Situation

Summer cowpea cover crops have proved to be a cost-effective means of enriching soil with carbon and more than 100 pounds of nitrogen per acre. They can also reduce pest populations, increase crop yields and reduce weed emergence and herbicide dependence.

Spurred by rising fertilizer costs and fewer available pesticides, cowpea cover crop acreage in Arizona and California increased dramatically from virtually none in 1995 to several thousand acres today.

However, adoption of cowpea covers crops in the West has been slowed by the lack of varieties adapted to Western production systems. Growers and seed companies have identified the production of cowpea cover crop seed as a new crop opportunity that could increase profits and sustain smaller producers in depressed desert regions.

The ideal cowpea cover crop for the West would be resistant to nematodes, aphids and wilt and compete well with weeds.

Objectives

1. Identify cowpea cover crop cultivars that resist nematodes, cowpea aphid, Fusarium wilt and shattering in the Western United States
2. Disseminate seed of improved varieties and related information through the California Foundation Seed Service and commercial seed companies
3. Demonstrate and optimize the merits of cover crops in specific cropping systems
4. Disseminate information about cover crops and their advantages and about seed production of cowpea as a new crop for limited-resource and other growers

Actions

Early stages of the project focused on developing new cowpea genotypes that incorporate nematode resistance and other desirable agronomic traits. In 2006, seed of a promising cover crop was...
Growth analyses for the six cowpea genotypes, sunflower and purslane were performed, and the overall aggressivity indices were regressed against growth parameters to relate to plant competition and growth.

Results

When grown with sunflower, erect and semi-erect cowpea genotypes had higher AI than prostrate genotypes. When grown with purslane, erect and prostrate genotypes had higher AI than semi-erect genotypes. Differences in competitive ability were due to specific plant characteristics. Plant height was the cowpea trait most correlated with the ability to outcompete sunflowers. Specific leaf area and seed weight were also important determinants of the ability to suppress tall weeds. Growth habit was the greatest determinant of its ability to shade out sunflower.

Potential Benefits

The data have been used by cowpea breeder Jeff Ehlers to develop a new cultivar that incorporates weed resistance traits. The variety is essentially ready for release, although the project team would like one more year of grower trials and are happy to provide seeds to those interested.

Widespread adoption could have several benefits:

- As most cowpea cover crop seed is currently produced in the Southeast, developing a seed for production in the West could decrease transportation costs.
- The new genotypes created by this project will enable production of a cowpea cover crop in the low-elevation desert, creating new opportunities for growers and seed people.
- A new pest-resistant cover crop variety could increase profitability by decreasing reliance on synthetic pesticides and fertilizers.