemlock unless no other forage is available or it is incorporated in hay, silage, or the seeds in grain. A commonly asked question is how much plant material must be consumed by cattle to kill them. Unfortunately, the answer is not clear cut as there is considerable variation in the toxic alkaloid content of the plant depending on its stage of growth, season, moisture, temperature, time of day, and geographic region. Cattle have died by eating 0.2-0.5% of their body weight in green hemlock.

Poison hemlock is classified as a biennial that reproduces only by seed. It is capable, however, of completing its lifecycle as a winter annual in Kentucky if it germinates during the fall months. New plants emerge in the fall as a cluster of leaves that form a rosette which remains green throughout the winter in a semi-dormant state. It is most noticeable at this stage of growth in late fall through early spring with its parsley-like leaves which are highly dissected or fern-like with leaf petioles that have purple spotting and no hairs (Figure 1). The individual leaves are shiny green and triangular in appearance.



**Figure 1.** Poison hemlock rosette.

After resuming active growth in late winter, they form larger rosettes. As the plant begins to send up flower stalks, the leaves are alternately arranged on the main stem. Each individual leaf is pinnately compound with several pairs of leaflets that appear along opposite sides of the main petiole. As the plant matures, poison hemlock can grow upwards to about 6 to 8 feet tall (Figure 2). At maturity the plant is erect, often with multi-branched stems, and forms a deep taproot. The hollow stems are smooth with purple spots randomly seen along the lower stem that helps distinguish it from other plants similar in appearance. The flowers, when mature, are white and form a series of compound umbels (an umbrella-shaped cluster of small flowers)



**Figure 2.** *Mature poison hemlock plants growing in hayfield.*

at the end of each terminal stalk. Poison hemlock foliage has an unpleasant mouse urine-like odor, detectable when near the plant or when a stem or leaf is crushed. Although this weed is often associated with areas that have moist soil conditions, it can also survive in dry sites.

Fortunately, most animals avoid grazing poison hemlock if other forage is readily available. However, animals are more likely to consume green plants during the late winter and early spring when other forage species are limited or when dry lotted or starving animals gain access to an overgrown field. All parts of the plant, including the seeds, contain the toxic alkaloids coniine and gamma-coniceine. Gamma-coniceine is more toxic than coniine and is at its highest concentration in early growth. As the plant matures, gamma-coniceine undergoes chemical reduction to the less toxic alkaloid coniine. Seeds and dried plant material contain the highest concentrations of coniine. Although toxicity is reduced during drying due to volatility of coniine, animals will eat much more dried poison hemlock than fresh because palatability is greatly improved. Seeds are highly toxic and can be a source of poisoning when they contaminate cereal grains fed to livestock. Therefore, avoid feeding animals hay or grain known to contain poison hemlock.

Symptoms of acute poisoning can occur rapidly after ingestion of plant material anywhere within 30 minutes to 2 hours depending on the animal species, quantity consumed, and stage of plant growth. Initially the affected animal may develop nervousness, salivation, tearing, frequent urination, and signs of abdominal pain. There may be a detectable mousy odor to the breath and urine. Symptoms progress to muscle tremors, incoordination, and weakness, difficulty breathing, and death can result within hours due to respiratory failure. If acute poisoning does not progress to collapse and death, signs can begin to improve within several hours, with full recovery in as few as 6-8 hours.



Diagnosis is based on history of plant ingestion, clinical signs, and chemical analysis for presence of alkaloids in rumen contents. Activated charcoal may help bind alkaloids if administered prior to onset of signs. Avoid exciting or stressing symptomatic animals, as that may exacerbate symptoms and result in death. Poisoning is prevented by providing sufficient, good-quality forage and preventing livestock exposure. Public health is a concern when dealing with poisoned animals because of the possibility of alkaloid residues in meat. Elimination of plant toxicants through the milk is a minor route of excretion but may be important when consumed by a calf or a human. More importantly, people have been accidentally poisoned when they confused poison hemlock for plants such as parsley, wild carrot, or wild anise.



*Figure 3: Limb deformity due to ingestion of poison hemlock during 1<sup>st</sup> trimester of pregnancy. Photo courtesy of Levi Berg, (Nov. 2018)*

Although acute poisoning is a primary concern, an equally serious problem is subacute intoxication of pregnant livestock that results in congenital birth defects. These defects are caused by inhibition of fetal movement by the plant toxin during critical fetal development. In cattle, the susceptible period of pregnancy is 40 to 100 days while in swine, sheep, and goats the susceptible period of gestation is 30 to 60 days. Defects possible include severe limb deformities (Figure 3), joint rigidity, rib cage anomalies, vertebral curvature, and cleft palate. Diagnosis of plant-induced congenital defects is only through known exposure during gestation since the alkaloids are long gone once the calf is born.

The principal strategy for poison hemlock control is to prevent seed production which can be a challenge since a fully mature plant can produce 35,000 – 40,000 new seeds. It is too late to utilize herbicide control methods after plants have produced flowers. Therefore, mechanical control efforts (if feasible) such as mowing or cutting down individual plants should be initiated just before peak flower production to avoid or reduce the number

of new seeds produced. **The best time for control using herbicides is generally when plants are in the younger rosette stages of growth in late October/ early November or February/ early March when daytime temperatures reach the 60<sup>o</sup>s.** Make note of areas heavily infested with poison hemlock (Figure 4) and begin to look there for emergence of new plants in the fall. Herbicide products containing 2,4-D, dicamba+2,4-D (e.g. Weedmaster, Brash, Rifle-D, etc.), and aminopyralid (e.g. DuraCor, GrazonNext) are



*Figure 4. Poison hemlock growing along fence line in December.*



the preferred choices for obtaining effective control. Effectiveness of chemical control can decrease as plants begin to elongate and become more mature. When using herbicidal control methods on larger plants, it is important to remove animals from treated areas since animals are more likely to graze poison hemlock plants following herbicide treatment.

## APRIL UPCOMING EVENTS

*Please call (859) 824-3355 and register your attendance in classes.  
Bold Classes will qualify for CAIP Education Requirements*

Mar 28	Grant County Farmer's Market WIC & SFMP Certification	GCFB Helton Street	7:00 pm
Apr 1	Grant County Cattlemen's Association	GCFB Helton Street	7:00 pm
<b>Apr 1</b>	<b>Kenny Burdine Cattle Market Forecast</b>	<b>GCFB Helton Street</b>	<b>7:00 pm</b>
<b>Apr 9</b>	<b>Lawn Care Basics</b>	<b>Temp 1212 N. Main St F</b>	<b>7:00 pm</b>
Apr 15	KY Backyard Beekeepers	Open Door Church, Dry Ridge Rd	6:30 pm
<b>Apr 15</b>	<b>Market Outlook and BQCA</b>	<b>Temp 1212 N. Main St F</b>	<b>7:00 pm</b>
<b>Apr 17</b>	<b>Cattle Health &amp; Vaccines</b>	<b>Producer's Stockyards, Owenton</b>	<b>8:30 am</b>
Apr 25	Grant County Farmer's Market Dept of Ag Scale Certification	GCFB Helton Street	7:00 pm
<b>Apr 29</b>	<b>Managing Diseases in the Garden</b>	<b>Temp 1212 N. Main</b>	<b>7:00 pm</b>

### Apple Sage Pork Chops

- **1 tablespoon** flour
- **1 teaspoon** dried sage
- **2 tablespoons** garlic powder
- **1/2 teaspoon** ground thyme
- **1 teaspoon** salt
- **4** boneless center cut pork chops
- **2 tablespoons** oil
- **1/2** large onion, thinly sliced
- **2** thinly sliced red apples
- **1 cup** unsweetened apple juice
- **2 tablespoons** brown sugar (optional)

**Wash** hands with soap and warm water, **scrubbing** for at least 20 seconds. **Gently clean** all produce under cool running water. **Mix** flour, sage, garlic, thyme, and salt together in a small bowl. **Sprinkle** 1 1/2 tablespoons of the mixture over both sides of the pork chops. Remember to **wash** hands after handling raw meat. **Heat** oil in a large skillet over medium-high heat. **Sear** pork chops for 2 to 3 minutes on each side. Pan will smoke a little. **Remove** pork chops from the pan and set aside. **Reduce** heat to medium. To the same skillet, **add** onion and **cook** for 2 minutes, or until soft. **Add** apples, and **continue cooking** until tender, about 2 minutes. **Add** apple juice, brown sugar, and remaining spice mixture and stir to dissolve. **Return** pork chops to the skillet by nestling them in the pan. **Bring** the liquid to a boil, **reduce** heat to low, and **simmer** for 5 minutes or until the pork is cooked through and reaches 145 degrees F on a food thermometer. **Refrigerate** leftovers within 2 hours.

**Yield:** 4 servings. **Nutrition Analysis:** 310 calories, 10g total fat, 1.5g saturated fat, 50mg cholesterol, 660mg sodium, 35g total carbohydrate, 3g fiber, 25g total sugars, 7g added sugars, 22g protein, 6% DV vitamin D, 2% DV calcium, 6% DV iron, 15% DV potassium.





# Garden Planting Calendar

**Table 14.** Vegetable gardener's calendar with planting dates for Western, Central, and Eastern Kentucky<sup>1</sup>

Western Ky	Central Ky	Eastern Ky	Planting Method <sup>2</sup>	Crop
Jan. 15	Jan. 22	Jan. 29	I	Onions
Feb. 1	Feb. 8	Feb. 15	I	Brussels sprouts
Feb. 15	Feb. 22	Mar. 1	I	Cole crops (Broccoli, cabbage, cauliflower, kohlrabi), lettuce, Chinese cabbage
Mar. 1	Mar. 8	Mar. 15	O	Spinach, mustard, beets, peas, edible podded peas
Mar. 15	Mar. 15	Mar. 22	M	Cabbage, kohlrabi
			O	Asparagus and rhubarb (crowns), beets, carrots, collards, kale, mustard, spinach, peas, edible pod-ded peas, early potato seed pieces, radishes, turnips, green onions, onion sets, endive
			I	Peppers, tomatoes, eggplant, sweet potato slips. Dig and divide any 4 year old rhubarb plants. Fertilize asparagus and rhubarb with 1 lb 5 10 10 per 100 sq ft.
Apr. 1	Apr. 8	Apr. 15	M	Broccoli, cauliflower, collards, lettuce, Chinese cabbage, Swiss chard, onions from seeds
			O	Mustard, spinach, radishes, lettuce, Swiss chard
Apr. 5	Apr. 12	Apr. 19	I	Muskmelons, watermelons, squash
			O	Sweet corn, beets, carrots, mustard, spinach, radishes, lettuce
May 1	May 8	May 15	O	Sweet corn, mustard, radishes, lettuce
May 7	May 15	May 22	O	Green beans, lima beans
			M	Tomatoes, muskmelons, watermelons, squash
June 1	June 8	June 15	O	Sweet corn
			M	Sweet potatoes
June 15	June 22	June 29	O	Sweet corn, late potatoes, summer squash, bush beans, lettuce, parsnips, beets, carrots
July 1	July 8	July 15	O	Sweet corn (early maturing variety), carrots, beets
July 10	July 18	July 25	O	Sow seeds of fall cole crops in a nursery area
July 15	July 22	July 29	O	Sweet corn (early maturing variety), kale, mustard, turnips, summer squash
Aug. 1	Aug. 8	Aug. 15	M	Transplant fall cole crops to permanent location between now and Aug. 15
			O	Peas, edible podded peas, bush beans, radishes, beets, mustard. Divide old rhubarb or plant crowns if not done in spring.
Aug. 15	Aug. 22	Aug. 29	O	Radishes, spinach, turnips, turnip greens, beets, mustard, lettuce, endive
Sept. 1	Sept. 8	Sept. 15	O	Radishes, spinach, mustard
Sept. 15	Sept. 22	Sept. 29	O	Radishes, mustard, turnips, turnip greens
Oct. 1	Oct. 8	Oct. 15	O	Radishes
Oct. 15	Oct. 22	Oct. 29	O	Sow sets of Egyptian tree or multiplier onions. Harvest carrots before heavy freeze.
Nov. 1	Nov. 8	Nov. 15	O	Dig parsnips and store at 32-40°F, or mulch parsnips heavily in the ground

<sup>1</sup> Planting dates are approximate, consult you local weather conditions and adjust planting dates accordingly.

<sup>2</sup> **I:** Start seeds indoors; **M:** Move transplants to garden; **O:** Start seeds outdoors



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