

Year 9 Assessment Task
Saffron Thistle
(*Carthamus Lanatus*)



By Shawnee Faul .

Introduction of studied area

The area I am writing of with regard to the growth, spread, control and eradication of the noxious weed, Saffron Thistle, is on the James Sheahan High School farm situated on the southern end of Anson Street and bordered on the south by Sundew Crescent running onto farm holdings and rifle range. On the west by Cecil Road, the east by Anson Street and to the north by neighbouring properties, mainly residential homes. It slopes slightly from west to east and the prevailing air current is generally a freshening wind from the west south west that blows from the direction of Mt. Canobolas.

The soil is not of a particularly high quality, slightly acidic, not fertilized at regular intervals and grazed on by sheep and cattle. There are paddocks sown with winter crops, mainly oats that are used for grazing but these are not rotated causing or at least adding to the likelihood of the weed saffron thistle getting a stronger foothold, the school has a stand of lucerne that is not cut and baled to its full potential but used as a feed paddock for stock, a likely reason for this may be due to the severe drought the country currently experiences at the time of writing, this however only lends itself to the growth and further spread of the saffron thistle within the confines of the school farm.

To the southern side of the farm there are several paddocks containing nature strips running north south approximately 3 metres wide that have native trees growing along their length, there is a rifle range along the border that has little nutritional value to the school as far as stock fattening is concerned.

The western boundary is made up of pasture grasses fenced into 3 paddocks used exclusively for cattle grazing being completely exposed to the westerly winds that blow in from the west south west. The northern section of the farm is enclosed by pasture continuing on from the western boundary paddock containing the shade shed, pig sty and the agriculture shed, cattle crush and yard students use for the preparation of show cattle and a grain feeding yard, a paddock sown to oats for stock grazing and a small paddock that has a small water course running its length, north south. The eastern side that enters onto the school's main sector has a larger paddock containing a lucerne stand used for stock grazing, a small dam and water tank, a nature strip running east west also runs alongside either edge of the main entrance road containing more native trees, that runs from the eastern gateway to the agriculture sheds.

The farm I have described above has an infestation of the weed Saffron Thistle. It is spread thinly over the entire farm, the method of treatment I have thought most cost and eradication effective is outlined in detail in the latter section of this task. To the western area of the farm there is very little in the way of clustered growth but individual plants are scattered thinly, the northern pastures are spotted with thistle in thin patterns, the eastern side of the farm has maybe the heaviest infestation of Saffron Thistle yet it is still only thin in its presence while the southern paddocks containing the nature strips have saffron thistle scattered in clusters that with proper weed control methods will I feel have the desired effect of ridding the farm of the noxious weed.

SCHOOL FARM LAYOUT

1. Neighbour's farm
2. Pasture
3. Pasture
4. Pasture
5. Pasture
6. Rifle range
7. Cottage
8. Rail carriage
9. Nature strip
10. Laneway
11. Pasture
12. Vegetables
13. Laneway
14. Cattle crush
15. Sheep pens
16. Ag. Shed
17. Handling yard
18. Shade shed
19. Pig Sty
20. Toilet block
21. Pasture
22. Pasture
23. Water tank
24. Pasture
25. Nature strip
26. Nature strip
27. Dam
28. Stream
29. Nature strip
30. / = gates

Saffron



Identifying the Weed

Scientific Name: *Carthamus Lanatus*

Common Name: Saffron Thistle

Nomenclature: '*Carthamus*' is thought to be from the Arabic '*qartam*' which refers to dyes collected from flowers. '*Lanatus*' is Latin for '*woolly*' and relates to the appearance of growth forms of that plant. '*Saffron*' is possibly obtained from the yellow colouration of the related safflower.

Description



- Emergent: The Saffron Thistle emerges from the soil as a rosette. They stay in this form during the colder months of winter. The rosettes can grow to be around 20 cm long and are divided with spiny terminal lobes.
- Growth: The rosette dies off in late spring and an erect stem develops. The singular stem can be a yellowish white to a very pale green colour. It usually has minute hairs and the stem branches out once older.
- Maturity: The thistle matures in November/early December. The whole plant is very rigid (including the leaves) and covered with sharp spines. Flowers are beginning to bloom. The flowers are yellow to off white in colour and have faint red to black veins surrounded by leaf-like bracts 3 to 5cm long with spines that act as 'armour'.
- Seed Dispersal: The dispersal of the thistle is only by seed. The bristles on the seed do not enable it to travel by wind but the seeds do fall close to the parent plant. The bristles do however cause the dried seeds to attach themselves to clothing, bags and tangle themselves in wool and fur. The parent plants dry out and break off at the base and act as a tumble weed which spreads seeds over long distances.



Problems & significance associated with Saffron Thistle.

Problems faced in relation to the infestation from the noxious weed saffron thistle can be seen in the following ways on JSCHS farm and the impact of said problem.

1. Sporting ovals being infested from seed spread. Spraying for eradication needed.
2. Injury to farm stocks mouths, eyes, ears and udders and scrotums from spines and thorns of weed. Veterinarian required for treatment.
3. Injury to workers hands and upper arms of shearers, roustabouts and wool classers from thorns of weed during shearing of stock. Reluctance of shearers to return to infested stock.
4. Down time during shearing to clear combs and cutters of burrs and thorn from handpiece. Longer to remove fleece and implications if weather is unfavourable, power cost rises.
5. Loss of wool price due to vegetable contamination of wool.
6. Decreased land available for stock grazing. Overgrazing on available land leading to problem that already exists.
7. Decreased land available for cereal crops. Loss of monies from farmed crops.
8. Decreased land available for lucerne type crops normally baled. Less baled fodder leading to less shedded feed or sale of crop.
9. Decreased volume of lucerne crop in first cut, remembering that the following cuts are always cleaner and the frequency of the cut means the thistle does not have the growth period needed to be a problem during the lucerne season.
10. Sunburn, sunstroke, from exposure to sun if manual eradication is needed although forward planning would eliminate this as explained in the weed eradication program. Skin cancer.
11. Expenditure in relation to cost of herbicides for proper management strategy. Blow out in budget for school farm with the possibility of cutbacks to certain areas of this area of schooling.
12. Danger to other plants and animals if errors are made by contracted sprayer. Possible accidental death to animals and killing off of plants considered valuable to the farm.
13. Competition with all crops for water and nutrients. poorer condition and less yield from sewn crops.
14. Reduction of final yield of cereal crops.
15. Becomes obstacle for stock, working dogs and farmers if weed becomes clumps blocking laneways and entrances.
16. Danger of contamination of vegetable patch if contractor is careless in delivery of herbicide(manual removal would be suggested). Poisoning of vegetables rendering them useless and allotment wasted for the growing season and possibly the next.
17. Fines for the non removal of noxious weed of which Saffron Thistle is listed. No biological agents are available for this weed so herbicidal eradication is unavoidable.
18. Any sale of stock, machinery from the farm would have to be cleaned of all chance the weed could be transferred onwards with the purchaser.
19. Quarantine of any particularly bad outbreak of the weed in any paddock.

Saffron Thistle (*carthamus lanatus*)

Treatment of lucerne, clover, perennial grass based pasture.
To preserve feed.

Buttress (2,4-DB).....@ 2.5 lt per hectare.

Broad strike.....@ 25gms per hectare.

+ non ionic surfactant (eg BS 1000).....@ 250 ml per 100lt H2O

To prevent seed set of weeds.

:TIMING IS CRITICAL:

Pasture quality will be degraded. Treatment at flowering is the preferred period for optimum results using this herbicide at this time during the weeds lifespan.

Gramaxone.....@ 1.0 lt per hectare.

MCPA.....@ 1.0 lt per hectare.

Please note: New regulations on use of 2,4-D and MCPA.

A new label warning from the APVMA states that phenoxy herbicides can cause severe damage to susceptible crops such as cotton, grapes, tomatoes, oilseed crops and ornamentals. It further states that the product is not to be used unless wind speed is more than 3 kph and less than 15 kph as measured at application site. Users are advised to apply with coarse to very coarse spray drops.

COSTS

Buttress.....@ \$330.00 per 20 Lt drum inc GST.

Broadstrike.....@ \$379.50 per 500 gms inc GST.

Gramaxone.....@ \$220.00 per 20 Lt drum inc GST.

MCPA.....@ \$137.50 per 20 Lt drum inc GST.

BS 1000.....@ \$154.00 per 20 Lt drum inc GST.

Dispersal of herbicides

Labour.....@ \$55 per hour

Spray Unit.....@ \$100 per hour

Application of Herbicides

The suggested method for the application of herbicides at the school farm is via spot spraying with the aid of an all terrain quad bike with a rear mounted herbicide tank. The infestation of saffron thistle is sparse on the school farm so the distribution of herbicide by boom spray would create herbicide waste and allow wind drift to be far greater than necessary, this in turn would lead to the increasing of allowable budget for the eradication program.

If the saffron thistles presence were in larger proportions, boom spraying would have been considered. I have made a decision on the quad bike spot spraying method because it lowers the risk of excess spray drift and maximises the effect on the weeds targeted for eradication. The use of a more direct shot on the weed using spot spraying allows for a larger droplet of herbicide to be delivered to the zone required.

The setting of the nozzles for such a coverage, produces a desirable droplet pattern.



Optimum conditions and timing for this method are important to ensure large droplets are produced and when temperatures are below 28 degrees Celsius this can be achieved. The use of a formulation herbicide considered volatile is most desirable due to the herbicides ability to pass from the liquid to gaseous phase in the atmosphere making it able to be moved about by the wind. Droplet drifts is easiest to contain when the conditions are considered ideal as they are carried down via the air turbulence and gravity to settle on plant surfaces. Vapour drift is specific to volatile herbicides such as 2, 4-D B.

Vapours can possibly rise directly from spray evaporation of herbicide from covered surfaces. It is best to avoid spraying under still conditions. The ideal winds speeds are normally 7-10 km/h, leaves and branches are in constant motion, explaining the need of a light breeze. For the maximum results in both uses and timing of spraying, rosettes should be sprayed when bright green and vigorous, whilst the seed set prevention is best undertaken during late spring, early summer.

While pastures will possibly be somewhat degraded during the latter of these spraying actions they will bounce back much more actively due to the uninhibited growth, as no saffron thistle infestation will be growing to take the needed nutrients the paddocks would otherwise lose. All lucerne, clover and perennial grass based pastures should be allowed a 7 day withholding period after the herbicide has been applied ,also it is advisable to not cut for stock food for same period after treatment. In the event no herbicide is wished used in the eradication of the saffron thistle, an option available to landholders involves slashing, spray topping or pasture improvement, although as previously mentioned with the sparseness of the weed, slashing would fall into the financially unviable category.

Merits of strategy.

The results of such an implementation are so long term, resulting in almost complete and total eradication of the Saffron Thistle from the school farm. Injuries to stock, workers and students would be almost non-existent, farm machinery checks not required unless weed is known to be prevalent again, which with the use of the process outlined would not be an event.

Crop yields and lucerne output would be far greater, income from farm would be higher making it a more self-sufficient product, reliance on herbicides for containment or removal of further growth of the weed should seeds that have lain dormant for years emerge will be far less expensive and easier maintained.

The movement of the farm towards an environment friendlier way of weed control would be much more easily entered into with the need for herbicide less.

The use of the pasture for cropping in a rotation system that is more in keeping with weed control and not allowing the pastures to be worn down and neglected should give the farm a far greater potential for improving its viability than at present.

Considering the difficult times we face in relation to the current drought, it makes it very hard for any form of farming but with a plan in place for the Saffron Thistle we will be well prepared for any re-emergence of this noxious weed when good times return.

The spray program I have outlined for the weeds eradication is non-threatening to the surrounding areas, hard on weeds targeted, once implemented shall make for an easier management of the Saffron Thistle.

The benefits are also outlined in the previous section on application of herbicides, so in finishing I would like to say if we all try we will be rid of Saffron Thistle from our farm with a concerted effort and a tenacious attitude to its eradication and implementation of all viable means at our disposal.

Bibliography

- Mr. Patrick Finn. Elders, Orange.
- Silmac, Orange.
- C.F. Williams Pty Ltd. Orange.
- Noxious & Environmental Handbook. Rod Ensbey & Annie Johnson.
- 3rd Edition, N.S.W. Dept of primary Industries. Orange.
- Weed Control in Lucerne & Pasture 2005, J.J. Dellow & M.C. Scott.
- N.S.W. Department of primary Industries. Orange.
- http://www.weeds.crc.org.au/for_schools/competition_winners.html
- <http://www.tawabush.wellington.net.nz/elements.html>
- <http://www.une.edu.au/agss/weeds/rsch-completed.php>
- <http://www2.dpi.qld.gov.au/pastures/4202.html>
- <http://www.dpiw.tas.gov.au/inter.nsf/WebPages/LJEM-6PQ4AP?open#top>
- <http://www.nrw.qld.gov.au/factsheets/pdf/pest/pp14.pdf>
- http://www.ento.csiro.au/history/rr93-95/wd_temp.htm
- <http://www.dpi.vic.gov.au/dpi/nreninf.nsf/LinkView/CBB0CD69B8B3E515CA256BCF000AD565ECC844336D72F0634A256DEA00293F8A>