

Factors that Affect Plant Growth Regulator Performance in Orchards

In order to be effective, PGRs must be applied with adequate coverage, and then be absorbed by the plant and translocated to the site of activity in sufficient concentration to give the desired response.

Plant growth regulators (PGRs) are chemicals used to modify tree growth and structure, remove excess fruit, or alter fruit maturity. Numerous factors affect PGR performance.

Weather conditions

Weather conditions before, during, and after application will impact their effectiveness. The environmental conditions before the application can alter leaf characteristics and affect the amount of chemical that will enter the plant. The environmental conditions (temperature and humidity) during the application and the details of the application itself (gallons of water applied, coverage, and surfactants) also can affect the amount of chemical that will enter the plant. The environmental conditions after the application can influence the responsiveness of the tree to the chemical that has entered the plant. Thus, the process of actually modifying plant growth processes is very complicated, and much research must be conducted to develop effective programs.

Water volume

The amount of water in which PGRs are applied can also alter performance. In general, the more water in which PGRs are applied, the more uniform will be the response. We recommend that you determine the dilute spray gallonage requirement for your orchard blocks based on tree row volume. Although many pest control sprays are applied at 50 gallons per acre, we recommend a minimum of 100 gallons per acre for PGR application in most instances.

Record Keeping for the Application of Plant Growth Regulators

Evaluating your application of plant growth regulators to your orchards is an important but often overlooked aspect of record keeping. The response of most PGRs is highly influenced by the weather conditions before, during, and after they are applied to the trees. Therefore, it is important that you have good weather records so you can learn how weather influences your use of PGRs in your orchard.

Please refer to the [Penn State Extension Tree Fruit Production Guide](#) for specific recommendations on plant growth regulator use.

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