



LARGE COCKLE BUR

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Large cockle bur, *Xanthium strumarium* L., family Asteraceae, like spiny cockle bur, is a menace to the wool industry because of the large, spiny burs that adhere to the wool.

Other names for this weed are burweed, ditchbur, heartleaf cockle bur and sheep bur, while in Australia it is known as noogoorabur. In Afrikaans it is called "kankerroos" or "groot boetebossie".

MORPHOLOGY

Large cockle bur assumes various shapes, depending on the environment in which it occurs. It is a branched, semi-herbaceous, annual, 0,3 to 1,2 m tall. It is bigger and sturdier than the spiny cockle bur, but less branched. The brown to reddish-brown stems which appear rough because of a short hair cover, sometimes display purple stripes or patches. The shape of the leaves resembles that of vine leaves; they are 20 to 120 mm long, dark green above and greyish-green underneath, with a long petiole. Both surfaces are rough and pubescent, dark green above and dull green below, and the three main veins are slightly red. There are no thorns on the leaf bases as is the case in the spiny cockle bur.

The flowers are inconspicuous and greenish and

their arrangement promotes self-pollination. The mature pollen drops from the male flowers borne on the tips of the branches, on to the female flowers directly below. Near the tips of the stem hard, oval-shaped, brown fruits or burs develop, as long as 25 mm, covered with hooked spines, and with two long, sturdy horns on the tip. The bur is considerably larger and the spines sturdier than those of the spiny cockle bur. Each fruit is divided into two locules, each containing a black seed.

DISTRIBUTION

As is the case with numerous other plants that have a world-wide distribution, there is doubt about the origin of large cockle bur. Some sources maintain that it was Central and South America, while others hold the view that it was the Mediterranean area around latitude 30°N. These latter sources maintain that large cockle bur was known there in classical times and that it is the only area where the plant grows in a 'natural' habitat.

Today it occurs virtually throughout the world, especially between latitudes 53°N and 33°S, usually in the temperate or subtropical regions, but it is rarely found in the tropics. It is regarded as a serious problem in India, Spain, the Middle and the Far



FIG. 2 - Burs of the large cockle bur are characterised by two sturdy horns on the tip

FIG. 1 - A dense large cockle bur infestation. Note the broad three-lobed leaves

East, and South Africa.

The plant was probably introduced to South Africa from Europe, and as far as is known it was first reported here in 1881. It has now spread through all four provinces, Botswana, Lesotho and Swaziland.

Large cockle bur grows on a wide range of soil types, from sand to heavy clay, and also under different moisture conditions in all rainfall areas. It requires a lot of sunlight so that it usually grows on open land where there is little competition from other plants, e.g. along roads, railway lines, river banks and dams, and also on overgrazed veld and neglected lands. It thrives on rich, moist, open soil and often forms pure stands while it only reaches a height of a few centimetres on dry, poor soil, but it will nevertheless flower and produce seed.

PROPAGATION

Large cockle bur is a short-day plant and therefore flowers in late summer when the days grow shorter than 14 hours, regardless of the size reached by the plant. The fruits mature in autumn, and usually detach from the plant in winter, although they sometimes remain attached to the plant until the following summer or autumn. The whole plant is killed by frost in winter.

The seeds germinate late, and, depending on the rainfall, the first seedlings will begin to emerge in November. Germination could, however, continue until as late as March. The lower seed in each fruit is bigger and less dormant than the upper one. The lower seed germinates first, and the upper one could germinate a season or two later when the first seed has already developed into a plant. The seedlings that emerged late in the season will form seeds regardless of their size, and the extended germination time makes it very difficult to eradicate the weed.

Large cockle bur is spread very effectively because the burs cling to the wool and hair of animals, to clothing and feed bags. When the plant is killed by frost in winter, the aerial parts break off and are carried away by the wind. Wherever the burs drop, the seeds will germinate as soon as conditions become favourable. Burs are also carried away by water so that plants become established on river banks, along irrigation canals and on flooded ground. When the animals drink from the river, they carry the burs back to the veld where new infestation nuclei are established.

ADVERSE CHARACTERISTICS

The spiny fruits or burs that adhere to the wool

of sheep make the wool unattractive to buyers, resulting in low prices. Contaminated wool is difficult to handle and must be cleaned at considerable cost before it can be processed. The cleaning process often adversely affects wool quality. Infested sheep could even lose condition as a result of the irritation of the burs on their skin.

Any infested piece of land is a potential source of infestation for the whole neighbourhood because of the numerous fruits that can be effectively spread. The plant also constitutes a threat for lands and pastures that are neglected or overgrazed because it can form pure stands that can oust crops and grassveld.

When the weed occurs in lands it competes with the cultivated crop for nutrients, moisture and light, hampers harvesting and increases production costs.

After the first rains, when other grazing is still sparse, animals tend to eat the young large cockle bur plants. At that early stage the plants are poisonous to cattle, sheep, horses and pigs because the plants possibly contain two toxins - hydroquinone and xanthostrumarin. These toxins cause symptoms such as a rapid, weak pulse, breathing difficulties, nausea, vomiting and convulsions of the leg and neck muscles.

LEGISLATION

Under the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) large cockle bur has been proclaimed a weed in the whole of the Republic. This means that no-one may disperse or permit the dispersal of the weed.

CONTROL

To prevent infestation, animals purchased or entering the farm must be examined for burs, and any burs found must be destroyed immediately. Seedlings can be pulled up by hand, but a farm must be inspected at least three times during the growing season because the seeds do not germinate simultaneously. It is not advisable to cut down the plants since this will stimulate them to sprout anew.

The following chemicals have been registered for the control of large cockle bur: bromoxynil; bromofenoxim; terbutylazine/metolachlor; metribuzin; cyanazine/atrazine; bendioxide; 2,4-D(A); 2,4-D(T); 2,4-D(I); 2,4-D/MCPA; MCPA-K; 2,4-DB; MCPB; diuron/MCPA; methabenzthiazuron/MCPA and acifluorfen. The directions on the label should be followed closely.