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Scientists Identify Markers That Could Speed Seedless Grape Breeding

The genetic tools may help breeders screen seedlings earlier and cut years from developing new varieties

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Scientists have identified genetic markers that could help grape breeders speed up the development of seedless varieties, a step that may shorten a process that has traditionally taken years and multiple growing cycles.

The work, reported by researchers in plant genetics, focuses on traits linked to seedlessness in grapes, one of the most widely consumed fruits in fresh markets and a major crop for table grape growers. Breeding seedless grapes has long been difficult because the trait is not always easy to track early in a plant’s life. Growers and breeders often have to wait until vines mature and produce fruit before they can tell whether a new cross has the desired characteristics.

By using genetic markers, scientists can screen seedlings much earlier, before the plants reach fruiting age. That can reduce the number of vines that need to be grown, lower costs and make breeding programs more efficient. It can also help breeders combine seedlessness with other traits that matter to growers and consumers, including flavor, firmness, disease resistance and shelf life.

The research comes as demand for seedless grapes remains strong in many markets, especially in the United States, where shoppers often prefer fruit that is easy to eat and pack for lunches or snacks. Table grape breeders have responded for decades by crossing varieties and selecting offspring with desirable traits, but the process is slow because grapevines take time to establish and evaluate.

The new markers are intended to give breeders a faster way to identify seedlings likely to produce seedless fruit. In practical terms, that means a breeding program could discard unsuitable plants sooner and focus resources on the most promising ones. The approach is part of a broader shift in agriculture toward marker-assisted selection, in which DNA tools are used alongside traditional breeding methods.

Researchers said the markers were developed by studying the genetic basis of seedlessness and comparing patterns across grape lines. The goal is not to replace field testing, which remains necessary for final evaluation, but to make early-stage selection more precise. That could matter for public and private breeding programs working with limited land, labor and time.

The findings may also have implications beyond grapes. Similar genetic tools are being used in other crops where breeders want to speed up selection for traits that are hard to observe early or that appear only under certain growing conditions. In grapes, though, seedlessness is especially important because it affects both consumer appeal and commercial value.

For growers, faster breeding could eventually mean more new varieties reaching vineyards sooner. For consumers, it could mean a wider range of seedless grapes with different flavors, colors and harvest windows.