BAS 516 (BAS 500 PYRACLOSTROBIN PLUS BAS 510 NICOBIFEN): MAGNITUDE OF RESIDUE ON PEACHES AND PLUMS POST HARVEST APPLICATIONS

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ABSTRACT

With financial support from the California Tree Fruit Agreement, the Western Region IR-4 Program conducted 2 plum and 1 peach post harvest residue field trials in California required for setting a national tolerance for BAS 516 on plums and peaches to include post harvest use. This residue work is required to set a national tolerance and to pursue a Section 3 [Federal] pesticide registration for BAS 516 on stone fruit. A national tolerance is required prior to the registration of any pesticide product at the state level.

In April 2002, the USDA funded Interregional Research Project No. 4 (IR-4) developed a research proposal to conduct the necessary field trials and laboratory analyses for the registration of BAS 516 on stone fruits. BAS 516 (tradename PRISTINE) is a fungicide used to control post harvest decays, brown rot (Monilinia spp.), gray mold (Botrytis cinerea) and Rhizopus rot (Rhizopus stolonifer). Field trials to determine magnitude of residues on the raw agricultural commodities were initiated in July and August of 2002. The residues will be based on post harvest use patterns for low volume application, high volume application and dip application. All applications were made at the same rate (BAS 500 02F (0.56 lbs active ingredient equivalent to 1270.1 grams of the 02F (20% WG) formulation + BAS 510 UCF (1.11 lb active ingredient equivalent to 719.3 grams of the UCF (70% WG) formulation per 200,000 pounds of fruit or in 100 gallons of solution as per the dip application. The low volume application was made in 8-25 gallons of solution (water + wax) per 200,000 pounds of fruit. The high volume application was made in 100 gallons of solution (water + wax) per 200,000 pounds of fruit and the dip treatment was made in 100 gallons of solution water + wax per 200,000 pounds of fruit.

Samples of whole fresh plums or peaches were sampled from the research plots in July (peaches) and August (plums). The fruit samples were brought to the packing or treatment shed for post harvest applications. After treatment and air drying the fruit, the pits were removed and samples were then frozen and shipped to the laboratory for analysis of potential residues. Samples were shipped to the laboratory in late July (peach), August and September (plums). The samples were held frozen at the analytical laboratory until they were analyzed.

Preliminary results indicate that overall the residues in the plums are the lowest of the 3 stone fruits tested, (peaches, cherries and plums). The residues also appear to be lowest in the high volume treatments with the low volume treatment and dip treatment having the highest residues depending on the fruit type.

Field Data Notebooks for these studies were submitted by the researcher, Dr. James Adaskaveg (UC Riverside) in September 2002 (peach) and January 2003 (plums). The Western Region office is responsible for field data review and then the books will be forwarded to IR-4 Headquarters at Rutgers University. Upon completion of the analytical work the final report will be written by the IR-4 Study Director (based at Rutger’s University) who will compile the data.
from all field sites as well as the analytical data into appropriate EPA required format. These reports will then be prepared as a tolerance petition and submitted to EPA in 2004. This project is an IR-4 “A” priority so IR-4 is committed to a 30 month timeline from project initiation to EPA submission. These projects are on track for submission to EPA prior to October 2004 the 30 month deadline. EPA will then review the data package and determine appropriate tolerances for nicobifen (BAS 510) and pyraclostrobin (BAS 500) on stone fruit including peaches and plums after post harvest applications.
INTRODUCTION

The fungicide BAS 516 (tradename PRISTINE), a combination of nicobifen (previously known as BAS 510) and pyraclostrobin (previously known as BAS 500) has registrations currently being pursued on a variety of row and permanent crops. Residue projects active in the IR-4 program in conjunction with BASF support include: carrots, celeriac, spinach, celery, caneberrys, herbs, and avocado in addition to stone fruit post harvest.

To establish a tolerance for these active ingredients on stone fruit (including peaches and plums), the magnitude of the residue in or on these commodities will be determined as per EPA Residue Chemistry Guidelines (Series 860.1500). The purpose of this study is to collect and analyze treated and untreated residue samples of the raw agricultural commodity (RAC), peaches and plums, after post harvest applications from field sites in California (EPA Region 10). The work is conducted according to the proposed label to provide the sponsor (IR-4) with residue data to support the pesticide tolerances. Based upon requests received, our program has determined that this use is important to peach and plum growers of California. In addition, this research effort will complete the EPA data requirements for the stone fruit crop group, thereby, allowing use of this product for post harvest on all stone fruit. IR-4 has the requisite facilities and cooperators to conduct the field and laboratory work required in compliance with the Good Laboratory Practice standards and to subsequently petition the U.S. EPA to establish residue tolerances for nicobifen and pyraclostrobin on these commodities.

MATERIAL AND METHODS

To determine the magnitude of residues of nicobifen and pyraclostrobin in or on stone fruit (including peaches and plums) a field trial protocol was developed under the direction of Dr. James Adaskaveg (UC Riverside) by IR-4 to satisfy EPA Residue Chemistry Guidelines (Series 860.1500). Post harvest treatment (field) trials were conducted under provisions outlined in 40 CFR Part 160 in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Good Laboratory Practice (GLP) standards.

Three post harvest treatment sites were chosen in California as per EPA requirements. The treatment sites were located at post harvest treatment facilities in Parlier, CA (UC KREC facility for one peach and one plum trial) and in Monrovia, CA for a second plum trial. Field trials were conducted by the Field Research Director, Dr. James Adaskaveg. These trials were conducted under conditions simulating commercial post harvest application and treatment practices.

BAS 516 (active ingredient nicobifen plus pyraclostrobin) was applied as BAS 500 (pyraclostrobin) the 02F formulation (20% WG) and BAS 510 (nicobifen) the UCF formulation (70% WG). BAS 500 was applied at the rate of 0.56 pounds active ingredient (1270 grams of formulated product) per 200,000 pounds of fruit and BAS 510 was applied at the rate of 1.11 pounds active ingredient (719.3 grams of formulated product) per 200,000 pounds of fruit. These applications were made in low and high volume treatments as well as a dip treatment. The low volume application was made in 8-25 gallons of solution (water + wax) per 200,000 pounds of fruit. The high volume application was made in 100 gallons of solution (water + wax) per 200,000 pounds of fruit and the dip treatment was made in 100 gallons of solution water +
wax per 200,000 pounds of fruit.

The test substances used in these trials was provided by the registrant (BASF) and characterized according to Good Laboratory Practice standards.

The peach and one of the plum trials had three treated lots (low and high volume and dip treatments). The other plum trial had two treated lots (low volume and dip). All treatment sites had an untreated lot of fruit.

Duplicate residue samples were taken from each lot of fruit, with at least 24 fruit sampled for each duplicate residue sample and a minimum of 48 treated fruit from each treatment. Each sample was air dried and then the pits were removed, samples were bagged and appropriately labeled and stored as to insure the treated and untreated samples were kept separated.

Samples were frozen shortly after pitting and stored frozen (~ 0°F) until shipment to the analytical laboratory. Samples were shipped frozen and remain frozen until analysis. This insures that the apparent residues found represent the raw agricultural commodity harvested as per the intended labeled use. The samples were shipped to BASF Corporation in Research Triangle Park, NC for analysis.

The residue samples resulting from these field trials were analyzed by the analytical method entitled, “Method for Determining BAS 500F, BF 500-3 and BAS 510F Residues in Plant Matrices using LC/MS/MS, BASF Method Number D9908”. The method was validated in accordance with Good Laboratory Practices on peach and plum matrices. All modifications to the method were documented. This method allows detection of 0.02 ppm of BAS 500 (pyraclostrobin) and 0.05 ppm of BAS 510 (nicobifen).

Quality Assurance reviews of the test facilities, research trials, analytical methodology and final reports will be performed by IR-4 Quality Assurance units. The field facilities and field portions of the project were audited by the IR-4 Quality Assurance unit from the Western regional office, during the course of the field portion of the trials.
RESULTS AND DISCUSSION

The analyses of the residue samples for both peach and plum trials are complete, although the analytical data are not available at this time. The analytical data needs to undergo quality assurance inspection as per Good Laboratory Practices, before the registrant is comfortable to release the apparent residues. In general terms the apparent residues in peaches are highest in the dip treatment (100 gallons of solution (water + wax)) at post harvest, followed by the low volume application (8-25 gallons of solution (water + wax) per 200,000 pounds of fruit), with the high volume application (100 gallons of solution (water + wax) per 200,000 pounds of fruit) providing the lowest apparent residues. All applications were made at the same rate (BAS 500 02F (0.56 lbs active ingredient equivalent to 1270.1 grams of 02F (20% WG) formulation + BAS 510 UCF (1.11 lb active ingredient equivalent to 719.3 grams of the UCF (70% WG) formulation per 200,000 pounds of fruit or in 100 gallons of solution as per the dip).

In general terms the apparent residues in plums are highest in the low volume application (8-25 gallons of solution (water + wax) per 200,000 pounds of fruit), followed by in the dip treatment (100 gallons of solution (water + wax)) at post harvest, with the high volume application (100 gallons of solution (water + wax) per 200,000 pounds of fruit) providing the lowest apparent residues. All applications were made at the same rate (BAS 500 02F (0.56 lbs active ingredient equivalent to 1270.1 grams of 02F (20% WG) formulation + BAS 510 UCF (1.11 lb active ingredient equivalent to 719.3 grams of the UCF (70% WG) formulation per 200,000 pounds of fruit or in 100 gallons of solution as per the dip). Overall the residues in the plums are the lowest of the 3 fruits treated, peaches, cherries and plums.

The raw data resulting from the field and laboratory work will be submitted to the National IR-4 Program for compilation into the tolerance petition package by the Study Director and submitted to the U.S. EPA for review. Submission to the EPA will correspond to the 30 month submission timeline from project initiation to EPA petition submission. Anticipated submission is fourth quarter 2004.

REFERENCES

IR-4 National Pesticide Clearance Protocol, BAS 516/Stone Fruits PR No. 07922; 4/9/02

Method for Determining BAS 500F, BF 500-3 and BAS 510F Residues in Plant Matrices using LC/MS/MS, BASF Method Number D9908 August 1999.
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