

**CANTERBURY CHAMBER OF COMMERCE**  
**AGRICULTURAL BULLETIN**

# BURRS AND VEGETABLE MATTER IN WOOL

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A great deal of the wool grown in New Zealand each year contains a certain amount of vegetable matter of either a harmless or harmful nature. Much of this contamination is avoidable and represents a definite monetary loss to the grower. Most of the plants which are troublesome rely on hooked seeds or fruits for their spread. The hard spiny hooks cling tenaciously to the wool fibre and in the main it is the spiny hook which is so difficult to remove and is particularly objectionable in woven or knitted materials.

Vegetable material is removed either by mechanical or chemical means. Mechanical removal is comparatively cheap, and consists of brushing the projecting burrs and vegetable matter off the wool as it revolves on a wire toothed roller.

Chemical removal, or carbonising, is used for heavily infested wools and involves soaking the wool in a bath of sulphuric acid until the vegetable matter is charred and brittle. Subsequent operations involve crushing, dusting, and neutralisation of the remaining acid. Carbonising is expensive and costs 7d per lb. clean weight.

A detailed analysis of the whole of the 1943/44 New Zealand wool clip showed that 18,701 bales of wool contained some sheep's burr and burr clover, and a further 8,026 were classed as carbonising wool because of the heavy contamination with burrs or other seeds. Tables I, II and III indicate the main classes of wool in which the burrs and various seeds occurred.

**TABLE I—Wool Containing Sheep's Burr and Burr Clover (Fleece).**

Total Bales	Bales containing burr	Percentage
546,384	10,243	1.87

**TABLE II—Wool Containing Sheep's Burr and Burr Clover (Oddments).**

	Total Bales	Bales containing burr	Percentage in each class
Necks .....	19,758	2,299	11.64
Second crutchings .....	5,392	430	7.97
Bellies .....	36,029	1,607	4.46
Bulky pieces .....	62,632	2,164	3.46
First crutchings .....	43,073	1,141	2.65
Lambs crutchings .....	2,026	47	2.32
Carbonising lambs .....	3,318	69	2.08
Dead wool .....	7,217	124	1.72
First and Second Lamb .....	33,492	369	1.10
Pieces and bellies .....	10,111	88	0.87
Carbonising crutchings .....	1,210	7	0.58
Second pieces .....	4,470	26	0.58
Locks .....	15,814	78	0.49
Crushed dags and eyeclips .....	2,513	9	0.36
	247,056	8,458	3.42

TABLE III—Number of Bales of Carbonising Wool in various sections of the clip other than fleece wool.

Class	Total Bales in Class	Total Carbonising wool	Percentage of each Class
		in Class	
Lambs	36,811	3,318	9.01
Pieces and bellies	10,111	574	5.68
Second pieces	4,470	195	4.36
Necks	19,758	783	3.96
Crutchings	51,701	1,210	2.34
Bulky pieces	62,632	1,327	2.12
Bellies	36,029	463	1.29
Stained pieces	1,937	18	0.93
Locks	15,814	138	0.87
Totals	239,263	8,026	3.35

No fleece wool was typed as carbonising but reliable sources indicate that practically all of the C., D. and E. grade fleece wools (i.e., lower grades of the appraisal system) were typed as such either because it was unskirted (C. grade) or because it contained appreciable quantities of vegetable matter. In the 1943/44 season 94,891 bales or 17% of the fleece wool was graded as C., D. and E. wool and there was a further 1,500 bales of low grade cotted wool most of which would contain some seed or burr. Including burry fleece wools from Table I it appears that between 15% and 20% of our fleece wool contains sufficient vegetable matter to cause discrimination. A further point is a limited demand for most wools of this type.

In the oddment section of the clip most of the lines graded average to inferior have been graded so because of vegetable matter, and it seems likely that not more than 70% of oddment wools in any year are entirely free from seed or burr. It is significant that by far the largest percentage of carbonising wool occurs in lambs' wool. This wool is usually shorn late in the season after the various burry seeds have ripened. It emphasises that early shearing is a valuable means of preventing contamination.

A conservative estimate of the monetary loss on all wools graded as burry and carbonising in the average year would be approximately 10%, and over the whole wool clip 2-3%. It is impossible to compute the actual loss to the industry. The burry plants and the familiar bidi bidi are widely spread and a manufacturer of specialty lines, who has to ensure his product is completely free from vegetable matter, may be forced to carbonise a great deal of his wool or cloth so that he may be certain that no burr or seed re-

mains. A small amount of burr which may not be seen or suspected in a bulk lot of wool weighing perhaps several thousand pounds, when broken up and distributed during manufacture, may depreciate a great deal of cloth.

#### TYPES OF VEGETABLE MATERIAL:

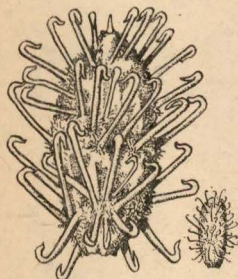
Vegetable material can conveniently be divided into two separate classes, one which includes such things as leaves and seeds which do not bear hooks and the other which includes all those plants with hooked seeds.

It is probably safe to say that more than half of the wool put up for sale in New Zealand in any year contains some vegetable material, a great deal of which is unimportant. Leaves of the manuka or tauhinu scrub, leaves or stalks of bracken fern, chaff, hay, the more common grass seeds, gorse, the various thistles, Wild Irishman or matagouri, wireweed, dock, burdock, and broken leaves of the various varieties of tussock are not regarded as being important.

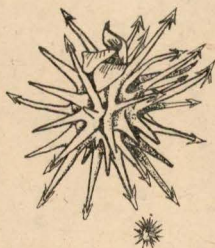
The plants causing most trouble are Burr clover, Sheep's burr, Storksbill, Bathurst burr, Bidi bidi, Horehound, Subterranean clover, and to a lesser extent Needle grass and Barley grass, and Bathurst burr. Bathurst Burr is so large that it is said to come out quite easily. The term "burr" in the wool trade refers mainly to Burr clover and to a lesser extent to Sheep's burr. The fruits of these plants are troublesome and expensive to remove, requiring carbonising or handpicking. The fruits of Bidi bidi, Horehound and Subterranean clover while botanically burrs are classed by the wool trade as "seed" as they are fairly easily removed mechanically unless present in large amounts. The corkscrew-like fruit of Storksbill is the most

# SEEDS OF PLANTS CAUSING DAMAGE IN WOOL

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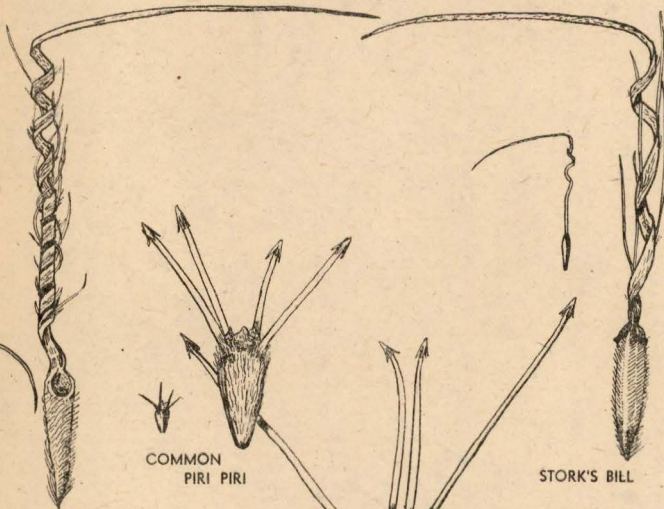
BATHURST BURR



SHEEP'S BURR



HOREHOUND



STORK'S BILL

COMMON  
PIRI PIRI

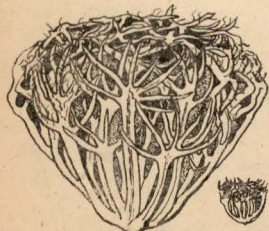
MUSKY STORK'S BILL



RED PIRI PIRI



SPOTTED MEDIC



SUBTERRANEAN CLOVER

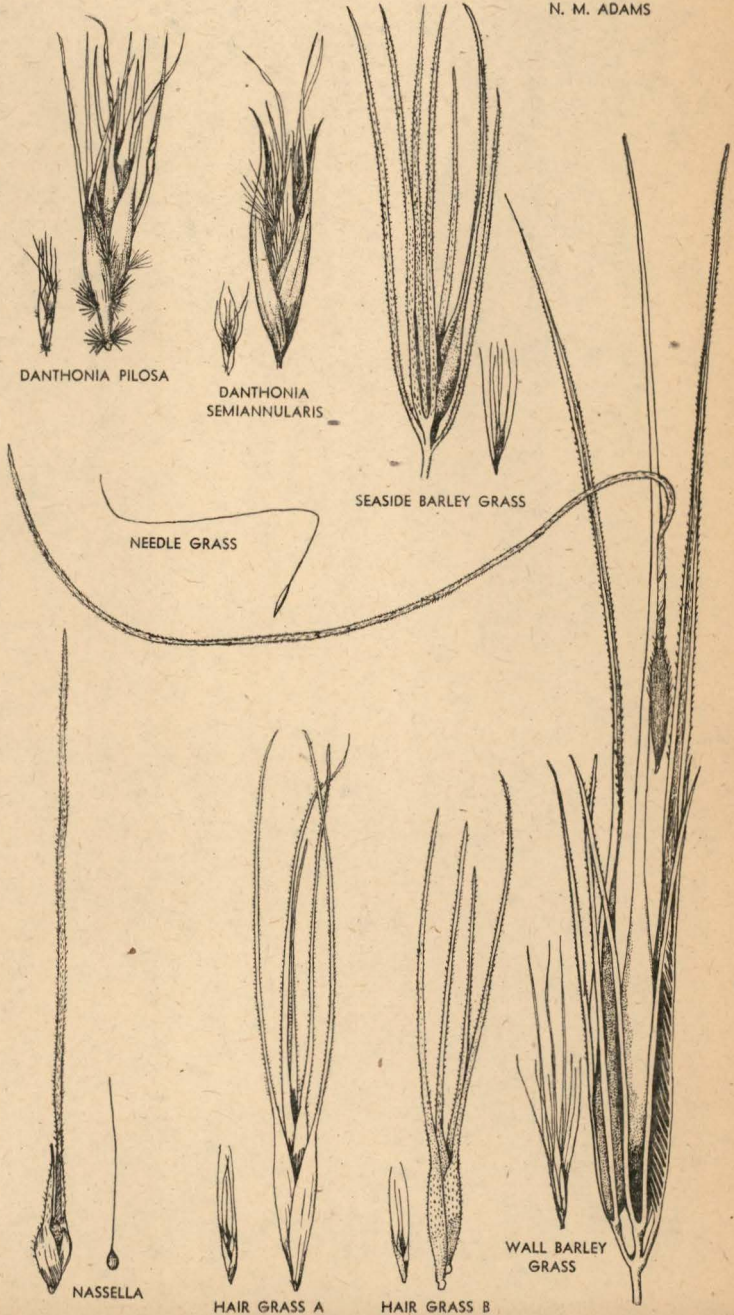


BURR CLOVER

# DRAWN NATURAL SIZE AND ALSO ENLARGED

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difficult to remove of any. Wool containing even a low percentage of this must be carbonised. As many as three carbonisings may be necessary. At 7d per pound for carbonising this means that wool containing Storksbill is practically worthless. Needle grass is mainly confined to neck wool and may necessitate carbonising. In the case of Subterranean clover it is mainly the belly wools that are adversely affected.

## BOTANICAL ASPECTS OR BURR IN WOOL:

### Identification of the Burr and of the Parent Plant:

To assist identification a page of illustrations is included. Individual plants are described separately.

#### Piri piri or Bidi bidi (*Acaena sanguisorbae*):

This common and widely spread native weed is a perennial plant with long trailing runners enabling it to take possession of open ground. The small leaflets are markedly toothed. The burr consists of a mass of fruits from each of which projects numerous barbed bristles. The fleece may carry a solid mat of these burrs. Early shearing and avoidance of badly infested paddocks near shearing time help to overcome wool damage.

Piri piri is a menace on unploughable country particularly on bush burns where the pasture shows a tendency to open up. It is not eaten by sheep and under hard grazing its runners spread widely occupying the land.

Control consists first of spelling, when the runners are drawn up to the light by the growing grass, then heavy stocking and grazing with cattle so that it is eaten out and damaged by trampling. The maintenance of a dense sward of grass is the aim.

An insect parasite (*Antholeus varinervis*) has been liberated and has had some success, but it cannot be expected to play a major part in the control of this weed.

#### Storksbill (*Erodium cicutarium*):

This with musky storksbill (*Erodium moschatum*) is called "Black Jack" in the wool trade, and is considered to be the worst "burr" in wool. Musky storksbill is the larger plant, the leaves have an odour of musk and the leaflets are less deeply divided and it is less commonly reported than the ordinary storksbill.

Storksbill is a weed of waste

places and cultivated ground, but reaches its maximum development in thin dry pastures. It has a deep tap root, trailing stems up to 2 feet long and leaves 6-18 inches long. The leaves are deeply indented to look almost like a carrot leaf. The flowers are in clusters, purplish or occasionally white; when mature there is a "bill" about one inch long. There are five seeds in the flower. When shed each has a long corkscrew awn formed by peeling off a portion of the bill. This awn is capable of expanding and contracting and thereby distributes and buries the seed.

Little control appears possible other than the maintenance of a dense sward.

#### Sheep's Burr (*Acaena ovina*):

Australian burr or false bidi bidi is found in both islands but more commonly in the north.

The leaves are like those of piri piri. There are no runners, the stem is upright, one to two feet tall, sparingly branched with single burrs growing scattered along its length. The "burr" is thus smaller than the aggregate burr of piri piri and is dark in colour as opposed to the brownish shade of the former. It is considered to be of increasing importance in its infestation of wool. It can be controlled by cattle as for piri piri.

#### Burr Clover (*Medicago hispica*):

A luxuriant annual, closely allied to lucerne, is common in thin pastures on good soil. Its trailing stems may be up to 4 feet long. The flowers are pale yellow and grow in small clusters. The light brown pods are coiled in a tight spiral clothed with hooks. A similar plant is spotted burr clover (*Medicago arabica*). This has a purplish spot in the centre of the leaf.

Under lax grazing burr clover is disliked by stock and it tends to smother out permanent species. Repeated seed production or haymaking encourages this process as it is then allowed to seed and re-establish in the weakened sward.

Control consists of close summer grazing and topping with the mower to prevent re-seeding coupled with topdressing and management to increase the vigour of the sward. If burr clover becomes dominant there is no alternative to ploughing and re-sowing. A summer fallow is advised to germinate the clover seeds.

#### Bathurst Burr (*Xanthium spinosum*):

This is a weed, confined mainly to the northern half of the North Island, and is found in waste places

and occasionally in pasture. It is a shrubby annual 9 inches to 3 feet high. The stem and underside leaves are whitish. Each joint of the stem has a group of 3 sharp spines. The leaves are 3 lobed, the central one long. The fruit is encased in a hard oval burr  $\frac{1}{2}$ " long, covered with barbed prickles. The plant is sporadic in its occurrence possibly due to delayed germination caused by the slow decay of the bony seed case. It should be attacked before seeding by grubbing or spraying with weed killer. Ingress of the weed is prevented by a good turf.

#### **Horehound (Marrubium vulgare):**

A common weed of waste places, and sheep camps in both islands. A perennial plant 1-2 feet high, much branched, with crinkly woolly leaves  $1\frac{1}{2}$  inches long. The dried remnants of the flowers containing the seeds act as burrs sticking to the wool of sheep thus accounting for the spread of the weed. The plant is not eaten by sheep unless feed is scarce. Control consists of either hand grubbing, or poisoning with dry sodium chlorate mixed with ten times its weight of lime or sand. After killing, scarify the area and surface sow.

Horehound is not of great importance as a burr, but can cause considerable loss where it has been allowed to form dense associations.

#### **Control of Weeds Causing Burr:**

Burr weeds are, in the main, weeds of low producing permanent grass land. Because of the type of farming, topography, areas involved and finance, they do not lend themselves to control by weed killers or cultivation except in isolated patches.

On a major scale the chief form of control is good pasture management. A dense vigorous sward will not be susceptible to weed invasion. Storks-bill, Sheep's burr and Horehound do not actively invade grass land. Their action is rather that of occupying the bare ground in a thin open pasture. Their removal by cultivation or weed killer leaves vacant ground ready for a fresh invasion unless active steps are taken

to encourage pasture growth. Insect control may prove of some value but spectacular results cannot be expected. There is no simple nostrum for the control of these weeds and the search for one is akin to the search for the philosopher's stone.

The development of weeds in a pasture may be caused by:

1. Any factor that breaks or weakens the turf sufficiently to allow light to penetrate to the ground surface and bring about the germination of weed seeds lying dormant in the soil, e.g., poor winter drainage, winter trampling with cattle, opening up of pastures in dry weather, weakening effect of hay and seed crops, overgrazing.
2. Close and continuous grazing. This encourages the spread of creeping and tillering weeds, e.g., Bidi bidi.
3. A weaf turf. This may be due to poor pasture establishment, the sowing of unsuitable species, inferior strains, and lack of top-dressing.
4. Unwise grazing management. The grazing animal may be used to eradicate or introduce pasture weeds.

Rotational grazing by giving a period of recovery to the pasture creates shade which prevents weed seed germination and discourages creeping and tillering plants. Different kinds of stock may be used to control different weeds, e.g., sheep eat Ragwort readily, cattle do not. The reverse is true of Bidi bidi.

Methods of control are avoidance of burr by early shearing, pre-lambing shearing, use of burr-free paddocks as shearing approaches, and the strict control of all burr around the shearing shed, yards and approaches.

The best method is to build up pastures free of these harmful "burrs" by means of special management practices. In the meantime, shear before the burr gets into the wool and carefully separate all burr free wool from wool with burr.

Copies of this Bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.