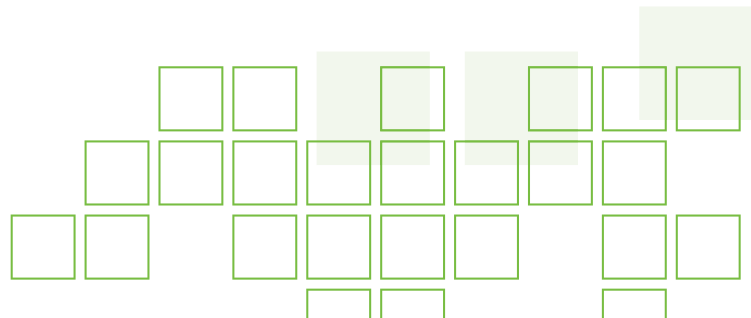




2022 SUNFLOWER & CANOLA

HYBRID & MARKET GUIDE



AN IMPORTANT AGRICULTURAL CROP

While the vibrant, strong sunflower is recognized worldwide for its beauty, it is also an important source of healthy edible oil and protein meal. As one of the world's leading oilseed crops, sunflower oil is a valued and healthy vegetable oil. Sunflower seeds are also enjoyed as a healthy snack and nutritious ingredient to many foods.

SUNFLOWER MARKETS

OIL

Approximately 75% of sunflowers grown are utilized for the oil that can be extracted from the seeds. Sunflower oil is naturally made up of a combination of monounsaturated, polyunsaturated, and low levels of saturated fat. Oil sunflowers are generally classified based on their oleic (monounsaturated fat) content. Oil sunflowers that are not used for oil extraction purposes can also be used in producing high quality bird food.

PRIMARY CATEGORIES OF COMMERCIALY AVAILABLE HYBRID SEEDS

Nusun®: Oleic levels of 55-75%

High Oleic: Oleic levels greater than 82% (common minimum crush requirement)

CONOIL (DEHULL)

The dehull market requires processors to mechanically remove the hull and separate the kernel to be sold as a raw ingredient or roasted for snacking. The shell of conoil type sunflower seeds (a cross between confection and oilseeds) is the easiest to separate.

CONFECTION

This highly recognizable black and white seed serves as a tasty and healthy snack. Confection sunflower hybrids are planted at a lower population in the field to grow longer more plump seeds. The largest of the seeds get sold to the in-shell market, like what you eat at baseball games, while the smaller seeds are utilized in the dehull market.

HERBICIDE TOLERANT TRAITS

Sunflowers are a non-GMO crop. Through years of selective breeding techniques Nuseed has built the Clearfield®, Clearfield® Plus and DuPont™ ExpressSun® traits into the majority of our hybrids to help growers manage weeds.



The Clearfield Production System for sunflowers provides growers with broad-spectrum residual grass and broadleaf weed control, including ACCase resistant weeds. The Clearfield system combines high-yielding sunflower hybrids with Beyond® herbicide tolerance for superior postemergent weed control in no-till, minimum or conventional tillage systems.



To help maximize sunflower yield, rely on the new Clearfield Plus Production System for sunflower. When paired with Beyond herbicide and performance-enhancing methylated seed oil, growers can better manage some of the toughest weeds in their fields.



DuPont ExpressSun sunflower hybrids are tolerant to Express® herbicide. This revolutionary production system offers broad-spectrum control or suppression of broadleaf weeds, a simplified approach for enhanced weed control in sunflower and improved yield potential for a cost-effective crop management solution with complete re-cropping flexibility the following year.

Nuseed hybrids are treated with the most advanced fungicide and insecticide seed treatment to protect your seed investment.

SUPERIOR SUNFLOWER HYBRIDS

Nuseed's U.S. Based nurseries are the breeding ground for superior sunflower hybrids

HERE'S WHY:

✓ R&D trials are strategically located in sunflower-growing areas in the United States

✓ Nuseed is the only multinational company working with all sunflower hybrid seed types and herbicide traits, including the largest confection hybrid breeding program in North America

✓ Industry leading sunflower molecular lab and seed production located in West Sacramento, California

✓ Hybrid trait selection at U.S. based trials under regional disease and insect pressures

✓ Strict quality assurance program



NEW! HIGH OLEIC

Nuseed is proud of our two NEWEST SUNFLOWER HYBRIDS – the ultra-early **N4H161 CL**, and the top-rated **N4H422 CL**. Developed in the U.S., our new high oleic oil hybrids deliver on high-performance agronomics, yield and top-end oil content.



HIGH OLEIC

While oleic levels can vary year to year due to environmental pressure, Nuseed sunflower hybrids target a minimum oleic level of 85% or higher, with some hybrids reaching greater than 90% oleic acid.

NEW N4H161 CL

Maturity: Ultra-Early

This ultra-early high oleic is the perfect hybrid for Northern climates with short growing seasons or in the High Plains for a double crop option. With a shorter plant height, N4H161 CL has excellent root strength and late season plant health.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Earliest maturity in the Nuseed lineup
- Excellent yield and oil content for maturity
- Short plant height

NEW N4H422 CL

Maturity: Medium

Top of the rating scale for stalk and root strength, this hybrid has consistently high test weights and uniformly clean stalks. A black seed coat with above average oil content makes the N4H422 CL an ideal hybrid for the bird food or the oil crush market.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Strong stalk and roots
- Excellent late season plant health
- Solid test weight

COBALT II

Maturity: Early

Cobalt II is an early and disease resistant high oleic hybrid. A great fit for both wet fields and late plantings, Cobalt II also delivers high yields to back it up. With excellent disease resistance including protection against multiple races of downy mildew, Cobalt II is a hybrid you can rely on.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Excellent disease resistance
- Excellent seed set and center fill
- Shorter plant height

N4H302 E

Maturity: Medium-Early

A welcomed addition to Nuseed’s high oleic lineup, N4H302 E will not disappoint. Best suited for the northern growing regions, this hybrid performs well from east to west. N4H302 E impresses producers all season long with its early season emergence and excellent oleic content at harvest.

MARKET: High Oleic **TRAIT:** DuPont ExpressSun **DMR:** No

- High oleic, tolerant to Express herbicide
- Excellent high oleic content
- Great early season emergence
- Good late season plant health



HIGH OLEIC

High oleic sunflower oil has a longer, more stable shelf-life, neutral taste profile, and heart healthy benefits that make it attractive for commercial cooking applications. The oilseed crush industry requires a minimum oleic level ranging from 82% to 85%. Some Nuseed sunflower hybrids reach oleic acid levels greater than 90%.

HORNET

Maturity: Medium

Looking for a high yielding high oleic hybrid with all-around protection? Hornet is for you. With stalk and root structures that have been proven against the elements and disease protection including downy mildew resistance, Hornet offers solid performance and profit.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Outstanding yield potential
- Consistent oil content
- Late season plant health

N4H470 CLP

Maturity: Medium

This hybrid delivers an all around win on the farm. With excellent agronomics including solid stalks and roots, plus the added benefits of downy mildew resistance and improved weed control with the Clearfield Plus production system, growers will achieve solid yields and top-end oil content.

MARKET: High Oleic **TRAIT:** Clearfield Plus **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Clearfield Plus provides improved weed control for higher yield potential
- Excellent stalk and root strength
- Good late season plant health

N4H521 CL

Maturity: Medium-Late

N4H521 CL is the fullest season high oleic hybrid in the Nuseed lineup and it yields big. The oil profile combined with a nice black seed color ensures multiple market options. An excellent fit for South Dakota, the High Plains and Texas, this hybrid will help a grower succeed with its outstanding yield potential.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** Yes

- High oleic, tolerant to Beyond herbicide
- Outstanding yield potential
- Full season plant health
- Great oil content and test weight

SUNFLOWER FACT

SUNFLOWERS CONTAIN

**MORE
VITAMIN E**



THAN ANY OTHER
VEGETABLE OIL



The NuSun sunflower oil profile was developed by the U.S. National Sunflower Association, in coordination with the USDA, to create an oil essential for the food industry. NuSun oil has a naturally high smoke point and does not require trans-fat creating hydrogenation to remain stable at high temperatures. It has a good shelf life and neutral taste profile making it an excellent choice for frying oil. A typical fatty acid profile is 65% oleic acid, 26% linoleic acid and 9% combined saturates.



TALON

Maturity: Early

Looking for market flexibility? Talon produces a valuable grain for the bird food market while providing growers additional marketing options for dehull or crush as required. Concerned about tough growing conditions? Talon is an early hybrid with excellent stalk and root strength. Weed pressure a problem? Talon is an ExpressSun hybrid and is a versatile solution for growers.

MARKET: NuSun **TRAIT:** DuPont ExpressSun **DMR:** No

- NuSun, tolerant to Express herbicide
- Excellent hullability and meat-to-hull ratio
- Early maturity, single-cross hybrid
- Excellent root strength

FALCON

Maturity: Medium-Early

Falcon is a fiercely resilient hybrid. Strong agronomics and the ExpressSun herbicide trait make for a low management season. Easy to grow and even easier to market, Falcon consistently delivers in both yield and oil content, making it a good fit for the NuSun and bird food markets.

MARKET: NuSun **TRAIT:** DuPont ExpressSun **DMR:** No

- NuSun, tolerant to Express herbicide
- Excellent stalk strength
- Consistently good yields
- Medium plant height

N4HM354

Maturity: Medium-Early

The high yield potential for this medium-early hybrid and its fit from Canada to Texas make it stand out from the rest. Great oil content, resistance to multiple races of downy mildew and strong stalks are additional benefits that make N4HM354 a must have for your farm.

MARKET: NuSun **TRAIT:** Clearfield **DMR:** Yes

- NuSun, tolerant to Beyond herbicide
- Consistent yield, oil profile
- Great root and stalk strength
- Widely adapted across multiple growing regions

CAMARO II

Maturity: Medium

Camaro II is a performance hybrid, engineered to resist both wind and weather. Its root and stalk structure is enhanced with stacked disease resistance to keep sunflower growers on the road to a low management, high-yielding season. Year after year Camaro II generates high yields and profits.

MARKET: NuSun **TRAIT:** Clearfield **DMR:** Yes

- NuSun, tolerant to Beyond herbicide
- Improved sclerotinia head rot tolerance
- Great stalks and late season plant health
- High yielding, uniform single-cross hybrid



CONOIL (DEHULL)

The conoil seed type is the most versatile of the sunflower seed types and offers opportunities across multiple markets including kernel, oil, confection and bird food. This seed is generally higher in oil content than confection seeds.

BADGER DMR

Maturity: Medium

Badger DMR's high yield is matched by its high test weight, a valuable quality for dehull processors. With Badger DMR there are abundant marketing opportunities, giving growers flexibility at harvest.

MARKET: Dehull **TRAIT:** Clearfield **DMR:** Yes

- Conoil, tolerant to Beyond herbicide
- High yield is matched with high test weight
- Excellent hullability and meat-to-hull ratio
- Striped seed for hulling

SUNFLOWER FACT

SUNFLOWERS DISPLAY A BEHAVIOR CALLED **HELIOTROPISM**. FLOWER BUDS AND YOUNG BLOSSOMS WILL FACE EAST IN THE MORNING AND FOLLOW THE SUN AS THE EARTH MOVES DURING THE DAY.



CONFECTION

Confection sunflowers are grown to meet the specific needs of processors in the in-shell snack market. These are the familiar snacking seeds that are characteristically large and have white stripes. They are generally over half an inch in length with half their weight coming from the kernel.

PANTHER DMR

Maturity: Early

Seed Type: Long (LT)

Panther DMR offers confection growers excellent yield potential and high test weight. Known for its very early maturity and great standability, this processor preferred hybrid with downy mildew resistance is a perfect fit for northern growers.

MARKET: Confection **TRAIT:** None **DMR:** Yes

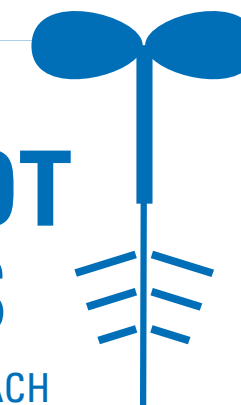
- Very high percentage of large seed
- High yield and test weight
- Shorter height, uniform plant type
- Very early flowering

SUNFLOWER FACT

SUNFLOWERS HAVE

DEEP ROOT SYSTEMS

ALLOWING THEM TO REACH NUTRIENTS AND WATER THAT OTHER CROPS MAY NOT BE ABLE TO ACCESS.



	HIGH OLEIC						NUSUN					CONOIL	CONFECTION
	NEW N4H161 CL	COBALT II	N4H302 E	HORNET	NEW N4H422 CL	N4H470 CLP	N4H521 CL	TALON	FALCON	N4HM354	CAMARO II	BADGER DMR	PANTHER DMR
MATURITY	ULTRA-EARLY	EARLY	MED-EARLY	MEDIUM	MEDIUM	MEDIUM	MED-LATE	EARLY	MED-EARLY	MED-EARLY	MEDIUM	MEDIUM	EARLY
TRAITS	Clearfield/DMR	Clearfield/DMR	ExpressSun	Clearfield/DMR	Clearfield/DMR	Clearfield Plus/DMR	Clearfield/DMR	ExpressSun	ExpressSun	Clearfield/DMR	Clearfield/DMR	Clearfield/DMR	DMR
EMERGENCE	8	8	9	8	8	8	8	7	7	8	7	8	7
DROUGHT TOLERANCE	7	7	7	8	8	9	8	6	8	7	8	7	6
UNIFORMITY AT FLOWERING	8	9	8	7	8	9	7	8	8	8	8	7	7
YIELD FOR MATURITY	8	8	7	9	8	8	9	7	8	9	9	7	8
TEST WEIGHT	8	7	7	7	8	8	8	6	8	7	8	7	8
DRY DOWN	6	8	8	6	7	7	6	7	7	8	7	7	7
OIL CONTENT	6	6	7	7	7	9	8	5	7	8	7	4	N/A
LATE SEASON PLANT HEALTH	8	7	7	8	8	8	8	6	8	7	8	7	7
STALK RATING	7	8	7	7	9	8	7	7	8	8	8	7	8
ROOT RATING	8	8	6	6	9	8	6	8	7	8	7	8	7
PLANT HEIGHT	3	5	6	7	8	7	7	5	6	6	6	8	6

CUTTING-EDGE CANOLA HYBRIDS

GENETICS WITH THE MOST ADVANCED WEED CONTROL SYSTEM

One of the smartest routes to high yield potential is through effective weed control. With improved control of tough weeds, flexibility in spray rates and timing, and higher yield potential through genetics and crop safety, Nuseed's TruFlex™ Canola with Roundup Ready® Technology can make it happen.



IMPROVED CONTROL OF TOUGH WEEDS

The flexibility of the TruFlex canola system will allow for the control of harder-to-kill weeds like cleavers, foxtail barley and wild buckwheat. It will also help enable season-long dandelion control.



FLEXIBILITY IN SPRAY RATES AND TIMING

TruFlex canola will have a wider application window as compared to Roundup Ready® canola. If weather or a late flush of weeds delays your spray date, no problem – you will be able to spray up to first flower* when applying sequential rates of 22 fl oz/ ac. The TruFlex canola system also enables flexibility with your Roundup PowerMAX® herbicide application rate to help get the job done.



HIGHER YIELD POTENTIAL THROUGH GENETICS AND CROP SAFETY

New genetics have packed a lot of yield potential into each TruFlex canola seed. New advances in trait technology will help enable better weed control and crop safety compared to Roundup Ready canola. It's a combination that could give you the opportunity to see much more yield potential at harvest time.

*First flower is when 50% of the plants in the field have no more than one flower.



CANOLA HYBRIDS

Reminiscent of “Polish-type” hybrids of the past, **NC155 TF** provides growers with an extremely early maturing hybrid that doesn't sacrifice yield. Flowering earlier and longer allows for exceptional pod set while maturing quickly to allow for quicker harvestability.

Use **NC155 TF** in long season zones to avoid summer heat blast or in shorter season zones to spread out capital requirements and avoid the risks of frost.

NEW NC155 TF

Maturity: Ultra-Early

- TruFlex™ Canola with Roundup Ready® Technology
- Extremely early maturing
- High yielding
- Early flowering with great longevity

DISEASE PACKAGE

Blackleg: Multi-gene Resistant
Fusarium Wilt: Resistant

AGRONOMICS

Plant height: Medium
Seed color: Black
Early season vigor: 8
Standability: 9

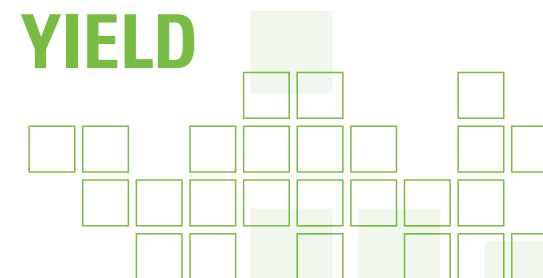
HARVEST CHARACTERISTICS

Oil content: 7
Straight cut rating: 4

Hybrid Rating Scale 1 = Poor, 9 = Excellent

HYBRID HIGHLIGHT

EARLY MATURING WITHOUT SACRIFICING YIELD





TruFlex™
CANOLA with Roundup Ready® Technology

CANOLA HYBRIDS

A long time in the making, Nuseed was proud to present their first hybrid in the U.S. canola market for the 2020 growing season. Chosen specifically for its yield potential in the Northern United States, **NC401 TF** would be a great choice for local farms.

NC401 TF

Maturity: Medium

- TruFlex™ Canola with Roundup Ready® Technology
- Outstanding early season vigor
- High yielding
- Excellent pod set

DISEASE PACKAGE

Blackleg: Multi-gene Resistant
Fusarium Wilt: Resistant

AGRONOMICS

Plant height: Tall
Seed color: Black
Early season vigor: 8
Standability: 7

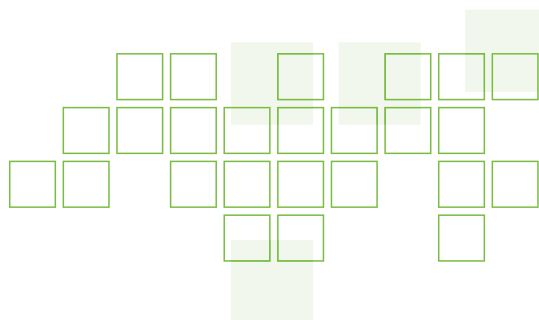
HARVEST CHARACTERISTICS

Oil content: 7
Straight cut rating: 5

Hybrid Rating Scale 1 = Poor, 9 = Excellent

HYBRID HIGHLIGHT

BRED FOR THE NORTHERN UNITED STATES



TruFlex™
CANOLA with Roundup Ready® Technology

CANOLA HYBRIDS

Nuseed is a global leader in canola genetics and trait development. **NC471 TF** has been developed for North American grower needs and has shown exceptional blackleg resistance. Together with the benefits of TruFlex technology, **NC471 TF** will provide growers a new level of protection against one of the most detrimental diseases of canola.

NEW NC471 TF

Maturity: Medium

- TruFlex™ Canola with Roundup Ready® Technology
- Excellent blackleg resistance
- High yielding
- Harvestability ease

DISEASE PACKAGE

Blackleg: Multi-gene Resistant
Fusarium Wilt: Resistant

AGRONOMICS

Plant height: Medium-Tall
Seed color: Black
Early season vigor: 8
Standability: 7

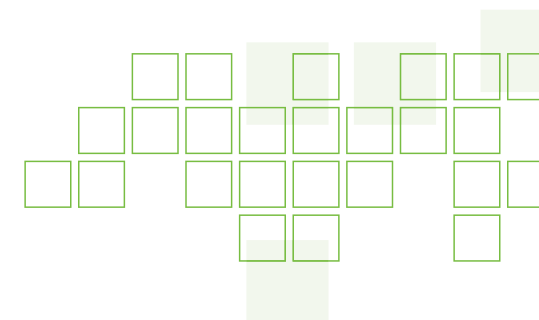
HARVEST CHARACTERISTICS

Oil content: 7
Straight cut rating: 5

Hybrid Rating Scale 1 = Poor, 9 = Excellent

HYBRID HIGHLIGHT

THE LEADER IN BLACKLEG RESISTANCE





TruFlex™
CANOLA with Roundup Ready® Technology

CANOLA HYBRIDS

Utilizing high yielding Nuseed genetics, **NC527CR TF** now combines the most current multigenic traits for clubroot resistance. A medium-late maturing variety with great harvestability characteristics.

NEW NC527CR TF

Maturity: Medium-Late

- TruFlex™ Canola with Roundup Ready® Technology
- Multigenic clubroot resistance
- High yielding
- Excellent harvestability

DISEASE PACKAGE

Blackleg: Multi-gene Resistant
Fusarium Wilt: Resistant

AGRONOMICS

Plant height: Tall
Seed color: Black
Early season vigor: 8
Standability: 7

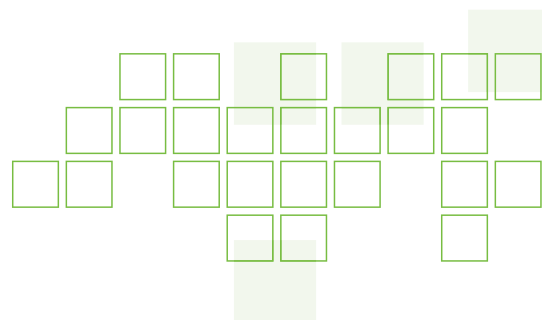
HARVEST CHARACTERISTICS

Oil content: 7
Straight cut rating: 4

Hybrid Rating Scale 1 = Poor, 9 = Excellent

HYBRID HIGHLIGHT

LEADING EDGE CLUBROOT RESISTANCE



**NEW
CONTRACT
OPPORTUNITY**



Nuseed Omega-3 Canola Contracts

SELECT contract growers are partnering with Nuseed to supply aquafeed and nutrition markets with the first land-based source of the essential omega-3 nutrients.

A NEW on-farm opportunity:

- Closed loop specialty canola production contract
- Increased profit potential
- Force majeure contract clause
- Harvest via straight cutting or swathing
- Independent lab grading with samples taken during harvest and at delivery
- Nuseed facilitates and provides on-farm pick-up
- Grower payment is within 30 days of pick-up or delivery based on contract terms

Contact:

Brian Morse, MT Production Coordinator
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VALUE BEYOND YIELD®

Nuseed teams locally and globally are dedicated to providing farm customers with excellent seed, service, and new opportunities.

Nuseed's R&D and breeding teams have a long history in building our world-class germplasm and delivering input traits with top agronomic performance proven locally.

Simultaneously, we're developing and commercializing proprietary output plant-traits, like Nuseed Omega-3 Canola, with very specific end-use benefits and added value.

We build Nuseed Value Chains connecting local growers to global end-use customers and add value at each step and for every participant.

Learn more at nuseed.com

