

GROWTH REGULATORS FOR MANAGEMENT OF FRUIT PRODUCTION ON AMERICAN SWEETGUM

by Thomas J. Banko and Marcia Stefani

Abstract. Arborists concerned with management of undesirable fruit on *Liquidambar* trees in urban areas can treat the trees at time of flowering with Florel (ethephon) for effective reduction in fruit formation. Atrimmec (dikegulac-sodium) also reduced the number of fruit produced; however, it is not currently labeled for this use. Florel reduced fruit formation by 87.7%; Atrimmec by 57%. Trim-Cut (mefluidide) did not significantly reduce fruit formation. Growth regulator treatments may be justified in certain locations to manage production of undesirable fruit.

American sweetgum can be an excellent landscape or street tree under the right circumstances (1). In summer, the star-shaped leaves are a deep, glossy green. Fall foliage can be outstanding, with colors ranging from golden to red to purple in the fall, often on the same tree. The bark is deeply ridged and grayish brown in color; while the smaller stems frequently develop corky wings during the second season of growth. The form of sweetgums tends to be pyramidal, at least when young, and they maintain a very neat, oblong to rounded crown when they mature. The fruit, a gumball, is rounded, brown when mature, and 1 to 1 1/2 inches in diameter. It is coveted by wreath makers and artisans for decorative uses. For arborists and landscapers, however, the fruit can be messy, unattractive, and a nuisance for maintenance crews. Maintenance of sweetgum would be easier if fruit production were less.

Commercial orchardists regularly make use of growth regulators to thin fruit crops (2,3). Some of these materials are also registered for use on ornamental trees and shrubs to eliminate or reduce fruit production. Atrimmec (dikegulac-sodium) is labeled for suppression of flowers and fruit on ornamental olive, glossy privet, and multiflora rose. Florel (ethephon) is labeled for home garden tomato ripening, mistletoe shoot removal, and undesirable fruit elimination on a number of ornamental shrubs and trees (including sweetgum),

while Trim-Cut (mefluidide) is labeled for suppression of flowers and fruit on ornamental olive. This study was conducted to evaluate the efficacy of Florel for elimination of sweetgum fruit (gumballs) in a landscape situation, and to evaluate the potential of other fruit-eliminating chemicals for this purpose.

For this study, mature sweetgums (which had flowered and produced fruit in previous years) were selected at two sites in Virginia Beach and Norfolk, Virginia. A total of 20 trees, 60 to 70 feet tall, were included in this study; 9 were located on the grounds of the Hampton Roads Agricultural Research and Extension Center, while 11 were located at the Norfolk Botanical Garden. Trees were treated with growth regulators during the second week of April, 1994, when both male and female flowers were still present on the trees (Fig.1). The treatments were Florel, 3.2 oz/gal; Atrimmec, 1.5 oz/gal.; Trim-Cut, 1.5 oz/gal.; and untreated control plants. Treatments were applied with a CO₂-pressurized sprayer set at 32 psi. Sprays were applied to thoroughly wet the flowers and foliage on a large branch of each tree. Female flowers on the treated portion of each tree were counted at the time of spraying. There were 6 trees (replications) for Florel, 5 trees each for Atrimmec and untreated checks, and 4 trees for Trim-Cut. Maturing gumballs were counted on Research Center trees on August 26, and at the Botanical Garden on September 14, 1994. Percent reduction in gumball formation was calculated by the following formula: [(Number of female flowers - number of gumballs) / number of gumballs] x 100. The data were subjected to analysis of variance and LSD test following arc sine transformation.

Results of this study are expressed as percent reduction in gumball formation based on the num-



Fig. 1. *Liquidambar styraciflua* flowers at the stage of growth when regulator treatments were applied. The upright raceme contains the male flowers. The female flower (arrow) is a globose 1/2" diameter structure below the male flowers.

ber of female flowers originally present. There was a significant reduction in the number of fruit produced on both Florel and Atrimmec-treated trees. Mean percent reduction in number of gumballs produced was 87.7% for Florel-treated trees, while Atrimmec-treated trees yielded a 57.8% reduction. The Trim-Cut-treated trees, at 44.7% reduction, did not significantly differ from the untreated check trees (19.2% reduction).

One of the Florel-treated trees showed signs of possible treatment injury. The treated branch was about 50% defoliated, and the remaining treated leaves were discolored at the time of evaluation. The Florel label cautions against treatment of trees that are under stress from drought or other environmental conditions, possibly leading to defoliation and leaf scorching. The tree showing these symptoms in our study could have been under stress at the time of treatment although it was not obvious at the time. The tree was located at the edge of a wooded, natural area at the Norfolk Botanical Garden, and was not receiving supplemental irrigation. None of the other treated trees showed any signs of injury.

This information will assist arborists concerned with gumball production in urban areas, where treatment of sweetgum trees may be justified in order to curb undesirable fruit production.

Literature Cited

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Résumé. Les arboriculteurs préoccupés par la gestion d'une fructification indésirable sur les *Liquidambar* en milieu urbain peuvent traiter ces arbres au cours de la période de floraison avec le Florel (ethephon) pour réduire le taux de formation de fruits. L'Atrimmec réduit lui aussi le nombre de fruits produits, bien qu'il ne soit pas homologué normalement pour ce type d'utilisation. Le Florel réduit la formation des fruits de 87.7%, tandis que les arbres traités à l'Atrimmec donnent une réduction de fruits à maturité de 57%. Le Trim-Cut (mefluidide) n'a pas réduit de façon significative la formation de fruits. Les traitements avec des régulateurs de croissance pourraient être appropriés en certains endroits pour gérer la production de fruits indésirables.

Zusammenfassung. Baumpfleger, die mit der Aufgabe betraut sind, die unerwünschten Früchte von Liquidambar-Bäumen in urbanen Bereichen zu entfernen, können die Bäume in der Blütezeit mit Florel (Ethephon) behandeln, um die Fruchtbildung effektiv zu reduzieren. Atrimmec reduziert ebenfalls die Anzahl der produzierten Fruchtbälle, obwohl dieses Mittel nicht speziell für diesen Einsatz vorgesehen ist. Florel reduziert die Fruchtbildung um 87.7%, während mit Atrimmec behandelte Bäume eine um 57% reduzierte Fruchtbildung aufzeigen. Tim-Cut (Mefluidid) verhindert die Fruchtbildung nicht besonders. Die Behandlung mit Wachstumsregulatoren könnte an einigen Standorten sinnvoll sein, um die Produktion von unerwünschten Früchten zu kontrollieren.