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Extruding Cotton Gin Byproducts to Reduce Chemical Residues

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Pages: 92-102
Engineering and Ginning

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An extrusion process was evaluated to determine the chemical residue reductions associated with that process. The cotton gin byproducts used in this study were from picker-harvested cotton and consisted primarily of leaf and plant material, fiber, and soil. Sufficient cottonseed was added to the cotton gin byproducts to maintain a uniform material flow through the extruder. To evaluate the chemical residue reductions associated with the process, additional chemicals were applied to the cotton gin byproducts so specific residue analysis could be performed. Chemical application concentrations were 0.8% of recommended field application concentrations. Various mixing ratios of cotton gin byproducts and cottonseed were evaluated in terms of chemical residue reduction and nutritional value. In addition, the extrusion process was evaluated for material processing time for mixtures that contained 75% cotton gin byproducts. Results from the extrusion tests indicated that some, but not all, residue levels of the chemicals tested were decreased by the extrusion process and further diluted by the addition of cottonseed. After one stage of processing, typical reductions, which did not incorporate dilution effects, were 27 and 40% for methyl parathion (O,O-dimethyl O-p-nitrophenyl phosphorothioate) and tribufos (S,S,S-tributyl phosphorotrithioate), respectively. After four stages of processing, reductions were 52 and 95% for methyl parathion and thidiazuron [N-Phenyl-N'-(1,2,3-thiadiazol-5-yl)urea], respectively. The extrusion process did not substantially impact most of the nutritional components that were analyzed; however, crude protein and soluble protein were decreased after four stages of processing by 10 and 29%, respectively.