

Oregon Department of Agriculture
Plant Pest Risk Assessment for
Coltsfoot, *Tussilago farfara*
2010

Name: Coltsfoot, *Tussilago farfara*
Family: Aster, *Asteraceae*

Findings of This Review and Assessment: Coltsfoot, *Tussilago farfara*, was evaluated and determined to be a category “**A**” rated noxious weed, as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination was based on a literature review and analysis using two ODA evaluation forms. Using the Noxious Qualitative Weed Risk Assessment v.3.6, coltsfoot scored **49** indicating a Risk Category of **B** ; and a score of **15** with the Noxious Weed Rating System v.3.8, indicating a “**B**” rating. Though coltsfoot scored as a “**B**” rated weed in assessment v.3.2, its threat to high value agriculture and rarity in the state place this as an “**A**” rated species.

Introduction: Native to the cold-temperate continental climates of Europe, and also North Africa and parts of Asia, *Tussilago farfara* was introduced to the eastern United States and Canada in the early 20th century. Globally it is known as an introduced weedy plant and is considered invasive or noxious in the United States, New Zealand and Canada. Within the United States, Alabama, Washington, Massachusetts, Connecticut, and Oregon have listed coltsfoot as a noxious weed. Aggressively spreading throughout northeastern North America, coltsfoot has jumped the continental divide in the 1990’s and was discovered in Washington, and later in British Columbia, Canada (Wright, 1997). Historically the plant was used for medicinal purposes to relieve respiratory ailments, but has been utilized as an ingredient in commercial cough preparations. It is a competitor in agricultural crops such as in corn, soybeans, winter wheat, spring grain and alfalfa. Due to the perennial nature of the roots, selective control of the species can be difficult.



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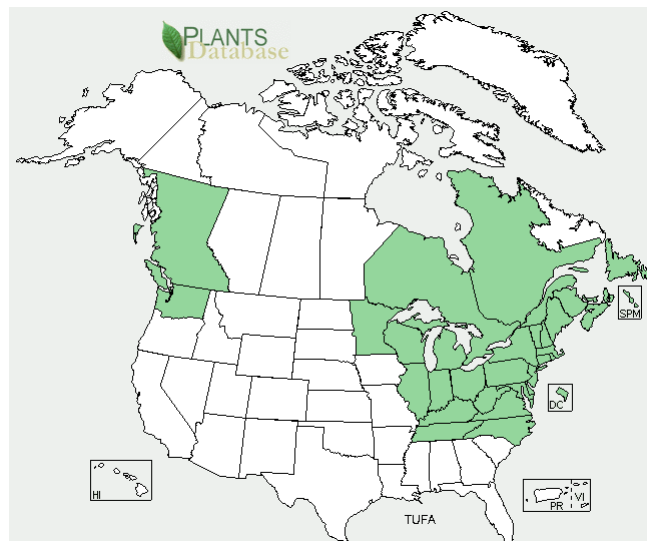
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Growth Habits, Reproduction, and Spread: Coltsfoot is a low-growing creeping perennial that shows intensive clonal growth with a branched rhizome system. Vegetative reproduction occurs very efficiently in coltsfoot, with clones readily produced from small rhizome segments containing only a single node. The rhizomes connecting the above-ground portions to the main plant stem are extremely brittle, showing signs of separation and breaks in a matter of weeks. Disintegration of these separation zones results in rooting segments becoming separated from the mother plant especially during tillage (Pfeiffer et al, 2006). An average of 102 nodes per plant after two years has been observed, indicating substantial potential for clonal expansion (Hendrickson, 2005). Although spread is by underground rhizomes, normally through agricultural activities, coltsfoot will also produce up to 350 seeds in each seed head which can be wind dispersed, albeit generative reproduction via seed is very low (Pfeiffer et al, 2007). The seeds are also short-lived (<5 months) (Hendrickson, 2005).

Coltsfoot has a very unique flowering characteristic. The bright yellow flowers, similar to dandelion's but slightly smaller, appear early in the spring, before any leaves emerge (Wright, 1997). Flower heads have even been known to push through snow. The white, fluffy seed heads also resemble those of dandelions. As seed ripens, coltsfoot leaves finally emerge, continuing to grow in number and size for several weeks, until the canopy reaches full density in late June to mid-July (Wright, 1997). The characteristic basal heart-shaped leaves are dense-wooley on the underside and expand after the flowers. Coltsfoot is a common pioneer species in more or less disturbed habitats, ranging from roadsides, waste areas, open forests, and arable fields. It prefers an open canopy, and does not grow well in forested environments abundant in moss. Typically, areas with the densest populations have moist soils (Hendrickson, 2005). It is commonly found in large areas on sea cliffs and unstable old mine heaps in its native habitat. Radial expansion of coltsfoot can reach 2.5 m in two years of growth (Hendrickson, 2005).

Native Range: Temperate Europe, North Africa and parts of Asia.

Distribution in North America: Coltsfoot has been established in the northeast and Great Lakes region of the United States, and eastern Canada in the early 20th century. The closest sites to Oregon are in Washington State's Jefferson and King counties, discovered in 1991 and 1999 respectively. A survey of Washington State weed supervisors in 2010 indicated that the plant was more widespread than Jefferson and King counties, but not at any high population level. It is not documented in agricultural fields in Oregon.



US distribution of coltsfoot on USDA Plants Database

Hardiness Zones: Coltsfoot thrives in many hardiness zones (3-5). See attachment A.

Probability of Detection: Coltsfoot is not a tall growing or showy plant. Detection of the species may only occur if growers, right-of-way managers or trained botanists are educated to identify the it.

Positive Economic Impact: Coltsfoot has been used for thousands of years as an herbal remedy in ancient Chinese medicine. It was primarily used as a cough suppressant (Ngyuen, 2005). Extracts of coltsfoot has supposedly been used in the formulation of cough suppressing lozenges in the UK.

Negative Economic Impact: A successful invader of disturbed areas, coltsfoot can displace native flora with its aggressive rhizomal spread. This is important for right-of-way management alongside disturbed roadsides, where the species has been known to propagate. It also has been noted as an invader of agricultural land used for corn, soybeans, winter wheat, spring grain and alfalfa production. Once well-established, coltsfoot appears to hold its own against competition from these crops (Wright, 1997). Tilling of fields would readily stimulate and spread new growth via spread of rhizomes, similar to the spread of *Convolvulus arvensis*. Reports from Europe indicate that the early successional nature of coltsfoot make abandoned, nutrient rich fields a likely environment where the plant would succeed. It appears that coltsfoot benefits from intensified agricultural methods that increase rates of disturbance (Jantunen, 2002). Literature does not indicate any impacts on grazing animals, but tumorigenic pyrrolizidine alkaloids contained in coltsfoot have shown to be damaging to human physiology, and could perhaps also negatively impact bovine physiology as well. Unprocessed medicinal uses, and accidental consumption of raw coltsfoot can pose a danger to human health as it has been determined that the tumorigenic pyrrolizidine alkaloids contained within the plant can cause significant liver damage (Kress, 2010).

Ecological Impacts: Coltsfoot is a disturbance dependent plant, with invasions in non-native range relying heavily on human activities. Chronically disturbed areas such as roadsides, gravel pits, trails, and slopes that are disturbed annually prove to be a strong anchoring point for this species (Hendrickson, 2005). Where established, coltsfoot out competes native plants via its radial extension, creating a mat of plant material that completely shades out the seed bank containing native seeds below coltsfoot. Because the plant is well adapted to unstable substrate and ongoing physical disturbance, it has a competitive edge over native vegetation following a disturbance event (Hendrickson, 2005).

Control: Glyphosate has been used for the non-selective control of coltsfoot and has often given good control though poor control is attributed to a herbicide application too early in the season (Wright, 1997). Coltsfoot foliage is slow to develop in the spring, particularly if the field has been worked and planted to a crop. Leaves may not be fully developed until late June or mid-July. Application of Glyphosate at an earlier stage will burn back foliage, but not impact the rhizomes (Wright, 1997). There are no biological control agents approved for coltsfoot.

Noxious Weed Qualitative Risk Assessment

Oregon Department of Agriculture

Common name: Coltsfoot
Scientific name: *Tussilago farfara*
Family: Aster, *Asteraceae*

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

Total Score: 49 Risk Category: B

GEOGRAPHICAL INFORMATION

1) 5 Invasive in Other Areas

- 0 Low- not know to be invasive elsewhere.
- 2 Known to be invasive in climates dissimilar to Oregon's current climates.
- 6 Known to be invasive in geographically similar areas.

Comments: Coltsfoot is known to propagate at latitudes and climatic zones similar to Oregon's.

2) 4 Habitat Availability: Are there susceptible habitats for this species and how common or widespread are they in Oregon?

- 1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
- 3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
- 6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).

Comments: Coltsfoot has very limited success establishing in any area that is not disturbed by natural or anthropogenic causes. Habitat succession eventually shades out the plant.

3) 0 Proximity to Oregon: What is the current distribution of the species?

- 0 *Present* – Occurs within Oregon.
- 1 *Distant* – Occurs only in distant US regions or foreign countries.
- 3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
- 6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.

Comments: Occurs in Washington and British Columbia.

4) 10 Current Distribution: What is the current distribution of escaped populations in Oregon?

- 0 *Not present* – Not known to occur in Oregon.
- 1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).
- 5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
- 10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

Comments: There are no known escaped populations in Oregon.

BIOLOGICAL INFORMATION

- 5) 4 **Environmental Factors:** Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).
- 1 *Low* – Severely confined by abiotic factors.
 - 2 *Medium* – Moderately confined by environmental factors
 - 4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

Comments: Low soil moisture and shading limit the plant's ability to spread, otherwise the plant is widely adapted to the temperature environment.

- 6) 3 **Reproductive Traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.
- 0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
 - 1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
 - 3 *Medium* – Reproduction is vegetative (e.g., root fragments, rhizomes, bulbs, stolons).
 - 3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
 - 5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
 - 6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

Comments: Produces seeds that are viable for five months and also spreads by rhizomes.

- 7) 4 **Biological Factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)
- 0 *Negligible* – Host plant not present for parasitic species.
 - 1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
 - 2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.
 - 4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

Comments: Native plant competition limits coltsfoot significantly.

- 8) 3 **Reproductive Potential and Spread After Establishment - Non-human Factors:** How well can the species spread by natural means?
- 0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).
 - 1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).
 - 3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed).

- 5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed).

Comments: Coltsfoot can be transported by flooding events moving rhizomes, as well as diaspores that can travel up to three miles on the wind.

- 9) **3 Potential of Species to be Spread by Humans.** What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.
- 1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).
 - 3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).
 - 5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

Comments: Coltsfoot is not known as an ornamental, but can be spread by tillage in agricultural fields.

IMPACT INFORMATION

- 10) **3 Economic Impact:** What impact does/can the species have on Oregon’s agriculture and economy?
- 0 *Negligible* – Causes few, if any, economic impacts.
 - 1 *Low* - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).
 - 5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).
 - 10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

Comments: Infestations in agricultural fields appear to be small in nature and easily controlled with glyphosate.

- 11) **1 Environmental Impact:** What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.
- 0 *Negligible* – None of the above impacts probable.
 - 1 *Low* – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.
 - 4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).

- 6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

Comments: Because of coltsfoot propensity to grow in mainly disturbed areas, the impacts appear to be of a lower risk.

- 12) 3 Impact on Health:** What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms).
- 0 *Negligible* – Has no impact on human or animal health.
 - 2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge).
 - 4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).
 - 6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock).

Comments: If eaten in large quantities by humans, specifically children, damage to liver and heart may occur.

CONTROL INFORMATION

- 13) 4 Probability of Detection at Point of Introduction:** How likely is detection of species after introduction and naturalization in Oregon?
- 1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).
 - 5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).
 - 10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

Comments: Plant is showy with yellow flowers and distinct leaves.

- 14) 2 Control Efficacy:** What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?
- 1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).
 - 2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).
 - 4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.

- 6 *High* – No effective treatments known or control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable. Political or legal issues may prevent effective control.

Comments: Glyphosate applications have been proven to be effective.

Category Scores:

19 Geographic score (Add scores 1-4)

17 Biological Score (Add lines 5-9)

07 Impact Score (Add lines 10-12)

06 Control Score (Add Lines 13-14)

49 Total Score (Add scores 1-14 and list on front of form)

Risk Category: 55-89+ = **A** 24-54 = **B** < 24 = unlisted.

This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species.

1/15/2013 v.3.8

Oregon Department of Agriculture
Noxious Weed Rating System

Common name: Coltsfoot

Scientific name: *Tussilago farfara*

Point Total: 15 Rating: B

- 1) **1 Detrimental Effects:** Circle all that apply, enter number of circles.
1. *Health:* causes poisoning or injury to humans or animals
 2. *Competition:* strongly competitive with crops, forage, or native flora
 3. *Host:* host of pathogens and/or pests of crops or forage
 4. *Contamination:* causes economic loss as a contaminate in seeds and/or feeds
 5. *Interference:* interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement
- 2) **4 Reproduction & Capacity for Spread:** Circle the number that best describes, enter that number.
1. Few seeds, not wind blown, spreads slowly
 2. Many seeds, slow spread
 3. Many seeds, spreads quickly by vehicles or animals
 4. Windblown seed, or spreading rhizomes, or water borne
 5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials
- 3) **3 Difficulty to Control:** Circle the number that best describes, enter that number.
1. Easily controlled with tillage or by competitive plants
 2. Requires moderate control, tillage, competition or herbicides
 3. Herbicides generally required, or intensive management practices
 4. Intensive management generally gives marginal control
 5. No management works well, spreading out of control
- 4) **6 Distribution:** Circle the number that best describes, enter that number.
1. Widely distributed throughout the state in susceptible habitat
 2. Regionally abundant, 5 or more counties, more than 1/2 of a county
 3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
 4. Contained in only 1 watershed, or less than 5 square miles gross infestation
 5. Isolated infestation less than 640 acres, more than 10 acres
 6. Occurs in less than 10 acres, or not present, but imminent from adjacent state
- 5) **1 Ecological Impact:** Circle the number that best describes, enter that number.
1. Occurs in most disturbed habitats with little competition
 2. Occurs in disturbed habitats with competition
 3. Invades undisturbed habitats and crowds out native species
 4. Invades restricted habitats (i.e. riparian) and crowds out native species

15 TOTAL POINTS

Note: Noxious weeds are non-native plants with scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as “A” rated weeds. *Ratings:* 16 + = A, 15 – 11 = B
ODA Weed Rating System 1/15/2013 v.3.8

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Appendix A

