THE CONTROL OF SOURSOB (Oxalis pas-caprae, L.)

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Soursob is of South African origin and is believed to have been introduced into this country as a garden plant for decorative purposes.

It is now very common throughout many of the settled areas of South Australia, and is a troublesome weed in some of the agricultural districts, as a weed of both cultivation and pasture land.

Probably the most important property of this weed is its ability to cause "soursob poisoning". This often occurs in sheep which have eaten soursob, and is due to the oxalic acid contained in the plant combining with calcium in the blood and other body fluids to form insoluble calcium oxalate.

All classes of sheep can be effected, but pregnant ewes and ewes with lambs at foot are particularly susceptible, due to their smaller reserves of calcium in the blood.

Sheep born and bred in districts in which soursob is prevalent seldom show symptoms of acute or sub-acute soursob poisoning, while sheep introduced from areas where the plant is seldom or never seen quickly succumb to it. Ewes which have been travelled for some hours or days before grazing on soursob are very prone to develop symptoms of acute soursob poisoning.

Other important properties of this weed are its hardiness and its ability to compete with other plants. These factors, combined with its unusual but effective means of reproduction and spread, often enable it to completely exclude other plants from pastures during the winter and early spring months.

Owing to the loss of production of useful pasturage and deaths of stock caused as a result of ingestion of the weed, such dominance of pasture land by this useless species is serious, both to the farmer and to the State.

The weed also competes with sown cereal crops in the early stages of growth and may seriously reduce grain and

hay yields.

Certain peculiarities of the soursob plant offer means whereby the weed can, in many situations, be controlled or eradicated.

In the first place, the general weakness and thin texture of the aerial parts enable successful attacks to be made on it with chemical sprays of such weak dilution as would be quite ineffective in the case of weeds of coarser texture.

Sodium chlorate solution, using 1 lb. of sodium chlorate to four gallons of water, will destroy soursob plants, and can be used to control the weed on small areas. The weak solution does not kill the tougher grasses, and the residual effect of the chemical on the ground is almost negligible if the solution is correctly applied, i.e. 3 gallons of spray solution made to cover 100 to 120 square yards of infested land.

Because of the cost involved it is not practicable to use sodium chlorate sprays on large areas of agricultural land, but control (and eventual eradication, if the method is persisted with) can often be effected on large areas either by sowing early with a vigorous variety of wheat, or by the late sowing, after repeated cultivations of an early-maturing variety.

Cultivations alone, i.e. without the seeding of the cereal crop, can do much toward controlling and eradicating soursob if undertaken at the right time.

The weed forms bulbs and bulbils after the tuber has reached maximum size; if control measures are introduced at this time, regeneration of the damaged plants is reduced to a minimum and bulbil formation greatly suppressed.

This most vulnerable stage generally occurs in mid-June or a little later, the incidence of the season's opening and follow-up rains largely determining just when soursob plants will reach this vulnerable growth stage.

A third efficient method for suppressing this weed is treatment of infested areas (also during the period of maximum tuber development) with the Weed-burner or flame-burner. This method, while cheaper than the abovementioned sodium chlorate treatment, is slower and more tedious, but

has the advantage that it does not disturb the soil as do methods requiring cultivation.

Once soursob is established on an area, any control method undertaken should be persisted with for a minimum of three consecutive seasons, or a different method used each year for at least three years, if total eradication is desired.

All the bulbils produced by the weed in a season do not develop into plants in the succeeding season; some remain dormant for three years and sometimes longer.

The hormone-like weed killers MCPA and 2,4-D have been used on soursob infestations, but the results achieved have been too inconsistent for recommendations to be made for their use.

During the 1953-54 season, the Department of Agriculture carried out experimental sprayings, using standard low-volume equipment applying 10⅓ gallons of solution per acre, in the Gawler River district.

The field chosen for the trials consisted of a comparatively poor germination of sown barley in an established lucerne stand, the entire area being covered by a very dense growth of soursob.

The aim of this project was to devise a selective chemical method for the control of the weed when occurring in established lucerne oversown with cereal.

Treatments applied, in duplicate, to one-acre plots, were:-

A.	¼	lb.	2,4-D	acid	equivalent	(amine	form)	per	acre,			
B.	½	"	"	"	"	"	"	"	"			
C.	¾	"	"	"	"	"	"	"	"			
D.	¼	lb.	2,4-D	a.e.	(amine	form)	plus	1	lb	NaCl	¾	per acre,
E.	½	"	"	"	"	"	"	"	"	"	"	"
F.	¾	"	"	"	"	"	"	"	"	"	"	"
G.	¼	lb.	2,4-D	a.e.	(Amine	form)	plus	2	lb.	"	"1	"
H.	½	"	"	"	"	"	"	"	"	"	"	"
I.	¾	"	"	"	"	"	"	"	"	"	"	"

Soursob on areas sprayed with 2,4-D alone (treatments A, B and C) showed no reaction to the treatment; similarly barley on these areas was unaffected, but lucerne was severely affected by treatment C and to a lesser extent by treatment B.

Varying degrees of reaction to the treatments were registered by soursob on all other areas, almost complete elimination of the top growth of the weed resulting from treatments G, H and I. These latter treatments exhibited little selectivity in action, however, even the sown barley being adversely affected.

Treatment D gave only partial control of soursob with insignificant damage to either lucerne or barley.

Lucerne growth was severely checked by treatment F which did not however, significantly affect the sown cereal, soursob control was almost complete.

Slight damage (by 2,4-D plus sodium chlorate) was done to lucerne by treatment E which also gave significant soursob control without any adverse effects being exhibited by the barley.

Although it is realised that the 1954-5r season's work on this project is necessary before firm recommendations can be made for chemical treatment of soursob when growing in similar situations to that of the trial area, the control problem involved is of such importance that provisional recommendations have been made (and acted upon by landowners, wihh very successful results), for the current season.

Treatment F has been used where sown cereals are being checked by soursob growth, and where a serious soursob infestation occurs on lucerne land oversown with cereal, treatment E is being employed with satisfactory results.

References

Clarke, G.H., (1949): Important Weeds of South Australia. S.A. Dept. of Agric. Bull. 406, p. 17.

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