

Timber Milk Vetch Poisoning on British Columbia Ranges

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TIMBER milk vetch (*Astragalus serotinus*), a perennial legume, which may be found on burned-over land, open stands of the montane forest zone and adjacent areas of the upper grassland zone (Tisdale, 1947), of interior British Columbia, is poisonous to livestock. Observations indicate that it most seriously affects lactating females. Average annual death losses of 3 to 5 percent are not uncommon, while in many areas a higher percentage of losses has been reported. In many areas losses in weight of 20 to 30 percent or reductions in rate of gain through timber milk vetch poisoning are of considerable economic importance.

Because of these adverse results many stockmen hesitate to fully utilize sections of the upper grassland and montane forest zones. This practice often results in overgrazing the middle and lower grassland zones which are in relatively short supply in British Columbia.

The result of timber milk vetch poisoning differs considerably from the conditions produced by other toxic species of *Astragalus* and the locoism produced by the genus *Oxytropis*. While confined to interior British Columbia and a small portion of northern Washington because of the ecological distribution of the plant, the disease has many common names. These names include timber milk vetch poisoning, timber paralysis, timber trouble, timber grass poisoning, jack pine fever, mountain fever, Kamloops cattle disease, Clinton horse disease, roaring disease, knocking disease, and husky. This variety of names often leads to confusion. However, since timber milk

vetch is the common name for the plant causing this poisoning or disease, the term timber milk vetch poisoning is preferable.

The Dominion Range Experimental Station, Kamloops, B.C., has undertaken a series of studies, accompanied by a review of literature, in an attempt to reduce or eliminate, by practical means, losses from timber milk vetch poisoning. A popular summary of some of this data has been presented by Clarke (1948).

SYMPTOMS OF TIMBER MILK VETCH POISONING

Poisoning is most common in lactating females but instances of dry stock, males, and young stock suffering the disease have been reported. Poisoned animals show a variety of symptoms (Fig. 1). While emaciation is general, some animals though affected remain fat. Grinding of the teeth and faulty ingestion is common. When excited, nasal discharges frequently occur. Other animals show a continuous discharge from the nostrils. With exertion rapid difficult respiration accompanied by a wheezing or roaring and coughing is common. A partial or complete loss of voice may be observed. When moved, affected animals may urinate repeatedly. Faeces may or may not be of normal consistency. Knocking and crossing of the hind legs accompanied by an arching of the back is common when walking. In general, paralysis is more marked in the hindquarters than in the forequarters. Animals often remain bright eyed and alert even when unable to rise. In attempting to rise an animal may

frequently skid for some yards on its knees having attained a standing position with the hind legs. In other cases the hind quarters may be dragged.

interior British Columbia. However further investigation by Eastman (1947) showed that the name *Astragalus campestris* Gray is untenable, being preoccupied

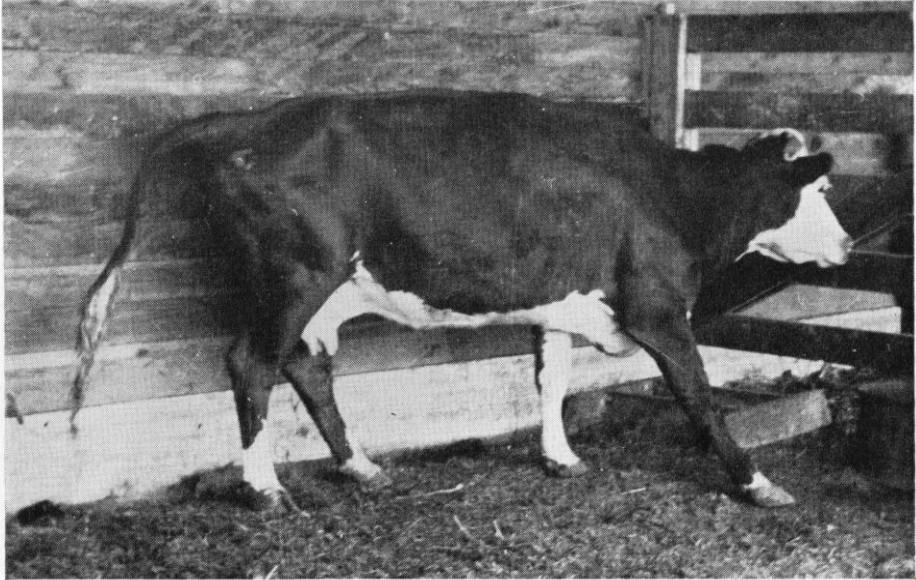


FIG. 1. Experimental cow showing timber milk vetch poisoning symptoms. Note the gauntness and awkward stance.

Autopsies of affected farm animals (Bruce, 1927) show symptoms of cardiac failure and respiratory disorders but no outstandingly distinctive symptom is noticed. Experimental guinea-pigs at Kamloops which consumed lethal quantities of timber milk vetch showed severe myocarditis and lung haemorrhages. One animal showed evidence of pneumonia as well. The poisonous principle in timber milk vetch is not known.

DESCRIPTION OF TIMBER MILK VETCH

This species is a member of the large loco-milkvetch (*Astragalus*) genus of the pea family (Leguminosae). In the early literature this species of *Astragalus* was referred to by Bruce (1927) and others as *Astragalus campestris* Gray, which is common on American ranges south of

by a Linnaean species. Our plant is *Astragalus serotinus* Gray.

In appearance timber milk vetch is from 8 to 16 inches high and grows in rounded tufts, the taller specimens being found in the moister locations (Fig. 2). It is a pretty, fragile vetch, with fine stems, small, narrow leaves and pea-like pinkish-mauve blossoms. The colour of the flowers varies considerably, some specimens being almost white and other bluish; the majority however, are pinkish mauve.

Henry (1915) describes timber milk vetch as follows: "Slightly pubescent, tufted 2-4 dm. high, stipules membranaceous below, less so above; leaflets 7-13, distant, 2 cm. long; narrowly oblong to nearly linear; peduncles long and slender; flowers few to many, whitish to mauve, tinged with purple, 8-19 mm. long; calyx-teeth $\frac{1}{2}$ the length of the tube, some black hairs among the pubescence; pod lenial-oblong,

not much flattened 2-2.5 cm. long, lightly pubescent or glabrous, finally deflexed. Very common, Lytton eastward."

Samples of timber milk vetch gathered at random for feedstuffs analyses throughout the growing season of 1949 show the average content summarized in Table 1.

growing in the upper grassland and lower montane forest zones between the altitudes of approximately 2000 and 4000 feet but may be found at higher or lower elevations. In British Columbia incidents of the disease have been reported in the Chilcotin and Caribou areas and the

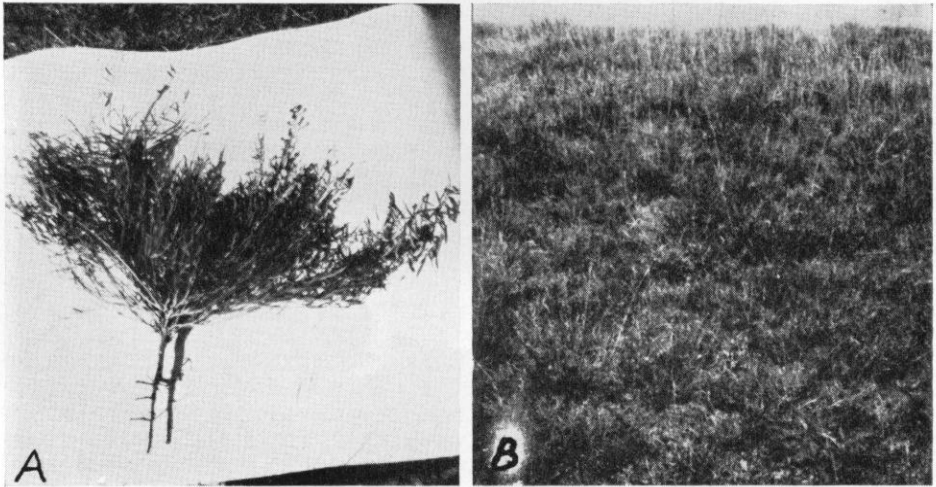


FIG. 2. TIMBER MILK VETCH. A. A typical plant (background 18 inches high). B. A badly infested range area.

TABLE 1
Feedstuffs Analysis, Timber Milk Vetch 1949

TIMBER MILK VETCH	PROTEIN N X 0.25	ETHER EXTRACT	CRUDE FIBRE	TOTAL ASH	CALCIUM	PHOS- PHORUS
	Percent					
Average	12.37	2.65	30.80	5.48	0.86	0.36
Variation +	6.56	0.59	6.90	2.20	0.34	0.12
Variation -	2.42	1.14	5.07	1.22	0.16	0.09

AREAS AFFECTED BY TIMBER MILK VETCH POISONING

Reports of timber milk vetch poisoning are confined to the dry belt and Rocky Mountain trench areas in British Columbia while cases have been reported in border counties in the state of Washington. It is estimated that approximately ten thousand square miles of range is affected. The plant may be found

Thompson, Nicola, Okanagan, Similkameen and Windermere Valleys.

There are indications that timber milk vetch may be found growing north of Latitude 52°.

The inaccessibility of many of our ranges and the reticence of the owners to admit losses of livestock and fleshing makes it difficult to determine the exact extent of the affected areas or the economic loss due to this disease.

Timber milk vetch is found on a variety of soil types but is rare or absent on areas of restricted drainage. Like other forest herbs, it is usually more abundant where the tree cover is fairly open. A study of some 75 plots in the Kamloops area (Spilsbury and Tisdale, 1944) indicates that timber milk vetch is confined mainly to areas of the upper grassland and montane forest zones (Table 2).

Throughout the Caribou and Kamloops districts it is suggested the timber milk vetch is most abundant on timber range which has been burned fairly recently.

CONDITIONS CONDUCTIVE TO POISONING

Overgrazing is undoubtedly the greatest single factor contributing to timber milk vetch poisoning. Grazing trials conducted by this station have shown that in the upper grassland zone, timber milk vetch is unpalatable when adequate forage is available but upon the depletion of desirable range forage stock will consume large quantities.

TABLE 2

Occurrence of Astragalus serotinus on Grassland and Forest Zones of The Tranquille Range

ZONE	FREQUENCY	ELEVATION
	Percent	Feet
Lower Grassland.....	0	1100-2300
Middle Grassland.....	0	2300-2800
Upper Grassland.....	63	2800-3200
Montane Forest.....	60	3200-4000
Lower Sub-alpine.....	0	4000-5800
Upper Sub-alpine.....	0	5800-6100

Early spring turnouts are also dangerous since at times timber milk vetch is often four to six inches tall before dominant grasses have attained two inches in height. Under such conditions cattle consume large quantities of the plant.

It is generally considered that more cases of timber milk vetch poisoning occur in years which the summer is unusually dry or there is a late spring. This is typical of many poisonous plants. During late springs or in dry years grazing live-stock may consume and show symptoms of poisoning as early as the latter part of May while other cattle may not show symptoms until August. However, the majority of cases appear during the latter part of June and through July. The

consumption of timber milk vetch after it has dried up on the range fails to produce any indications of poisoning.

As previously mentioned lactating cows and ewes are by far the most susceptible animals as far as cattle and sheep are concerned. It is not uncommon to find many affected while dry females and males are not showing symptoms. As a general rule the latter classes if affected are not as badly poisoned as females in milk.

Immunity does not appear to exist since animals may be re-poisoned year after year. However, the greatest losses occur in animals which are new to interior British Columbia ranges. First calf cows show the highest percentage of poisoning. Nursing lambs and calves are rarely affected probably because of their failure to consume sufficient quantities of *Astragalus* to cause poisoning.

Dr. E. A. Bruce reports (1917) that in horses the death rate as a rule, is not high, but secondary pneumonia is liable to occur, and the slightest exertion will bring on an alarming attack of difficult breathing, which often results in death. Some of these cases recover but the majority are never much use for hard or fast work.

TREATMENT FOR TIMBER MILK VETCH POISONING

Since stock ranching in British Columbia is a most extensive form of agriculture a practical treatment of timber milk vetch poisoning must not be time consuming or involve a highly technical procedure. The procedure recommended and followed by practical stockmen is as follows.

Affected animals are removed from the poisonous areas as soon as symptoms develop. This is usually done by moving the stock to a lower or higher elevation than that at which timber milk vetch may be found. It is suggested that if

possible the stock should be moved to lower elevations since high elevations may possibly aggravate the condition either through the increase in altitude or the exertion of attaining the higher elevation. Poisoned animals should be moved slowly and quietly to avoid undue excitement.

In the event that affected animals are too weak to travel good quality forage and fresh water should be provided for them until they gain enough strength to be removed to a low altitude area where they may have access to good quality roughages and water. If conveniently possible nursing stock should be weaned. Extra care and attention must be provided for poisoned cows during the wintering period since they are often weak and susceptible to cold.

PREVENTION OF TIMBER MILK VETCH POISONING

As in the case of most poisonous plant problems prevention lies in limiting or in preventing the consumption of this plant by animals which may be affected. The abundance of timber milk vetch and the general topography of most British Columbia ranges makes elimination of the plant by chemical, mechanical, or cultural means impossible.

Instances where large percentages of a herd are poisoned are almost invariably connected with shortages of other palatable forage either as a result of overgrazing or too early a spring turn out. Prevention of losses through timber milk vetch poisoning as with other poisonous plants undoubtedly lies in religiously practicing the principles of good range management whereby potentially poisonous ranges are grazed by properly distributed herds of correct size.

Because dry females and males are less susceptible to poisoning they should be allowed to graze in timber milk vetch

bearing areas provided overgrazing is not permitted. Since lactating cows and ewes are susceptible they should be kept off heavily grazed upper grassland and montane forest ranges at least until the timber milk vetch has dried up. This would necessitate keeping the wet herd at lower elevations until the forage at higher levels is ready for grazing. Normally the wet herd could be trailed to the higher elevation during early July.

SUMMARY

Astragalus serotinus Gray, commonly called timber milk vetch, is a poisonous plant which is indigenous to British Columbia. It causes losses in cattle, sheep, and horses; lactating females being more susceptible than dry females and males. Timber milk vetch is abundant throughout the upper grassland and montane forest zones of British Columbia. Instances of poisoning are evident from the end of May until late August although most cases occur in late June and July.

Upon autopsy symptoms of cardiac failure and respiratory disorders are common. The poisonous principle in *Astragalus serotinus* is not known. Beef cattle and sheep show such symptoms as loss of voice, nasal discharges, roaring, incoordination of the legs and rapid difficult breathing.

In grazing experiments conducted on an upper grassland range, timber milk vetch was found to be relatively unpalatable to cattle.

A management practice to prevent serious losses from timber milk vetch poisoning has been outlined.

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PRODUCTIVE LAND

Productive land is much more limited than has commonly been supposed. It occurs only on the surface of the earth, and only on part of this surface. It is not permanent—it is not a renewable natural resource. It cannot be stockpiled or shipped in from other countries like rubber, tin, or copper. Once the fertile topsoil is washed or blown away, it cannot be restored or replaced in any practical way for generations. And what is left—subsoil—usually is far less productive, less stable, and less absorptive of rainfall. There are not substantial undiscovered reserves of productive land anywhere. And we cannot dig deeper into the earth and find new productive soil. We cannot pump it from wells, plant it with seeds, or dig it from mines. We must keep what we have or do without.

Dr. H. H. Bennett
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