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Wallace Institute Information

The Henry A. Wallace Institute for Alternative Agriculture is a nonprofit, tax-exempt research and education organization established in 1983 to encourage and facilitate the adoption of cost-effective, resource-conserving and environmentally-sound farming methods. It works closely with producer groups, public research and education institutions, and government agencies in promoting a sustainable agriculture system.

Its programs include providing a national information clearinghouse, serving as a voice for sustainable agriculture in Washington, and developing and implementing research and educational outreach programs. It holds an annual scientific symposium and publishes a monthly newsletter.

The Institute is governed by a grass roots Board of Directors, which includes several commercial-scale organic farmers, and maintains a small professional staff. It is supported by memberships and donations and grants from foundations, corporations, and individuals.

Cover Photo

Four cover crops (crimson clover, subterranean clover, rye and wheat) being studied for their effects on weed emergence. The plant with yellow flowers is wild radish. Photo supplied by Udo Blum, North Carolina State University.

ACKNOWLEDGMENT AND THANK YOU

As this issue of the *American Journal of Alternative Agriculture* went to press, Dr. William Lockeretz passed the editorial baton to Dr. Robert I. Papendick at Washington State University. The Henry A. Wallace Institute's Board of Directors and Staff, in addition to welcoming Bob to the role of editor, see this occasion as an opportunity to express their deepest appreciation to Willie for the enormous contributions he has made to this *Journal* over the past 12 years.

Throughout this period, Willie has abundantly and unfailingly demonstrated the full range of intellectual and technical competencies which are so essential to enhancing the scientific basis and understanding of alternative agriculture. Moreover, despite the enormous challenges associated with the launching of a new journal, Willie's passion for alternative agriculture, as well as his sense of humor, never wavered. We are deeply indebted to Willie, no less for these reasons than for his commitment to the scientific stature and credibility of the *Journal.*

— Garth Youngberg
Editor in Chief

Effects of clover and small grain cover crops and tillage techniques on seedling emergence of some dicotyledonous weed species

Udo Blum, Larry D. King, Tom M. Gerig, Mary E. Lehman, and Arch D. Worsham

Abstract. *We monitored emergence of morning-glory, pigweed, and prickly sida from seeded populations in no-till plots with no debris (reference plots) or with crimson clover, subterranean clover, rye, or wheat debris. Cover crops were either desiccated by glyphosate or mowed and tilled into the soil. Debris levels, soil temperature, moisture, pH, nitrate, total phenolic acid and compaction were monitored during May to August in both 1992 and 1993. Seedling emergence for all three weed species ranged from <1 to 16% of seeds sown. Surface debris treatments delayed weed seedling emergence compared with the reference plots. Rye and wheat debris consistently suppressed weed emergence; in contrast, the effects of clover debris on weed emergence ranged from suppression to stimulation. Glyphosate application resulted in a longer delay and greater suppression of seedling emergence in May than in April. In 1993, plots in which living biomass was tilled into the soil were also included and monitored. Weed seedling emergence was stimulated when living biomass was incorporated into the soil. Covariate, correlation and principle component analyses did not identify significant relationships between weed seedling emergence and soil physical and chemical characteristics (e.g., total phenolic acid, nitrate, moisture, temperature). We hypothesize that the observed initial delay of the weed seedling emergence for all three species was likely due to low initial soil moisture. The subsequent rapid recovery of seedling emergence of morning-glory and pigweed but not prickly sida in the clover compared with the small grain debris plots was likely due to variation in soil allelopathic agents or nitrate-N levels. The stimulation of weed seedling emergence when living biomass was incorporated into the soil was likely caused by an increase in "safe" germination sites coupled with the absence of a zone of inhibition resulting from tillage.*

Key words: morning-glory, prickly sida, pigweed, clover, rye, wheat

Introduction

As growers in the United States implement the conservation requirements of the 1985 Food Security Act and the 1990 Food, Agriculture, Conservation and Trade Act, more will turn to reduced- or zero-tillage production methods (Worsham, 1990). This may result in increased use of small grain and legume cover crops. Besides erosion control and reduced energy and nitrogen inputs, the use of appropriate cover crop residues can aid in early season weed control (Barnes and Putnam, 1983; Putnam et al., 1983; Enache and Ilnicki, 1988; Teasdale, 1988; White et al., 1989; Worsham, 1989).

Cover crop residues may control weeds by several means: the physical barrier of the

Udo Blum is Professor of Botany, Larry D. King is Professor of Soil Science, Tom M. Gerig is Professor and Head of Statistics, Mary E. Lehman is a graduate student in Botany, and Arch D. Worsham is Professor Emeritus of Crop Science, North Carolina State University, Raleigh, North Carolina 27695.