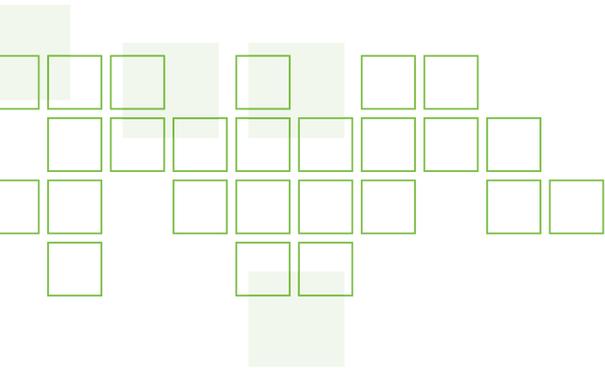


GOLDEN OPPORTUNITIES

2021

**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 because herbicide tolerance has been established through years of selective breeding. Nuseed has introgressed the Clearfield®, Clearfield® Plus or DuPont™ ExpressSun® traits into a number of 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.

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

HIGH OLEIC

Nuseed is proud of our NEWEST PLAYERS – the adaptable N4H302 E, the strong N4H470 CL Plus and the high-yielding N4H521 CL. Developed in the US, our new high oleic oil hybrids deliver on high-performance agronomics, yield and top-end oil content. 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.

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

N4H470 CL Plus

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, Beyond herbicide tolerant
- Clearfield Plus provides improved yield potential
- Excellent stalk and root strength
- Good late season plant health

N4H521 CL

Maturity: Medium-Late

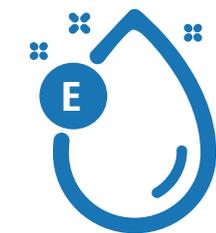
N4H521 CL is the fullest season high oleic hybrid in the Nuseed lineup and it yields big. The oil profile combined with a nice black seed color ensures multiple market options. An excellent fit for South Dakota, the High Plains and Texas, this hybrid will help a grower succeed with its outstanding yield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

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

- High oleic, Beyond herbicide tolerant
- Outstanding yield potential
- Full season plant health

SUNFLOWER FACT

SUNFLOWERS CONTAIN
MORE
VITAMIN E



THAN ANY OTHER
VEGETABLE OIL

HIGH OLEIC

High oleic sunflowers were developed through traditional breeding methods to deliver much higher levels of monounsaturated fats (oleic content) than traditional oil sunflower seeds. 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%.

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

DAYTONA

Maturity: Medium-Early

With shorter plant height and earlier maturity, Daytona stands up in drier environments. Its excellent stalk and root strength are more than a match for strong winds. Combine all this with the Clearfield production system and this proven high oleic hybrid from Nuseed is a tough one to beat.

MARKET: High Oleic **TRAIT:** Clearfield **DMR:** No

- High oleic, Beyond herbicide tolerant
- Excellent stalk and root strength
- Improved disease tolerance
- Does well in drier, western environments

HORNET

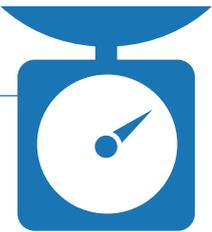
Maturity: Medium

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

SUNFLOWER FACT



SUNFLOWERS PRODUCE
AS MUCH AS

**1,400 POUNDS
OF OIL PER ACRE**

MORE THAN COTTON,
SOYBEAN OR CORN.



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, Express herbicide tolerant
- 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 has an improved oil content which fits well into the NuSun and bird food markets.

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

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

N4HM354

Maturity: Medium-Early

N4HM354 is the newest NuSun hybrid from Nuseed. 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, Beyond herbicide tolerant
- 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, Beyond herbicide tolerant
- 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 and realizes a greater yield. Most conoil production is sold into the kernel or dehull market where the seeds are mechanically dehulled by a processor.

N5LM307

Maturity: Medium-Early

Nuseed was first to market with a black seeded conoil. N5LM307 is now a top choice hybrid for the dehull market. Easy to grow, this uniform, medium-early maturity Clearfield hybrid also provides market flexibility and the flexibility to be planted in all sunflower growing regions.

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

- Conoil, Beyond herbicide tolerant
- Excellent hullability preferred by processors
- Excellent end-of-season plant health
- Medium-Early maturity gives planting flexibility in all regions

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, Beyond herbicide tolerant
- 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. The smaller seeds that are not used as in-shell confection are typically mechanically hulled by the processor and sold into the kernel market. They can be sold raw, roasted as a snack or used as an ingredient. The smallest of the sunflower seeds are used in the bird and pet food markets.

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

LD5009

Maturity: Medium
Seed Type: Long/Extra Long (LT/XL)

LD5009 is a medium maturing confection hybrid specifically developed to produce uniform, long and dark colored seed for sunflower export markets. LD5009 is a medium height hybrid with excellent stalk and root strength that performs best in sunflower producing regions.

MARKET: Confection **TRAIT:** None **DMR:** No

- Large, dark striped - processor preferred
- Uniform single-cross hybrid
- Excellent emergence
- Excellent stalk and root strength

4334

Maturity: Medium-Late
Seed Type: Long (LT)

4334 produces very large, long and dark grain required for the ever changing global confection markets. This Clearfield hybrid has above average yield, good uniformity and is easy to harvest. 4334 is a competitive hybrid that provides growers an exceptional return on their investment.

MARKET: Confection **TRAIT:** Clearfield **DMR:** No

- Beyond herbicide tolerant
- Excellent seed size, length and color
- Excellent stalk health and standability
- Fits domestic and export markets

NEW N6L691 CL

Maturity: Late
Seed Type: Extra Extra Long (XXL)

N6L691 CL produces an XXL mid-oleic confection seed perfect for the demands of the growing export market. With excellent late season plant health and Beyond herbicide tolerance, this niche market is a win for your operation in fuller season growing regions.

MARKET: Confection **TRAIT:** Clearfield **DMR:** No

- XXL seed type for export
- Beyond herbicide tolerant
- NuSun oil
- Excellent roots and late season plant health

	HIGH OLEIC						NUSUN				CONOIL (DEHULL)		CONFECTION			
	COBALT II	N4H302 E	DAYTONA	N4H470 CL PLUS	HORNET	N4H521 CL	TALON	FALCON	N4HM354	CAMARO II	N5LM307	BADGER DMR	PANTHER DMR	LD5009	4334	NEW N6L691 CL
MATURITY	EARLY	MED-EARLY	MED-EARLY	MEDIUM	MEDIUM	MED-LATE	EARLY	MED-EARLY	MED-EARLY	MEDIUM	MED-EARLY	MEDIUM	EARLY	MEDIUM	MED-LATE	LATE
TRAITS	Clearfield/DMR	ExpressSun	Clearfield	Clearfied Plus/DMR	Clearfield/DMR	Clearfield/DMR	ExpressSun	ExpressSun	Clearfied/DMR	Clearfield/DMR	Clearfield/DMR	Clearfield/DMR	DMR	N/A	Clearfield	Clearfield
EMERGENCE	8	9	8	8	8	8	7	7	8	7	8	8	7	8	7	7
DROUGHT TOLERANCE	7	7	8	9	8	8	6	8	7	8	7	7	6	6	7	7
UNIFORMITY AT FLOWERING	9	8	6	9	7	7	8	8	8	8	7	7	7	8	6	7
YIELD FOR MATURITY	8	7	7	8	9	9	7	8	9	9	8	7	8	7	8	6
TEST WEIGHT	7	7	8	8	7	8	6	8	7	8	7	7	8	7	7	7
DRY DOWN	8	8	7	7	6	6	7	7	8	7	8	7	7	7	6	6
OIL CONTENT	6	7	6	9	7	8	5	7	8	7	4	4	N/A	N/A	N/A	N/A
LATE SEASON PLANT HEALTH	7	7	7	8	8	8	6	8	7	8	8	7	7	6	8	8
STALK RATING	8	7	8	8	7	7	7	8	8	8	7	7	8	7	7	8
ROOT RATING	8	6	6	8	6	6	8	7	8	7	7	8	7	8	7	7
PLANT HEIGHT	5	6	5	7	7	7	5	6	6	6	6	8	6	7	7	7

NEW CANOLA

NEW GENETICS WITH THE
MOST ADVANCED WEED
CONTROL SYSTEM

TruFlex™ CANOLA with Roundup Ready® Technology

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.

NC401 TF

Maturity: Medium

Nuseed is proud to present our first hybrid for the U.S. commodity canola market. Developed specifically for its yield potential in the Northern United States, NC401 TF is a great choice with proven performance for local farms.

- TruFlex™ Canola with Roundup Ready® Technology
- Outstanding early season plant health
- High yielding
- Excellent pod set
- New genetics

DISEASE PACKAGE

Blackleg:
Multi-gene Resistant

Fusarium Wilt:
Resistant

AGRONOMICS

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

HARVEST CHARACTERISTICS

Yield for maturity: 8
Oil content: 7
Straight cut rating: 5

Hybrid Rating Scale 1 = Poor, 9 = Excellent

A NEW on-farm opportunity:

- Closed loop specialty canola production contract
- Increased profit potential
- Force majeure contract clause
- Harvest via straight cutting or swathing
- Harvested crop is stored on-farm with delivery prior to the following harvest
- Independent lab grading with samples taken during harvest and at delivery
- Grower payment is within 30 days of pick-up or delivery based on contract terms
- Local Nuseed agronomic and stewardship support
- Local support for coordinating delivery of planting seed, collecting samples and elevator delivery logistics

Grower requirements:

- Crop inputs
- Responsible, stewarded management
- Completed stewardship forms for seed and grain handling and field activities
- Isolation from any other canola
- Ensure that no canola, other than Nuseed Omega-3 Canola is grown on the same land for the following three years
- Additional requirements as stated in the grower's contract and Nuseed Stewardship Guidelines*

Email Omega3Canola@nuseed.com for a contract production assessment.

Or contact:

Brian Morse, MT Production Coordinator
(406) 425-2182 | brian.morse@nuseed.com

Michael Schaefer, ND Production Coordinator
(701) 818-2375 | michael.schaefer@nuseed.com

*Nuseed is a member of Excellence Through Stewardship®. Omega-3 Canola is grown in an identity-preserved system, and growers agree to follow our stewardship practices such as: crop segregation from on farm delivery; handling during planting, harvest and storage; maintaining and recording adequate isolation distances from sexually compatible crops; and other procedures designed to prevent mixing and maintain product integrity quality.



Nuseed Omega-3 Canola Contracts

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



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.

