

Iceberg lettuce is one of the standard salad crops which is grown by a small number of specialised growers. Iceberg lettuce until the 1930's was known as crisphead lettuce. It is a crop only for the committed producer producing a quality product who has good outlets in the wholesale or retail markets.

Iceberg is in demand all year round. It can be produced outdoors in this country from June-October. In the milder areas of the country it may be possible to crop from the fourth week of May onwards if the first plantings are covered with fleece or bird netting.

In order to ensure that the necessary quality and continuity is achieved investment will be required in:

- Propagation/planting - Glass or polythene tunnel/blocking machine/specialised block transplanter.
- Packing/cooling Facilities - Harvesting rig/vacuum cooler/cold storage.
- Irrigation Equipment - Essential for iceberg production.

The crop is normally propagated under glass using split pills into peat blocks and later transplanted out in the field. Alternatively plants can be purchased from a propagator.

SOIL Lettuce grows best in fertile well-structured soils. Silt or sandy loams are ideal. Can also be grown on heavier soils if well structured.

FARMYARD MANURE Manure or other organic matter can be used on ready to eat crops provided it is stacked for 3-6 months and applied 7 days prior to planting.

LIME Lettuce is sensitive to soil acidity. Crop growth is increasingly restricted on mineral soils below a pH of 6.1. Aim for a pH of around 6.5.

FERTILISER Iceberg lettuce has a higher requirement for nitrogen

than speciality lettuces but in general lettuce is not particularly responsive to large quantities of nitrogen. 70-100 kg/ha should be adequate for most situations but an additional 50 kg/ha is allowable under the Nitrates Directive. This crop has a high requirement for potash and phosphorus. Apply P and K according to soil analysis results. The preferred form of potash is the sulphate form. There are no special requirements for boron so compound like 7-6-17 would be suitable.

Apply the following NPK kg/ha according to soil analysis:

Soil Index	N	P	K
1	100	80	250
2	90	60	200
3	80	40	150
4	70	20	100
Topdress	50		

VARIETIES

Gondar	Early
Mossation	Maincrop
Templin	Maincrop
Eduardo	Maincrop
Elmundo	Maincrop
Gonzalo	Maincrop
Gondar	Late

Varieties normally have inbuilt resistance to downy mildew and some may have additional resistance to *Nasanovia* leaf aphid.

PROPAGATION

Propagate under glass or plastic using 3.8 - 4.3 cm blocks and split pills. Ideal temperature for germination is approximately 15-21°C. Take note that at temperatures greater than 27°C, high temperature dormancy can occur. Temperature can be controlled by using germination chambers, or by sowing in the evening and covering with Styrofoam sheets. Maximum stay in the germination room is 2-3 days: when the seed has chitted take out at evening time and keep in high humidity for the first day out in the house. Keep an eye out for possible bird and mouse damage. Propagation time is usually 2-3 weeks but earliest sowings can take up to 2 months. Harden off the plants by standing outdoors in a sheltered area for a week prior to planting.

CONTINUITY PROGRAMME

Sowing Date	Planting Date	Harvest Date
5 January	6 March (F)	21 May
18 January	16 March (F)	27 May
17 February	1 April	9 June
15 March	18 April	24 June
30 March	28 April	3 July
10 April	8 May	10 July
25 April	18 May	15 July
6 May	26 May	21 July
18 May	7 June	28 July
30 May	17 June	9 August
6 June	24 June	14 August
11 June	28 June	19 August
16 June	3 July	24 August
23 June	12 July	30 August
29 June	16 July	7 September
4 July	21 July	13 September
6 July	24 July	16 September
9 July	26 July	20 September
13 July	30 July	24 September
19 July	6 August	4 October
23 July	9 August	14 October

The above table is to be used as a guide only as maturity date will depend on the seasonality of the weather. May production is only for milder areas. To achieve continuity the maximum interval between sowings from January to May should be one week and twice a week or more frequently from June to July. F = fleece covered crop.

EARLY CROPS

Harvest date can be advanced by covering the first few plantings with fleece. Seed can be sown from January to mid-February for planting in March to crop from the fourth week May to mid-June.

TRANSPLANTING

Transplant at the 2-3 true leaf stage using a specialised block planter. Ensure that the block is level with the soil. Time from planting to harvest will vary from 50-75 days depending on time of year.

SPACING

35 x 30 cm on beds
72,000 plants/ha

WEED CONTROL Groundsel is the major weed problem in growing outdoor lettuce - they are both in the same family, Asteraceae. It builds up where lettuce is grown in the same fields year after year. And the issue is compounded by the fact that the available herbicides are poor in controlling this weed. So use a proper rotation to stop groundsel building up. Use of stale seedbeds will also help. Suggest using 1.25 L/ha Stomp Aqua followed by 3.5 L/ha Kerb Flo post planting. This should be supplemented by follow-up mechanical weed control.

Stomp Aqua 2.9 L/ha
Residual herbicide; groundsel resistant; usually tank mixed with Wing P. Apply pre-planting.

Wing P 1.25 L/ha
Similar to Stomp Aqua but more effective on annual meadow grass and groundsel; however only very low rate approved for lettuce as an off-label which limits its usefulness in groundsel control. Apply pre-planting.

Kerb Flo 2.75-3.5 L/ha
Apply pre or post planting but normally applied 1-2 weeks post planting. Has little contact effect except for annual meadow grass and chickweed. Groundsel resistant.

Bonalan 8.0 L/ha
Expensive herbicide that is incorporated in prior to planting. Not effective on groundsel.

Dual Gold 0.7 L/ha
May damage Little Gem. Not effective on groundsel.

IRRIGATION Essential. In dry seasons, without irrigation it is impossible to meet production targets and the percentage cut is reduced. Irrigation also assists in making the best use of herbicides.

With a leafy crop such as lettuce, irrigation to restore a soil moisture deficit at any crop growth stage will give a yield response. Apply 12-15 mm at any one application. Use a couple of irrigations at planting to settle a crop in if weather is dry.

PESTS

Slugs May be troublesome especially around headlands. The use of pellets will prevent this pest from damaging newly planted crops.

Aphids Commonest pest of lettuce. A number of aphids attack lettuce including Lettuce Aphid (*Nasonovia ribisnigri*). Some varieties now have resistance to this species - Movento is the most effective spray. Apply control as soon as seen. Cruiser seed dressing is available which gives early control of aphids.

Product	Rate/ha	Harvest Interval
Movento	0.5 L/ha	1 week
Closer	200 ml/ha	1 week
Gazelle	250 g/ha	3 days

Lettuce root aphid Uncommon pest of lettuce. It feeds on the roots of lettuce causing yellowing of the foliage and stunting. The aphid overwinters on Lombardy poplar and in June and July fly to and infest lettuce crops. It has been known to over-winter in the soil.

Cultural control: rotavate the infected ground. This will greatly reduce aphid population in the soil. Good rotation.
Chemical control: Gazelle

Caterpillar Sporadic pest of lettuce. Commonest species to attack lettuce is Silver Y moth, a migrant species, which can be a major pest in some years. Pheromone traps can be used to detect arrival of moths.

Product	Rate/ha	Harvest Interval
Lepinox Plus	1 kg	Zero
Tracer	200 ml	3 days
Decis	250 ml	1 week

Pigeons Take precautions especially in the April to June period : bangers, shooting, kites or nets.

DISEASES

Downy mildew The most troublesome disease of lettuce. Cool moist conditions favour it. Most varieties are resistant to this disease but needs backup from fungicides. Phosphite products (e.g. Farm-Fos) can help to counter mildew.

Product	Rate/ha	Harvest Interval
Acrobat	2 kg/ha	3 weeks
Revus	0.6 L/ha	1 week
Dithane DF	2.1 kg/ha	4 weeks
Infito	1.6 L/ha	2 weeks

Botrytis May be troublesome on autumn maturing crops.

Product	Rate/ha	Harvest Interval
Scala	1.33 L/ha	2 weeks
Signum	1.5 kg	2 weeks
Switch	0.7 kg	1 week

Sclerotinia If lettuce is intensively cropped sclerotinia can build up. Signum is effective against it. Otherwise it can be managed by using bio-fungicides such as Contans or Prestop.

DISORDERS

Tipburn Causes brown tipping of the leaves. Can also cause some of the inner leaves to go brown. Occurs when plants are losing more moisture through their leaves than they are taking up through their roots. Irrigation during dry spells will help prevent this problem. Foliar application of calcium should also be considered - Inca, CalMax etc.

HARVESTING

Iceberg lettuce will mature in 7-11 weeks from planting. Getting iceberg ready for market is a labour intensive process as it involves cutting, trimming, wrapping and boxing - all carried out on a field harvesting rig.

On a hot summers day the head temperature will be considerably higher than the air temperature. The packed crop needs to be cooled in a vacuum cooler down to 3°C and then kept at that temperature in a holding fridge prior to transport. If a vacuum cooler isn't available it's essential to cut early in the day when the heads are still relatively cool. This is necessary to ensure satisfactory shelf life.

The minimum head size is 350g.

YIELD

Assuming a 70% cut, that works out at 50,400 heads per ha. Early and late cuts may be less - down to 60%. A good cut-out would be 80%. The crop is packed in cardboard boxes - 10/12 heads per box depending on size.