

## Ragwort : a Poisonous plant

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Ragwort is a herbaceous plant which contains toxic substances which can cause serious liver damage. It is usually non palatable to horses, but they will sometimes eat it in fodder or when grazing in dry summers, when grass becomes scarce. When symptoms appear, the poisoning is in an advanced stage, and it is often fatal. Learning to recognise this plant is therefore a step towards implementing measures of prevention.

by **Laetitia MARNAY-LE MASNE - Nelly GENOUX** | 06.08.2018 |

Technical level   



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### Characteristics of the most common species of ragwort

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Ragwort is a herbaceous plant with yellow flowers belonging to the daisy (Asteraceae) family. Of the 1200 species of ragwort in the world, three main species can be found in France :

- Groundsel (*Senecio vulgaris* L.)
- South African ragwort or narrow-leaved ragwort (*Senecio inaequidens* DC.)
- Common ragwort or stinking willie (*Senecio jacobaea* L.)

They can be differentiated by their respective size, bearing, and life cycle. Below is a chart comparing the three species.

Main characteristics of the three most common types of ragwort

	Groundsel	South African ragwort or narrow-leaved ragwort	Common ragwort or stinking willie
Life cycle	Annual plant	Herbaceous perennial plant (between 5 – 10 years life cycle)	Biannual species, with some plants surviving for more than 2 years (it is then qualified as perennial)
	Germination, flowering and fruiting spread over the year	Flowering season from May through to December	Flowering season from July to September
Habitat	Gardens, poor soils, roadsides...	Requires a bare or poorly covered soil area	Pastures, fallow land, edge of woodland, cultivated fields, banks and roadsides...
Height (cm)	15 – 40	40 – 80 (even up 110)	50 - 120
Leaves	Bright green and shiny, pinnatifid, sessile at the top of the stem, petiolar at the base	Alternate and linear, often with a group of small filiform leaves at the axils	Alternate, hairless, pinnatipartite divided into more or less equal oblong or serrated segments. Petiolate lower leaves, followed by sessile clasping lobe shaped leaves

	Groundsel	South African ragwort or narrow-leaved ragwort	Common ragwort or stinking willie
Stalks	Angular upright and ramified	Horizontal at the base, then upright. Bushy shape	Ramified at the top. Generally fanning out
Inflorescence	Yellow capitulum with black marks on the involucre and epicalyx	Golden yellow capitulum, from 1,8 to 2,5 cm in diameter, surrounded by 12-14 yellow ligules	Yellow capitulum from 1,5 to 2,5 cm in diameter, forming a corymb at the flowery top of the stalks
Seeds	Short haired achenes	Silvery white, silky light achenes measuring 5mm in length	Cylindrical linear achenes with a sessile tuft of silky hairs
Concentration of pyrrolizidine alkaloids	+	+++	+++
Other characteristics	-	-	Very resistant to drought and cold winters



Common ragwort  
© N. Genoux



Common ragwort at the beginning of flowering. The absence of ligules is particular to this species compared to others © L. Marnay Le Masne



Common ragwort achenes © N. Genoux



Common ragwort flowers © N. Genoux



Common ragwort leaves © N. Genoux

## Circumstances when poisoning can occur



Ragwort is rarely eaten when fresh, except during periods of drought.  
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Ragwort poisoning occurs when the horse ingests the plant, either when grazing, or dried in hay. The plant contains hepatotoxic molecules : pyrrolizidine alkaloids (PAs). Once ingested these molecules are metabolised by the liver as extremely toxic metabolites for veterbrates, specifically for horses, and they cause severe and often fatal liver damage.

Whether eaten fresh or dried in hay, the entire plant is poisonous, particularly in the first stages of growth (young shoots). Because PA s give the plant a bitter taste, ragwort is usually ignored by grazing horses, but certain conditions increase the risk of poisoning :

- When dried, the bitterness due to PA s lessens and makes ragwort more palatable in hay than when in the

field. Thus poor quality hay or haylage, containing ragwort, is a major source of poisoning

- During periods of drought, when different types of grass begin to suffer and become scarce, ragwort, which is more resistant, becomes more attractive. Horses may then eat some, particularly the leaves and the flowers.

## Symptoms and diagnosis

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Ragwort poisoning causes irreversible damage to the liver cells. However, liver cells have the capacity to regenerate, which explains why horses can recover.

**Acute poisoning** is rare, and is due to ingestion over a few days of a large quantity corresponding to 3 % to 5 % of the horse's body weight (around 15 to 25 kg). This type of poisoning leads to a rapid death following symptoms of the nervous system (phases of excitability and lack of movement coordination, associated to loss of sight, leading to injuries) and digestive symptoms (colic, loss of appetite, intestinal impactions, excessive thirst)

**Chronic poisoning** follows a daily consumption of 50 to 100 g over a 6 to 8 week period. This type of poisoning generates an accumulation of toxic metabolites in the liver. The horse is apparently in good health until the sudden onset of clinical signs, sometimes several months after the first ingestion.

The following are progressively observed :

- Weight loss without loss of appetite
- loss of appetite, which then accelerates weight loss
- Recurring bouts of colic
- Jaundiced skin and mucous membranes
- Photosensitivity : Abnormal sensitivity of the skin to sunlight, leading to allergic reactions

In the more advanced stages of poisoning, deterioration is more or less brutal depending on the horse, symptoms indicating hepatic encephalopathy occur :

- Change in the animal's consciousness state : either excitability or depression
- Ataxia : lack of movement coordination



Because of the wide range of clinical signs, the latency period between the horse ingesting ragwort and the first visible clinical signs, and the lack of specific clinical or biochemical symptoms (plasmatic concentration of certain enzymes, plasmatic concentration of bile acids...) related to this affliction, diagnosis is difficult to establish with certainty. This is all the more true because different horses grazing on the same area of land, will not all develop symptoms, and not all at the same time. It is likely that different individuals will have different tendencies to consume the plant, and different sensitivity to the poisonous substances



## Treatment

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At present there is no specific treatment for ragwort poisoning. Biochemical testing should be carried out on a horse having been in a field containing ragwort. This test will show up any liver damage, and allow implementation of a palliative treatment to support hepatic function before the appearance of clinical signs. Palliative treatment consists in :

- Giving a high (but not too high) glucose feed ration (molasses, sugar beet, cereal...) the ration should also be low protein (metabolising protein produces ammonia, and leads to the appearance of nervous system symptoms). The ration should be given in small fractions (4 to 6 meals a day).
- Feed the horse a hepato-protective supplement
- Put to rest and avoid stress

When treatment is implemented early, horses often recover completely. Prognosis is however much more reserved once the horse shows symptoms of the nervous system. Mortality in these cases reaches 60 %.

## Prevention

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Prevention measures remain the best way of limiting the risk of ragwort poisoning. The aim being to prevent the horse ingesting the plant. Several measures can be put in place :

### Good pasture management

This entails preserving the quality of grazing land so that ragwort does not have the chance to develop. When the grass is thick and of good quality, weeds like ragwort do not develop as readily as when the cover of grass is sparse, therefore the following measures are recommended :

- Avoid overgrazing, by reducing the load (number of horses/ ha) and increase the pasture's resting time.
- Restrict grazing in dry conditions
- Cut the roughs (places the horses do not graze) so as to promote better regrowth of grass.

### Good pasture maintenance

- **Over sow** with a grass mix in places where the cover is sparse, they can even be ploughed and replanted when the field is too damaged (> 20 % of the surface with a poor cover of grass, or a low ratio of grass/ weeds)
- **Pull out and burn ragwort plants** in or around the fields. This should be done when ragwort is in its young stages to avoid seeds being dispersed.
- **Chemical control** : when the area is invaded with ragwort, a chemical weedkiller for dicotyledons can be used. Take care not to have horses graze the area for a fortnight following treatment. This is because ragwort becomes more palatable before dying...

Localised spraying plant by plant works best, as this restricts the use of weedkillers to the areas or to the plants to be treated.



The use of weedkillers must be carried out by certified professionals (see the zoom on Certiphyto below) and in the right conditions of temperature, humidity, and favourable winds. When the plant is in full leaf is the best time to treat.



### Zoom on Certiphyto

Certiphyto is an individual certification for safe usage of phytopharmaceutical products (weedkillers, insecticides, fungicides). Any professional person (farmer or agricultural worker) working with these products is concerned by French and European regulations. The European directive (2009/928/CE) provides for an initial and continuous training session to acquire and update knowledge of usage of phytopharmaceutical products. Certiphyto is compulsory for any user since 1st October 2014. In France you can contact the DRAAF of your area ((Direction Régionale de l'Alimentation, de l'Agriculture et de la Forêt).

- **Eliminate any remaining waste** after treatment, and do not place on the compost or on the manure heap. This could lead to disseminating any seeds or fruits of the weeds when fertilising. The best course of action is to burn them.

### Ideas for organic control ?

Using « auxilliary cultures », such as introducing a specific blight (parasitical fungus which infects the plant and provokes orangey blisters on the leaves, and then weakens the plant) or a ragwort predatory species of greenfly, on colonised areas are methods being studied today. They act as antagonists to organisms which are harmful to crops.

Ragwort control is a long-winded process. Information and awareness of horse-owners is essential in avoiding this insidious and often irreversible form of poisoning.

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