

VINE KILLING AS A PART OF LATE BLIGHT MANAGEMENT

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With the presence of Late Blight a distinct probability in Washington potato fields the use of vine desiccating chemicals to minimize the potential of tuber infection will be an important component of an effective control strategy.

Currently the four materials available for use on potatoes that are to be stored are:

1. Des-I-Cate (endothall) 1.5 to 2.0 gallon product/A.
2. Diquat up to 2 pt. Product/A.
3. Sulfuric Acid (93%) 17 to 20 gallons/A.
4. Enquik (monocarbamide dehydrogensulfate) 20 gallons product/A in 40 gallons water.

An issue brought up at meetings last fall was the rate of desiccation as a result of application of these different products. A number of trials conducted in Washington and Idaho provide some information on this question.

A study done by Mick Qualls at Ephrata presents an overall summary of the results shown by these studies (Fig. 1 & 2). LEAF desiccation is most rapid with Sulfuric Acid through the first 5 days following application, thereafter both the Diquat and acid treatments were essentially the same (Figure 1). One hundred percent leaf desiccation occurred at 7 days with Sulfuric Acid and at 10 days with Diquat.

STEM desiccation rate for both materials was slower than leaf desiccation, but Sulfuric Acid had higher % stem desiccation than Diquat up to 10 days after application. At 10 days and beyond % stem desiccation was the same (Figure 2). Complete stem desiccation did not occur with either material until 15 days after application. In this trial plants were judged to have declined to somewhere around 20% of full vigor (80% decline) at the time the desiccants were applied.

In a similar trial at the WSU Othello Research Unit when plant decline at the time of application was close to 50% (50% of full vigor) 100% LEAF desiccation with 2 pt/A Diquat was obtained at 7 days after application. It was not until 20 days after application that STEM desiccation was determined to have desiccation reach 90% or 10% of full vigor (Table 1).

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An Idaho study shows Sulfuric Acid stem decline to be slightly more rapid for the first 10 days following application compared to Enquik and Diquat. At 14 days after application, desiccation from Enquik and Sulfuric Acid was the same and slightly higher than Diquat. At 21 days after application Enquik, Sulfuric Acid and Diquat had similar % leaf desiccation (not shown) and stem desiccation (Figure 3).

Complete vine desiccation is an important factor because of the high level of late blight stem infection that has been observed to be present in Washington. Unless the stems are completely dead (dead-dead-dead) at harvest tubers harvested in the presence of living infected stems stand a good chance of going into storage infected.

It is very important to keep in mind that after desiccants have been applied a fungicide program should be continued until stem desiccation is complete (dead-dead-dead).

Another concern at meetings in the fall of 1995 was the impact application of desiccants could have on yield. Results from the Ephrata Washington study show that desiccation treatments tended to lower total and US No. 1 yield (Figure 4). Based on the data from this study an expected total yield of 35 tons at 80% US 1's (28 T/A) without desiccation would be a total yield of 33.2 T/A with 26.6 T/A US when desiccated with Sulfuric Acid. Desiccation with Diquat could result in a total yield of 32.2 T/A and yield of 25.8 T/A US 1's.

When late blight is present potential yield decline (in the example 2.3 T/A total yield and approximately 2 T/A US No. 1's) has to be weighed against the impact of having late blight infected tubers in storage. Late blight infected tubers require storage management practices that will minimize tuber break down. If these conditions are not achieved complete loss of tubers in storage has been known to occur.

Information Sources

Haderlie, Lloyd - Agri Service Inc., Am. Falls, Idaho 1989. Potato Vine Killing with Enquik®, Sulfuric Acid and Diquat Special Report to Entek Corporation.

Qualls, Mick - Cenex/LOL Research 1989. Evaluation of Diquat Potato Harvest Aid and Effects on Tuber Quality, Special Report to Zenec Corporation.

Thornton, Robert E. 1995. Vine Desiccation - Some Considerations, Spud Topics Vol. 41, No. 6 August 31, 1995. Published by Washington State Potato Commission, 108 East Interlake Road, Moses Lake, Wa. 98837.

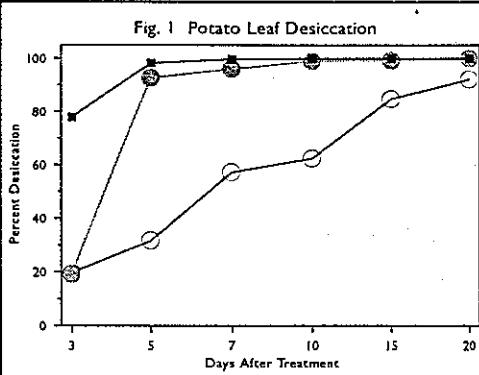


Figure 1

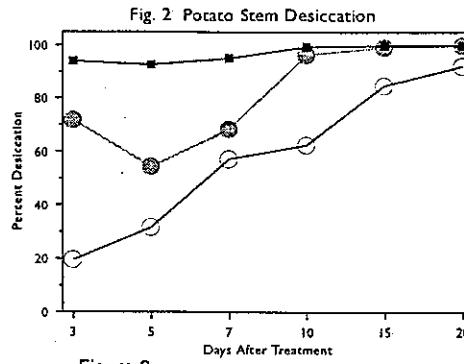


Figure 2

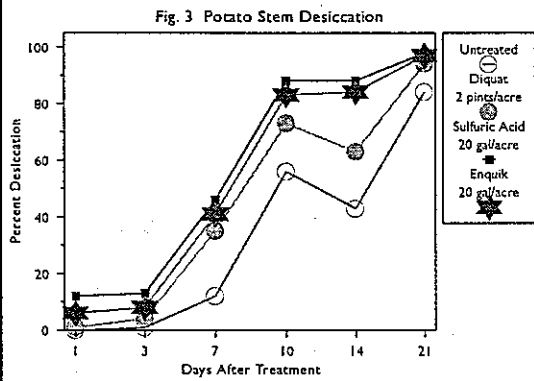


Figure 3

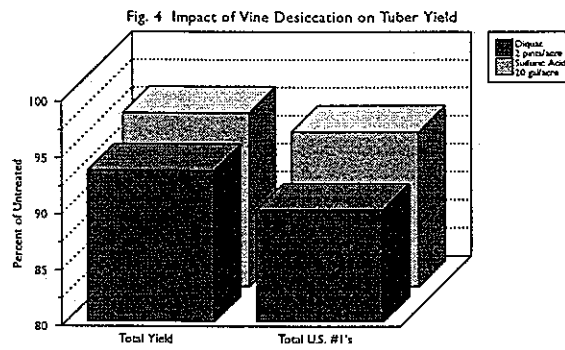


Figure 4

Table 1

Potato Leaf and Stem Viability after treatment
with 2 pt/A Diquat Othello 1988

Days After Application					
Treatment	0	5	10	15	20*
Untreated					
Leaf	46	37	18	16	10
Stem	53	42	31	25	20
Diquat					
Leaf	44	3	0	0	0
Stem	53	15	11	8	3

*estimated from 17 day reading