# Impact of Pre-PM Glyphosate Treatment on Spring Wheat Performance

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**Objective**

Determine the effect of a pre-harvest application of glyphosate on spring wheat performance when the treatment is applied too early or previous to when the wheat has attained true physiological maturity. The hypothesis is that because of the ambiguity of when wheat reaches true PM, that there are times when the pre-harvest burndown is applied too early. The study was designed to provide information related to how grain yield and quality may be impacted by an application made close to PM but within the timeframe of when the crop might be considered ready for the pre-harvest burndown.

**Materials and Methods**

- An application of 'Cornerstone' at 24.0 fl oz + 0.25% NIS / acre was applied to all spring wheat varieties on July 24. This application was applied knowing that the wheat had not attained physiological maturity. However, the wheat varieties had reached a point of development where heads were changing color and the crop could be confused as having reached a point of maturity appropriate for a pre-harvest application of glyphosate. General review of wheat kernels indicated most were in the medium- to later-dough stage. This timing was made to achieve study objectives.

- Stage of development when treatments were applied:
    - Faller at strongly-medium to firm-dough stage.
    - Prosper at medium-dough stage.
    - Barlow at medium- to firm-dough stage.
    - Glenn at medium- to firm-dough stage.

**Results and Discussion**

The application of glyphosate at a time prior to when wheat had truly reached physiological maturity resulted in reduced grain yield and seed quality. The reduction in yield and quality was much greater than what was anticipated based on the observed stage of the wheat crop. Visual assessment of the wheat plants based on canopy color and general dry down suggest that this is a crop stage where pre-harvest glyphosate applications would or have been made by producers.

Results from this study demonstrate the importance of properly determining full physiological maturity in the wheat crop before a pre-harvest or burndown application of herbicide is applied. It was previously stated that this treatment was applied at a time when some producers may believe their wheat crop was adequately mature to warrant a burndown herbicide application. The reduction in grain yield realized in this study was greater than investigators would have anticipated based on visual assessment of crop growth stage. The associated reduction in test weight and grain protein along with significant yield loss further compounds the economic loss that can occur due to the application of pre-harvest glyphosate made prior to when the wheat crop has attained actual physiological maturity.

**Table 1. Influence of a glyphosate treatment on spring wheat grain yield and quality when applied previous to attainment of physiological maturity.**

| Management Factor | 1000 KWT | Test Weight | Grain Protein | Grain Yield |
|---|---|---|---|---|
| | gram | lb/bu | % | bu/ac |
| Untreated Check | 28.7 | 58.6 | 13.8 | 53.1 |
| Pre PM Glyphosate | 26.2 | 56.8 | 13.4 | 46.6 |
| LSD 0.05 | 0.8 | 0.4 | 0.27 | 2.8 |
| LSD 0.01 | 1.1 | 0.5 | 0.37 | 3.7 |
| # Obs | 16 | 16 | 16 | 16 |

**Planting Date = May 1 ; Harvest Date = August 7 ; Previous Crop = Soybean**

**Table 2. Influence of a pre-PM glyphosate treatment on performance of four spring wheat varieties.**

| Variety | Management Factor | 1000 KWT | Test Weight | Grain Protein | Grain Yield |
|---|---|---|---|---|---|
| | | gram | lb/bu | % | bu/ac |
| Faller | Untreated Check | 27.7 | 55.9 | 13.3 | 46.9 |
| Faller | Pre PM Glyphosate | 26.2 | 54.6 | 13.0 | 43.6 |
| Prosper | Untreated Check | 28.0 | 56.5 | 13.3 | 46.0 |
| Prosper | Pre PM Glyphosate | 24.8 | 53.6 | 12.9 | 39.5 |
| Barlow | Untreated Check | 28.6 | 59.3 | 14.0 | 58.2 |
| Barlow | Pre PM Glyphosate | 25.7 | 57.5 | 13.5 | 49.3 |
| Glenn | Untreated Check | 30.5 | 62.4 | 14.5 | 59.6 |
| Glenn | Pre PM Glyphosate | 28.3 | 61.3 | 14.2 | 54.0 |
| | MEAN | 27.5 | 57.7 | 13.6 | 49.8 |
| | C.V. (%) | 4.0 | 0.9 | 2.7 | 7.6 |
| | LSD 0.05 | 1.6 | 0.7 | 0.5 | 5.5 |
| | LSD 0.01 | 2.2 | 1.0 | 0.7 | 7.5 |
| | # Obs | 4 | 4 | 4 | 4 |

**Planting Date = May 1 ; Harvest Date = August 7 ; Previous Crop = Soybean**