Incorporating the experimental herbicide CGA 362622 into Cotton Weed Management Programs in Virginia

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(ABSTRACT)

As the importance of cotton (*Gossypium hirsutum* L.) to Virginia crop growers has increased, so has the need for more efficient weed control programs. Current cotton herbicides do not control all broadleaf weeds over the entire growing season, and many cotton herbicides must be applied at specific growth stages in order to minimize crop injury. CGA 362622 (proposed common name trifloxysulfuron sodium) is an experimental sulfonylurea herbicide that controls many broadleaf weeds at low use rates. Field, greenhouse, and laboratory studies were conducted to evaluate the potential benefit of CGA 362622 to Virginia cotton growers. Postemergence applications of CGA 362622 resulted in moderate crop effects that proved transient in all instances and did not affect cotton yield. Broadleaf weed control from herbicide combinations with CGA 362622 generally controlled weeds more consistently than individual herbicide applications. Timely applications of CGA 362622 controlled common ragweed (*Ambrosia artemisiifolia* L.), common lambsquarters (*Chenopodium album* L.), annual morningglory species (*Ipomoea* spp.), and common cocklebur (*Xanthium strumarium* L.). However, CGA 362622 applications generally did not control spurred anoda [*Anoda cristata* (L.) Schlecht.], jimsonweed (*Datura stramonium* L.), velvetleaf (*Abutilon theophrasti* Medicus), or annual grass species; but combination treatments of CGA 362622 plus pyrithiobac did control velvetleaf, spurred anoda, and jimsonweed. Combinations of CGA 362622 plus glyphosate controlled common lambsquarters and smooth pigweed (*Amaranthus hybridus* L.) better than glyphosate alone, and in most instances the combination controlled annual morningglory species better than glyphosate applied alone. Timely applications of CGA 362622 plus bromoxynil controlled velvetleaf, smooth pigweed, common ragweed, common lambsquarters, and common cocklebur. Spurred anoda control was generally not acceptable from CGA 362622, bromoxynil, or the two in combination. In laboratory studies, results supported differential absorption, translocation, and metabolism as the main factors for differential tolerance of cotton, spurred anoda, and

smooth pigweed to CGA 362622. Rapid translocation and a slow rate of metabolism likely explain the susceptibility of smooth pigweed to this herbicide, while reduced absorption and translocation plus rapid metabolism contribute to CGA 362622 tolerance in cotton. Limited translocation may also explain the intermediate tolerance of spurred anoda to the herbicide CGA 362622.