University of California
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THE VALUE OF HOST PLANT RESISTANCE IN ALFALFA VARIETY SELECTION

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Variety selection should be based on:

- Fall Dormancy (range is 7-10 in the San Joaquin Valley)
- Yield Potential (over multiple years, sites)
- Stand Persistence Potential
- Forage Quality Potential
- Biotech Traits (Herbicide Tolerance and Low Lignin)
- Pest Resistance Characteristics

Of these, **yield** is the most important economic factor. Potential stand life and quality are influenced by genetic factors (Fall Dormancy, Pest Resistance) along with environmental conditions and management of the field (Harvest, Irrigation). Other genetic improvements may benefit your production system or not. Herbicide tolerant varieties may help with weed management programs. Salt Tolerant varieties are appropriate for some areas (germination vs. tolerance of established plants). Low lignin varieties may offer greater flexibility in harvest management for quality. Remember that varieties have improved over time; new varieties have demonstrated greater performance in many cases than the old standards.

HOST PLANT RESISTANCE IS AN IMPORTANT IPM STRATEGY

Variety selection based on resistance characteristics is an important part of an IPM program. **Genetic resistance** isn't available for some of the key pests in alfalfa - weevils, worms, weeds, but it is often the only *economically viable* means of managing some diseases, nematodes, and insects where registered chemicals to prevent crop losses are limited. Planting resistant varieties also avoids a few of the potential downsides to pesticide applications – impact on nontarget species, resistance development, and material and application costs to treat a field.

Think about pest resistance as you do auto insurance – it may not be important every year, but it can be very important in those years with severe pest pressure.

Alfalfa varieties consist of a population of plants. Unlike corn and wheat where each plant of the same variety is essentially genetically identical, alfalfa cultivars consist of a POPULATION of genetically diverse plants, so resistance levels vary throughout the population. For example, a variety characterized as being Highly Resistant (HR) shows resistance in a majority of the population, but a proportion of the plants remains susceptible. Therefore, HR varieties are far from "immune" to pests and diseases. Even a highly resistant variety can be overwhelmed by a severe pest infestation.

Resistance Classes: High Resistance (>50%), Resistant (31-50%), Moderate Resistance (15-30%), Low Resistance (6-14%), and Susceptible (0-5%)

Recommended resistance levels for key insects, diseases, and nematodes are available for the various production regions in CA. Soil type and local pest pressure can have an influence on recommended resistance levels. For example, PRR resistance is very important for heavy soils, but not so much for sandy soils. Nematode resistance is more important in sandy soils vs. clay.

Recommendations for the Central Valley of California:	
Fall Dormancy	7-10 Rating
Spotted Alfalfa Aphid (SAA)	HR
Pea Aphid (PA)	HR
Blue Alfalfa Aphid (BAA)	HR
Pythopthora Root Rot (PRR)	HR
Bacterial Wilt (BW)	MR
Fusarium Wilt (FW)	HR
Stem Nematode	HR
Root Not Nematode	HR
Verticillium Wilt (VW)	R

Host Plant Resistance may help growers manage pest problems by suppressing the pest so it doesn't reach economic thresholds for damage or keeping problems at low enough levels to manage.

New and improved varieties are always coming to the marketplace. Make the time to review available information each time you are preparing to plant a new field. Look at **Performance Potential** before you look at the **cost of the seed**.