

Tips for growing a successful maize silage crop

Growing a crop of maize for silage can be extremely profitable and rewarding. We hope our “Tips for growing a successful maize silage crop” is of some help to you. If you are a first up silage maize grower or an experienced grower we are sure you will find some useful information within it.

Paddock Selection.

If possible, select your paddock in the early autumn. Look for perennial (grass and flat) weeds and apply the necessary chemical to control them. This is also best done early in the autumn, after which the paddock can be drilled into a winter greenfeed crop i.e. Annual ryegrass. Maize does not like waterlogged soils. Waterlogging will also encourage weeds that invade the crop. This can reduce maize yields and also impact on silage quality & palatability. Select a free draining soil type for best results.

Other things to consider when selecting a paddock are its suitability for large maize machinery and we recommend that you consult with your contractor before finalising your site selection. Also the distance from the paddock to stack will reflect in the harvest cost, as will rough farm tracks with poor access.

Soil Test.

Arrange for your preferred fertiliser supplier to do a soil test once a suitable paddock has been identified. We recommend that the core sample be taken to the same depth the cultivation is to be done normally 150 mm. You need to sample deeper for maize, as its roots are deeper than pasture. This test should be a basic soil test, testing for soil pH, Olsen P, K, Ca, and Mg. We also recommend a deep N test later once the crop has emerged before you apply any N as the amount of N (if any) you apply will be identified by this test see more details below.

Once the test results are back discuss the paddocks requirements with your fertiliser advisor.

Establishment.

Maize can be established by either direct drilling, minimal tillage or traditional full cultivation. Below you will find information on each method.

Spray out pasture.

Spraying out pasture with a Glyphosate type product (or similar) reduces the number of cultivation passes and better prepares the paddock for either direct drilling or minimal tillage. It also eliminates pasture re-growth and reduces turf clods on the seed bed surface. This in turn enhances the performance of chemicals for weed control.

Spray out pasture as soon the paddock can be taken out of the grazing rotation. If going through a winter greenfeed cropping program you get the opportunity to spray the paddocks at least two times once before the autumn sow down and once again when you spray out the winter green feed crop in the spring. If you are using minimum tillage you should spray out 3-6 weeks prior to starting your minimum tillage program and if direct drilling 3-6 weeks before you drill, 2-3 days before drill check the paddock for any re growth and if required re spray at a lower rate per hectare. These suggested



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time breaks are ideal as it gives plenty of time to create a good seed bed. Avoid leaving waste weedy areas around the paddock edges as insect infestations can start in these areas and spread into the crop.

Tips for establishing maize using full cultivation.

Ploughing is a very effective way to bury your problems however excessive cultivation weakens the soil structure, you should try to keep cultivation to a minimum and avoid cultivation when the soil is either too wet or too dry.

Some of the benefits of cultivation include, creating an even seed bed, breaking up compaction, contouring paddocks where required, aerating soils, burying old pasture/crop residues and or weeds, drying soils out and allows you to work in any pre plant lime and fertiliser requirements.

Try to achieve a firm seed bed where the soil is to a crumb size about the same size as your maize seed. A well cultivated paddock will help ensure the best strike of your seed and also helps to make sure your weed and insect control products give the best results.

Try to give the paddock its final cultivation just prior to drilling if rain has occurred or longer than 24 to 36 hours have occurred since the last pass of the paddock.

In very cloddy soil types we recommend a light rolling after drilling to improve the seed to soil contact. Rolling can also seal in moisture and help reduce the risk of wind erosion.

Tips for establishing maize using minimal tillage or direct drilling.

Minimal tillage and direct drilling are now well recognised ways to get your maize paddocks successfully established, however you're planning and execution of the required tasks need careful consideration as you only get one chance to do the job properly. Many of the factors that need consideration are not as problematic when you use full cultivation.

Some of the important factors to consider are soil type, soil texture, amount of cultivation (if any) that will be required, timing, paddock evenness, potential insect problems.

We have discussed issues involving paddock selection above and these rules apply to whatever establishment method you decide to use. Maize seed is best drilled approximately 5 cm in depth so any paddocks that have uneven soil types or have large ruts will need to have either minimal tillage or full cultivation used on them. The other major consideration when using these two establishment methods is potential insect problems most importantly slugs. Many of the significant maize establishment insects are controlled with the application of a suitable seed treatment however these will not control grey field slugs. If you are direct drilling they can cause significant damage and we recommend that you place ply wood (1 x 1 metre weighted down with blocks) over the paddock for 2 days before drilling and check to see if any are present. If you find as little as 4-6 slugs you will need to use slug bait before drilling.

Once again a consultation with your contractor prior to establishing will help identify the best establishment method.



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Sowing time, sowing depth and plant population.

As a rule of thumb the earlier you sow your maize the better it will yield. In the Waikato maize sown in early September can yield 20% more than if sown in early December. One of the key reasons for this is the effect of radiation interception. The aim is to sow your crop so you have full canopy cover when radiation in your area is at its peak, normally mid to late December. Other factors that will also have an influence on sowing date are soil temperature, soil conditions, risk of frost and what you are doing with the paddock before you commence your drilling program (i.e. spring pasture silage).

Soil temperature is critical to the success of your maize silage crop it is therefore important to do a soil temperature test and only commence sowing when the early morning (9am) soil temperature is above 10° C or better (at sowing depth see below) and is so for at least 3 consecutive days.

Frost will potentially lower silage yields and can even mean a complete re drill operation so drilling after the risk of frosts has past is once again very important.

The optimal plant population for a silage maize crop is between 100,000 – 120,000 plants per hectare, seed normally comes in 80,000 plant bags and you have to allow for up to 10% seedling and germination loss. If drilling early you will need a higher plant population as the cooler temperatures will slow growth and the use of higher plant populations will help achieve canopy closure sooner.

Most maize that is drilled for silage is normally drilled at between 3.5 and 5 cm in depth. We recommend that maize planting should be done through a well maintained specific maize planter operated by experienced contractors.

Cultivar selection.

On today's market in New Zealand there is a wide range of suitable silage maize cultivars. On our web site you will see a map of New Zealand and the recommended cultivars for each region. This will make your selection of a suitable cultivar an easy process. Once you have selected your cultivar you can go to our cultivar description page for more information on each specific cultivar. This information contains some abbreviations you may be unfamiliar with, below is a glossary to help explain these.

Fertiliser.

Like most things when growing a maize silage crop attention to detail is very important and this is particularly true of its fertiliser requirements. Maize uses fertiliser at all stages of its growth with its greatest requirement when it's growing the quickest from about 45 cm high until grain fill. To support the below mentioned fertiliser program we recommend regular plant tissue tests.

Fertiliser is normally applied by either banding at sowing (with a precision drill) or side dressings.

Fertiliser Timing

There are 4 main times that you should apply fertiliser to maize these are;

1/ Pre Plant Work out your fertiliser plan (based on your soil test) with your fertiliser advisor, normally you will apply 2/3rds of your sowing fertiliser as the pre plant application and work into the paddock with the final cultivation.

Some of the nutrients a maize silage crop requires are best applied at this stage. **P or phosphate** is



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required in the main for early root development therefore it's important to supply most of the P your crop will require at drilling. Although a maize crop uses very little P it is a very essential element.

2/ Planting the balance (1/3rd) of your total sowing requirements are applied now. You should consider both the fact that your maize crop uses large amounts of **N nitrogen** and to a lesser degree **K potassium**. Between 50 – 100 kgs of Urea is normal at this stage. The level of **K potassium** is unlikely to have a major effect on your final yield unless your paddock is very low in it to begin with. However maize will happily use up extra **K potassium** if it is available so you should bear this in mind when sowing down your paddock after the maize.

3/ 1st side dressing normally happens when your maize crop is 45 cm high when you will have 5 leaves fully emerged. At this stage your maize crop is growing very quickly and needs to be supported with **N nitrogen**. A typical application of 300 kgs of Urea is recommended at this stage.

4 / 2nd side dressing your maize crop uses up to 75% of its total **N nitrogen** requirements between tassel emergence (5-6 leaves) and pollination (20 leaves). The first side dressing will look after your crop until it reaches the 12 leaf stage at which stage you would apply this 2nd side dressing.

Other important nutrients

There is a range of minor nutrients that can be important for your maize silage crops, they include Zinc which is best applied at stage 1 or as a foliar feed, Sulphur that if you are deficient in it will most affect the early seedling and Magnesium. Magnesium deficiency like Sulphur tends to affect the crop at the very early stage. And like Sulphur is best corrected at stage 1 of your fertiliser plan. It can also be corrected by using foliar sprays as well.

Weed and Pest control.

Insect Control

There are two major and several less important insects pests that may affect your maize silage crop. The two insects that can cause the most significant damage are Argentine Stem Weevil (ASW) and Black Beetle. Luckily both these insect pests are very effectively control with a seed treatment called Poncho®.

Poncho® is applied to your seed on request and we strongly advise the use of on all maize seed sold especially if you are use minimum tillage or direct drilling as your method of establishment.

Other pests that can cause significant problems from time to time are birds and Greasy Cutworm. You can identify Greasy Cutworm as a dark green caterpillar that feeds at night. When present Greasy Cutworms can appear in significant numbers and build up very quickly and you need to move quickly to control them.

Birds can also cause significant issues at most time during the maize life time however the damage they do is greater at establishment.

Once again this issue can be addressed at seed sowing time by adding a chemical called MeasuroI® to you other seed treatment chemicals i.e. Poncho®.

MeasuroI® is a very effective bird repellent.



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Weed Control

All weeds compete for valuable sunlight, moisture and nutrients and therefore the control of them is another very important job to be considered when growing maize.

Weeds fall into two categories either grass weeds or flat weeds. The weeds present in your maize crop will be very different from farm to farm. Specialty Seeds recommend that you acquire the services of a local chemical expert to discuss your weed program prior to growing your maize crop. There is a wide range of products available on the market today for controlling almost every weed that we find in New Zealand maize crops and local advice on how controlling them is very important. If you have difficulty in finding a suitable local weed expert please contact us and we will help you.

Always read the label on the chemical container and follow the instructions carefully.

Glossary.

CRM: Comparative Relative Maturity. Is a rating system for the maize maturity period from planting to harvest. The higher the value (i.e. 112 CRM) the longer it will take for that particular cultivar to mature while the lower value (i.e. 87 CRM) indicates that cultivar will take a shorter period to mature. Generally the lower the CRM the lower the yield potential, for example a 95 CRM hybrid may have a potential lower yield of 2-3 tonnes DM/Hec when compared to a 110 CRM hybrid.

DM: Dry matter, and will either relate to the overall dry matter yield of the paddock or the dry matter content of the silage within the silage stack.

GDD: Growing degree days. Is a term used to describe the accumulated days when the average daily temperature (maximum temp + minimum temp) is over the base temperature (or lowest temperature) that is required to grow maize in your region, in New Zealand this figure is nominally quoted 8° C. A good crop of maize requires between 1000°C to 1500°C GDD to mature.

The equation used is as follows:

Temperature average – base temperature x available days you have to grow your crop in.

For example if you want to grow a crop between 1 st November and the 28th February, get the daily average maximum and minimum temperature – base temperature x 119 = GDD. To find the average temperatures go to

<http://www.metservice.com/rural/index>

ME: The quality of maize silage in New Zealand is generally described by the energy content of The maize silage measured in Megajoules of Metabolisable Energy (ME) per kilogramme of

Dry matter: (DM), or ME/kgDM. This is generally referred to as the ME of a pasture or the M/D value. This value is not the total energy content of the maize silage, but the amount of energy available to a Grazing animal for metabolic processes.

K: Equals one thousand maize plants, and is used when referring to plant population within the



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paddock. The following equation is used for calculating your plants per hectare.

A / Measure several random and representative rows in the paddock at 4 metres and count all the plants and add them up to give a total number of plants counted.

B / Divide the total plants counted by the number of 4 metre strips you measured, then divide this figure by 4 to get the average number of plants per metre.

C / Divide this figure by the distance between rows (i.e. 0.65 m) and multiply this by 10,000 (total sq metres per hectare)

For example

After doing steps A & B your average plants per sq metre was 20 divide this by 4 this equals 5 (plants per sq metre).

Therefore $5 \text{ plants/m} \div \text{row width } 0.65\text{m} = 7.69 \text{ plants/m}^2 \times 10,000 = 76900 \text{ plants per hectare}$. This figure would therefore be known as 76.9 K.

Staygreen: Refers to the plants ability to maintain its plant health (and greenness) late in the season. Cereal silage crops i.e. Triticale obtain most of their total yield in the grain. Maize silage however will get over half its final yield from the stalk so the ability to “staygreen” is important.

If you have any other questions please don't hesitate to contact us:

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