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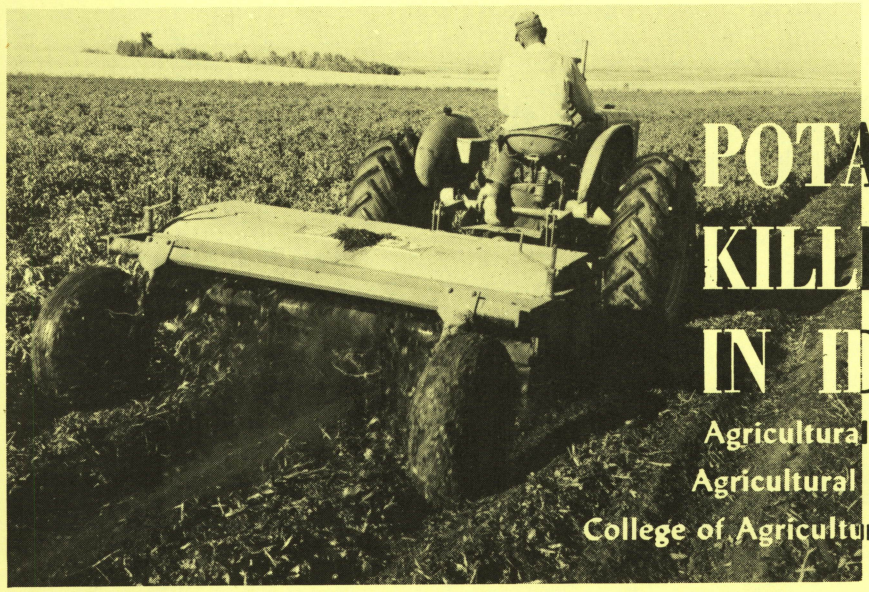

POTATO VINE KILLING IN IDAHO

Agricultural Extension Service
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***UNDER CONDITIONS OF HEAVY VINE GROWTH** chemical applications may not be entirely satisfactory as a method of vine killing.*

By

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Mechanical or chemical methods can be used to kill potato vines when frosts have not occurred or when early harvest is desired. Timely vine killing can aid in maturing the crop for harvest and in the reduction of seed borne virus diseases.

VINE KILLING AIDS HARVEST

Mature potato tubers are injured less at harvest and will also store better than immature tubers. In eastern Idaho *timely vine killing can lengthen the harvest season.* This will allow the same harvesting equipment to cover more acreage. In western Idaho where potatoes move directly from harvest to the consumer the skins of potato tubers often need to be "set." *Vine killing, properly carried out, aids in "setting" the skin and maturing the tubers.*

WHEN TO KILL

The time interval between vine killing and harvest depends upon the method used to kill vines, the condition of the vines, and the moisture level in the soil. If the vines are green and the soil moisture is greater than 50% available, at least 3 weeks must be allowed for the skin to set. If the soil moisture is less than 50% available and the vines are partially dead, roto-beating or vine killing chemicals should be applied at least 10 to 14 days prior to harvest. If the vines are to be undercut or pulled, this operation can be delayed until 5 to 10 days prior to harvest.

HOW TO KILL

Success with vine killers depends largely upon the amount of soil moisture and vigor of the potato vines. Timely termination of irrigation will, in itself, help mature the tubers as well as help prevent a loss in specific gravity when the vines are killed and even, in certain instances, aid in the prevention of stem-end discoloration.

Stem-end discoloration as shown in Figure 1 is the type commonly associated with rapid vine killing. This type of discoloration can be distinguished from that due to the leaf roll virus by the depth of penetration. Discoloration associated with rapid vine killing does not penetrate more than ¼ inch whereas net necrosis due to leaf roll may extend much deeper.

Figure 1. Stem-end discoloration due to vine killing.

SPECIFIC GRAVITY EFFECT

The effect of vine killing on specific gravity depends upon the moisture level of the soil and the stage of growth at the time the vines are killed. This in turn depends upon the time of planting, amount of disease, and other factors. If the soil moisture level is above 50% available and the vines are killed quickly without killing the roots; the roots continue to absorb water and

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cause a reduction in the specific gravity. When due to rain or late irrigation a high soil moisture level is encountered, a slow kill is especially recommended so that the roots will die at a rate comparable with the tops.

MECHANICAL METHODS

Most farmers in Idaho prefer the mechanical methods for killing vines. These methods are satisfactory if proper equipment is available. The methods include roto-beating, vine pulling and undercutting. Better results are obtained with each of these methods if the soil moisture content is lower than 50% available. *If the vines are still very green and actively growing, best results have been obtained by undercutting, with vine pulling next.* In all methods of vine killing it is essential that proper adjustment of equipment be practiced.

CHEMICAL METHODS

Chemicals have been investigated in Idaho for potato vine killing and those which show the most promise are sodium arsenite and various nitrogen fertilizers. Sodium arsenite does a good job of killing potato vines at concentrations of 1 gallon of sodium arsenite applied in 34 gallons of water per acre. Sodium arsenite has the advantage of being a reliable vine killing chemical. Its disadvantages are that it is toxic to humans and animals, and there is more danger of stem-end discoloration occurring because it may kill too fast.

The nitrogen fertilizers have the advantage of providing nitrogen for the next year's crop. This provides nitrogen to aid in breaking down organic material during the fall, winter and early spring months. The three sources of nitrogen—ammonium nitrate, ammonium sulfate and urea—are all suitable in Idaho. The gallonage and rate of application per acre are given in Table 1.

Table 1. Application of Selected Chemicals for Potato Vine Killing

Chemical	Rate of Application*	Gal. water/acre
Sodium Arsenite	1 gal/acre	34
Nitrogen		
Ammonium Nitrate	140 to 200 lbs/acre**	70 to 30***
Ammonium Sulfate	100 lbs/acre	100
Uran (32% Urea Nitrate)	15 gal/acre	34

*Under heavy vine growth these rates will not do the job and mechanical removal is necessary.
**Use the lower rate with the higher water gallonage.
***Some reports of better results by addition of a spreader sticker.

Difficulty may be experienced in getting ammonium sulfate and ammonium nitrate into solution. It should be pointed out that ammonium salts are highly corrosive. Equipment should be thoroughly washed and rinsed out after use.

FLAME KILLING

Burning potato vines is preferred by some farmers and has certain advantages. These advantages are a sure vine kill and sanitation by removing old potato vines that may help perpetuate organisms such as those causing early blight and early dying. Although not much work has been done in Idaho on the use of flame, it is recommended that vines be killed by several light applications over the field. The disadvantages of flame might be listed as higher costs per acre and destruction of organic matter. Here again, *caution should be exercised to avoid a fast kill which may result in stem-end discoloration.*

VINE KILLING HELPS CONTROL DISEASE

The leaf roll virus is a continual threat to the seed grower and to the commercial grower who does not plant certified seed. The amount of leaf roll spread can be reduced by early vine killing. This is especially important in certified seed areas. When the leaf roll virus has started to spread in commercial fields, defoliation of the vines can stop further spread, and thereby reduce the amount of net necrosis in the crop. *Since net necrosis continues to develop in storage, potatoes from a field that shows current season leaf roll spread should move directly into commercial channels* and not go into storage.

SUMMARY

The condition of the vines, stage of growth, moisture level, availability of equipment are factors which may influence vine killing decisions. A gradual kill is recommended regardless of method employed. When chemical equipment is used, care in the adjustment of the equipment is necessary. After vine killing, a roller should be used to fill the cracks in the soil to avoid light greening and frost spots on the tubers. If the soil is moist at the time the vines are killed the specific gravity of the tubers may be lowered.

CONTINUING POTATO RESEARCH. This report describes several potato vine killing methods that may be used by commercial growers this fall. Further work on this subject is being carried on by the University of Idaho Agricultural Experiment Station. As pertinent new information is obtained, it will be published.

CHEMICAL RESIDUES—The foregoing recommendations are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed established tolerances. Follow recommendations carefully with respect to dosage levels, number of applications, and minimum interval between application and harvest.

THE GROWER IS RESPONSIBLE for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

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