

Foraging Around



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Legume Pesticides

A short time ago 5,000 scientists from throughout the U.S. and Canada met at Minneapolis MN for the 84th annual meeting of the American Society of Agronomy. As you might expect the subjects discussed during the 4 day conference covered a wide range of topics. Many were very technical. But there were also plenty of papers with information of immediate interest and use to you. In today's column I'd like to zero in on just one series of papers dealing with a subject of concern to all of us—how to improve stand longevity of forage legumes.

But first let's consider what you as a producer expect from your forage legumes. Over the years I've asked many farmers, like yourself, and they generally agree on three points; high-yield, high quality forage, and persistent stands. And for many persistence or stand longevity ranked at the top.

So let's try to sum up what several of our top scientists had to say

regarding this issue. And, as you might expect most, but certainly not all, of their remarks centered around alfalfa.

To begin with, poor persistence for many legumes is an international problem according to Dr. A. G. Matches of Texas Tech University. Matches recently headed up a Trilateral Legume Persistence Workshop involving workers in Australia, New Zealand and the U.S.A. All agreed, he said, that we simply may be trying to extend legumes beyond their limits of adaptation. In the Eastern U.S. for example, how often are we guilty of establishing alfalfa on soils that are too wet, too acid, or too low in fertility? And then we criticize the legume when it disappears. Improved new technology for breeding and germplasm selection will expand opportunities for more successful legume production, Matches concluded.

Forage breeders Drs. Joe Bouton, University of Georgia, and Mark McCaslin, Forage Genetics, agreed. Bouton, who developed

alfa-graze alfalfa, listed several factors including unfavorable temperature and moisture; inadequate soil pH and fertility; disease, insect and nematode pests; competition from aggressive companion grasses; and the harshness of the overall grazing environment as contributing to the inability of alfalfa to maintain a productive stand. Both breeding and management research, he said, are underway to modify or overcome these factors.

Plant breeders have long focused alfalfa breeding efforts on improving two key components of persistence; disease resistance and winter hardiness, according to McCaslin, breeder of a number of multiple pest resistance alfalfa varieties. "In the last decade," he said, "considerable progress has been made in improving multiple disease resistance. However, there has been little improvement in winter-hardiness."

Relative to winter-hardiness Minnesota workers noted that cold-tolerance is a primary component of alfalfa winter hardiness. In this regard they noted that the plant size, measured as crown width, appears to be a factor influencing alfalfa cold-tolerance.

But, according to L.H. Rhodes, Ohio State University, disease is one of the major factors affecting persistence of perennial forage legumes. Over the past five decades, he said, improvements in disease resistance characteristics of alfalfa have resulted in varieties which have the capability to persist in geographical regions where diseases such as bacterial wilt, phytophthora root rot and other diseases previously caused severe stand depletion. Referring to red clover, Rhodes agreed that diseases, along the clover root curculio, are most often stated as the

reason for the short life of the legume.

Insects, both above and below ground, also affect the life of a stand through plant/seed mortality, delayed development, and retarded growth, according to University of Maryland Entomologist W.O. Lamp. However, he said, crop management practices may be manipulated to significantly reduce insect-induced damage to the crop.

Dr. C. C. Sheaffer, University of Minnesota Agronomist, had much more to say about the role of management strategies to improve legume persistence. Frequency, height and timing of defoliation all have a significant effect on legume persistence, Sheaffer says, by influencing leaf area and carbohydrate reserves sites for vegetation and floral initiation and competition with associated non-legumes in mixtures. Deficiencies of essential plant nutrients or excess of toxic elements also have a dramatic effect on legume persistence.

Another important factor relating to persistence for many legumes is hard seed. There are many factors which influence the percentage of hard seeds and the degree of hardness. And while excessive amounts of hard seeds, especially with alfalfa, are sometimes a concern workers agree that hard seeds can be, and are, very beneficial for filling in where old plants disappear.

Summing up this special ses-

sion Missouri's C.J. Nelson, a leading forage physiologist, stated "Stand longevity of forage legumes, nationwide and worldwide, is critical for sustained productivity in natural and agricultural ecosystems. Much progress has been made in understanding the factors of persistence and in developing breeding and management strategies to optimize each legume species based on its specific characteristics. And researchers will continue to stress the importance of legume persistence with respect to forage potential, animal production, environmental issues, and economics.

Finally let's put this in perspective for your situation in terms of today's knowledge relative to legume persistence or longevity. First use sound cropping systems for your farm and choose legume species that are most likely to persist under your soil and environmental conditions. Second, correct pH and fertility problems before establishing new legume stands. Third, select adapted multiple pest resistant varieties best suited for your needs. And then use a management strategy to keep your legume stands productive and persistent.

Production, persistent perennial legume and legume-grass stands are vital to the economical production of animal products. We don't have all of the answers, but by taking advantage of the knowledge we do have you can make legumes more profitable in your forage livestock system.

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