



# QUICK HERBICIDE REFERENCE GUIDE 2024

This factsheet represents herbicides registered on field corn and available as of April 2024. This list is prone to changes and it is recommended to always refer to [Manitoba's Guide to Field Crop Protection](#) and herbicide labels before in-field applications. Page numbers in the below tables are references to the Guide to Field Crop Protection.

\*Important pages to note in the Guide to Field Crop Protection 2024:

**Page 56, Table 8:** Herbicide Mode of Action and Chemical Family for Resistant Weed Management

**Page 62, Table 9:** Mode of Action, Site of Uptake and Symptoms of Different Herbicide Groups

**Page 63, Table 10:** Herbicide-Resistant Weeds in Western Canada

**Page 72, Table 5:** Weed Control in Corn

\*Crop Staging is stated according to the herbicide label. For help with leaf staging, refer to Manitoba Crop Alliance's [Vegetative Growth Stages](#) factsheet, also attached at the bottom of this document.

**Table 1: Fall-Applied Herbicides**

| Page | Herbicide         | Active Ingredient     | Group | Site of action       | Chemical Family   | Crop Staging/Timing                            | Weed Spectrum |                 |
|------|-------------------|-----------------------|-------|----------------------|-------------------|--|---------------|-----------------|
|      |                   |                       |       |                      |                   |  | Grassy Weeds  | Broadleaf Weeds |
| 471  | <b>Express SG</b> | 50% tribenuron-methyl | 2     | ALS Enzyme Inhibitor | Sulfonylurea (SU) | fall-applied only, with glyphosate             |               | X               |
| 488  | <b>Valtera</b>    | 479.2 g/L flumioxazin | 14    | PPO Inhibitor        | N-Phenyl-imide    | fall-applied or up to 7 days prior to planting | X (GF only)   | X               |



**Table 2: Pre-Plant Herbicides**

| Page | Herbicide            | Active Ingredient             | Group | Site of action                       | Chemical Family          | Crop Staging/Timing   | Weed Spectrum |                 |
|------|----------------------|-------------------------------|-------|--------------------------------------|--------------------------|---|---------------|-----------------|
|      |                      |                               |       |                                      |                          |   | Grassy Weeds  | Broadleaf Weeds |
| 163  | <b>Carfentrazone</b> | 240 g/L carfentrazone-ethyl   | 14    | PPO Inhibitor                        | Triazolinone             | pre-plant   |               | X               |
| 236  | <b>Fierce</b>        | 160 g/L flumioxazin           | 14    | PPO Inhibitor                        | N-Phenyl-imide           | 7 - 30 days prior to planting   | X             | X               |
|      |                      | 203 g/L pyroxasulfone         | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide          |   |               |                 |
| 265  | <b>Frontier Max</b>  | 720 g/L dimethanamid-P        | 15    | Very Long Chain Fatty Acid Inhibitor | Acetamide                | pre-plant incorporated  | X (GF only)   |                 |
| 385  | <b>Prospect</b>      | 15 g/L halauxifen             | 4     | Growth Regulators                    | Pyridine carboxylic acid | pre-plant incorporated  | X (BYG only)  | X               |
|      |                      | 27.97 g/L carfentrazone-ethyl | 14    | PPO Inhibitor                        | Triazolinone             |   |               |                 |
| 488  | <b>Valtera</b>       | 479.2 g/L flumioxazin         | 14    | PPO Inhibitor                        | N-Phenyl-imide           | fall-applied or up to 7 days prior to planting                        | X (GF only)   | X               |
| 503  | <b>Zidua SC</b>      | 500 g/L pyroxasulfone         | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide          | pre-plant (up to 30 days), pre-emergent or post-emergent up to 4 leaf | X             | X               |



**Table 3: Pre-Plant or Pre-Emergent Herbicides (very large window of application)**

| Page | Herbicide                  | Active Ingredient                                  | Group | Site of action                       | Chemical Family      | Crop Staging/Timing  | Weed Spectrum |                 |
|------|----------------------------|--|-------|--------------------------------------|----------------------|--|---------------|-----------------|
|      |                            |  |       |                                      |                      |  | Grassy Weeds  | Broadleaf Weeds |
| 106  | <b>Aatrex</b>              | 480 g/L atrazine                                   | 5     | Photosystem II Inhibitor             | Triazine             | pre-plant incorporated or pre-emergent, and post-emergent 1 – 6 leaf stage; please see product label |               | X               |
| 142  | <b>Blackhawk</b>           | 473 g/L 2,4-D Ester                                | 4     | Growth Regulators                    | Phenoxy acetic acids | pre-plant or up to 3 days following planting   |               | X               |
|      |                            | 6.1 g/L pyraflufen-ethyl                           | 14    | PPO Inhibitor                        | Phenylpyrazole       |  |               |                 |
| 194  | <b>Conquer II</b>          | 467 g/L bromoxynil                                 | 6     | Photosystem II Inhibitor             | Nitriles             | pre-plant or up to 3 days following planting   |               | X               |
|      |                            | 15 g/L pyraflufen-ethyl                            | 14    | PPO Inhibitor                        | Phenylpyrazole       |  |               |                 |
| 260  | <b>Focus</b>               | 53 g/L carfentrazone-ethyl                         | 14    | PPO Inhibitor                        | Triazolinone         | pre-plant or up to 3 days following planting   | X             | X               |
|      |                            | 447 g/L pyroxasulfone                              | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      |  |               |                 |
| 281  | <b>GoldWing</b>            | 420 g/L MCPA Ester                                 | 4     | Growth Regulators                    | Phenoxy acetic acids | pre-plant or up to 3 days following planting   |               | X               |
|      |                            | 13.65 g/L pyraflufen-ethyl                         | 14    | PPO Inhibitor                        | Phenylpyrazole       |  |               |                 |
| 286  | <b>Heat Brands</b>         | 70% saflufenacil (WG) or 342 g/L (LQ) saflufenacil | 14    | PPO Inhibitor                        | Pyrimidinedione      | pre-plant or pre-emergent  |               | X               |
| 290  | <b>Heat Complete</b>       | 342 g/L saflufenacil                               | 14    | PPO Inhibitor                        | Pyrimidinedione      | pre-plant or pre-emergent  |               | X               |
|      |                            | 500 g/L pyroxasulfone                              | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      |  |               |                 |
| 314  | <b>Insight Liquid SC</b>   | 339 g/L tiafenacil                                 | 14    | PPO Inhibitor                        | Pyrimidinedione      | pre-plant or pre-emergent  | X (WO only)   | X               |
| 337  | <b>Metolachlor</b>         | 915 g/L s-metolachlor and r-metolachlor            | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      | pre-plant incorporated or pre-emergent, please see product label                                     | X             | X               |
| 381  | <b>Primextra II Magnum</b> | 320 g/L atrazine                                   | 5     | Photosystem II Inhibitor             | Triazine             | pre-plant incorporated or pre-emergent, please see product label                                     | X             | X               |
|      |                            | 400 g/L s-metolachlor                              | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      |  |               |                 |
| 424  | <b>Simazine</b>            | 90% simazine or 480 g/L simazine                   | 5     | Photosystem II Inhibitor             | Triazine             | one week prior to planting (incorporated) to 4 days following planting; rainfall required            | X             | X               |
| 500  | <b>Voraxor</b>             | 125 g/L trifludimoxazin                            | 14    | PPO Inhibitor                        | Triazolone           | pre-plant or pre-emergent  |               | X               |
|      |                            | 250 g/L saflufenacil                               | 14    | PPO Inhibitor                        | Pyrimidinedione      |  |               |                 |
| 502  | <b>Voraxor Complete</b>    | 125 g/L trifludimoxazin                            | 14    | PPO Inhibitor                        | Triazolone           | pre-plant or pre-emergent  | X             | X               |
|      |                            | 250 g/L saflufenacil                               | 14    | PPO Inhibitor                        | Pyrimidinedione      |  |               |                 |
|      |                            | 500 g/L pyroxasulfone                              | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      |  |               |                 |
| 503  | <b>Zidua</b>               | 500 g/L pyroxasulfone                              | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      | pre-plant (up to 30 days), pre-emergent or post-emergent up to 4 leaf                                | X             | X               |

**Table 4: Pre-Emergent Herbicides (small window of application)**

| Page | Herbicide          | Active Ingredient | Group | Site of action       | Chemical Family | Crop Staging/Timing                             | Weed Spectrum |                 |
|------|--------------------|-------------------|-------|----------------------|-----------------|---|---------------|-----------------|
|      |                    |                   |       |                      |                 |   | Grassy Weeds  | Broadleaf Weeds |
| 410  | <b>Rimsulfuron</b> | 25% rimsulfuron   | 2     | ALS Enzyme Inhibitor | Sulfonylurea    | pre-emergent, post-emergent up to V2 (RRV ONLY) | X             | X               |
| 431  | <b>Sortan IS</b>   | 20% rimsulfuron   | 2     | ALS Enzyme Inhibitor | Sulfonylurea    | pre-emergent, post-emergent up to V3            | X             | X               |

**Table 5: Post-Emergent Herbicides**

| Page | Herbicide                | Active Ingredient                          | Group | Site of action           | Chemical Family          | Crop Staging/Timing  | Weed Spectrum |                 |
|------|--------------------------|--|-------|--------------------------|--------------------------|--|---------------|-----------------|
|      |                          |  |       |                          |                          |  | Grassy Weeds  | Broadleaf Weeds |
| 100  | <b>2,4-D</b>             | 564 g/L 2,4-D Amine or 660 g/L 2,4-D Ester | 4     | Growth Regulators        | Phenoxy acetic acids     | Foliar: prior to 6" tall; Directed spray: 6+" tall   |               | X               |
| 104  | <b>2,4-DB</b>            | 625 g/L 2,4-DB                             | 4     | Growth Regulators        | Phenoxy acetic acids     | Directed spray: 15" - tassel, using drop nozzles   |               | X               |
| 106  | <b>Aatrex</b>            | 480 g/L atrazine                           | 5     | Photosystem II Inhibitor | Triazine                 | pre-plant incorporated or pre-emergent, and post-emergent 1 - 6 leaf stage; please see product label | X             | X               |
| 138  | <b>Bentazon</b>          | 480 g/L bentazon                           | 6     | Photosystem II Inhibitor | Benzothiadiazinones      | no staging restrictions  |               | X               |
| 149  | <b>Bromoxynil</b>        | 240 - 480 g/L bromoxynil                   | 6     | Photosystem II Inhibitor | Nitriles                 | 4 - 8 leaf, later than that, use drop nozzles  |               | X               |
| 155  | <b>Bromoxynil/MCPA</b>   | 225 - 280 g/L MCPA Ester                   | 4     | Growth Regulators        | Phenoxy acetic acids     | 4 - 6 leaf stage   |               | X               |
|      |                          | 225 - 280 g/L bromoxynil                   | 6     | Photosystem II Inhibitor | Nitriles                 |  |               |                 |
| 162  | <b>Callisto 480 SC</b>   | 480 g/L mesotrione                         | 27    | HPPD Inhibition          | Triketone                | 2 - 6 leaf stage   |               | X               |
| 183  | <b>Lontrel XC (only)</b> | 600 g/L clopyralid                         | 4     | Growth Regulators        | Pyridine carboxylic acid | VE - V6  |               | X               |
| 197  | <b>Dicamba</b>           | 350 - 600 g/L dicamba                      | 4     | Growth Regulators        | Benzoic acids            | up to 8" tall, use drop nozzles when taller  |               | X               |
| 210  | <b>Distinct</b>          | 50% dicamba                                | 4     | Growth Regulators        | Benzoic acids            | 2 - 6 leaf stage   |               | X               |
|      |                          | 20% diflufenzopyr                          | 19    | Auxin Inhibitor          |                          |  |               |                 |

**Table 5: Post-Emergent Herbicides (cont.)**

| Page | Herbicide                 | Active Ingredient                        | Group | Site of action                       | Chemical Family      | Crop Staging/Timing   | Weed Spectrum |                 |
|------|---------------------------|--|-------|--------------------------------------|----------------------|---|---------------|-----------------|
|      |                           |  |       |                                      |                      |   | Grassy Weeds  | Broadleaf Weeds |
| 215  | <b>Enlist DUO</b>         | 194 g/L 2,4-D (choline salt)             | 4     | Growth Regulators                    | Phenoxy acetic acids | Enlist corn-only; up to V8 or 48" tall                                | X             | X               |
|      |                           | 204 g/L glyphosate                       | 9     | EPSP Synthase Inhibitor              |                      |   |               |                 |
| 271  | <b>Glufosinate 200 SN</b> | 200 g/L glufosinate                      | 10    | Glutamine Synthetase Inhibitor       |                      | glufosinate-tolerant corn only; 1 - 8 leaf stage                      |               | X               |
| 273  | <b>Glyphosate</b>         | 360 - 540 g/L glyphosate                 | 9     | EPSP Synthase Inhibitor              |                      | up to and including 8 leaf stage                                      | X             | X               |
| 326  | <b>Laudis</b>             | 420 g/L tembotrione                      | 27    | HPPD Inhibition                      | Triketone            | 2 - 8 leaf stage  | X             | X               |
| 331  | <b>MCPA</b>               | MCPA - various formulations              | 4     | Growth Regulators                    | Phenoxy acetic acids | up to 6 - 7" tall as foliar application                               |               | X               |
| 334  | <b>MCPB/MCPA</b>          | 375 g/L MCPB<br>25 g/L MCPA K or Na Salt | 4     | Growth Regulators                    | Phenoxy acetic acids | 18" tall to the start of VT, using drop nozzles                       |               |                 |
| 349  | <b>Nicosulfuron</b>       | 54.55 - 75% nicosulfuron                 | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | 1 - 8 leaf stage, VE - V6   | X             |                 |
| 361  | <b>Option 2.25 OD</b>     | 22.5g/L foramsulfuron                    | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | 1 - 8 leaf stage, VE - V5   | X             | X               |
| 369  | <b>Permit WG</b>          | 72.6% halosulfuron                       | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | 1 - 10/12 leaf stage  |               | X               |
| 410  | <b>Rimsulfuron</b>        | 25% rimsulfuron                          | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | pre-emergent, post-emergent up to V2 (RRV ONLY)                       | X             | X               |
| 419  | <b>Shieldex</b>           | 400 g/L tolpyralate                      | 27    | HPPD Inhibition                      | Pyrazolone           | VE - V6 or up to 50 cm tall, whichever is more restrictive            | X             | X               |
| 431  | <b>Sortan IS</b>          | 20% rimsulfuron                          | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | pre-emergent, post-emergent up to V3                                  | X             | X               |
| 433  | <b>Steadfast IS</b>       | 12.5% rimsulfuron                        | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         | VE - V4   | X             | X               |
|      |                           | 25% nicosulfuron                         | 2     | ALS Enzyme Inhibitor                 | Sulfonylurea         |   |               |                 |
| 452  | <b>Topramezone</b>        | 336 g/L topramezone                      | 27    | HPPD Inhibition                      | Pyrazolone           | 1 - 7 leaf stage; must be applied as a tank mix                       | X             | X               |
| 456  | <b>Tough EC</b>           | 600 g/L pyridate                         | 6     | Photosystem II Inhibitor             | Phenyl-pyridazines   | up to the 8-leaf stage  |               | X               |
| 503  | <b>Zidua</b>              | 500 g/L pyroxasulfone                    | 15    | Very Long Chain Fatty Acid Inhibitor | Chloroacetamide      | pre-plant (up to 30 days), pre-emergent or post-emergent up to 4 leaf | X             | X               |

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CORN



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# VEGETATIVE (V) GROWTH STAGES

Corn development is categorized into vegetative and reproductive stages. Vegetative growth refers to leaf and stalk development and elongation. The vegetative stage is broken down into subdivisions, mainly identified numerically.



## VE: EMERGENCE

VE is defined as the stage where the coleoptile has emerged from the soil until just prior to the first leaf collaring.



## V1: ONE LEAF COLLAR

This stage is only defined once the first leaf collar is fully visible. The first true leaf of a corn plant is the only leaf to be rounded at the tip and is included when counting leaf collars for the full vegetative growth period.

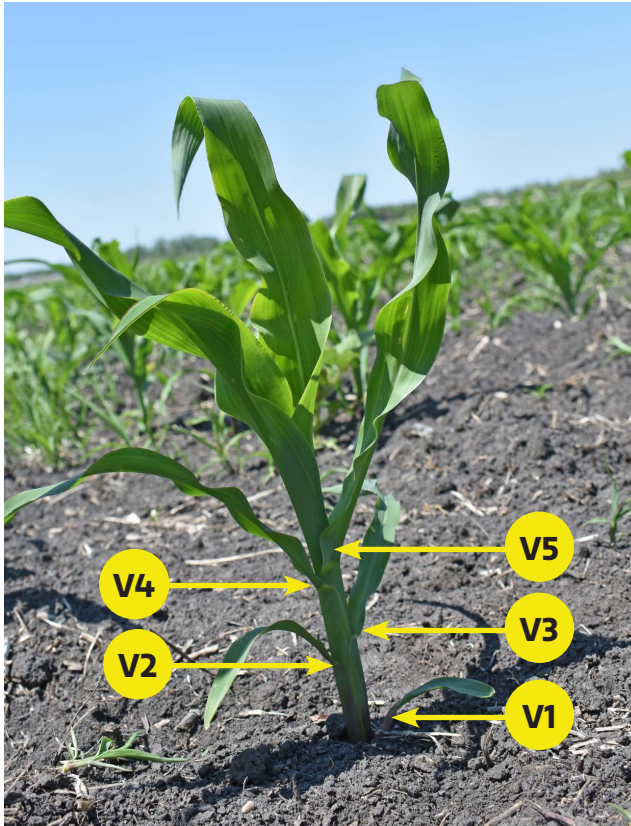


## V2: TWO LEAF COLLARS

Two leaf collars are fully visible. This second true leaf will have a pointed tip that is typical in corn plants. All leaves moving forward will bear the same resemblance.

CORN





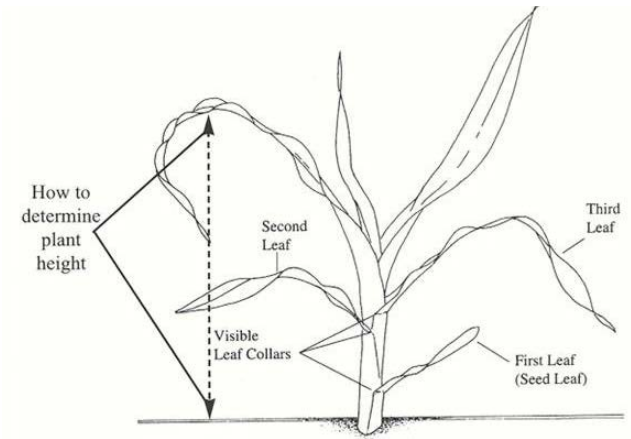
**V3, V4, V5, ...Vn: LEAF COLLARS**

Vn, where 'n' represents the last stage before VT (tasseling).



**VT: TASSELING**

When the tassel is fully emerged and extended, no longer being held in by the upper plant leaves. A corn plant remains in VT stage until any of the silk extends past the husk. This means that pollen shed can begin, even prior to entering the reproductive growth stages.



**ALTERNATE METHODS OF STAGING VEGETATIVE CORN**

**LEAF TIP METHOD:**

Count all leaves, including any leaf tips that have emerged from the whorl at the top of the plant. In the image shown, the corn plant is 6-leaf, according to the leaf tip method.

**LEAF OVER METHOD:**

Count the number of leaves, starting from the lowest leaf (the coleoptile leaf with a rounded tip) to the last leaf that is arched over (tip pointing down). Younger leaves that are standing straight up are not counted. In the image shown, the corn plant is 4-leaf, according to the leaf over method.

**LEAF HEIGHT METHOD:**

Measure from soil level to the arch of the last leaf that is fully arched over. Height is usually measured in inches when referring to herbicide applications.

**NOTE:**

*When considering a herbicide application that does not clearly state which leaf counting method is used on the label, always contact the corresponding chemical company.*



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