

Weed Control From a Farm Manager's Perspective

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S & J Ranch farms permanent crops throughout the San Joaquin Valley. We farm our own land and provide farm management and development for other growers as well. We also have a commercial citrus and pistachio nursery.

We approach our vegetation management program with the same IPM strategy that we use in our insect and disease management programs. We use the classical of definition of IPM where it is not equated with biological control. Integrated pest management uses a multi-disciplinary approach including mechanical, cultural, biological, and where necessary chemical tools to control pests. In our cultivated systems, bio-control programs for insects are further developed than those for weeds or diseases. I will touch on a few specific examples of some unique challenges that we face and how we have approached solutions.

Donuts is a term that we use to designate those areas that receive irrigation from micro-sprinklers but are outside of an herbicide treated berm. In a crop such as almonds this situation can be critical if excessive weed growth occurs before harvest as we harvest off of the ground. Options used to address this have been: widen the chemically treated berm, treat the donuts post emergent with a sprayer with one directed spray nozzle, chemical mow the entire middle more frequently, or mow the entire middle more frequently. We have performed economic analysis on the various options and one option does not stand out as being superior. We select our option on a case by case basis in various crops.

Algae on the berms of almonds is a problem in some years. It also interferes with the harvest process. Options for control have included treating with Gramoxone or altering the irrigation schedule to allow more dry time between irrigations. Neither of these has been highly successful.

Puncture vine seems to occur in cycles. Where it is severe we have exercised care to do less mechanical tillage. Post-emergent chemical treatments before seed formation and maintaining constant diligence has seemed to be the best strategy. The stem and seed weevils have helped sporadically in the control of this pest. We have purchased and released the weevils on several occasions. It appears that the bio-control option functions best when the weed gets out of control on an area-wide basis and the weevils can build to high levels.

We have had the circumstance where two pests have controlled each other thus alleviating control measures to be prescribed for the crop. Morning glory can be a severe problem in replanted areas of pistachios. Pacific mite is also an occasionally severe pest of pistachios. Morning glory is a preferred host to pistachios for the spider mites. The spider mites infest the weeds and render them a non-economic pest. The morning glory operates as a trap crop thus saving the trees from a mite infestation. I've observed this same situation in grain sorghum work effectively as well.

Vegetation management in pistachios presents some significant challenges. Pistachio culture is typically bare ground or middles with winter cover crops. These cover crops provide benefits such as supplying organic matter and preventing erosion, and ancillary benefits like being used as a trap crop for insect pests. Encroachment onto the berms can be a significant problem where cover crops are utilized especially if plants such as vetch are present. Pistachios have been increasingly affected by the diseases botryosphaeria and alternaria. These diseases are accentuated by elevated humidity. Elimination of vegetation in affected blocks during the late spring and summer season is recommended thus adding another layer to the vegetation management decision process. In pistachio plantings on the east side of the valley large numbers of replants are present because of tree death associated with Verticillium Wilt. These replant areas may need supplemental applications of pre-emergents in order to properly control the weeds because available light is increased and the smaller trees have a greater sensitivity to a given population. Our arsenal of herbicides in crops such as pistachios is very limited. This makes implementing a proper prescription for each block a daunting task. We perform a weed survey for every parcel we farm 2-3 times a year. Proper monitoring is always the key to any successful IPM program.

Weed ID is at times more difficult than insect or pathogen ID because existent weeds may be subjected to sublethal doses of herbicide altering their phenotypical characteristics. Also identifying weeds in their seedling stage is difficult sometimes even for an experienced weed specialist.

We are constantly faced with the decision of whether to split our pre-emergent applications into a fall and a spring application or a single fall or single spring treatment. In untilled crops such as citrus, a split application is possible in most years if desired. In a tilled crop such as our pistachios, it is very difficult or impossible to access the orchards in the spring in many years. With a bud swell cut off for the application of Goal, a strategy which assumes a spring herbicide application can be risky.

The nursery presents unique vegetation management challenges. Spurge is our most chronic weed problem We are affected by a lack of available tools here as well. Frequent irrigation limits the duration of any chemical control. Once the trees reach 10-12 inches, uniform application inside the pots with either a spray or granular material is difficult. An eradication program in the vicinity of the nursery for all weeds has lowered the available seed bank and has improved our success. In the nursery weeds need to be controlled not only for their allelopathic or competitive affects on the trees but for regulatory purposes as well. Trees can not be legally shipped with weeds present.

Weed management has unique aspects that can make it a very challenging proposition. It is important that all of us (growers, chemical manufacturers and distributors, extension, PCA's, researchers, biologists, botanists, pathologists, entomologists, and regulators) work together as a team to solve the continual bevy of problems which challenge us. Weed management is a critical component towards assuring a bountiful food supply at affordable prices.