



## 2001 Agro Engineering Bruise News

With harvest fast approaching, it is important to start planning for minimizing bruising in this year's crop. This should include a vine kill that allows enough time for tubers to mature and set skin, which makes them less susceptible to skinning and bruising. With frost setting back the crop this year, many growers are planning to keep fields green longer than in years past to reach their yield goals. One option for maximizing the growing time per acre while still allowing adequate time for the tuber to mature, is to match your kill date to the acres you can harvest in a given period of time (most likely killing 1/2 of a field at a time).

Agro typically recommends the following amount of time from a vine kill to harvest for the following varieties:

<b>Centennials</b>	<b>14-21 days</b>	<b>Norkotahs</b>	<b>21-28 days</b>
<b>Nuggets</b>	<b>17-25 days</b>	<b>Reds and Yellows</b>	<b>28-35 days</b>

Excessive and late applications of Nitrogen can increase the time for skin set. Also, the speed of the kill will affect these times.

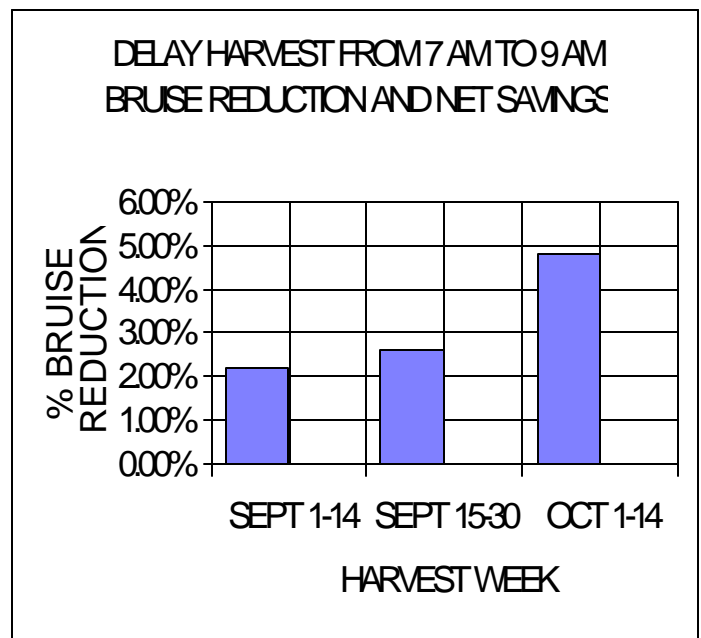
In some instances, your method of vine kill can directly affect the amount of damage coming out of a field. Increased traffic through the field prior to harvest causes more damage. We have seen up to 10% damage prior to the harvester entering the field.

Now is a great opportunity to check your chain speeds and drops to allow time to make modifications that minimize bruising through the harvester. Drops greater than 8" on cushioned chain can increase your bruising, and reducing that drop by 1" can reduce your potential for bruising by 3%. This can be accomplished by either adjusting the chain speed and keeping the chains full or by physically modifying the drop. Also, chains that were adequately cushioned at one time may now be worn and no longer providing adequate protection. Chain speed adjustment can affect the amount of bruising you have in other ways. For example, too slow a chain speed can allow back feeding, and too fast a chain speed can fling the potatoes on to the receiving chain, causing damage.

In past years, we have found a very strong correlation between warmer pulp temperatures and reduced bruising. Therefore, delaying harvest in the morning and running later in the evening will minimize the cooler pulp temperatures. This adjustment of harvest times becomes more important later in harvest, and a 2 hour shift in harvest times can reduce bruising by 5%

Another factor to take into account is the operation speed of your equipment. With the frost this year you may see a large variation in yield from field to field and, as a result, your chains may not be running at optimum capacity. To account for this you may need to adjust your ground speed and/or tractor RPM.

To assist in finding the optimum operation, we will have a **Smart Spud** this year. A Smart Spud is a device which measures impacts. We can run a Smart Spud through your harvester as you adjust to current



## Is Your Storage Ready to Use?

### **Pre-Harvest Storage Checkup**

Soon you will be relying on your potato storage to maintain a healthy, long term environment for your potato crop. A pre-harvest check on building conditions and ventilation system operations will help, and should be planned soon. All advantages gained in effective crop management to achieve harvest quality can be lost if the storage and/or handling equipment are not in peak operating condition for receiving and storing the potato crop.

### **Structural**

Building Framing: Check sills and framing members for rust and/or decay. Hidden structural weakness has caused unexpected building failures at bad times.

Doors: Tight fitting doors are essential for control of temperature and relative humidity in the storage. Inspect and replace seals along edges and seams if they are in poor condition.

Inside the Storage: Inspect and repair all insulation that has been cracked and/or dinged by the piler. This will reduce the likelihood of condensation this coming winter. Check bin partitions for decay and rot, especially at the sill.

Clean and Soak: A thorough cleaning and disinfecting is a high priority for destroying any remaining organisms from last year's crop. Dampening floors and walls prior to filling can reduce pressure bruising. Floors should be damp without puddles or free water.

### **Ventilation System Check**

- 1) Check thermometers and thermostats for accuracy and operation. Thermometers and thermostats sometimes change calibration for no obvious reason. Storage management is facilitated when thermometer and relative humidity sensors read accurately in storage conditions of high relative humidity and desired pile temperature on the top and bottom.
  - 2) Start the humidifiers, sprays, and evaporative coolers. Observe the spray pattern and wetting pattern, and clean and adjust as necessary.
  - 3) Lubricate the fan motor per manufacturer's recommendations. Check fan blades for any build up, and clean if necessary. Replace damaged or missing fan guards.
  - 4) Lubricate louvers and check for operation. Check doors on all airflow control openings to ensure hinges are lubricated and the edge seals fit snugly. Also, lube and check operation of exhaust louvers.
  - 5) Run the panel box through a cycle to assure that components are functioning. Arrange to have your ventilation system serviced, and make needed checks and/or repairs before harvest.
  - 6) Ducts are an important part of the ventilation system. Ducts that have been bent need to be repaired or replaced so they fit tightly together at joints.
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## Late Blight Update:

It is the time of year when weather conditions begin to favor the development of one of the most dreaded diseases known in the potato industry—Late Blight (*Phytophthora infestans*).

Disease severity units are over the threshold at this point in the season, while the weather conditions for the past two weeks have been very conducive for the development of Late Blight. With this in mind, there are several things to consider to reduce the possibility of becoming the next late blight victim. They include the following:

- Late Blight is a fungus, which attacks mostly new, lush plant growth located on the upper portion of the canopy. As vines begin to senesce naturally, the probability of an infection in dead tissue decreases. At this point, when most early season varieties are beginning to senesce, our main concern should be the late-maturing varieties.
- Tighten up fungicide application intervals on your farm. This is especially important with late-maturing varieties, which will remain alive for a couple of weeks. A commonly used interval at this point is about an 8-10 day application interval.
- Late blight thrives under moist, cool conditions. It is a very good idea to check regions of your fields which tend to remain wet for long periods of time (i.e. low spots and pivot wheel tracks).

These are just a few things to keep in mind to protect yourself, as well as your neighbors from this nasty disease. Let's keep our fingers crossed and maybe we will not have to deal with the disease this year!

## Time For Fall Nematode Sampling

The best time of year for nematode sampling is in August. Nematode numbers reach their peaks around the time the crop is mature. In grain fields, we prefer to sample after the first irrigation just following crop harvest. This way, there is enough soil moisture to get a really good sample. In seed potato fields, it is best to get a sample just following vine kill, but prior to harvest. However, if samples need to be taken from specific seedlots, it is better to sample just prior to vine kill. In a commercial potato field, samples can be taken just following harvest operations. It is important to get fields sampled early, because labs get backed up this time of year. Also, metam sodium, when needed, should be applied fairly early in the fall.

## 2001 INSECT LEVELS

Insect pest levels have been way down this year in comparison to the last two years. We have seen this both in the field and in the pan trap results. Green peach aphids just started to rise in the pan traps last week, about a month behind 2000, and just in time for vine kill on seed fields. Psyllids continue to be a problem in fields with low levels of beneficial insects and fields on edges of the Valley.

## Bruise

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condition to find the point where impacts and bruise is minimized. Also, we can monitor your bruising throughout harvest by taking samples at given intervals, depending on your specific interest and, if you drop below a set point, we will make a field visit to adjust your harvester.

Area of Interest	Population Size	Sampling Rate	Cost/Acre
Overall Bruise Free Average	10 Fields or 420000 cwt	Every 3600 cwt or 12 trucks	\$1.67
Individual Harvester Over a Season	5 Fields or 210000 cwt	Every 2400 cwt or 8 trucks	\$2.50
Individual Field Results	1 field or 42000 cwt	Every 1200 cwt or 4 trucks	\$5.00

The hot box can also be used to spot check your harvest operation to determine the amount of bruising that is currently occurring.

### BRUISING = LOST \$\$\$

The economic cost of bruising varies from grower to grower, and depends on the amount of cullage or loss in grade from bruising. In a 1999 study, Agro found one case where the amount of cullage due to bruising was 3.4% of total tubers bruised, and the loss in grade was 14% of total tubers bruised. Assuming \$4.00 is lost due to cullage and \$2.00 to loss in grade, the total cost per acre is as follows, assuming the Valley average bruised on these three varieties.

VARIETY	TOTAL % BRUISE	CULLAGE DUE TO BRUISING CWT/ACRE	LOSS IN GRADE DUE TO BRUISING CWT/ACRE	COST/ACRE 400 CWT/ACRE
NUGGET	33%	4.5	19.0	\$56
NORKOTAH	23%	3.1	13.2	\$39
CENTENNIAL	18%	2.4	10.4	\$30

For every percentage point that bruise is reduced, the net savings is \$1.70/acre and, if maximum bruise-free levels are attained, the average savings would be **\$24.36/acre**. One farm that Agro worked with had bruise reduced by 12%, a savings of \$20.40/acre. With an incentive program, where the buyer pays an additional \$0.05/cwt for every percentage point of bruise below a set level, the reduction of bruise by 1% would increase income by **\$20.00/acre**.



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