



# JERUSALEM ARTICHOKE - A PERENNIAL FODDER CROP? (OR ANOTHER WEED?)

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Jerusalem artichoke (*Helianthus tuberosus* L.) is a member of the sunflower family. Summer growing, it produces small (about 5 cm diameter) yellow-petalled sunflower "heads" which, however, rarely if ever produce seeds. After flowering in summer/autumn, the top growth dies, and in this respect it is an annual plant. However, large quantities of tubers are formed below ground level, and these survive over winter to produce new shoots in the following spring. In this respect, it is for practical purposes, a perennial plant. Even when the tubers are harvested, it is almost impossible to remove all of them from the soil; and a few remaining tubers, or pieces of them, are sufficient to provide a regenerating crop in spring. Jerusalem artichoke is a potential "energy" crop, which can produce carbohydrates capable of being fermented into alcohol. Because of its abundant vegetative growth it also has possible potential as a fodder crop for grazing animals and therefore a preliminary experiment was conducted near Canberra in 1989-90 to measure the effect of various cutting treatments on dry matter production. Tubers of a selected line, from CSIRO, were used to establish the experiment. One tuber per hill, at 1 metre spacings, was planted on 15 September 1989 with 100 g of single superphosphate, about 5 cm deep. Irrigation was applied in the dry October, and several times during January and February, to keep the plants growing vigorously.

The following cutting (to about 5 cm above ground level) treatments were applied, in a randomised block design of 4 replicates:

Control (uncut)

Cut at early bud formation (21 December)

Cut at full flowering (24 January)

Cut at early bud and again at full flowering (21 December and 16 February)

Tubers were dug in June 1990, washed and weighed, and returned to their plots.

## Results

Treatment	Tops DM t/ha	Progn. Leaf %	Tubers Yield		In vitro dig		Protein	
			Fresh DM t/ha	t/ha	Leaf	Stem	Leaf	Stem
Control	N.M.		25.7	5.7				
Cut bud	1.85	30.8	32.0	7.1	79.5	82.7	22.5	4.7
Cut flowering	6.46	35.1	23.1	5.1	76.3	58.3	22.5	6.3
Cut bud and flowering	6.11	34.8 (regrowth)	15.1	3.6	77.2 (regrowth)	84.0 (regrowth)	22.8 (regrowth)	4.6 (regrowth)

N.M. (Not measured). At maturity, top growth completely dry and much leaf fallen.

## Comments

Dry matter of tops was reasonable, considering only one tuber per m<sup>2</sup> was planted. The regenerating crop in 1990-91 should be much more productive. Cutting the tops twice (bud and flowering) depressed tuber yield. Nutritive value, as indicated by digestibility and protein, of leaf was good, but the stems were of low protein content. Acceptability of artichoke tops by grazing animals was not tested; observations elsewhere indicate they are readily browsed by eastern grey kangaroos and black wallabies. There is a limited domestic market for fresh tubers, which, according to European reports, are acceptable at least to pigs. Although Jerusalem artichokes could have some weed potential because of their persistent tubers, they are unlikely to spread by seed. The crop could warrant further investigation as a novel fodder, or regenerating silage crop, in areas receiving reasonable summer rains.