

# North Dakota Herbicide Chart

Repeated use of herbicides with the same site of action alone can result in the development of herbicide-resistant weed populations.

## By Mode of Action (effect on plant growth)

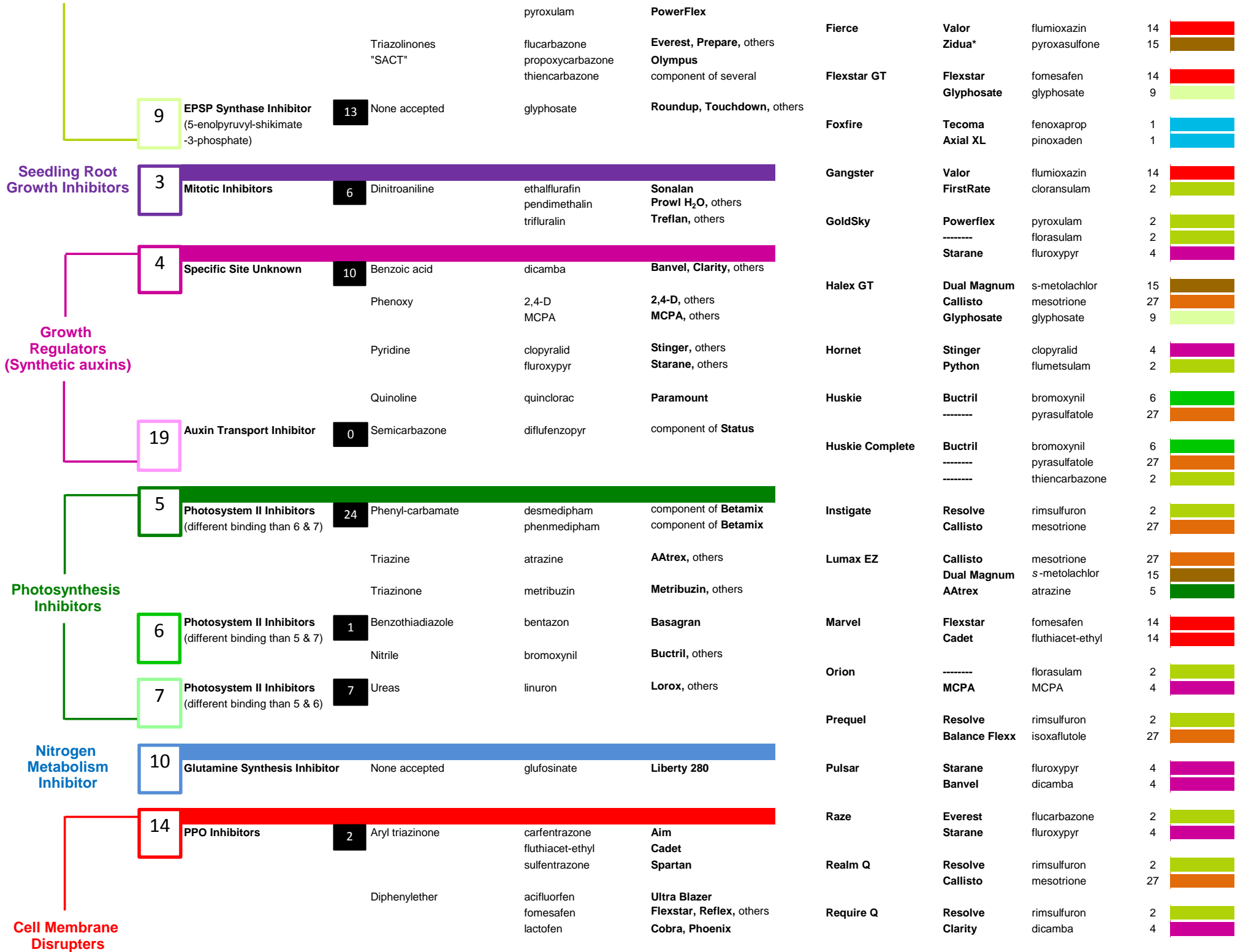
This chart groups herbicides by their modes of action to assist you in selecting **1)** to maintain greater diversity in herbicide use and **2)** to rotate among herbicides with different sites of action to delay the development of herbicide resistance.

The Site of Action Group is a classification system developed by the Weed Science Society of America.

| Site of Action Group            | Site of Action                             | Number of resistant weed species in U.S. | Chemical Family                 | Active Ingredient | Product Examples Trade Name ® |                         |
|---------------------------------|--|--|---------------------------------|-------------------|-------------------------------|-------------------------|
| 1                               | ACCase Inhibitors (acetyl CoA carboxylase) | 15                                       | Aryloxyphenoxy propionate "Fop" | clodinafop        | Discover NG                   |                         |
|                                 |  |  |                                 | fenoxaprop        | Tacoma, Parity, others        |                         |
|                                 |  |  |                                 | fluzafop          | Fusilade DX                   |                         |
|                                 |  |  |                                 | quizalofop        | Assure II, Targa              |                         |
| Lipid Synthesis Inhibitors      | Lipid Synthesis Inhibitors                 | 8  | Cyclohexanedione "Dim"          | clethodim         | Select Max, others            |                         |
|                                 |  |  |                                 | sethoxydim        | Poast, others                 |                         |
|                                 |  |  |                                 | pinoxaden         | Axial XL                      |                         |
| Lipid Synthesis Inhibitors      | Lipid Synthesis Inhibitors                 | 8  | Thiocarbamate                   | cyloate           | Ro-Neet SB                    |                         |
|                                 |  |  |                                 | EPTC              | Eptam, others                 |                         |
|                                 |  |  |                                 | triallate         | Far-Go                        |                         |
| 2                               | ALS Inhibitors (acetolactate synthase)     | 44                                       | Imidazolinone "Imi"             | imazamox          | Raptor, Beyond                |                         |
|                                 |  |  |                                 | imazapic          | Plateau                       |                         |
|                                 |  |  |                                 | imazethapyr       | Pursuit                       |                         |
|                                 |  |  |                                 | Sulfonylurea "SU" | halosulfuron                  | Permit, others          |
|                                 |  |  |                                 |                   | mesosulfuron                  | Osprey                  |
|                                 |  |  |                                 |                   | rimsulfuron                   | Resolve, Matrix, others |
|                                 |  |  |                                 |                   | sulfosulfuron                 | Maverick                |
| thifensulfuron                  | Harmony, others                            |  |                                 |                   |                               |                         |
| tribenuron                      | Express, others                            |  |                                 |                   |                               |                         |
| triflusulfuron                  | UpBeet                                     |  |                                 |                   |                               |                         |
| Amino Acid Synthesis Inhibitors | Amino Acid Synthesis Inhibitors            | 44                                       | Triazolopyrimidine "TPS"        | clorasulam        | FirstRate                     |                         |
|                                 |  |  |                                 | florasulam        | component of several          |                         |
|                                 |  |  |                                 | flumetsulam       | Python                        |                         |

This chart lists premix herbicides alphabetically by their trade names so you can identify the premix's component herbicides and their respective site of action groups. Refer to the Mode of Action chart on the left for more information.

| Premix Trade Name ®        | Trade Name ®  | Active Ingredient | Site of Action Group |
|----------------------------|---------------|-------------------|----------------------|
| Affinity BroadSpec         | Harmony :1    | thifensulfuron    | 2                    |
|                            | Express :1    | tribenuron        | 2                    |
| Affinity TankMix           | Harmony :4    | thifensulfuron    | 2                    |
|                            | Express :1    | tribenuron        | 2                    |
| Anthem *                   | Zidua*        | pyoxasulfone      | 15                   |
|                            | Cadet         | fluthiacet-ethyl  | 14                   |
| Audit                      | Harmony :3    | thifensulfuron    | 2                    |
|                            | Express :1    | tribenuron        | 2                    |
| Authority Assist           | Spartan       | sulfentrazone     | 14                   |
|                            | Pursuit       | imazethapyr       | 2                    |
| Authority First - or Sonic | Spartan       | sulfentrazone     | 14                   |
|                            | FirstRate     | clorasulam        | 2                    |
| Authority MTZ              | Spartan       | sulfentrazone     | 14                   |
|                            | Metribuzin    | metribuzin        | 5                    |
| Axial Star                 | Starane       | fluroxypyr        | 4                    |
|                            | Axial XL      | pinoxaden         | 1                    |
| Betamix                    | -----         | desmedipham       | 5                    |
|                            | -----         | phenmedipham      | 5                    |
| Boundary                   | Dual Magnum   | s-metolachlor     | 15                   |
|                            | Metribuzin    | metribuzin        | 5                    |
| BroadAxe                   | Dual Magnum   | s-metolachlor     | 15                   |
|                            | Spartan       | sulfentrazone     | 14                   |
| Bronate (generics)         | Buctril       | bromoxynil        | 6                    |
|                            | MCPA          | MCPA              | 4                    |
| Callisto Xtra              | Callisto      | mesotrione        | 27                   |
|                            | Atrazine      | atrazine          | 5                    |
| Capreno                    | -----         | thiencarbazone    | 2                    |
|                            | Laudis        | tembotrione       | 27                   |
| Corvus                     | -----         | thiencarbazone    | 2                    |
|                            | Balance Flexx | isoxaflutole      | 27                   |
| Curtail                    | Stinger       | clopyralid        | 4                    |
|                            | 2,4-D         | 2,4-D             | 4                    |
| Curtail M                  | Stinger       | clopyralid        | 4                    |
|                            | MCPA          | MCPA              | 4                    |
| Extreme                    | Pursuit       | imazethapyr       | 2                    |
|                            | Glyphosate    | glyphosate        | 9                    |



**Seedling Shoot Growth Inhibitors**

|    |                                 |   |                     |   |   |
|----|---------------------------------|---|---------------------|---|---|
| 22 | Photosystem I Electron Diverter | 5 | N-phenylphthalimide | flumiclorac<br>flumioxazin                | Resource<br>Valor                                   |
|    |                                 |   | Pyrimidinedione     | saflufenacil                              | Sharpen   |
| 15 | Long-Chain Fatty Acid Inhibitor | 1 | Bipyridilium        | diquat<br>paraquat                        | Reglone, others<br>Gramoxone, others                |
|    |                                 |   | Acetamide           | acetochlor<br>metolachlor<br>dimethenamid | Harness, Surpass, others<br>Dual, others<br>Outlook |
|    |                                 |   | Pyrazole            | pyroxasulfone                             | Zidua*  |

**Pigment Inhibitors**

|    |                 |   |            |                              |  |
|----|-----------------|---|------------|------------------------------|--|
| 27 | HPPD Inhibitors | 1 | Isoxazole  | isoxaflutole                 | Balance Flex                           |
|    |                 |   | Pyrazolone | pyrasulfatole<br>topramezone | component of Huskie<br>Impact, Armezon |
|    |                 |   | Triketone  | mesotrione<br>tembotrione    | Callisto<br>Laudis                     |

**Unknown**


|    |                       |         |              |                 |
|----|-----------------------|---------|--------------|-----------------|
| 16 | Specific Site Unknown | Unknown | ethofumesate | Nortron, others |
|----|-----------------------|---------|--------------|-----------------|

**COLD HARD STEEL**

|    |  |  |  |                          |
|----|--|--|--|--------------------------|
| 30 |  |  |  | Plow, Cultivator, others |
|----|--|--|--|--------------------------|

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|                |                               |  |              |          |
|----------------|-------------------------------|--|--------------|----------|
| Basagran       | bentazon                      | 6  |              |          |
| Poast          | sethoxydim                    | 1  |              |          |
| Rimfire Max    | Olympus<br>Osprey             | propoxycarbazone<br>mesosulfuron           | 2<br>2       | <br>     |
| Sequence       | Glyphosate<br>Dual Magnum     | glyphosate<br>s-metolachlor                | 9<br>15      | <br>     |
| Spartan Charge | Spartan<br>Aim                | sulfentrazone<br>carfentrazone             | 14<br>14     | <br>     |
| Starane Flex   | -----<br>Starane              | florasulam<br>fluroxypyr                   | 2<br>4       | <br>     |
| Starane NXT    | Buctril<br>Starane            | bromoxynil<br>fluroxypyr                   | 6<br>4       | <br>     |
| Status         | -----<br>Clarity              | diflufenzopyr<br>dicamba                   | 19<br>4      | <br>     |
| Supremacy      | Starane<br>Harmony<br>Express | fluroxypyr<br>thifensulfuron<br>tribenuron | 4<br>2<br>2  | <br><br> |
| SureStart      | Surpass<br>Stinger<br>Python  | acetochlor<br>clopyralid<br>flumetsulam    | 15<br>4<br>2 | <br><br> |
| Storm          | Basagran<br>Ultra Blazer      | bentazon<br>acifluorfen                    | 6<br>14      | <br>     |
| TripleFLEX     | Harness<br>Stinger<br>Python  | acetochlor<br>clopyralid<br>flumetsulam    | 15<br>4<br>2 | <br><br> |
| Trump Card     | Starane<br>2,4-D              | fluroxypyr<br>2,4-D                        | 4<br>4       | <br>     |
| Verdict        | Sharpen<br>Outlook            | saflufenacil<br>dimethenamid-P             | 14<br>15     | <br>     |
| Weld           | MCPA<br>Starane<br>Stinger    | MCPA<br>fluroxypyr<br>clopyralid           | 4<br>4<br>4  | <br><br> |
| WideMatch      | Stinger<br>Starane            | clopyralid<br>fluroxypyr                   | 4<br>4       | <br>     |
| Wolverine      | Tacoma<br>-----<br>Buctril    | fenoxaprop<br>pyrasulfatole<br>bromoxynil  | 1<br>27<br>6 | <br><br> |
| Zemax          | Callisto<br>Dual II Magnum    | mesotrione<br>s-metolachlor                | 27<br>15     | <br>     |