

they were grazing." It was proved by the United States Department of Agriculture that cattle and horses were also poisoned by zygadenus, but under ordinary conditions they could not consume sufficient quantity to cause death. The "fatalities were almost entirely confined to sheep."

SYMPTOMS: According to Chesnut and Wilcox, the first signs of poisoning are "a certain uneasiness and irregularity in the movements of the sheep. These irregularities rapidly become more and more pronounced, accompanied by inco-ordination of the muscular movements, spasms and rapid breathing. Although sheep are highly excited under the influence of zygadenus poisoning, the cerebral symptoms seldom constitute a condition of frenzy. It was readily observed that until a few minutes before death, ewes were able to recognize their lambs, and indicate in other ways that they were not in any sense crazed. The later symptoms were those of complete motor paralysis, combined with an exceedingly rapid and sharp breathing and a frequent weak pulse. The duration of these different stages of poisoning varies to a considerable extent, and depends entirely upon the amount of death camas which the sheep have eaten."

The principal symptoms are given by Marsh and Clawson as "salivation, nausea, muscular weakness, coma and sometimes attacks of dyspnoea."

In general, the symptoms in horses and cattle are similar to those shown by sheep.

REMEDY AND MEANS OF CONTROL: Medical remedies have been found of little use, as most of the cases are discovered too late for treatment. Rest and quiet are recommended. To prevent loss, it is important to recognize the plant and to avoid pasturing sheep upon it. Hargrave, however, has obtained good results by the use of permanganate of potash and aluminum sulphate administered in the very early stages of poisoning. He says "that for some years past sheepmen in the Walsh District, Alberta, have looked upon potassium permanganate and aluminum sulphate as almost specific in sheep poisoned with this plant, and, especially in cases recognized early, recovery follows in every instance. Some years ago the plant was so plentiful over the range that sheep herders were kept supplied with powders containing five grains of each, and carried with them a pint bottle so that on recognizing any sheep showing effects of poisoning, they at once dissolved the powder in a bottleful of water and immediately administered it as a drench. Very rarely was it necessary to administer the second dose."

In restricted areas, the weed may be exterminated by putting the land under cultivation for a time. After the spring rains, when the ground is soft, the bulbs may be readily pulled, and where the weed is less abundant it would be well worth while to incur the expense of hand-pulling.