

Hard red spring wheat and barley tolerance to postemergence herbicides at Crookston, MN - 1997. Durgan, Beverly R., Eric Spandl, and Jim Cameron. This experiment was designed to evaluate wheat and barley tolerance to various postemergence herbicides. The experiments were conducted at Crookston, MN on a Donaldson and Wheaton loam soil. Following weedy fallow, the experimental area received 100 lb/A of N and was fall plowed. In the spring the experimental area was disked and harrowed. 'Bergen', 'Butte 86', 'Marshall', 'Pioneer 2375', 'Russ', 'Sharpe', 'Sonja' hard red spring wheat varieties, 'Excel' and 'Stander' barley varieties were seeded on May 9 at 1.75 Bu/A and 2 Bu/A for wheat and barley, respectively. Propachlor (3 lbs ai/A) was broadcast to reduce grassy weed interference. Bromoxynil (0.25 lb ai/A) was broadcast to reduce broadleaf weed interference. All herbicide treatments were applied with a backpack type sprayer delivering 10 gpa at 30 psi using 80015 flat fan nozzles. The experimental design was a split block with three replications. Varieties were seeded in strips randomized within each replication. Herbicide treatments were applied across all nine varieties. Each herbicide x variety plot was 8 by 8 ft. Herbicide treatments were applied June 4 and June 10. Environmental conditions are listed below. Crop injury was rated visually on June 17, July 1, and July 14. Crop height was measured and yields taken. Data were summarized by variety and are presented in Tables 1-5.

| | | |
|--------------------------------|----------|---------|
| Treatment Date | June 4 | June 10 |
| Target crop stage | 3-4 leaf | 4- leaf |
| Soil Moisture | adequate | dry |
| Wind (mph) | 0-2 S | 0-5 S |
| Cloud Cover | clear | clear |
| Air Temperature (°F) | 63 | 68 |
| Rainfall before Application | | |
| Week 1 (inch) | 0.60 | 0.00 |
| Rainfall after Application | | |
| Week 1 (inch) | 0.00 | 0.56 |
| Week 2 (inch) | 0.81 | 3.09 |
| Wheat leaf no. | 3 | 4.5 |
| Barley leaf no. | 3 | 4.5 |

Table 1. Barley tolerance to postemergence herbicides at Crookston, MN - 1997 (Durgan, Spandl, and Cameron).

| Treatment | Rate (lb/A) | Robust | | | | | Stander | | | | |
|--|---------------------------------|---------------|------------|---------------|------------------|-----------------|---------------|------------|---------------|------------------|-----------------|
| | | Injury | | | Height (inch) | Yield (Bu/A) | Injury | | | Height (inch) | Yield (Bu/A) |
| | | 6/17 ----- | 7/1 (%) | 7/14 ----- | | | 6/17 ----- | 7/1 (%) | 7/14 ----- | | |
| Postemergence (June 4) | | | | | | | | | | | |
| HOE 1133 | 0.104 | 7 | 8 | 7 | 32 | 77 | 7 | 7 | 7 | 28 | 84 |
| HOE 1133 | 0.208 | 5 | 7 | 2 | 33 | 69 | 5 | 5 | 0 | 29 | 78 |
| Tralkoxydim + TF8035 COC | 0.18 + 0.5% | 10 | 12 | 3 | 30 | 65 | 10 | 8 | 5 | 30 | 71 |
| Tralkoxydim + TF8035 COC | 0.36 + 0.5% | 17 | 22 | 12 | 28 | 69 | 17 | 22 | 12 | 26 | 76 |
| Fenoxaprop & MCPA ¹ + thifensulfuron & tribenuron ² | 0.091 & 0.37 + 0.009 & 0.005 | 12 | 13 | 2 | 34 | 83 | 22 | 18 | 0 | 30 | 85 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 12 | 15 | 3 | 31 | 74 | 20 | 22 | 2 | 30 | 81 |
| Postemergence (June 10) | | | | | | | | | | | |
| Difenzoquat | 0.75 | 20 | 10 | 5 | 30 | 75 | 17 | 8 | 3 | 29 | 87 |
| Difenzoquat | 1.0 | 23 | 13 | 5 | 30 | 73 | 18 | 7 | 3 | 29 | 77 |
| Difenzoquat | 1.5 | 27 | 20 | 7 | 30 | 68 | 27 | 15 | 8 | 29 | 77 |
| Imazamethabenz + difenzoquat + NIS ¹ | 0.23 + 0.5 + 0.25% | 22 | 13 | 5 | 30 | 79 | 22 | 10 | 5 | 29 | 87 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.091 & 0.37 + 0.009 & 0.005 | 12 | 7 | 3 | 31 | 77 | 20 | 10 | 0 | 31 | 80 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 12 | 8 | 2 | 32 | 81 | 13 | 10 | 2 | 31 | 94 |
| Check | | 0 | 0 | 0 | 32 | 82 | 0 | 0 | 0 | 30 | 89 |
| LSD (0.05) | | 10 | 11 | ns | ns | ns | 9 | 9 | ns | ns | ns |

¹ Premix = Cheyenne 2.69E.

² Premix = Harmony Extra 75DF.

¹ NIS = Class Preference nonionic surfactant.

Table 2. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 1997 (Durgan, Spandl, and Cameron).

| Treatment | Rate (lb/A) | Bergen | | | | | Butte 86 | | | | |
|--|---------------------------------|----------------------|---------------------|----------------------|------------------|-----------------|----------------------|---------------------|----------------------|------------------|-----------------|
| | | Injury | | | Height (inch) | Yield (Bu/A) | Injury | | | Height (inch) | Yield (Bu/A) |
| | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | |
| Postemergence (June 4) | | | | | | | | | | | |
| HOE 1133 | 0.104 | 7 | 5 | 2 | 29 | 37 | 12 | 8 | 3 | 34 | 39 |
| HOE 1133 | 0.208 | 3 | 5 | 0 | 31 | 43 | 8 | 5 | 2 | 34 | 38 |
| Tralkoxydim + TF8035 COC | 0.18 + 0.5% | 3 | 2 | 2 | 30 | 36 | 8 | 2 | 2 | 34 | 41 |
| Tralkoxydim + TF8035 COC | 0.36 + 0.5% | 8 | 7 | 7 | 27 | 41 | 8 | 10 | 7 | 31 | 39 |
| Fenoxaprop & MCPA ¹ + thifensulfuron & tribenuron ² | 0.091 & 0.37 + 0.009 & 0.005 | 8 | 5 | 0 | 30 | 45 | 8 | 5 | 0 | 32 | 42 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 12 | 7 | 2 | 28 | 40 | 15 | 7 | 3 | 33 | 39 |
| Postemergence (June 10) | | | | | | | | | | | |
| Difenzoquat | 0.75 | 18 | 8 | 7 | 29 | 31 | 20 | 15 | 13 | 32 | 24 |
| Difenzoquat | 1.0 | 25 | 15 | 8 | 29 | 29 | 25 | 17 | 10 | 31 | 27 |
| Difenzoquat | 1.5 | 25 | 17 | 12 | 28 | 30 | 27 | 18 | 10 | 32 | 26 |
| Imazamethabenz + difenzoquat + NIS ³ | 0.23 + 0.5 + 0.25% | 18 | 10 | 3 | 29 | 38 | 18 | 12 | 2 | 32 | 34 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.091 & 0.37 + 0.009 & 0.005 | 17 | 8 | 2 | 30 | 43 | 23 | 15 | 3 | 33 | 42 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 17 | 12 | 3 | 29 | 44 | 22 | 12 | 5 | 32 | 38 |
| Check | | 0 | 0 | 0 | 29 | 32 | 0 | 0 | 0 | 32 | 30 |
| LSD (0.05) | | 7 | 7 | 5 | 2 | 8 | 9 | 9 | ns | ns | 7 |

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Table 3. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 1997 (Durgan, Spandl, and Cameron).

| Treatment | Rate (lb/A) | Marshall | | | | | Pioneer 2375 | | | | |
|--|---------------------------------|----------------------|---------------------|----------------------|------------------|-----------------|----------------------|---------------------|----------------------|------------------|-----------------|
| | | Injury | | | Height (inch) | Yield (Bu/A) | Injury | | | Height (inch) | Yield (Bu/A) |
| | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | |
| Postemergence (June 4) | | | | | | | | | | | |
| HOE 1133 | 0.104 | 13 | 8 | 7 | 31 | 46 | 10 | 3 | 2 | 30 | 42 |
| HOE 1133 | 0.208 | 7 | 2 | 3 | 32 | 46 | 5 | 5 | 3 | 30 | 49 |
| Tralkoxydim + TF8035 COC | 0.18 + 0.5% | 7 | 2 | 0 | 32 | 45 | 5 | 2 | 3 | 30 | 50 |
| Tralkoxydim + TF8035 COC | 0.36 + 0.5% | 7 | 8 | 5 | 30 | 48 | 7 | 7 | 17 | 29 | 43 |
| Fenoxaprop & MCPA ¹ + thifensulfuron & tribenuron ² | 0.091 & 0.37 + 0.009 & 0.005 | 10 | 2 | 2 | 32 | 44 | 10 | 7 | 5 | 30 | 51 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 8 | 2 | 2 | 32 | 46 | 12 | 5 | 3 | 29 | 47 |
| Postemergence (June 10) | | | | | | | | | | | |
| Difenzoquat | 0.75 | 18 | 8 | 10 | 33 | 31 | 18 | 17 | 15 | 29 | 39 |
| Difenzoquat | 1.0 | 23 | 13 | 12 | 31 | 36 | 23 | 22 | 13 | 28 | 36 |
| Difenzoquat | 1.5 | 27 | 17 | 17 | 30 | 35 | 25 | 22 | 17 | 29 | 29 |
| Imazamethabenz + difenzoquat + NIS ³ | 0.23 + 0.5 + 0.25% | 17 | 12 | 3 | 32 | 40 | 17 | 13 | 5 | 28 | 45 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.091 & 0.37 + 0.009 & 0.005 | 10 | 7 | 2 | 32 | 45 | 15 | 8 | 3 | 28 | 49 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 10 | 5 | 0 | 32 | 47 | 18 | 13 | 5 | 28 | 48 |
| Check | | 0 | 0 | 0 | 32 | 38 | 0 | 0 | 0 | 29 | 42 |
| LSD (0.05) | | 7 | 8 | 8 | ns | 7 | 8 | 7 | 8 | ns | 9 |

¹ Premix = Cheyenne 2.69E.

² Premix = Harmony Extra 75DF.

³ NIS = Class Preference nonionic surfactant.

Table 4. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 1997 (Durgan, Spandl, and Cameron).

| Treatment | Rate (lb/A) | Russ | | | | | Sharpe | | | | |
|--|---------------------------------|----------------------|---------------------|----------------------|------------------|-----------------|----------------------|---------------------|----------------------|------------------|-----------------|
| | | Injury | | | Height (inch) | Yield (Bu/A) | Injury | | | Height (inch) | Yield (Bu/A) |
| | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | |
| Postemergence (June 4) | | | | | | | | | | | |
| HOE 1133 | 0.104 | 15 | 8 | 7 | 30 | 45 | 10 | 5 | 3 | 32 | 41 |
| HOE 1133 | 0.208 | 8 | 5 | 3 | 30 | 45 | 7 | 5 | 2 | 32 | 42 |
| Tralkoxydim + TF8035 COC | 0.18 + 0.5% | 7 | 3 | 3 | 32 | 47 | 3 | 0 | 2 | 32 | 39 |
| Tralkoxydim + TF8035 COC | 0.36 + 0.5% | 8 | 7 | 8 | 31 | 43 | 10 | 7 | 5 | 32 | 44 |
| Fenoxaprop & MCPA ¹ + thifensulfuron & tribenuron ² | 0.091 & 0.37 + 0.009 & 0.005 | 7 | 5 | 2 | 31 | 48 | 8 | 5 | 3 | 29 | 41 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 10 | 7 | 2 | 32 | 47 | 10 | 8 | 5 | 31 | 39 |
| Postemergence (June 10) | | | | | | | | | | | |
| Difenzoquat | 0.75 | 15 | 20 | 10 | 30 | 32 | 18 | 12 | 10 | 32 | 32 |
| Difenzoquat | 1.0 | 23 | 50 | 27 | 32 | 28 | 22 | 12 | 8 | 29 | 33 |
| Difenzoquat | 1.5 | 28 | 38 | 32 | 32 | 24 | 23 | 18 | 7 | 30 | 26 |
| Imazamethabenz + difenzoquat + NIS ³ | 0.23 + 0.5 + 0.25% | 18 | 13 | 2 | 30 | 41 | 17 | 12 | 8 | 30 | 36 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.091 & 0.37 + 0.009 & 0.005 | 13 | 7 | 3 | 32 | 47 | 17 | 12 | 5 | 32 | 42 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 15 | 10 | 2 | 30 | 50 | 23 | 15 | 3 | 30 | 41 |
| Check | | 0 | 0 | 0 | 33 | 41 | 0 | 0 | 0 | 32 | 32 |
| LSD (0.05) | | 7 | 16 | 8 | ns | 5 | 5 | 5 | ns | ns | 6 |

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Table 5. Hard red spring wheat tolerance to postemergence herbicides at Crookston, MN - 1997 (Durgan, Spandl, and Cameron).

| Treatment | Rate (lb/A) | Sonja | | | | |
|--|---------------------------------|----------------------|---------------------|----------------------|------------------|-----------------|
| | | Injury | | | Height (inch) | Yield (Bu/A) |
| | | 6/17 ----- (%) | 7/1 ----- (%) | 7/14 ----- (%) | | |
| Postemergence (June 4) | | | | | | |
| HOE 1133 | 0.104 | 15 | 10 | 8 | 28 | 44 |
| HOE 1133 | 0.208 | 7 | 3 | 2 | 30 | 45 |
| Tralkoxydim + TF8035 COC | 0.18 + 0.5% | 7 | 2 | 0 | 28 | 45 |
| Tralkoxydim + TF8035 COC | 0.36 + 0.5% | 7 | 7 | 8 | 28 | 50 |
| Fenoxaprop & MCPA ¹ + thifensulfuron & tribenuron ² | 0.091 & 0.37 + 0.009 & 0.005 | 10 | 7 | 0 | 30 | 48 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 13 | 8 | 0 | 28 | 45 |
| Postemergence (June 10) | | | | | | |
| Difenzoquat | 0.75 | 18 | 3 | 8 | 28 | 36 |
| Difenzoquat | 1.0 | 23 | 8 | 10 | 28 | 29 |
| Difenzoquat | 1.5 | 27 | 13 | 17 | 28 | 30 |
| Imazamethabenz + difenzoquat + NIS ³ | 0.23 + 0.5 + 0.25% | 20 | 10 | 8 | 27 | 40 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.091 & 0.37 + 0.009 & 0.005 | 15 | 7 | 2 | 29 | 46 |
| Fenoxaprop & MCPA + thifensulfuron & tribenuron | 0.14 & 0.55 + 0.014 & 0.007 | 17 | 8 | 5 | 28 | 49 |
| Check | | 0 | 0 | 0 | 30 | 33 |
| LSD (0.05) | | 7 | 7 | 10 | ns | 11 |

¹ Premix = Cheyenne 2.69E.

² Premix = Harmony Extra 75DF.

³ NIS = Class Preference nonionic surfactant.