PIONEER

A YATES FAMILY BUSINESS

maize for Grain

2022-2023

18 proven maize hybrids

+

New hybrids don't just crop up

Seed treatment fully covered

Marking a special milestone

Profitability meets sustainability

Chris Pellow strives for the perfect balance

PIONEER® BRAND · PRODUCTS

Welcome to the 2022-23 season issue of the Pioneer® Maize for Grain catalogue. Featured inside are three key things we believe are important to the past and ongoing performance of maize for New Zealand growers and the wider industry. These are our focus on hybrid research; seed quality (including proven seed treatments); and our local in-field sales and service team.

Creating the potential for stable, high yields starts with planting the best maize genetics. Our rigorous local hybrid evaluation program allows us to test and bring to market a comprehensive range of maize grain hybrids to suit New Zealand's diverse growing environments and end-use requirements. To learn more about the testing and commercialising of Pioneer® hybrids in New Zealand see pages 8-13.

Establishing the best possible crop starts with planting high quality seed protected by a proven seed treatment. This year's catalogue further explores the importance of seed quality, and thoroughly tested and trusted seed treatments (see pages 38-43 for more details).

Planting the right hybrid in the right paddock is also fundamental to producing a successful crop. Your local Pioneer field team works closely with merchants and contractors to help growers get the most out of their investment in Pioneer seed. It is our pleasure to introduce our recently appointed Grain Account Manager Hamish Johnstone on page 33.

This year marks my father Philip's 90th birthday. To celebrate this significant milestone we include the story of Dad's long involvement in the seed industry, together with the history of Pioneer® maize in New Zealand (see pages 14-17).

We proudly market seed grown in Gisborne, because like you, we understand the importance of locally grown products to the New Zealand economy. It is something we have always known, but which has been further reinforced by recent global events.

With my warmest regards and best wishes for the coming season.

Sincerely,

William Yates
Managing Director

Philip and Will Yates.

A detasseling crew work their way through a crop of Pioneer® hybrid seed maize on a Judd Co lease block at Kaiteratahi near Gisborne.

In this issue

MAIZE FOR GRAIN 2022-2023

Farm success stories

Inside Pioneer

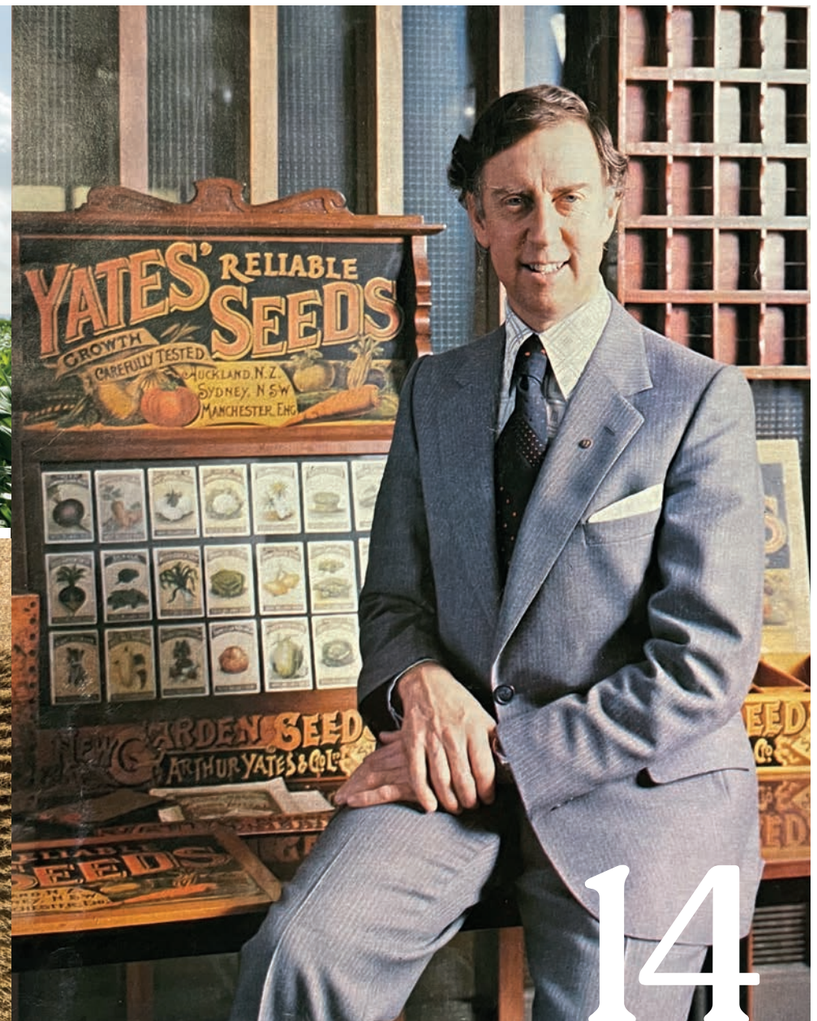
Maize grain hybrids

Calculators & guides

04

20

44



14

08

PIONEER LONG LOOK

We strive to produce the best products on the market.

We deal honestly and fairly with customers, employees and business associates.

We vigorously market our products, but without misrepresentation.

We provide helpful management information to assist customers in making optimum profits from our products.

Growing maize *the sustainable way*

While many growers chase high yields, north Waikato farmer Chris Pellow has his eyes firmly focused on building a maize cropping system which is profitable, environmentally sustainable, and climatically resilient.

Chris crops a total of 122 ha of land in three blocks located at Onewhero (28 ha), Churchill (28 ha) and Mercer (66 ha). Each season he grows around 10 ha of barley, 15 ha of maize for silage and the remaining area is planted in maize for grain.

Chris started his cropping operation growing sweetcorn and pumpkins. Maize was introduced into the system in 1995 and by 2000 the vegetables had gone and his focus was on maize.

"I started with growing vegetables but switched to maize, so I didn't need to employ staff" says Chris. "It is a crop I enjoy growing and I can do the work myself".

While Chris started cropping conventionally, he began experimenting with direct drilling in the early 2000's. Over the next five years he slowly expanded the area and by 2005 he had migrated to a 100% no-till maize system.

Winter cover crops were introduced in 2009 and for the last 13 seasons, Chris has experimented with different crop species and blends including lupins, faba beans, brassicas including mustard and tillage radish, phacelia, buckwheat, and clover. The cover crop is direct drilled after maize harvest and left to grow without the addition of fertiliser until the spring. When ground conditions allow, Chris roller crimps the accumulated vegetation, spreads the base fertiliser and maize is direct drilled using a modified John Deere planter.

"The cover crop, which grows up to 1.6-1.8 m in height, captures nitrogen that might otherwise leach and assists with weed control" says Chris. "It's a big bulk of material and as it breaks down, it replenishes soil organic matter and provides nutrients for the growing maize".

Paddocks are grid soil tested every three years and variable rate spreading technology is used to apply lime and base fertiliser nutrients.

Maize planting starts on the home block at Onewhero from early October, then moves south to Churchill and Mercer. Chris aims to finish planting the wet river flats of the Mercer block by the end of November at the latest.

"I tear out my hair trying to decide the optimum time to plant the wetter paddocks" says Chris. "It's a balancing act".

Chris has been growing Pioneer maize hybrids for the past 26 years. He grows a range of Pioneer® brand maize hybrids including P0937, P0891, P0021, P9721, P9400 and P9127 to fulfill food grade, starch, and feed grade maize contracts.

ABOVE Chris Pellow and Pioneer Area Manager Gil Dallas.

Farm walk

- Plants a mixture of long and short maturity hybrids
- 97 ha of maize grain across three blocks
- Harvested 12.95 t/ha in 2020-21 season

Planting generally starts with the long maturity hybrids and Chris moves to the shorter maturity hybrids as the season progresses.

While the average planting population is 95,000 to 105,000 seeds per hectare, variable rate seeding technology enables the planting of higher populations in more favourable parts of the paddock and lower populations in lower yielding zones.

Depending on soil test results, maize crops are planted with YaraMila Actyva S or DAP. Prior to side-dressing, Chris deep nitrogen (N) tests by management zones to determine N requirements and the appropriate rate of urea is applied using variable rate technology. Refining the fertiliser management process has resulted in a 200-300 kg/ha reduction in the amount of urea applied.

"I know the system is working because my N-use efficiency is at the higher end of the scale" says Chris. "This has significant economic and environmental benefits".

Grain harvest starts in May and continues into June. Chris uses contractors with yield mapping technology to harvest the maize. While 2021 harvested grain crops averaged 12.95 t/ha, the five-year average yield is 12.08 t/ha across all three blocks, a pleasing result as the soils are challenging in places and input costs are low relative to the industry standard.

Once the grain harvest is finished, it is a race to get the cover crop planted before the paddocks get too wet.

Over the winter months Chris spends hours poring over the season's precision farming data and planning the next year's cropping programme. He uses analytical computer software to combine yield and soil maps in a single place. This provides important data layers to generate prescription plant populations and fertiliser maps, which are fed directly to the planter or fertiliser spreader via the tractor.

"The more data you collect, the more you realise that every part of every paddock is different" says Chris. "We are improving both our economic and environmental performance by better understanding the variation and spatially applying what the crop needs".

Chris is a meticulous record keeper and uses ProductionWise to benchmark his paddocks across seasons.

"I'm also interested to compare our performance with other growers to find opportunities to make further improvements".

Research *drives yields*

Small plot trials are planted all around the country

Years of breeding, research, testing, and data analysis come together each season to bring growers a proven Pioneer® brand maize grain hybrid range that sets a new performance standard. The hybrid advancement process starts with Pioneer maize breeders around the world, progresses to our local Research Team and reaches completion with the commercial release of a limited number of new hybrids every season.

Pioneer's breeding process

The best germplasm

Pioneer® brand seeds have built one of the largest global maize genetic libraries in the world. They can trace the genetics of each maize hybrid back 90 years to the beginning of the Pioneer brand. Impeccable pedigree records allow breeders to quickly select parent lines with the most potential to address agronomic challenges and increase yield.

THIS PAGE Pioneer Research Manager Tania Gunn and Pioneer Maize Product Manager Barry McCarter inspecting a crop of P0900. **OPPOSITE** Pioneer Research Associate Jamie Millar operating a small plot planter during an IMPACT™ trial.

Computer simulation

Scientists use advanced conventional breeding technologies, unique characterisation and predictive breeding tools to simulate and predict the best performing genetic combinations across hundreds of thousands of environments before they are field tested. Petabytes of data (1M GB each) feed into computers, running millions of simulations to predict performance of different genetic combinations.

Advanced breeding technologies

Over the last decade the application of advanced conventional breeding technologies has effectively increased Pioneer's breeding pipeline twenty-fold while reducing hybrid development time by 30%. They allow rigorous testing of far more hybrid options which creates increased opportunities to find the best hybrid for your paddock.

Field trials and hybrid advancement

Now, the testing gets exponentially tougher. At Pioneer's research plots, maize hybrids that have made it this far undergo rigorous stress tests including:

Wind: The Boreas mobile wind machine simulates high winds to test stalk and root strength at critical points in the growing season.

Drought: Pioneer tests in dedicated managed stress environments and water-limited environments to develop new hybrids that make the most of every drop of water.

Disease: They breed for disease tolerance, achieving greater resistance to threats like Northern Leaf Blight and Eyespot.

Is a bigger research programme better?

With over 160 grain IMPACT™ and PAT trials around the country, growers don't have to go far to find a nearby trial. But why does Pioneer® brand seeds invest so much resource into its local hybrid trialling programme? According to Pioneer Maize Product Manager Barry McCarter, there are two main reasons:

"Firstly, even though the NZ maize market is small on a global scale, we use a variety of crop management practices to grow a wide range of hybrid maturities for a range of end uses across an array of latitudes, soil types and climatic conditions. A hybrid which performs well on a high fertility peat paddock in the Waikato may not be suitable for a moisture challenged paddock on sand in Northland. We need a lot of trials to test hybrids under local growing conditions to be sure of relative hybrid performance".

"Secondly, our maize growing seasons are extremely variable. We can't predict what the weather conditions might be during the next growing season but by planting trials at many locations over several years, we can be sure our hybrids have been tested under a wide range of conditions".

THIS PAGE A Pioneer IMPACT™ trial at Gordonton, Waikato.

New Zealand hybrid selection

Hybrid identification and trial planning

New Zealand Maize Product Manager Barry McCarter works with Pioneer maize breeders around the world to identify the best experimental Pioneer® brand maize hybrids to include in the New Zealand testing programme. Identifying and sourcing hybrids to test and coordinating the research programme is a massive job which requires careful planning and attention to detail. All trials are planted according to strict ISO 9001:2015 protocols.

IMPACT™ trials

The first stage of local trialling is the IMPACT™ (Intensively Managed Product Advancement, Characterisation and Training) trial programme. These replicated small plot trials are planted at approximately 50 sites around the country using a precision research planter. Up to 100 hybrids are tested in a single location and every trial is monitored intensively through the growing season. IMPACT™ trials are harvested using a small plot research combine that electronically captures yield, grain moisture and test weight on the go.

THIS PAGE A Pioneer IMPACT™ trial combine in action.

Product Advancement (PAT) trials

The handful of hybrids which possess promising agronomic, yield and quality characteristics move to the Product Advancement Trials (PAT) stage of testing where they are planted in strips alongside commercially available hybrids in growers' paddocks. If you are keen to visit one near you, give your local Pioneer representative a call.

Data analysis and publication

After harvest each season, multi-year hybrid performance information collected from both IMPACT™ and PAT trials is collated and statistically analysed by the Research Team using customised statistical analysis software. The resultant analysis is presented in our Maize Grain Research publications. This information assists local Pioneer Area Managers, merchant representatives and contractors to help growers choose the hybrid which will maximise their returns. Thousands of new hybrids are developed and tested by Pioneer around the world each year but less than 0.01% of products survive to make it into a Pioneer bag.

RIGHT Tania Gunn, Pioneer Research Manager in a crop of P0900.

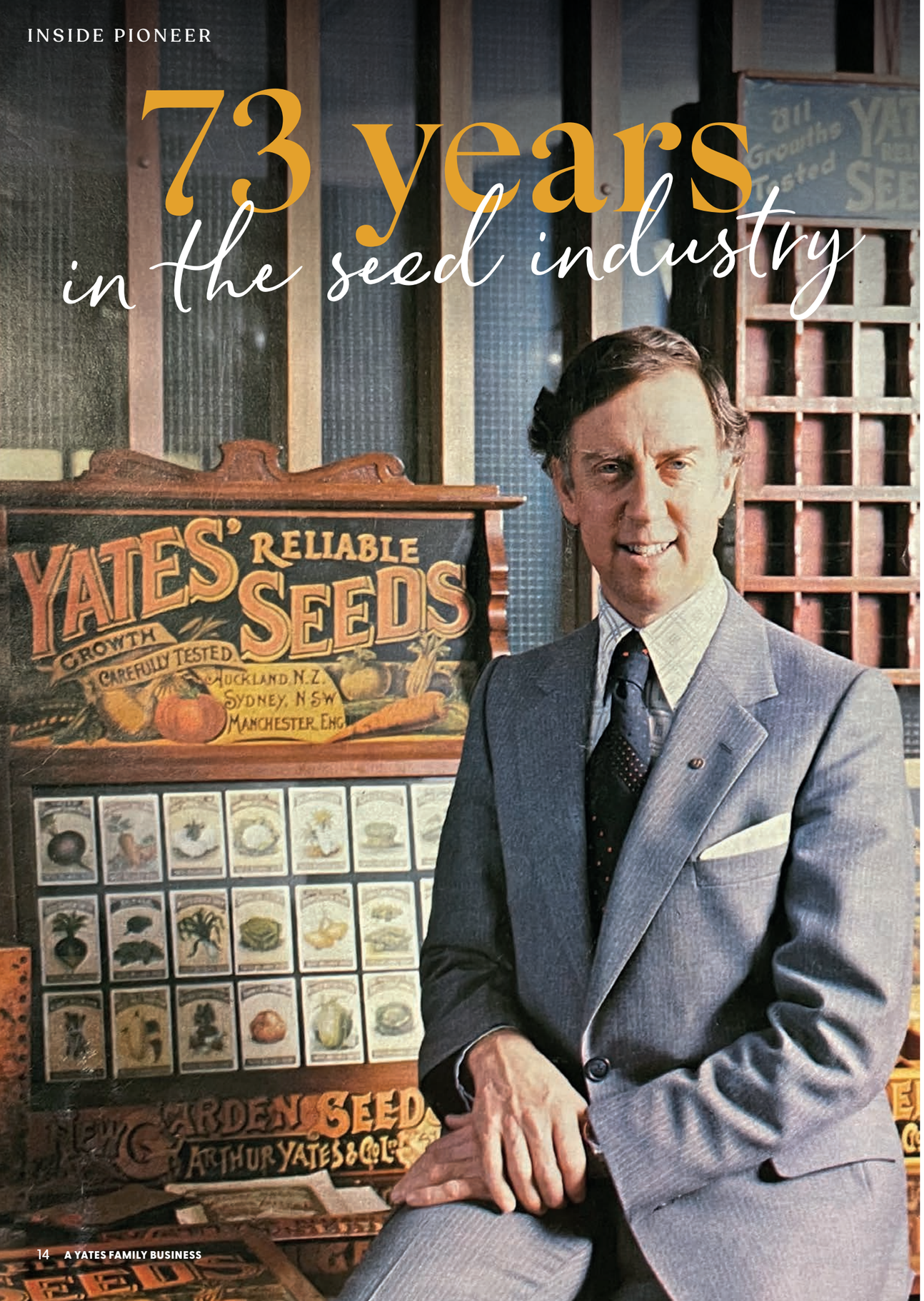
The importance of statistical significance

If you've read one of the Pioneer® brand seeds Hybrid Performance publications, you will note all hybrid comparisons include statistical significance ratings (or stars). This statistical analysis helps quantify whether the reported yield differences are due to genetic yield differences and not merely chance.

"When Hybrid A has a statistically significant yield advantage over Hybrid B, it simply means you can feel confident that the yield difference is real, not just luck or a one-off win" says Pioneer Research and Agronomy Manager Dr Rowland Tsimba.

> "I'm passionate about the Pioneer maize hybrid evaluation process because it helps identify improved hybrids which will bring increased profitability to local grain growers."
>
> Tania Gunn, Pioneer Research Manager

73 years in the seed industry



Philip Yates, founder of Genetic Technologies Ltd celebrated his 90th birthday in March 2022. In this article we honour his dedication and commitment to the New Zealand maize industry and briefly document the 47 years of Pioneer® brand maize in New Zealand.

Philip Yates joined his family's seed business, Arthur Yates and Co Ltd in 1949 as a shy 17-year-old junior. In doing so, he followed a long line of his family into the seed trade.

The Yates family's involvement in the seed industry started in England in the late 1700's. James Yates, a cotton importer purchased a small quantity of Egyptian cotton seed and on-sold it to the colonists in the southern part of the present-day USA. This proved an inspired move as the demand for cotton seed grew and very soon James relinquished his cotton importing business and became a seed merchant. His younger son, George Yates, opened the family's first seed store in Macclesfield near Manchester in 1826. Three years later he opened a second store and in 1846 his eldest son, Samuel Yates (15), was put in charge of the branch!

Over the years that followed Samuel's five sons joined him in the family seed business. Samuel's second son Arthur who suffered from asthma was given medical advice to take a sea voyage away from the smoky cold air of the industrialising British Midlands. Arthur's destination was Otago where he worked as a shepherd before settling in the Hawke's Bay. In his spare time, and to supplement his income, Arthur scythed grass seed from the sides of the road. His seed revenue quickly outstripped his shepherd's wages, and in 1882 he moved to Auckland, rented a rickety wooden shop in Victoria St West and opened a specialised seed business.

Arthur's younger brother Ernest Yates travelled from England to join him in business in 1886. A man of great vision, Ernest built a successful seed business based on integrity and focused on delivering value to his customers. Ernest was followed in the trade by his son Norman who became Managing Director of Arthur Yates & Co Ltd in 1949. Norman took the family seed firm "public" in 1969 when it was listed on the New Zealand stock exchange.

Philip, Norman's eldest son, was the sixth generation of the Yates family to be involved in the seed trade. Over the next two decades he slowly rose through the ranks of the company becoming Chief Executive and Managing Director in 1973.

Arthur Yates and Co Ltd prospered under Philip's innovative and passionate leadership. Over the next decade sales grew from $6 million to $275 million and staff numbers increased from 250 to approximately 2,000. Yates Reliable Seeds became a household name, wholesaling seed of every kind from flowers to vegetables, broad acre agricultural seeds to bird seed.

While their product range was large, Philip was always looking for superior seed products. A magazine article about hybrid wheat caught his interest and ultimately led to a phone call to Pioneer Hi-Bred's Overseas Division based in Des Moines, Iowa.

"International phone calls were both expensive and uncommon in the 1970's", says Philip. "Pioneer was surprised to get my call and even more stunned when I told them "If you will agree to see me, I can be in your office next week".

Pioneer agreed, and Philip caught a Pan Am flight to the USA that weekend. What followed was a whirlwind tour of Pioneer's operations and breeding programmes and meetings with many people including Dr William Brown and Tom Urban who, at the time, were Head of Research and Chief Executive respectively.

OPPOSITE Philip Yates on the front cover of The New Zealand Financial Times (July 1979). **THIS PAGE (TOP)** Philip Yates with his son Will, and **(ABOVE)** a Yates Catalogue published in 1932 – the same year Philip Yates was born.

Philip was impressed by Pioneer's significant library of elite maize germplasm, their commitment and innovation in plant breeding, and above all else, their conservative family values and customer-focused "Long Look" philosophies. A long-term relationship was formed, and the Yates company became the New Zealand distributor and producer of Pioneer® brand seed.

The timing could not have been better. In the 1970's Pioneer had invested significantly developing hybrids with ever-higher yields. Their new corn hybrids were breaking USA yield records and sales were on a rapid upward trajectory increasing five-fold from 1972 to 1980.

While Pioneer had a range of exciting new products, New Zealand's tight biosecurity requirements meant that only about 48 individual maize seeds could be imported at a time. On arrival seed had to be treated with a toxic combination of fungicides which meant only half would remain viable.

"Because we started with such a small seed volume, it took us three years to get enough seed for a single trial" says Philip.

The first Pioneer maize hybrid to be commercialised in New Zealand was 3780.

"Growers loved it because it not only yielded well, but it didn't fall over" says Philip. "This was a real bonus because prior to 3780's introduction it was not uncommon for the combine to drive slowly with people walking in front standing up plants so the cobs could be harvested".

The initial Pioneer seed crops were hand-picked, and sun dried but as sales grew, Arthur Yates and Co built a seed production plant at Waharoa in the eastern Waikato. The seed drier was fired by burning the cob cores which saved fuel costs but ultimately proved to be a costly decision.

"The level of technology was low at the time and the smoke and gases discharged from incomplete cob combustion was so acidic that after three years the new seed production plant was almost completely rusted away" says Philip.

As the maize seed production plant was coming to an untimely end, so too was the Yates family's involvement in the Yates company. In 1985, Equiticorp, a recently established investment bank, took control of the company via a share market raid and at the age of 53, Philip was dismissed and given two days to vacate his office.

It was a rough blow for Philip who had lost a 200-year-old family business along with the only career he knew. Pioneer were unimpressed by the turn of events. They cancelled their distribution agreement with the now Equiticorp-controlled Yates company and offered Philip the Pioneer representation in New Zealand. Genetic Technologies, a 100% Yates family-owned agribusiness was formed.

For the first two seasons, Genetic Technologies imported Pioneer® brand maize seed but in 1991, a new seed production plant was commissioned in Gisborne.

"The growing conditions in the Gisborne region were perfect for maize allowing us to produce some of the world's finest quality seed" says Philip.

Over the next few years, Genetic Technologies invested significantly in hybrid and agronomic research as well as promoting the use of maize silage into the dairy industry.

"We quickly realised it was impossible to get high quality trial data from a handful of trials" says Philip. "Pioneer had an enormous pool of maize genetics but we needed to grow sales so we could afford to invest in a large-scale local hybrid evaluation program which would allow us to accurately identify those which performed best under New Zealand's wide range of growing conditions"

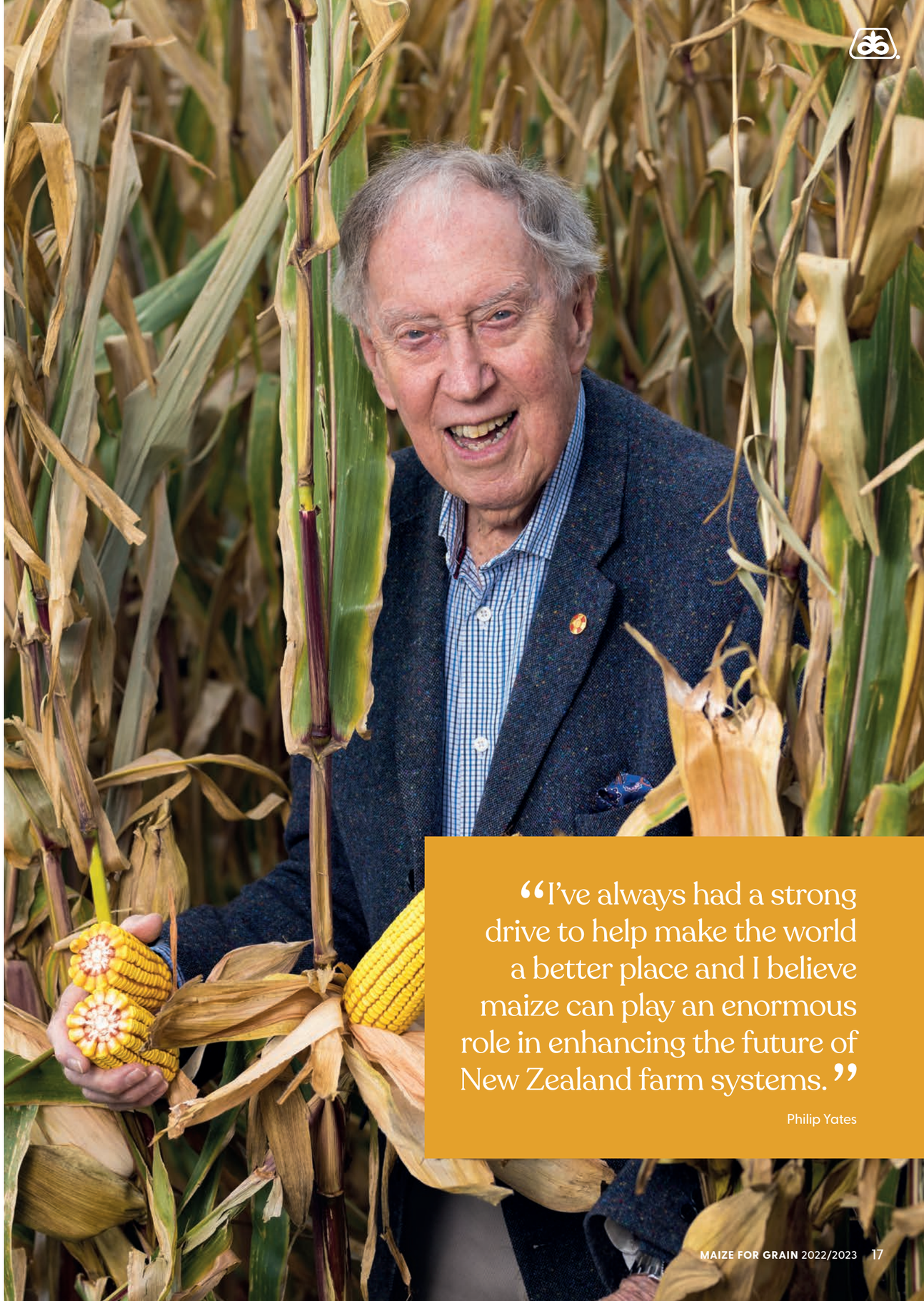
For Philip a highlight has been seeing maize yields increase year after year, as a result of both higher yielding maize genetics and improved crop management practices.

"We have gone from plate planters to sophisticated, computer-controlled vacuum planters. High rates of granular insecticides have been replaced with more user-friendly and effective insecticide seed treatments. We have replaced long fallow periods with fast maize crop establishment using a range of selective herbicides to control weeds".

Today Philip's son Will, who joined the company in 1990, leads the management team. However, at 90 years young, and after many "retirement" functions held over the past 20-years, Philip is still well and truly engaged in the business. His key passion remains the identification and advancement of new, superior maize hybrids.

"I've always had a strong drive to help make the world a better place and I believe maize can play an enormous role in enhancing the future of New Zealand farm systems" says Philip. "Hybrid maize is quite an extraordinary crop and Pioneer's ongoing global breeding investment will make it even better into the future".

Happy 90th birthday Philip and thank-you for 47 years of contribution to the New Zealand maize industry.



"I've always had a strong drive to help make the world a better place and I believe maize can play an enormous role in enhancing the future of New Zealand farm systems."

Philip Yates

Growing the market *for your grain*

The high price of imported livestock feeds (including palm kernel extract) coupled with a promising forecast dairy payout is enhancing the demand for New Zealand grown maize grain.

Pioneer Farm Systems Specialists continue to vigorously promote maize products including maize grain, earlage and silage to the livestock sector. They are seeing an increasing number of farmers who recognise the animal performance, reproductive and health benefits from feeding maize.

The Pioneer Maize Grain for Dairy Cows manual outlines the economic, nutritional and environmental advantages of feeding maize grain. It presents details of the various forms of maize grain available in New Zealand, together with processing and feeding guidelines. Also available is a shorter Maize Grain for High-Performing Dairy Cows brochure.

Please contact your local Pioneer Area Manager to request copies of either publication, or to arrange for one of our Farm Systems Specialists to visit you, or your current or potential customers.

For more information or to download a copy of the Maize Grain for Dairy Cows manual scan here

Maize hybrids

When we commercialise Pioneer® brand maize grain hybrids, we think local. Pioneer products are tested in around 160 maize grain trials across New Zealand. Chances are there is a trial located somewhere near you. Our field team are also based in the main maize growing regions around the country. They understand how our hybrids perform and they know the best products for your local climate, soil types, growing conditions and farm system requirements. Give one of them, your local merchant or contractor a call for advice on choosing the right product for your paddock.

For more information on the performance of Pioneer® brand maize grain hybrids see our Maize Grain Research Publication.

The drought performance leaders

Optimum AQUAmax® hybrids are developed to deliver yield stability, rain or shine.

Designed to make more out of every drop

Optimum AQUAmax® hybrids are highly resilient in challenging conditions and responsive to favourable ones. These hybrids are bred to include key traits that improve your crop's root system and silk emergence, among other agronomic characteristics, to manage drought stress.

Superior performance year after year

Optimum AQUAmax® hybrids minimise the risk of decreased yields in water-limited environments while also designed to take advantage of more favourable growing conditions.

Optimum AQUAmax®

NEW

Meet the latest from Pioneer

They're here: new products designed to deliver high yield potential and top performance in your local conditions. These hybrids have all demonstrated yield and agronomic advantages over current Pioneer hybrids in PAT and IMPACT™ trials – bringing higher grain yields to your farm. It's a whole new level of profitability.

PIONEER® BRAND P8333

HIGHLY PRODUCTIVE OPTION FOR COOLER REGIONS.

see page 23

PIONEER® BRAND P9978

VERY PRODUCTIVE. VERY STABLE. VERY DEFENSIVE.

see page 27

PIONEER® BRAND P0900

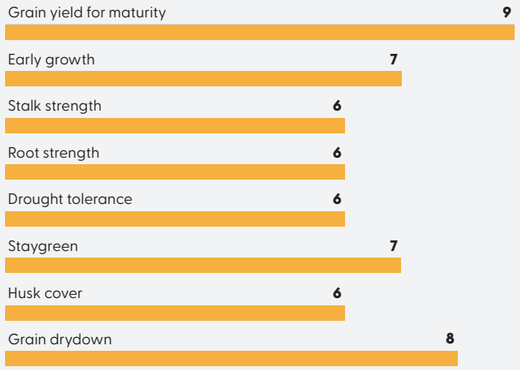
Optimum AQUAmax®

HARD TO FAULT, STABLE, ALL-ROUND HYBRID.

see page 30

CRM 80

PIONEER® BRAND P8000



Widely adapted, versatile stalwart.

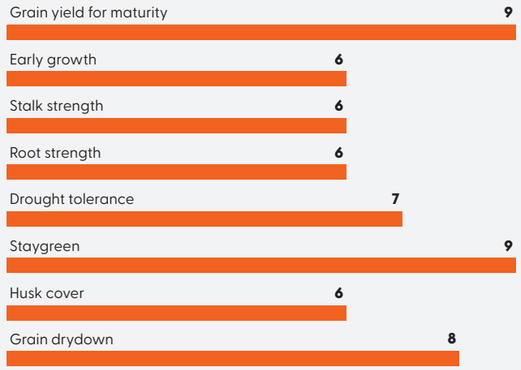
P8000 is tall, with low ear placement, strong roots and stalks for dependable standability.

- Strong staygreen, Northern Leaf Blight and Rust resistances that deliver season long eye appeal.
- Good husk cover over a chunky cob with deep dent grain with high test weight.
- Yields well and has fast drydown.

A popular choice in the lower North Island and South Island, while providing a balance of yield and earliness in northern growing regions.

CRM 85

PIONEER® BRAND P8500



Yield leader with looks to match.

Delivers grain yields and test weights similar to **P8805**.

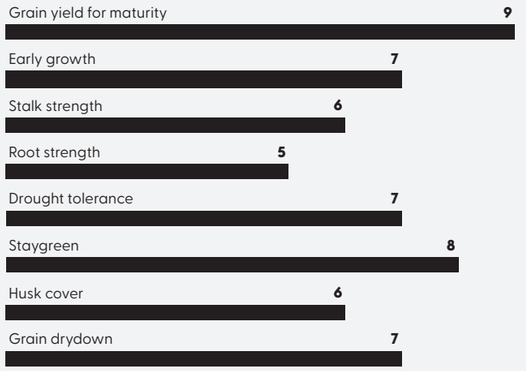
- Tall plant with a solid agronomic package, great standability, drought tolerance and staygreen.
- Above average husk cover, test weight and very fast drydown for timely grain harvest.
- Where Northern Leaf Blight is a concern plant **P8805** or **P8666**.

Well adapted to the lower North Island and South Island growing regions where a hybrid of this maturity is required.

NEW

CRM 83

Highly productive option for cooler regions.



P8333 is a tall plant with a long ear, good husk cover, supported by strong all-round agronomics, superior drought tolerance and staygreen.

- Has fast drydown, good test weight and raises the yield bar in this maturity.
- While slightly earlier than **P8666** it has similar in-paddock appearance.
- An important mid-maturity option between **P8000** and **P8500**.

Delivers much higher grain yields than **P8000** in the cooler regions of the lower North Island and South Island where this maturity is required.

Key yield comparisons

Feature hybrid	Comparison hybrid	Number of trials	Harvest moisture difference (%)[1]	Yield advantage (kg/ha)[2]	Statistical significance[3]
Lower North Island & Taranaki					
P8333	P8000	27	-0.22	1,702	★★★
P8333	P8500	27	0.19	-774	★★

Recommended plant populations

Since **P8333** is a tall leafy plant, optimum populations should be approximately 5,000 per hectare less than applied for **P8000** and **P8500**.

Recommended established plant populations (000s/ha)		
Challenging yield environments	Medium yield environments	High yield environments
85	95	105

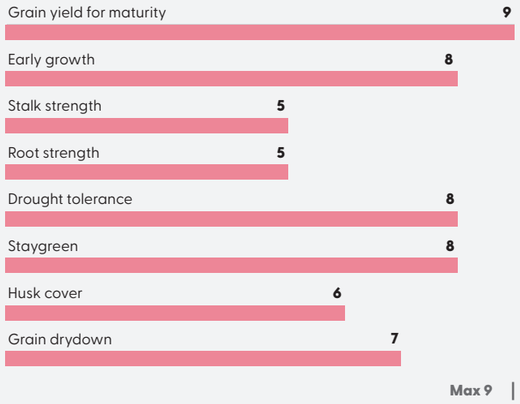
[1]Positive harvest moisture differences means the bolded hybrid was drier at harvest, negative differences mean it was wetter. [2]A positive yield advantage means the bolded hybrid produced more yield, a negative yield advantage means it produced less. [3]For information on statistical significance see the Pioneer Maize Grain Research Publication.

IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or - 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54-55. Contact your local Pioneer Area Manager or merchant for further advice.

See pages 52-53 for regional hybrid recommendations.

CRM 86

PIONEER® BRAND P8666



High performance hybrid with excellent agronomic properties.

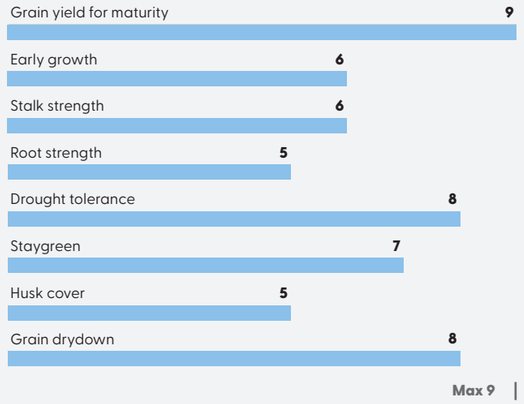
A tall imposing plant with strong all-round agronomics, superior drought tolerance, Northern Leaf Blight resistance and staygreen.

- Good husk cover, very good drydown and delivers top grain yields for maturity, with superior test weights.
- Large-framed hybrid so established plant populations should be approximately 10,000 per hectare lower than planted for **P8805**.
- Widely adapted from Dargaville to Ashburton where a hybrid of this maturity is required.

P8666 is intermediate in maturity between **P8500** and **P8805**.

CRM 88

PIONEER® BRAND P8805



All-rounder for tough and ideal conditions.

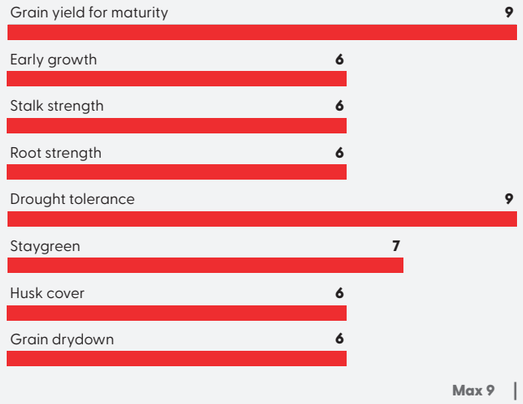
A tough hybrid providing growers with production stability.

- Performs where water may be limited as well as under ideal conditions.
- Has excellent all-round agronomics, a balanced disease profile and fast drydown.
- A popular choice for growers in northern production regions who require early grain harvest.

A resilient widely adapted plant which may be grown from Northland, as a very early option, all the way to Canterbury as a fuller season product.

CRM 91

PIONEER® BRAND P9127



Bred to defend – yields to impress.

Early maturity Optimum AQUAmax® offering yield stability for grain and silage.

- Tall plant with strong roots, stalks, drought tolerance and staygreen combined with solid leaf disease resistances.
- Good husk cover and ear rot resistances.
- Often produces a second cob resulting in higher-than-expected grain yields.
- Yields best in moderate to high yielding paddocks.

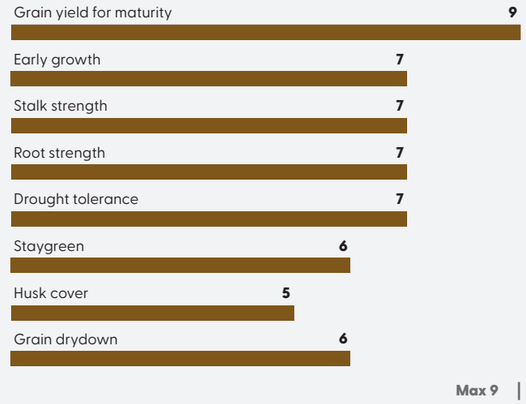
Companion with **P8666**, **P8805** or **P9400**.

Widely adapted to all North Island growing regions where a hybrid of this maturity is required.

Optimum AQUAmax®

CRM 94

PIONEER® BRAND P9400



Trusty and reliable. Delivers year after year.

An imposing plant that delivers consistent grain yields with high test weights.

- Strong agronomically with a sound all round disease resistance offering.
- A widely adapted hybrid intermediate in maturity between **P9127** and **P9721**.
- When planting very early into cold wet soils consider **P9127** or **P9721** depending on maturity requirements.

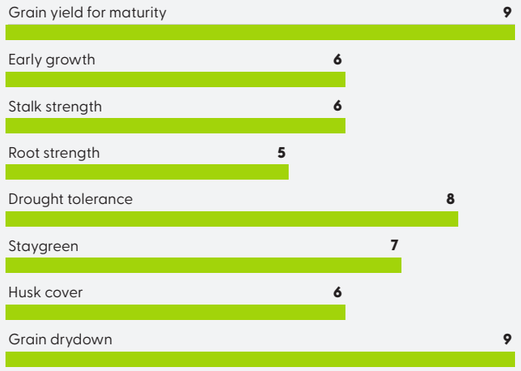
Performs best in moderate to high yield environments from Kaitaia to Masterton.

IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or - 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54-55. Contact your local Pioneer Area Manager or merchant for further advice.

See pages 52-53 for regional hybrid recommendations.

CRM 97

PIONEER® BRAND P9721



The hero for fast drydown and timely harvest.

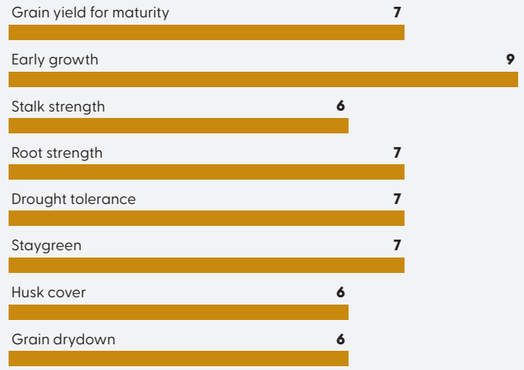
P9721 offers a great all-round balanced package of agronomic and disease resistance traits.

- High ratings for drought, staygreen, Northern Leaf Blight and Rust contribute to the delivery of consistent grain yields.
- Has very fast drydown for earlier harvest and reduced drying costs.
- Plant with **P9127**, **P9978** or **P0021**.

Popular as a mid to late maturity hybrid in the lower North Island while being an earlier option in the warmer regions in the north.

CRM 100

PIONEER® BRAND P0021



Hard to beat consistency.

Produces an eye-catching cob on plants with sound standability and staygreen, bundled together with top disease resistances.

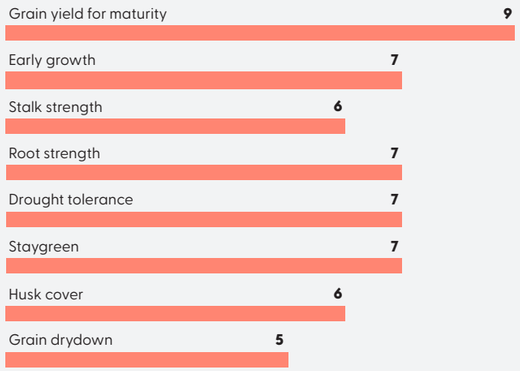
- A relatively short plant with excellent grain yields.
- Most productive in moderate to high yield environments.
- An important mid-maturity hybrid in the north and a top full-maturity option in the lower North Island.
- Companion with **P9721**, **P9978** or **P0362** depending on agronomic and maturity requirements.

Widely planted from Northland to Rangitikei.

NEW

CRM 99

Very productive. Very stable. Very defensive.



P9978 is a modern erect-leaf hybrid with strong standability, drought tolerance and great all-round agronomic and leaf disease resistance package.

- Trials show that **P9978** delivers industry leading grain yields in this maturity.
- Harvest moisture is at the mid-point between **P0021** and **P0362**.
- Consider in place of **P9721**, **P0021** or **P0362** depending on maturity requirements.

Widely adapted to all North Island growing regions where this maturity is required.

Key yield comparisons

Feature hybrid	Comparison hybrid	Number of trials	Harvest moisture difference (%)[1]	Yield advantage (kg/ha)[2]	Statistical significance[3]
National					
P9978	P0021	96	-0.71	969	★★★
P9978	P0362	94	0.84	394	★★
P9978	P9721	59	-1.50	1,025	★★★

Recommended plant populations

Delivers in challenging through to high yielding environments and will reward the time taken to select and plant the best seeding rate for the growing situation.

Recommended established plant populations (000s/ha)		
Challenging yield environments	**Medium yield environments**	**High yield environments**
85	95	110

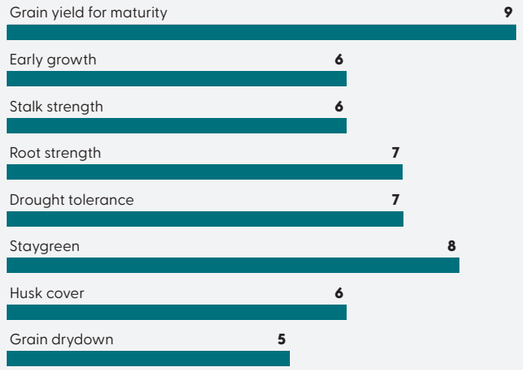
[1]Positive harvest moisture differences means the bolded hybrid was drier at harvest, negative differences mean it was wetter. [2]A positive yield advantage means the bolded hybrid produced more yield, a negative yield advantage means it produced less. [3]For information on statistical significance see the Pioneer Maize Grain Research Publication.

IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or - 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54-55. Contact your local Pioneer Area Manager or merchant for further advice.

See pages 52-53 for regional hybrid recommendations.

CRM 103

PIONEER® BRAND P0362



Robust hybrid with yield stability and “eye appeal”.

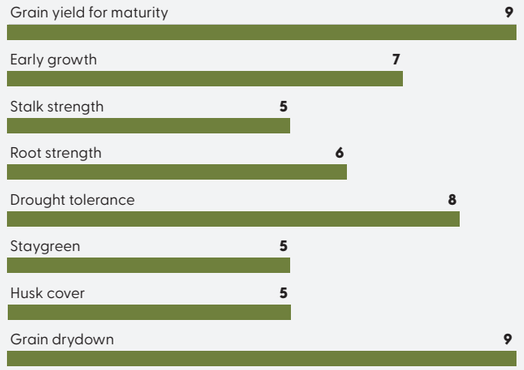
Has an exceptionally robust all-round plant profile producing a chunky ear with deep grain and sound husk cover.

- A top option where standability, Northern Leaf Blight, Rust or Eyespot are concerns.
- These strengths are complemented by superior drought tolerance, staygreen, sound ear rot resistances, good test weight and yield stability.
- Compared to **P0547**, **P0362** has better Northern Leaf Blight resistance and standability, similar yield performance while being about 1.5% wetter at harvest.

Widely adapted to North Island growing regions where a hybrid of this maturity is required.

CRM 105

PIONEER® BRAND P0547



The Rangitikei pace-setter.

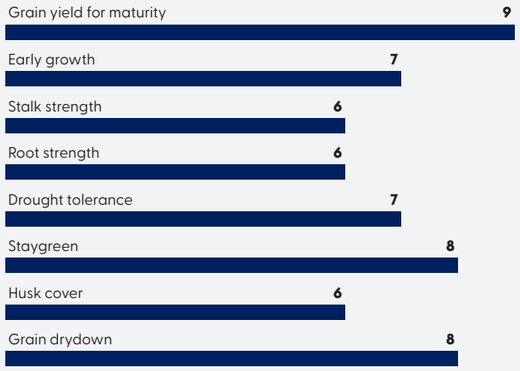
A broadly adapted hybrid that is particularly productive in Rangitikei.

- A well-balanced hybrid with grain appeal.
- Outstanding early growth and drought tolerance.
- Shows very fast grain drydown so reaches grain harvest moisture as a 101 CRM hybrid to facilitate earlier harvest timing.

Where Northern Leaf Blight is a concern plant **P9978**, **P0021**, or **P0362**.

CRM 106

PIONEER® BRAND P0640



Leaf disease champion delivering yield stability.

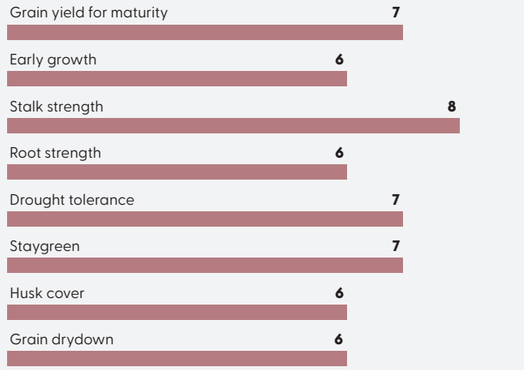
Great looking hybrid combining excellent all-round agronomics with desirable ear rot, superior Northern Leaf Blight, Common Rust and Eyespot resistances.

- Tall plant with sound standability, staygreen and drought tolerance.
- Growers will appreciate the harvest opportunity presented by this hybrid’s very fast grain drydown.
- Companion with **P0362**, **P0900** and **P0937** after considering yield expectation, hybrid maturity and desired harvest timing.

Particularly productive from Northland through Waikato, Bay of Plenty and the East Coast where its foliar health, fast drydown and yield performance have been noted by many growers.

CRM 107

PIONEER® BRAND P0891



A veteran hybrid which produces a “sea of gold”.

Very good drought tolerance, standability and staygreen combined with strong resistance to Northern Leaf Blight, Common Rust and Eyespot.

- Best suited to moderate to high yielding paddocks.
- Produces grain with excellent appearance, very high test weight and with food grade end-use quality.
- Well adapted to high plant populations which should be adjusted to match growing conditions and yield expectations.
- Other hybrids to consider include **P0640**, **P0900** and **P0937** which is better adapted to planting in cool challenging situations.

Delivers yield stability for grain and silage from Kaitaia to Napier.

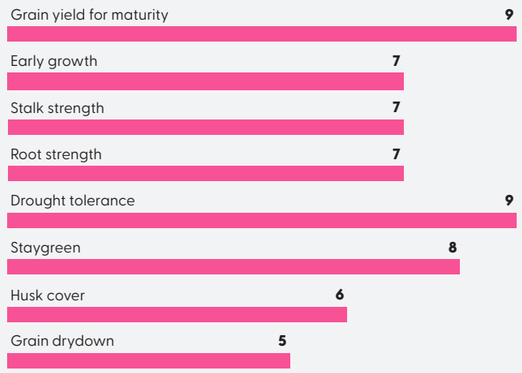
IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or - 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54-55. Contact your local Pioneer Area Manager or merchant for further advice.

See pages 52-53 for regional hybrid recommendations.

NEW

CRM 109

Hard to fault, stable, all-round hybrid.



P0900 is a tall plant with a long ear, packed with deep grain to deliver impressive grain and silage yields.

- The season long grain appeal of **P0900** is delivered by excellent standability, low ear placement, AQUAmax® drought tolerance, great foliar health and staygreen.
- An exceptionally balanced package that delivers yield stability.
- East Coast growers will value strong Head Smut resistance.
- Companion with **P0640** or **P0937**.

Already extensively planted between Dargaville and Napier.

Key yield comparisons

Feature hybrid	Comparison hybrid	Number of trials	Harvest moisture difference (%)[1]	Yield advantage (kg/ha)[2]	Statistical significance[3]
		National			
P0900	P0891	82	-0.68	670	★★★
P0900	P0937	82	-0.41	-526	★★

Recommended plant populations

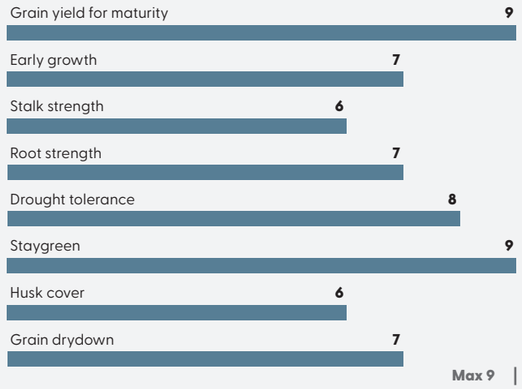
A classic AQUAmax® hybrid delivering top of the line yield stability. Maximise this strength by adjusting plant populations according to paddock yield expectation.

Recommended established plant populations (000s/ha)		
Challenging yield environments	Medium yield environments	High yield environments
80	90	110

[1]Positive harvest moisture differences means the bolded hybrid was drier at harvest, negative differences mean it was wetter. [2]A positive yield advantage means the bolded hybrid produced more yield, a negative yield advantage means it produced less. [3]For information on statistical significance see the Pioneer Maize Grain Research Publication.

CRM 109

PIONEER BRAND P0937



Solid hybrid with next generation grain yield.

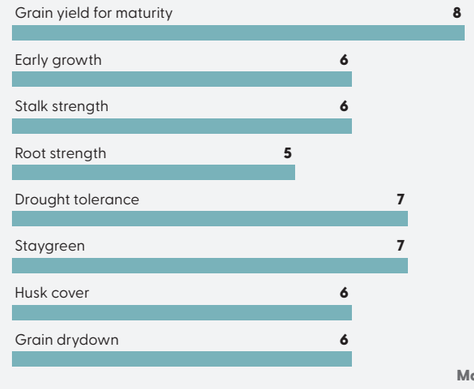
A widely adapted high yielding hybrid shown to deliver the next step in grain yield performance in this maturity.

- Very appealing modern plant type, with low ear placement, erect leaves, notable standability and sound husk cover.
- Combines superior resistances to Northern Leaf Blight and Rust with strong stress emergence, exceptional staygreen and drought tolerance.
- With average test weight it will not match the food corn grain quality of **P0891** and **P1253**.

P0937 is well adapted in moderate to high yielding situations in Northland, Waikato, Bay of Plenty, Gisborne and Hawke's Bay growing regions.

CRM 109

PIONEER BRAND P1253



Pack your paddock for top grain quality.

P1253 is moderate in height, with low ear placement, a strong agronomic package, excellent staygreen and good drydown for maturity.

- **P1253** is well adapted to moderate to higher yielding situations.
- Produces grain with high test weight and notable food corn quality.
- Plant with **P0900** and particularly **P0937** for very early planting into cold challenging paddocks or where Northern Leaf Blight is a concern.

P1253 is a widely grown grain hybrid in Bay of Plenty, Gisborne and Hawke's Bay growing regions.

IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or – 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54-55. Contact your local Pioneer Area Manager or merchant for further advice.

See pages 52-53 for regional hybrid recommendations.

CRM 114

PIONEER® BRAND P1477W

Grain yield for maturity	9
Early growth	6
Stalk strength	8
Root strength	8
Drought tolerance	7
Staygreen	8
Husk cover	5
Grain drydown	6

Max 9 |

Top performing late white hybrid.

A white grained hybrid producing attractive well filled cobs of food quality, high test weight grain. Valued by food corn and poultry producers.

- Tall, erect leaf, modern plant type with excellent standability, drought tolerance and staygreen.
- Has superior Northern Leaf Blight, Common Rust, Eyespot and Fusarium ear rot resistances.

Plant before 20th October in Northland, Bay of Plenty and East Coast to deliver on the yield potential of this compelling hybrid.

IMPORTANT NOTE: Hybrid comparisons are only valid within a range of + or – 4 CRM. These descriptions mainly feature product strengths. When choosing hybrids, also review carefully the trait ratings found in the table on pages 54–55. Contact your local Pioneer Area Manager or merchant for further advice.

Hamish Johnstone
Grain Account Manager

According to Hamish

Hamish, who holds a Bachelor of Agricultural Science from Lincoln University, worked in extension agronomist and sales roles within the seed industry before joining the Pioneer team.

His role includes working with grain growers in the Waikato and Northland helping them to maximise the yield and profitability of their crops whilst keeping abreast of increasing environmental requirements. He also works with key industry partners to explore and develop market opportunities for New Zealand grown maize grain.

Hamish has an interest in minimum and strip tillage systems and an excellent knowledge of catch crop options.

“I’m passionate about the opportunities for locally produced maize grain and enjoy working with local growers to help them maximise yield and the return they can generate from their maize grain cropping systems” says Hamish.

Maize grain *increases income*

CRANSTONE FAMILY, FORDELL, WHANGANUI

Maize grain has provided a diversification option whilst generating additional income for the Cranstone family.

Peter and Roseanne along with their son James and his partner Sarah farm 252 ha at Fordell, approximately 20 km from Whanganui in the Whangaehu valley. The 2022 maize harvest season was a very happy one for the family delivering a grain yield of 16 t/ha as well as Tommy, a baby son for James and Sarah and sister to Georgie (4).

"I hope Tommy is going to like tractors and combines, because every year they are going to arrive on farm on his birthday" says James.

James is the third generation to farm the land which was purchased after the Second World War by his grandfather Jim Cranstone who was an RAF fighter pilot.

"He came home from the war, travelled the country looking for land and ended up buying a property just a few miles down the road from his family's home farm" says James.

The property comprises of 60% flat land in two terraces, the lower of which borders the Whangaehu River. Around 13 ha of barley is grown and 23 ha of maize grown on the river flat. Livestock is farmed around the crops and on the reasonably steep hills in between the terraces.

"Each year we run 330 dairy heifers on a May-to-May contract while also grazing around 60 wagu weaners over summer and run 140-150 head of Friesian x Hereford steers" says James. "The beef cattle come onto the property as weaners and are killed out as rising three-year-old's at around 350 kg carcass".

LEFT Peter Cranstone (right) with his son James, his partner Sarah and their daughter Georgie.

Five years ago Peter and James were looking at diversification options and their local contractor introduced them to Pioneer Regional Manager David McDonald.

"They both came over and we had a good chat about how maize grain might fit into our system" says James.

The following spring the Cranstones "jumped in and took a bit of a gamble" with a 17 ha maize grain crop. It yielded 16.8 t/ha, the family were hooked and have grown maize every year since.

They have divided some of the bottom flats into three blocks and the long-term plan is to grow maize grain for three years rotating between them. This will mean each paddock has three years in crop followed by six years in pasture.

The first year, the perennial ryegrass pasture is sprayed out and Peter and James prepare the land for planting. First they plough, then use a paddle roller to flatten the furrows. Base fertiliser at 400 kg/ha of superphosphate plus coated urea and lime (1½ t/ha) are spread, then the area is disced before a local contractor plants the crop with 300 kg/ha of Nitrophoska Select down the spout.

Farm walk

- Hybrids planted: P8666 and P9127
- 23 ha of maize grain grown in 2021-22 season
- 2021-22 harvest yielded 16 t/ha

Peter and James are looking for maize hybrids which will "consistently yield as much as possible but come off as soon as possible". This season they have planted a mix of Pioneer® P8666 and P9127.

"Consistency is what we look for in all of our farming practices" says James. "We don't want to be in the position where income is high one year, but low the next".

Crops are generally planted at 105,000 seeds per hectare, but the contractor drops the population to 80,000 seeds per hectare in the lower yielding, sandy parts of the paddocks.

After the crops are side-dressed in mid-to-late November, it is just a matter of watching them grow until harvest time which is usually in the first couple of weeks in April.

For the first two years of the maize grain rotation, crops are planted into annual ryegrass. High yielding maize crops deliver high levels of stover behind the combine which can make the rapid establishment of pasture challenging. After trying a few options, the Cranstones have settled on using heavy speed discs to incorporate the stubble before sowing the pasture using a roller air seeder.

Once the new grass is 5-7 cm high, it is fertilised with 75 kg N/ha which also helps with stubble breakdown. Typically the ryegrass is ready for grazing within five to six weeks of planting and usually delivers six grazings before the paddocks are sprayed out and replanted in maize the next spring.

"Getting a good stand of new grass established early is an important part of our system" says James. "We have found we can generate a really good income from the combination of maize grain and wintering the dairy heifers on annual ryegrass".

OPPOSITE PAGE Peter and James inspect their maize grain crop.

> "We have found we can generate a really good income from the combination of maize grain and wintering the dairy heifers on annual ryegrass."
>
> James Cranstone

LumiGEN™ Seed Treatment

GIVING YOUR MAIZE SEED A HEAD START

Maximise your crop's yield potential with Pioneer's exclusive LumiGEN™ seed treatment recipes which have been tested and proven for use on Pioneer® brand maize hybrids. You can plant with confidence knowing your seeds and seedlings have advanced protection against pests, disease, and uncertain soil conditions during the critical early growth period.

THIS PAGE Freshly treated seed for research.

LumiGEN™ seed treatments are available to:

1. Protect your maize from diseases

Our seed treatment recipe includes fungicides which provide robust protection against a range of seed and soil borne diseases in maize, such as Pythium, Rhizoctonia and Fusarium.

2. Protect seedlings from insect damage

We offer several insecticides options which provide protection against the most common NZ maize pests – Argentine stem weevil, greasy cutworm, black beetle, and nematodes.

3. Keep birds away from your seed

A scientifically formulated non-lethal bird repellent stops birds from eating newly planted maize seed. This unique formulation is based on an organic chemical found in a number of plants, including aloe vera and rhubarb. Each kernel is surrounded with a protective coating that causes birds immediate, yet temporary, digestive discomfort.

Talk to your local Pioneer representative, merchant or contractor to determine the best LumiGEN™ seed treatment option for your crop.

	Fungicide	Insecticide				Bird Repellent
	Seed & Soil borne diseases	Black Beetle	Argentine Stem Weevil	Greasy Cutworm	Nematodes[1]	
LumiGEN™						
L-200	✓					
L-200+	✓					✓
L-300	✓	✓	✓			
L-300+	✓	✓	✓			✓
L-400	✓	✓	✓*	✓	✓	
L-400+	✓	✓	✓*	✓	✓	✓

* Research data shows the insecticide in L400 and L400+ is more effective at reducing plant loss due to Argentine Stem Weevil damage than the insecticide in L300 and L300+

[1] L400 and L400+ contains Bacillus spp which suppresses nematode damage in maize

Quality seed treatment

You've invested in outstanding Pioneer genetics for your paddock. We've invested in protecting their performance potential. Seed is a living organism and anything which is applied to it has the potential to impact its ability to emerge evenly and grow into healthy, uniform crops. While the ability of seed treatment ingredients to control pests and diseases (also known as its efficacy) is important, seed safety is equally critical. Each hybrid has a unique genetic background which means the seed from each reacts differently to varying combinations of seed treatment ingredients. Join us on a journey which outlines the steps we take to ensure we maximise the quality and performance of every bag of LumiGEN™ treated maize seed you plant.

High quality ingredients

The Pioneer team in New Zealand works closely with the world's leading seed treatment suppliers to identify and source the most effective active ingredients for the unique combination of pests and diseases local growers encounter in their paddocks.

We are currently working with several seed treatment suppliers to identify, trial and where applicable, register new maize seed treatments which will deliver improved pest or disease control, increased yield and/or environmental benefits for New Zealand maize growers.

Extensive seed treatment trials

Our seed batch treater allows us to treat small quantities of seed which can be used to assess the impact of seed treatment ingredient combinations on maize seed quality and in-field performance. All our LumiGEN™ seed treatment options have been tested across the range of Pioneer maize hybrids sold in New Zealand.

Our seed treatment trial programme includes both laboratory and field trials. Seed quality is tested before and after treatment, and then repeatedly over the next two years to monitor the longer-term impacts on seed quality. We monitor warm germination but also use a proprietary Pioneer Stress Test (PST) to evaluate how well the seed will germinate and grow in cool, wet soils.

Our replicated, multi-year stress emergence trials are designed to test the field performance of different seed treatment formulations under local growing conditions. We plant seed ultra-early at twice the normal planting depth to replicate the toughest planting conditions seed will encounter in the field. Stress emergence trials are carefully monitored by the Research Team. Days to emergence and emergence percentage data is collected, collated, and statistically analysed.

THIS PAGE Pioneer Seed Treatment Manager Kyle Gardyne using the trial seed treater.

Rigorous commercial product testing

Once a seed treatment combination has passed laboratory and stress emergence trial testing, a larger quantity of seed is treated through our commercial seed treatment system and used in our IMPACT™ and PAT trial programmes (see pages 8–13 for more information).

You can purchase LumiGEN™ seed treatments with confidence knowing they have been rigorously tested on many farms across multiple growing regions over several seasons.

LumiGEN™ seed treatment process

We comply with Pioneer's global ISO 9001:2015 accredited standards for sizing, conditioning, and seed treating to ensure you receive the best quality seed every time.

Accurate chemical application

Our experienced seed treatment team use continuous batch treaters (CBT) and carefully calibrated "loss in weight" pump stations to apply exact quantities of each individual ingredient to measured amounts of seed. This process allows us to deliver a precise and even application of the desired LumiGEN™ treatment to each and every seed. All treatment runs are accurately calibrated based on seed counts per kilogram to ensure individual seeds receive the correct amount of active ingredient regardless of their size. This maximises protection and safeguards seed germination and seedling vigour. A high-quality polymer ensures all components of the treatment ingredients adhere to every seed for superior plantability.

Careful and consistent moisture removal

The fluidised bed drying system removes excess moisture from the treatment process ensuring that seed is dry before it is bagged. This is important as small fluctuations in the moisture content of seed can have a big impact on its shelf-life and field performance.

Strict quality control

Throughout the entire process, electronic monitoring and strict quality controls ensure an accurate high quality treatment finish for every seed in every bag. Every bag of Pioneer® brand seed is mechanically stitched closed with green and white bi-colour tamper proof string. This 'locks-in' the Pioneer warranty, re-plant risk policy and guarantees the amount (80,000 kernels) and quality of seed in each and every bag. Treated seed is sampled for quality testing, before being carefully stacked onto pallets.

THIS PAGE (above right) "Loss in weight" chemical pump stations.

Andrew Powell
Seed Production Manager

According to Andrew

After spending nine years in a range of Pioneer sales, technical and research roles, Andrew took on the role of Seed Production Manager in 2020.

For the past two seasons he has enjoyed the challenge of producing some of the world's finest seed maize grown on the fertile flats of the Gisborne region.

Andrew and the Gisborne Seed Production Team work tirelessly, up to seven days a week in critical periods including planting, detasseling, conditioning, treating and dispatch, to ensure every bag of maize seed they produce meets Pioneer's rigorous global quality standards.

"Maize seed is a living organism, and every hybrid responds differently to seed treatment ingredients and the treatment process" says Andrew. "We place a huge importance on ensuring that the treatments we apply control target pests and diseases whilst having the lowest possible detrimental impact on seed quality".

Maize growing *a family business*

Farming is a family affair for Tom and Amanda Newman who along with sons George (18) and Charlie (16), run a diversified farming operation on close to 500 ha near Gisborne.

The Newmans, who were the national winners of the 2021 Pioneer Maize for Grain Yield Competition with a P0640 yield of 22.33 t/ha, grow around 120 ha of maize for grain each season. They also lease land out to grow a range of vegetable crops including broccoli and squash, fatten around 5,000 lambs and 150 beef cattle and run a 7 ha citrus orchard. An 11 ha apple orchard is leased out as is a further 22 ha for onions. Tom also runs a contract harvesting business and typically harvests around 400 ha of maize and popcorn for local growers each year.

OPPOSITE Tom Newman and Pioneer Area Manager Simon Begley.

Farm walk

- Hybrids planted: P1253 and P9978
- 120 ha of maize grain grown each season
- 40+ years of growing maize grain

The Newmans are also long-term Pioneer® seed maize growers. They planted their first crop in 1996 and have grown seed maize ever since.

It's a busy operation and Tom credits Amanda for holding it all together behind the scenes while he manages the day-to-day operation. "We work well as a team" he says. Charlie loves to help with the stock work when he is home from school and George, who is studying engineering at Canterbury University, drives in the holidays. Tom's father Bill is the "courier" fetching and delivering and still hops on a tractor when he is needed.

The 400 ha home farm located at Waipaoa, 20km north-west of Gisborne was purchased by Tom's grandfather who left the family's South Island-based Newman's Coach Line business and moved north in the 1940's. Tom's father Bill first started growing maize grain on the land more than 40 years ago.

"We believe in looking after the land and are careful to maintain soil structure and fertility" says Tom. "Some of our paddocks have been in continuous maize for 40 years and yield 16-17 t/ha each year".

When it comes to hybrid selection, Tom looks for food grade hybrids which are sold at a premium for local processing. Last season he planted Pioneer® P1253 as a long maturity option and P9978 on the later ground.

"P1253 is our "go-to" option because it produces reliable yields of high-quality food grade maize" says Tom. "Typically, we expect it to deliver average yields of 18 t/ha".

Tom does all the groundwork with one full-time and one part-time labour unit to assist him. Paddocks are generally ploughed, then power harrowed. Maize planting usually starts in late September with the aim to get all the crop in the ground by the end of the second week of October. Maize is planted at around 97,000 seeds/ha. The starter fertiliser is 300 kg/ha of YaraMila COMPLEX® (N12-P5-K15) and crops are side-dressed with 350-400 kg/ha urea.

Tom considers potential issues when determining the most appropriate seed treatment and weed control programme for each maize block. Paddocks at risk of being "hammered" by pheasants are planted with bird repellent while the focus is on insecticide for those coming out of pasture.

Last winter Tom used spatial yield maps to identify low yielding areas of his maize paddocks and spread compost on them prior to planting to try and improve organic matter and fertility levels.

"We aim to do everything right for the maize crop" says Tom. "If you start taking shortcuts you get nowhere".

Tom is a self-proclaimed machinery addict. His latest purchases include a 12-row maize planter to replace his 4-row machine and a brand-new Case IH Axial-Flow® combine due to arrive this winter.

"When I am buying something, I tick the box for every available accessory and feature" says Tom. "I'm driving it every day, so I don't try to scrimp or save".

Maize grain harvest starts in March with the early maturing crops and paddocks are direct drilled with pasture which is used to winter lambs.

The later maturing hybrid is harvested in late April and early May with these paddocks usually left fallow over the winter months.

The 2021 Pioneer Yield Competition win was the Newman's first, but Tom is determined that it won't be his last.

"I don't want to be a one-year wonder" says Tom with a big smile. "The real challenge is to do it again!"

> "P1253 is our "go-to" option because it produces reliable yields of high-quality food grade maize."

THIS PAGE Tom Newman, Pioneer Seed Production Manager Andrew Powell and Pioneer Area Manager Simon Begley.

Pioneer Maize for Grain Yield Competition

The Pioneer Maize for Grain Yield Competition recognises grain growers achieving the highest yields with Pioneer® brand maize hybrids on their farms.

The competition covers five regions: Auckland Province and North, Waikato, Bay of Plenty, Gisborne/Hawke's Bay and the Manawatu/Rangitikei.

There are three categories in each region which include early, mid and late hybrid maturity groups. All on-farm co-operators in the Pioneer Product Advancement Trials (PAT) are automatically entered into the competition for their region.

Congratulations to Gisborne's Tom Newman (pictured right) who takes home the Paul Baker Memorial Yield Cup as national winner of the 2021 Pioneer Maize for Grain Yield Competition.

	NATIONAL YIELD CUP WINNERS			AUCKLAND PROVINCE & NORTH		WAIKATO		BAY OF PLENTY		GISBORNE/HAWKE'S BAY		MANAWATU/RANGITIKEI	
YEAR	WINNER	HYBRID	REGION	WINNER	HYBRID	WINNER	HYBRID	WINNER	HYBRID	WINNER	HYBRID	WINNER	HYBRID
1999	John Locke	33R87	Waikato	-	-	John Locke	33R87	Mick Doherty	33R87	David Clark (Opou Station)	3514	Tim & Dennis Harris	3753
2000	Mo Paratene	33G26	Gisborne/Hawke's Bay	-	-	Jeff & Todd Crabb	34E79	Neil Rogers	33R87	Mo Paratene	33G26	Bruce Gibbons	36H36
2001	Jeff & Todd Crabb	34K77	Waikato	-	-	Jeff & Todd Crabb	34K77	Mick Doherty	34E79	Mo Paratene	33R87	Tim Harris	34K77
2002	Brownrigg Agriculture	34V56	Gisborne/Hawke's Bay	-	-	Jeff & Todd Crabb	34E79	Neil Rogers	36B08	Brownrigg Agriculture	34V56	Paul Carter	38P05
2003	Mike & Karen Insley	33J24	Bay of Plenty	-	-	David Waller	36B08	Mike & Karen Insle	33J24	Hugh Ritchie	34K77	William Duncan	38T27
2004[1]	Terry O'Brien	34K77	Waikato	Wharepapa Farm Ltd	36B08	Terry O'Brien	34K77	Mick Doherty	33J24	Mark Armstrong	33J24	Paul Carter	36B08
2005	Brownrigg Agriculture	34D71	Gisborne/Hawke's Bay	Paul & Susannah Ambler	34D71	George & Ross Thompson	34D71	Mick Doherty	33J24	Brownrigg Agriculture	34D71	Patrick O'Neill	38T27
2006	Brownrigg Agriculture	33J24	Gisborne/Hawke's Bay	Pukerimu Holdings Ltd	38P05	Wayne Henderson	34D71	Guy & Isobel Nicol	33J24	Brownrigg Agriculture	33J24	Paul Carter	38T27
2007	Mark Armstrong	34B97	Gisborne/Hawke's Bay	David & Adrienne Wordsworth	38B85	Steve Finer	34D71	Mick Doherty	34B97	Mark Armstrong	34B97	Andrew Russell	38P05
2008	Brian Amor	34B97	Gisborne/Hawke's Bay	D & A Wordsworth/Pouto Topu A Trust	35D28	Lloyd Farms Ltd	34P88	Neil Rogers	34P88	Brian Amor	34B97	Stephen Voss	38P05
2009	Brownrigg Agriculture	34B97	Gisborne/Hawke's Bay	Pouto Topu A Trust	35A30	Lloyd Farms Ltd	34D71	Guy & Isobel Nicol	33J24	Brownrigg Agriculture	34B97	Stewart Glasgow	37Y12
2010	Brian Amor	34D71	Gisborne/Hawke's Bay	David & Adrienne Wordsworth	34P88	Bruce Bateup	35Y33	Neil Rogers	34B97	Brian Amor	34D71	Stewart Glasgow	38P05
2011	Geoff MacGregor	P0537	Gisborne/Hawke's Bay	Shawn & Tracey Nichols	37Y12	Alan Henderson	34P88	Regan Studer	34P88	Geoff MacGregor	P0537	Richard Redmayne	35Y33
2012	Brian Amor	P0537	Gisborne/Hawke's Bay	Gavin Woolsey	P0537	Graeme Bateup	34P88	Joe Rua	34P88	Brian Amor	P0537	Stewart Glasgow	37Y12
2013	Brownrigg Agriculture	P1253	Gisborne/Hawke's Bay	Shawn & Tracey Nichols	37Y12	Steve Finer	P0021	Guy & Isobel Nicol	34P88	Brownrigg Agriculture	P1253	Dennis Nitschke	P0891
2014	Brian Amor	P1253	Gisborne/Hawke's Bay	Shawn & Tracey Nichols	P0021	Lloyd Farms Ltd	P0891	Dovaston Agriculture Ltd	P1253	Brian Amor	P1253	Dennis Nitschke	P0021
2015	Brownrigg Agriculture	P1253	Gisborne/Hawke's Bay	David & Adrienne Wordsworth	P0547	Alan Henderson	P9911	Dovaston Agriculture Ltd	P1253	Brownrigg Agriculture	P1253	Dennis Nitschke	P9721
2016	Donald & Craig Stobie	P1253	Waikato	Gavin & Trish Woolsey	P9911	Donald & Craig Stobie	P1253	Doherty & Studer Ltd	P1253	Paul Steele	P0891	Dennis & Marcus Nitschke	P9911
2017	Bostock New Zealand	P0640	Gisborne/Hawke's Bay	Paul Bamforth	P1477W	Alan Maxwell	P0640	Dovaston Agriculture Ltd	P0725	Bostock New Zealand	P0640	Stewart Glasgow	P0547
2018	Brian Amor	P1253	Gisborne/Hawke's Bay	David Waller	P0640	Richard Bain	P0640	Stockland Ag Ltd	P0725	Brian Amor	P1253	Dennis Nitschke	P9911
2019[2]	Not awarded in 2019	-	-	-	-	-	-	-	-	-	-	-	-
2020	Stuart Gray	P0937	Gisborne/Hawke's Bay	Paul Bamforth	P0937	Stuart & Michele Clarke	P0937	Dovaston Agriculture Ltd	P1253	Stuart Gray	P0937	Simon Nitschke	P0937
2021	Tom Newman	P0640	Gisborne/Hawke's Bay	David & Adrienne Wordsworth	P0937	Lloyd Farms Ltd	P0937	Ken & Helen Edkins	P0937	Tom Newman	P0640	Stewart Glasgow	P0362

[1] The competition was expanded in 2004 to include Auckland Province and North
[2] The competition was not run in the 2018-19 season.

Maize grain

Indicative maize for grain costs of production for the 2022-2023 season

The economics of growing maize for grain are dependent on growing costs, crop yield and the price received per tonne of grain.

As a guide, the approximate fixed and variable costs to grow maize for grain are shown in this table. Please contact your local merchant representative or contractor to establish current costs.

Use the 'My costs' column to determine your costs based on the estimates provided.

Visit pioneer.nz to calculate your farm-specific costs.

	Growing and harvest costs	Indicative cost estimate ($/ha)	My costs ($/ha)
Pre-planting	Soil tests, other	10	
	Base: Lime @ 1 t/ha + application	110	
	Base fertiliser: 300 kg/ha + application	340	
	Cultivation: To planting specifications	410	
Planting	Pioneer® brand maize seed P0640 @ 94,000/ha	510	
	FAR levy ($1.00/10,000 kernels @ 94,000/ha)	10	
	LumiGEN™ System L-400 seed insecticide treatment	140	
	Starter fertiliser: 250 kg/ha DAP + application	340	
	Planting	200	
Post-planting	Pre emergence weed control + application	105	
	Post emergence weed control + application	125	
	Side dressing: 250 kg/ha urea + application	390	
	Harvest: Combine	440	
Total input costs per hectare		**$3,130**	
Interest on input costs excluding harvest			
	Interest on $3,130 @ 5% for 8 months	$100	
Total costs (inputs & interest)		**$3,230**	

Cartage and drying costs

Yield					
Tonnes per hectare: DRY (@ 14% moisture)	**10.00**	**11.00**	**12.00**	**13.00**	**14.00**
Tonnes per hectare: WET	11.03	12.13	13.23	14.33	15.44
Cartage and drying costs ($)					
Cartage - 50 km @ $22 per wet tonne	243	267	291	315	340
Drying (from 22% - 14%) @ $46 per wet tonne	507	558	609	659	710
Total drying costs per hectare	**750**	**825**	**900**	**975**	**1,050**
Cost summary ($)					
Input costs	3,130	3,130	3,130	3,130	3,130
Interest (on input costs)	100	100	100	100	100
Drying costs & cartage costs	750	825	900	975	1,050
Total costs	**3,980**	**4,055**	**4,130**	**4,205**	**4,280**

Maize for grain net return* per hectare sensitivity analysis

Maize for grain price ($/tonne)	Maize grain yield (t/ha DRY) 10	11	12	13	14
$475	$770	$1,170	$1,570	$1,970	$2,370
$500	$1,020	$1,445	$1,870	$2,295	$2,720
$525	$1,270	$1,720	$2,170	$2,620	$3,070
$550	$1,520	$1,995	$2,470	$2,945	$3,420
$575	$1,770	$2,270	$2,770	$3,270	$3,770
$600	$2,020	$2,545	$3,070	$3,595	$4,120

*If applicable land lease costs should be deducted from the net return

Assumptions

1. **Costs to grow, harvest, transport and dry the crop are estimates only. Estimates are based on a sample of contractor rates, other typical industry charges and product costs. All costs exclude GST and were indicative at 31 March 2022. Given the volatility of farm input prices over the last few months, we would encourage you to complete your own budget prior to the start of the growing season.**
2. Medium yield growing environment where 94,000 seeds of hybrid P0640 are planted per hectare.
3. Wet (harvest) moisture content of 22%.

Hybrid recommendations for grain by region

Region 1

Northland / North Auckland

Hybrids	CRM range
P8000	< 85
P8666 P8805 P9127	86-93
P9400 P9721 NEW P9978	94-99
P0021 P0362 P0640	100-106
P0891 NEW P0900 P0937	> 107

Region 2

South Auckland / North & Central Waikato

Hybrids	CRM range
P8000	< 85
P8666 P8805 P9127	86-93
P9400 P9721 NEW P9978	94-99
P0021 P0362 P0547 P0640	100-106
P0891 NEW P0900 P0937 P1253	> 107

Region 3

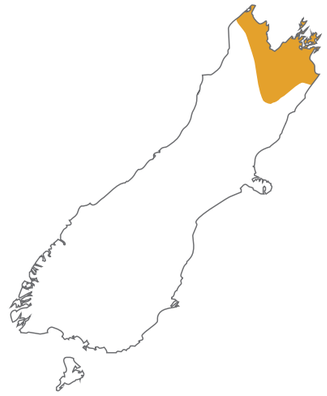
Coastal BOP / Gisborne / Northern Hawke's Bay

Hybrids	CRM range
P8000	< 85
P8666 P8805 P9127	86-93
P9400 P9721 NEW P9978	94-99
P0021 P0362 P0547 P0640	100-106
P0891 NEW P0900 P0937 P1253 P1477W	> 107

Region 4

South Waikato / King Country / Coastal Taranaki / Rangitikei / Manawatu / Southern Wairarapa / Central Hawke's Bay

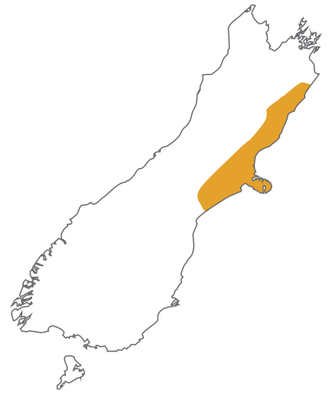
Hybrids	CRM range
P8000 NEW P8333 P8500	< 85
P8666 P8805 P9127	86-93
P9400 P9721 NEW P9978	94-99
P0021 P0362 P0547	> 100



Region 5

Nelson / Marlborough

Hybrids	CRM range
P8000 NEW P8333 P8500	< 85
P8666 P8805 P9127	86-93
P9400 P9271 NEW P9978	94-99
P0021 P0362 P0547	> 100



Region 6

North & Mid Canterbury

Hybrids	CRM range
P8000 NEW P8333	< 83
P8500 P8666	84-86
P8805	> 87

Publication abbreviations

ha = hectare
cm = centimetres
m = metres
km = kilometres

t/ha = tonnes per hectare
kg = kilogram
kg/ha = kilograms per hectare
kg/ha/year = kilograms per hectare per year

kg/hl = kilograms per hectolitre
$/ha = $ per hectare
$/tonne = NZ dollars per tonne

Notes

Regions depicted reflect general similarity of hybrid requirements. When choosing hybrids review carefully the hybrid performance profiles and the trait ratings on pages 54-55. Contact your Pioneer or merchant representative for further positioning advice.

Hybrid comparisons are only valid within a range of + or - 4 CRM (Comparative Relative Maturity). Contact your local Pioneer® brand products or merchant representative for further advice.

Pioneer® brand maize for grain hybrid trait characteristics for 2022-2023

Hybrid	Maturity			Yield			Plant and agronomic traits										Grain quality	
	CRM to black layer[3]	CRM to silking[2]	CRM to grain harvest moisture (22%)[3]	Grain yield for maturity[4]	Adaption to high population[5]	Adaption to low population (ear flex)[6]	Drought tolerance	Stalk strength	Root strength	Stress emergence[7]	Early growth[8]	Plant height[9]	Ear height[10]	Staygreen[11]	Husk cover[12]	Grain drydown[13]	Grain appearance[14]	Test weight
P8000	80	80	80	9	7	7	6	6	6	6	7	8	5	7	6	8	7	7
NEW **P8333**	83	83	83	9	5	9	7	6	5	6	7	8	6	8	6	7	7	7
P8500	85	85	85	9	6	8	7	6	6	6	6	8	6	9	6	8	7	6
P8666	86	86	86	9	5	9	8	5	5	6	8	8	6	8	6	7	7	7
P8805	88	88	88	9	9	5	8	6	5	6	6	5	6	7	5	8	6	6
P9127	91	91	91	9	6	9	9	6	6	6	6	7	6	7	6	6	5	5
P9400	94	94	94	9	6	9	7	7	7	4	7	8	7	6	5	6	7	7
P9721	97	97	97	9	8	6	8	6	5	7	6	7	6	7	6	9	6	5
NEW **P9978**	99	99	99	9	9	7	7	6	7	7	7	7	6	7	6	5	6	5
P0021	100	100	100	7	9	6	7	6	7	7	9	6	5	7	6	6	5	6
P0362	103	103	103	9	9	6	7	6	7	6	6	7	5	8	6	5	6	6
P0547	105	100	101	9	7	6	8	5	6	7	7	6	5	5	5	9	5	6
P0640	106	106	104	9	7	9	7	6	6	6	7	8	6	8	6	8	6	5
P0891	107	107	107	7	9	6	7	8	6	4	6	7	4	7	6	6	9	9
NEW **P0900**	109	109	109	9	9	9	9	7	7	7	7	7	5	8	6	5	6	6
P0937	109	108	109	9	9	7	8	6	7	7	7	6	4	9	6	7	6	5
P1253	109	109	109	8	6	6	7	6	5	4	6	6	5	7	6	6	9	9
P1477W	114	111	114	9	9	6	7	8	8	5	6	7	5	8	5	6	8	8

Hybrid	Food grade characteristics							Disease resistance ratings[23]								Recommended established plant populations (000'S/HA)[24,25,26]			Hybrid
	Processing use[15]	Kernel hardness[16]	Kernel crown[17]	Kernel red streak[18]	Kernel size[19]	Horny endosperm[20]	Kernel colour[21]	Northern Leaf Blight[22]	Common rust[22]	Eyespot[22]	Head smut	Fusarium ear rot	Diplodia ear rot	Gibberella ear rot	Anthracnose stalk rot	Challenging yield environments	Medium yield environments	High yield environments	
P8000	n/a	6	6	6	6	6	6	6	6	6	7	6	6	5	-	100	110	115	**P8000**
NEW **P8333**	n/a	6	6	6	7	6	6	5	6	-	4	-	-	5	-	85	95	105	**P8333** NEW
P8500	n/a	6	5	6	7	5	6	5	5	5	7	6	6	6	-	90	100	115	**P8500**
P8666	n/a	6	5	6	7	6	6	6	6	-	6	-	-	6	-	85	95	105	**P8666**
P8805	n/a	6	5	7	6	5	6	6	7	6	6	6	7	6	-	95	105	110	**P8805**
P9127	n/a	5	5	5	5	5	5	5	6	7	6	5	5	7	-	85	95	105	**P9127**
P9400	n/a	7	6	5	6	6	7	7	6	6	7	5	7	6	-	85	95	105	**P9400**
P9721	n/a	5	5	6	7	5	7	6	7	7	5	5	6	5	-	88	96	102	**P9721**
NEW **P9978**	n/a	5	5	6	7	5	6	7	7	-	6	5	-	5	-	85	95	110	**P9978** NEW
P0021	n/a	6	5	7	6	6	7	7	6	5	7	6	7	7	-	85	95	100	**P0021**
P0362	n/a	6	6	7	7	6	6	6	7	7	6	6	6	5	-	85	95	105	**P0362**
P0547	n/a	5	5	6	6	5	6	5	6	5	6	5	6	4	4	88	96	102	**P0547**
P0640	n/a	5	5	6	6	4	6	7	7	6	6	5	6	7	-	85	95	100	**P0640**
P0891	HT/AC	9	7	7	5	8	5	6	6	6	5	5	5	6	5	85	95	105	**P0891**
NEW **P0900**	n/a	6	6	6	7	5	6	7	7	-	7	4	-	5	-	80	90	110	**P0900** NEW
P0937	n/a	5	6	6	6	4	6	7	6	-	5	5	5	4	-	85	95	110	**P0937**
P1253	HT/AC	9	8	9	5	9	5	5	6	5	5	6	6	5	6	88	94	100	**P1253**
P1477W	HT/AC	9	7	7	7	7	8	7	6	7	5	6	5	6	6	85	95	100	**P1477W**

Ratings 9 = Outstanding 1 = Poor - = Insufficient data available NEW = New hybrid

CRM = Comparative Relative Maturity n/a = Not applicable HT/AC = Refer to page 56, point 15

Pioneer sets tough yet honest standards when rating maize hybrids. These ratings are based on comparisons with other Pioneer® brand hybrids, **NOT** competitor hybrids and on average performance across areas of adaptation under normal conditions. The ratings are based on both customer 'side-by-side' paddock experience and research comparison data. Individual seasons and paddock ratings may show a variation from these average comparative ratings. Extreme conditions may adversely affect performance. Comparisons between hybrids for yield and plant height are only valid within a similar maturity group (+ or – 4 CRM). Notes on performance traits can be found on page 56.

Disease precaution

Growers should balance hybrid yield potential, hybrid maturity and cultural practices (especially stubble management) against their anticipated risk of specific diseases and need for resistance. In high disease risk situations, consider planting hybrids with resistance ratings of 6 or higher to help reduce risk. When susceptible hybrids are planted in conditions of high disease pressure, the grower assumes a higher level of risk. If conditions are severe, even hybrids rated as resistant can be adversely affected. Independent of yield reduction, diseases can predispose plants to secondary diseases such as stalk rots. This requires individual field and hybrid monitoring for stalk stability and earlier harvest if necessary.

The hybrid descriptions in all New Zealand Pioneer® brand products publications conform to strict word usage protocols approved and used by Pioneer around the world. We do not use descriptive adjectives randomly or loosely. We have a policy of avoiding exaggerated superlatives in product descriptions or product discussions. The following words are those approved for use in the product performance descriptions listed on pages 20-32 of this catalogue.

Trait ratings	**Word and numeric alignment for yield & agronomic traits**
8-9	Excellent, exceptional, outstanding, superb, impressive, industry-leading.
7	Superior, very good, strong, sound, reliable, stable, dependable, consistent.
6	Good, above average, sound, reliable, stable, dependable, consistent.
5	Average, acceptable, adequate, moderate.
4	Acceptable, slightly below average.
1-3	Marginal, susceptible, below average.

Trait ratings	**Word and numeric alignment for disease traits**
8-9	Highly resistant, excellent, exceptional, outstanding, impressive.
6-7	Resistant, superior, strong, very good.
4-5	Intermediate, moderate, adequate, acceptable.
1-3	Susceptible (caution on use if disease is prevalent).

Trait characteristic notes

1 **CRM to black layer:**
Based on the GDUs required for a hybrid to reach black layer (physiological maturity) relative to other Pioneer® brand hybrids. It gives an indication of whether a hybrid reaches black layer early or late relative to its CRM to Harvest Moisture rating. Black layer refers to the stage of grain fill when the plant is physiologically mature and no further grain filling or weight increment will take place. Important: To help decide if a new hybrid fits your area's growing season, compare its black layer rating to a hybrid that you have planted previously, or one that is successfully used in your area.

2 **CRM to silking:**
Based on the Growing Degree Units (GDUs) required for a hybrid to silk (flower) relative to other Pioneer® brand hybrids. It gives an indication of whether a hybrid flowers early or late relative to its CRM to Harvest Moisture rating. Hybrids with an early flowering CRM compared with black layer CRM will generally be better adapted to cool seasons within their area of adaption.

3 **CRM (Comparative Relative Maturity) to harvest moisture:**
Based on the grain moisture content at harvest, relative to other Pioneer® brand hybrids. The higher the rating, the longer the growing season required for the hybrid. It serves as a relative guide to compare the maturity difference between Pioneer® brand hybrids to the grain harvest moisture stage, stated as 22% moisture.

4 **Grain yield for maturity:**
Valid only to compare hybrids of approximately the same maturity (+ or – 4 CRM).

5 **Adaptability to high population:**
A measure of the mix of genetic factors that permit a maize plant to withstand the stresses of high population and still give good standability and a high yielding ear of fine quality grain on every plant.

6 **Adaptability to low population:**
An indicator of a hybrid's ability to compensate (flex) ear size for low planting rates or loss from poor emergence or insect attack. Fertility levels and moisture must be adequate for 'flex' to be effective.

7 **Stress emergence:**

These ratings are based on data collected from local replicated small plot trials planted early and at depth into wet and cold conditions and vigour ratings on New Zealand commercial seed provided by Pioneer's regional seed laboratory. All seed supplied to the market is expected to establish excellent plant stands if planted well and under normal germination conditions. Ratings of 7–9 indicate very good potential to establish normal stands under stressful environmental conditions of cold, wet soils. A 5-6 rating indicates good potential to establish normal stands under moderate stress conditions; and ratings of 1-4 indicate the hybrid has below average potential to establish normal stands under stress and should not be used if severe wet and cold conditions are expected after planting. Hybrids with high ratings are best adapted to early planting but due care to apply best agronomic practices is still required.

8 **Early growth ratings:**
Taken when two leaf collars are visible.

9 **Plant height:**
9 = Tall. 1 = Short.

10 **Ear height:**
9 = High. 1 = Low.

11 **Staygreen:**
A measure of a hybrid's ability to stay as a green growing plant leading up to black layer (physiological maturity). It is a measure of late season plant health and drought tolerance which may affect plant standability and suitability for silage. A high rating indicates a wider "harvest window" providing a greater degree of harvest timing flexibility.

12 **Husk cover:**
Measures the length of the husk leaves extending past the end of the cob, with a loose husk cover scoring one point lower for the same length of husk cover.

13 **Grain drydown:**
Scores represent the rate of moisture loss after physiological maturity. Hybrids with high scores dry faster. They are not recommended for early harvest where planted as a full season hybrid.

14 **Grain appearance:**
In the bin scored down for mould, cracks, red streak, etc.

15 **Processing use:**
AC = Hybrids suitable for alkaline products.
HT = Hybrids with hard texture, suitable for dry milling of hard textured grain such as grits.

16 **Kernel hardness:**
Relative rating of absolute density of kernels determined by stenvert analysis.
1-3 = Soft (low density). 4-5 = Average.
6-7 = Hard. 8-9 = Very hard.

17 **Kernel crown:**
Indicates size of dent with a higher score indicating smoother (flintier) crown on the kernel.

18 **Kernel red streak:**
Indicates the tendency of the kernels to red streak with a higher score indicating less tendency.

19 **Kernel size:**
A higher score indicates greater percentage of larger kernels.

20 **Horny endosperm:**
Score determined from visual observation of cross sectioned kernels. Score indicates that portion of the kernel with hard translucent starch suitable for dry milling into maize grits. Higher scores indicate higher percentage of hard endosperm.

21 **Kernel colour (yellow):**
Higher score indicates a pale coloured kernel. Lower score indicates a darker colour. Scores in the 5-7 range indicate a more desirable yellow coloured grain.

22 **Northern Leaf Blight (NLB), Common Rust and Eyespot:**
Caution: In conditions where leaf disease risks are high, growers should only consider planting hybrids with at least moderate resistance ratings of 6 or higher for these diseases.

23 **Disease resistance ratings:**
8-9 = Highly resistant. 6-7 = Resistant.
4-5 = Moderately resistant. 1-3 = Susceptible.
– = Insufficient data available.

Disease ratings are based on overseas and New Zealand observations. Scores are based on visual assessment only and not on yield reduction data.

24 **Cool environments:**
In cool environments including high altitude sites (greater than approximately 150 m/500 ft above sea level) select your growing environment using the definitions below, then increase populations to the next level e.g. for P9721 in a medium yield environment at high altitude, plant to achieve 102,000 plants per hectare.

25 **Established plant populations:**
The planting populations shown in the Pioneer® brand maize for grain hybrid trait characteristics chart assume good seed establishment conditions.
If you are planting very early or into a less than ideal seedbed or where insect pressure may be high, planting populations should be increased to compensate for reduced establishment due to the higher risk of early seedling mortality.

26 **Growing environment definitions:**
May include some or all of the following characteristics:

Challenging yield environments (CYE)
- Light, sandy or shallow soils of low fertility, predictably low summer rainfall (drought-prone) environments.
- Exposed sites with very high wind run.
- High cob, leaf or stalk disease pressure.

Medium yield environments (MYE)
- Average fertility soils with predictably adequate summer rainfall.
- Continuously cropped soils.
- Medium to low cob, leaf or stalk disease pressure.
- Planting at these populations are recommended for new maize growers and food grade grain production.

High yield environments (HYE)
- Deeper, highly fertile and well structured soils.
- Predictably good summer rainfall, shelter from high wind run.
- Good soils straight out of long term pasture.
- Low or no cob, leaf or stalk disease pressure.

Notes:

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