The Vegetable and Small Fruit Gazette

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Horticulture Department
The Pennsylvania State University

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Tip for the Month: "Life may not be the party we hoped for, but while we are here we might as well dance"

Comments from the Editor

Bill Lamont, Department of Horticulture

The month of March is a full of swings in the type of weather that we may experience and it has certainly lived up to its reputation thus far. We still have several educational opportunities, so be sure to check the list of upcoming meetings at the end of gazette. I look forward to receiving Lee Young's article that will appear in the April issue and also want to encourage my colleagues from other departments to contributed articles throughout the year. If you have an event that you would like to advertise, please send it to me. As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns.

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Schedule for Agent Articles

Bill Lamont, Department of Horticulture

April	Lee Young
May	George Perry
June	Tom Butzler
July	Eric Oesterling
August	Tom Ford
September	Cheryl Bjornson
October	Mary Conklin
November	John Esslinger
December	Andy Muza

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Vegetable Production and Management in the Cold, Wet Spring of 2003

Michael D. Orzolek, Department of Horticulture

The winter of 2002/2003 has not only produced record precipitation in the form of rain and snow, but also some of the coldest months experienced in Pennsylvania in the last 10 years. As I write this article and look out my office window, I can still see 8 to 12 inches of snow on the ground and what bare ground I see, it is still frozen. The critical questions for growers are: 1) when will the snow be completely melted off the fields this Spring, (2) when will air temperatures get into the 60°F during the day and stay there for the next 6 months, and (3) more importantly, when will the soil be completely thawed out to plow depth. It appears winter will not depart very quickly in Pennsylvania in 2003. Many growers will not be able to soil test this year prior to plowing the ground because of the frozen conditions. Also, with the saturated soils that we are currently experiencing in Pennsylvania, tilling fields should not be rushed because the potential compaction and reduction in soil tilth that accompanies the working of wet soils will have residual effects the entire growing season. Patience will surely be a virtue in 2003 and tested often. Once soils that have thawed and dried sufficiently to be plowed occurs, planting crops

should not be rushed until soil temperatures reach a minimum of 50°F with 55° F being more acceptable for most seeding and transplant operations. Both warm air (70° to 85°F) and soil (55°F or warmer) temperatures increase plant growth and development. Soil temperature affects the rate of seed germination, growth rate of potato sprouts, rate of root establishment and development, growth of transplants and germination of weed seeds. Cool/cold soil temperatures do not encourage root growth and/or nutrient uptake. Chilled transplants will respond to applications of foliar fertilizers (1-2-1 or 1-1-1 ratios) early in the growing season, when plants are stressed. In addition to both air and soil temperature, wind (5 to 20 mph) can cause moderate to severe dehydration of young plants and transplants and delay application of pre-emergence and post-emergence herbicide applications.

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Smart Pricing Strategies

Wen-fei Uva, Senior Extension Associate
Department of Applied Economics and Management
Cornell University

Pricing is an important piece of smart marketing. The price a farmer receives depends largely on the distribution channel used to sell the product. Farmers are usually price-takers at terminal and wholesale markets. One of the major attractions of direct marketing for farmers is the opportunity of gaining control over the prices they can charge. Yet frustration often arises when trying to determine prices, and one of the most difficult problems in direct marketing often centers around the all-too-common practice of price-cutting.

Price provides income, guides the quantity supplied and demanded, serves as a signal to customers, and transfers ownership. Questions one should ask before determining prices including: How much do the competitors charge? How much are customers willing to pay? Does the product have additional value for which the price may be raised? What is the cost to produce the product? And if you slash prices (below competition), how will you maintain profitability?

The most basic element of pricing is to know your costs, including variable costs and fixed costs. Variable costs are cost items directly related to production ?? plants, seeds, fertilizer, labor, packaging, etc. Fixed costs are cost items that do not vary with production volume such as rent, taxes, management salaries, and cost of capital. The price of one item should at least cover variable costs in the short run and need to cover both variable and fixed costs in the long run. It is important to establish a gross margin that will cover the total costs of growing and marketing the product and provide a satisfactory profit for the business. Gross margin is the difference between the cost of the product and its selling price.

After the prices are established based on the desired gross margin for each product, it is often

necessary for the smart marketer to adjust the prices to match the marketing strategy. One might want to lower prices of certain items to meet competition, attract customers to the retail outlets (i.e. advertised specials), or sell products that may have been damaged, overstocked or seasonal. Sometimes, one will want to increase prices of certain items to reflect the value of a unique product, a special service, or a prestige image. When considering changing prices, it is important to calculate the impact of such a reduction or increase on the total gross margin of the business. This can be done as illustrated in the following example.

Assume a direct marketer is selling just five major items from a farm stand. The direct marketer has calculated the gross margin for each product sold using the cost of goods (a cost of production or market wholesale price) and has also estimated the approximate sales for each product as a percent of total sales. The percentage of sales and gross margin for each product are shown below.

Item	A. Percent of Total Sales (Estimated)	B. Percent Contribution to Gross Margin	C. Total Gross Margin (C=AxB)
Apples	35	30	10.5
Mums	10	35	3.5
Pumpkins	15	30	4.5
Sweet Corn	10	20	2.0
All Others	30	20	6.0
Total	**100%**		**26.5%**

In this situation, if the direct marketer decided to lower the price on pumpkins as Halloween promotions to meet a lower price by a competitor or to sell out the seasonal stock. If the price reduction resulted in a gross margin of 10 percent (a drop from 30 percent) and stimulated sales to increase to 20 percent of the total (up from 15 percent). The impact of the price reduction on the total sales and profits of the business could be calculated as following:

Item	A. Percent of Total Sales (Estimated)	B. Percent Contribution to Gross Margin	C. Total Gross Margin (C=AxB)
Apples	33	30	9.90
Mums	9	35	3.15

Pumpkins	20	10	2.00
Sweet Corn	10	20	2.00
All Others	28	20	5.60
Total	**100%**		**22.65%**

Therefore, the direct marketer could forecast a drop in total gross margin from 26.50% to 22.65%, or a loss of -3.85% in gross margin. Assuming that sales for the business averaged $5,000 per week, this would mean a loss of: $ 5,000 x -3.85% = -$ 192.5.

However, if the lower price on pumpkins attracted more customers or more sales for the business, and resulted in an overall increase in sales of more than $192.50, the result would be an increase in total gross revenue for the direct marketer.

For example:
Gross margin before the price reduction $5,000 x 0.265 = $1,325.00

Gross margin after the price reduction (with a $900 sales increase) $5,900 x 0.2265 = 1,336.35

Now there is a slight gain in total gross margin.

Remember that having the "lowest price in the market" image can't get you higher prices for higher quality products. Having a "value" image is to reach an optimal combination of quality, service, information and price. Price competition in a market situation with multiple similar sellers in one location can cause severe consequences.

The following are some pricing strategies for *Smart Marketers.*
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- Price-lining: Price-lining features products at a limited number of prices, reflecting varying product quality or product lines. This strategy can help smart marketers to sell top quality produce at a premium price and an "economy line", e.g. overripe or smaller fruits. Price-lining can also make shopping easier for consumers and sellers because there are fewer prices to consider and handle.
- Single-pricing: The single-price strategy charges customers the same price for all items. Items are packaged in different volumes based on the single price they would be sold for. With such a policy the variety of offerings is often limited. The strength is being able to avoid employee error and facilitate the speed of transactions. Also, customers know what to expect. There are no surprises for customers.
- Loss-leader pricing: A less-than-normal markup or margin on an item is taken to increase customer traffic. The loss-leaders should be well-known, frequently purchased items. The idea is that customers will come to buy the "leaders" and will also purchase

regularly priced items. If customers only buy the "loss leaders," the marketer is in trouble.

- Odd-ending pricing: Odd-ending prices are set just below the dollar figures, such as $1.99 a pound instead of $2.00. Some believe that consumers perceive odd-ending prices to be substantially lower than prices with even-ending. However, it might not be suitable in some markets. For example, in a farmers' market situation, products should be priced in round figures to speed up sales and eliminate problem with change.
- Quantity discount pricing: A quantity discount is given to encourage customers to buy in larger amounts, such as $2.00 each and three for $5.00. Gross margins should be computed on the quantity prices.
- Volume pricing: Volume pricing uses the consumers' perception to its advantage, and no real discount is given to customers. Rather than selling a single item for $2.50, two are priced for $4.99 or $5.00.
- Cumulative pricing: Price discount is given base on the total volume purchased over a period of time. The discount usually increases as the quantity purchased increases. The type of pricing has a promotional impact because it rewards a customer for being a loyal buyer.
- Trade discount/Promotional allowances: Price is reduced in exchange for marketing services performed by buyers or to compensate buyers for performing promotional services.
- Cash discount: A discount is given to buyers who pay the bills within a specified period of time to encourage prompt payment.
- Seasonal discount: This type of discount is used to induce buyers to purchase at the end of the season or during off-season.

While the above strategies are widely used and proven effective, smart marketers should not be limited to these strategies. Creative pricing ideas can help you differentiate your products and services. No matter how you price your products, always go back to check it against your bottom-line. Make sure prices for your products reflect your business image and target market and make a profit. Smart pricing can be a good marketing strategy.

This article appeared in **"Smart Marketing"** which is a monthly marketing newsletter for extension publication in local newsletters and to place in local media. It reviews the elements critical to successful marketing in the food and agricultural industry. Articles are written by the faculty members in the Department of Applied Economics and Management at Cornell University

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Bug vs. Bug - Managing Plant Diseases with Biofungicides

Cathy Thomas, Integrated Pest Management Program
Pennsylvania Department of Agriculture

Caterpillar pests are not usually considered to be a major pest in greenhouse vegetables, however they can be a problem in warmer months of the growing season

when the adult stage, (moth or butterfly, order Lepidoptera) migrates into the greenhouse to lay eggs. One of the most common species found in tomatoes is the Tomato Hornworm, however Tomato fruitworm, Armyworm, and Loopers can also infest tomatoes and peppers. If you are introducing natural enemies to control other pests, caterpillars must also be controlled with natural enemies or compatible pesticides.

There are many enemies of caterpillars found in natural populations that will attack caterpillars if you are not using a broad spectrum insecticide program. Examples of these include predators such as assassin bugs, damsel bugs, minute pirate bugs, and parasitic flies and wasps. If populations are not kept in check with indigenous natural enemies consider supplementing with biological controls that can be purchased through a biological control distributor.

Caterpillar Life Cycle

Caterpillars and moths undergo complete metamorphosis consisting of four stages, egg, caterpillar (larva), pupa and adult. Eggs are laid in groups on leaves. Eggs hatch into larvae that have well developed chewing mouthparts. Larvae eat continuously and can cause damage to foliage and fruit in a short period of time. After several developmental larval stages, the insect transforms into a stage called the pupa or the resting stage. This stage does not feed and is usually inactive. Pupae are often covered by a cocoon or some other kind of protective material. The final stage occurs when the adult butterfly or moth emerges from the cocoon to begin the egg laying process again. Damage symptoms from larvae appear as holes chewed in leaves and/or fruit and large of amounts of excrement may be observed on the foliage.

Biological Controls

Trichogramma spp.

One of the most popular and effective controls for caterpillars is the egg parasitoid, *Trichogramma*. These tiny wasps (.9 mm) work by laying eggs (parasitizing) in the eggs of many destructive caterpillar pests. A new wasp will emerge from the parasitized egg. If you are going to use this biocontrol, inspect the crop for the presence of eggs since this is the life stage that is attacked. *Trichogramma* is not effective against the larval stages. Grain moth eggs parasitized by *Trichogramma* are glued to small cards and shipped to the grower. The cards are then placed throughout the crop where the wasps will emerge to search the plants. Protect the cards from ants since they will feed on the eggs.
The species available from most biocontrol suppliers include *T. brassicae, T. minutum* and *T. pretiosum*. Consult suppliers for applications rates and appropriate species needed for the crop and pest.

Microbial Insecticides

A microbial insecticide such as *Bacillus thuringiensis* (Bt) has a selective mode of action that will target caterpillars but not harm other beneficial organisms. Various subspecies (strains) are commercially available for controlling many common foliage feeding caterpillars. The most widely used Bt insecticides are formulated from the bacteria *Bacillus thuringiensis var. kurstaki* (Dipelä, Javelinä). This isolate is toxic only to the larvae of butterflies and moths. When the Bt is ingested by an insect, the protein toxin paralyzes and destroy the cells of the gut wall. Insects may die quickly or may stop feeding within 2 to 3 days. Mortality varies with larval size, target species, and the dose consumed. Caterpillars must feed on treated leaves for it to be effective since it is not a contact poison.

Botanical Insecticides

Azadirachtin (Azatin XLâ , Neemixâ) is a botanical insect growth regulator derived from kernels of the neem tree. As an insect growth regulator, Azadirachtin blocks the insects production of hormones, and interrupts the moulting process, preventing the insect from completing its life cycle. Azadirachtin may also serve as a feeding deterrent for some insects. This compound is compatible with beneficial insects and in addition to controlling caterpillars it will kill/repel a variety of greenhouse pests.

Microbial and biological insecticides are registered by the Environmental Protection Agency. Growers must read and follow the label to determine if the intended use has been approved. Always read the label before using.

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Pesticide Groups for Berries- Part III

Kathy Demchak, Department of Horticulture

As mentioned last month, this month we'll cover the groups that herbicides labeled for use on berry crops fall into, based on target site of action for resistance management purposes. Insecticides and fungicides were covered in the last 2 months. Though buildup of resistant populations of weeds is not something we hear a lot about, relative to buildup of resistant strains of diseases or mites, it can happen. Only groups which contain insecticides labeled for berries are listed below. Also, there are many other

materials within each group, but if they're not labeled for berries, they are not listed below. This information was almost entirely obtained from "Pesticide Registration (PR) Notice 2001-5, Guidelines for Pesticide Registrants on Pesticide Resistance Management Labeling" on EPA's Web site (http://www.epa.gov).

Herbicides:
I'm not listing the target sites of action this time (most of us would need to dig out a reference book or two to understand them). Growers could sometimes guess correctly which ones fall into the same group, based on the similar effects that they have.
Group 1 includes fluazifop-P-butyl (Fusilade), clethodim (Select), and sethoxydim (Poast)
Group 3 includes oryzalin (Surflan), DCPA (Dacthal) and trifluralin (one of the active ingredients in Snapshot)
Group 4 is the synthetic auxins and contains 2,4-D (Formula 40) and clopyralid (Stinger), which isn't labeled for strawberries YET.
Group 5 includes simazine (Princep) and terbacil (Sinbar)
Group 9 includes glyphosate (Roundup) and sulfosate (Touchdown 5)
Group 12 includes norflurazon (Solicam)
Group 14 includes oxyfluorfen (Goal) and sulfentrazone (Spartan), mentioned only because of past Section 18's in PA.
Group 15 herbicides inhibit cell division: napropamide (Devrinol) and pronamide (Kerb)
Group 20 inhibits cell wall synthesis at one particular site: diclobenil (Casoron)
Group 21 inhibits cell wall synthesis at a different site: isoxaben (Gallery, and one of the active ingredients in Snapshot)
Group 22 includes paraquat (Gramoxone).

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Pennsylvania Strawberry Production Statistics

Kathy Demchak, Department of Horticulture

The Noncitrus Fruit and Nuts 2002 Preliminary Summary released by the USDA National Agricultural Statistics Service in January showed some very interesting data on Pennsylvania strawberry production. Despite a spring during many growers lost all or a portion of their crop to frost damage, the value of production was at an all-time high, just exceeding $10 million for the first time. The value of production has nearly doubled since 1999, which, at a typical value for that time, was at about $5.5 million. This put PA in 5th place nationally for value of production overall, and in 4th place for fresh-market value. There were about 1300 acres of strawberries grown, a figure which had been holding steady for 4 years, placing Pennsylvania 7th nationally for acreage in strawberries. Pennsylvania producers obtained the second highest price of the top ten producing states (though Virginia figures weren't available yet) with an average price of $1.37/pound obtained. This is attributed to close proximity to populations centers, and to

good demand for a high-quality product. New York growers received slightly higher prices, averaging $1.40 per pound.

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Potato Musings

Bill Lamont, Department of Horticulture

Handling Potato Seed

Bill Lamont, Department of Horticulture

When it is time to cut seed, warm it up to 55-600 F before handling it (a few degrees per day to prevent condensation on the tuber surface). This minimizes bruising of the seed tubers, which can lead to increased seed rot and stand establishment problems. Do not begin the cutting process until all seed handling and cutting equipment is thoroughly washed and disinfested. Quaternary ammonium compounds, sodium hypochlorite (household bleach) and calcium hypochlorite are all effective disinfectants. The activity of disinfectants is greatly reduced if soil or organic matter is not removed from the surface before treatment. Don't forget to clean trucks and conveyors used to handle seed.

Cleaning the equipment between seed lots may seem to be a waste of time. However, the cutting process is a very efficient way to spread diseases from one seed lot to another, and it may not be obvious that a seed lot has a disease problem until it is too late. If you come across a disease problem in the seed while cutting, shut down the cutting operation and clean the equipment, then discontinue the use of that seed lot or attempt to grade of diseased tubers before cutting. Above all, don't mix seed lots during the cutting and planting process. Maintaining the integrity of the seed lot is essential, not only to minimize disease losses, but also to allow you to obtain compensation if there is a problem.

Planting practices can also affect the losses associated with seed decay problems. Seed planted into warm, well-drained soil will emerge faster. Planting shallow and lightly cultivating to break up compacted soil will also increase the temperature and improve the oxygen levels around the seed piece, which will speed plant establishment.

Useful Websites for Potatoes

Bill Lamont, Department of Horticulture

Dr. Alexander D. Pavlista, from the University of Nebraska, UNL-PREC, 4502 Avenue I, Scottsbluff, NE 69361, phone: 308-632-1240, fax: 308-632-1365, and e-mail: apavlista@unl.edu has two websites that would be of special interest to county extension personnel and to growers. His Nebraska Potato Eyes website http://www.panhandle.unl.edu/peyes.htm has been around for several years and is an excellent newsletter. Alex also has an excellent website for Potato Educational Guides located at http://www.panhandle.unl.edu/potato/. He is continually adding to this site and it is a really useful site for finding a wide variety of information on potatoes. I would

encourage you to check out both these sites.

Additional websites are listed below:

Global Potato News - http://www.potatonews.com
International Potato Center- http://www.cipotato.org
Maine Potato Board- http://www.mainepotatoes.com
Michigan State University- http://www.msue.msu.edu/msue/imp/modc4/51795003.html
National Potato Council - http://www.npcspud.com
Oregon State University - http://www.orst.edu/dept/botany/epp/guide/index/P.html
Oregon State University, Potato Research & Extension - http://www.css.orst.edu/coarc
Potato Association of America - http://www.potato.tamu.edu/variety/paa.htm
Potato Engine - http://www.potatoengine.com/thinkpotato.html
Potato Information Exchange - http://www.css.orst.edu/potatoes/main.htm
Potato Research Online - http://www.potatoresearch.com
University of Idaho - http://www.uidaho.edu/ag/plantdisease/plbstem.htm
European Association for Potato Research (EAPR) -http://www.agro.wau.nl/eapr

Potato Seed Treatments 2003

Sara R. Mahoney and Barbara J. Christ, Department of Plant Pathology

There are many seed treatments that can be used on potatoes to prevent the spread of seed borne pathogens and to provide some protection against pathogens in infested fields. This article discusses treatments for controlling Rhizoctonia, seed borne late blight, and pink rot and pythium leak.

Rhizoctonia control: liquid treatments
Dithane, which can be applied as a seed dip, and Maxim 4FS, which can be applied as a seed spray, are registered for use against Rhizoctonia on potatoes. Research has found that these liquid treatments often result in poor stands and reduced yields due to seed decay. There are treatments that have proven to be more effective against Rhizoctonia so we do not recommend the use of these liquids. Table 1 shows results of an experiment done at Penn State in 2001 on the cultivar Superior. Although the differences in emergence are not significant, the reduction in the yield of US #1 potatoes is. Table 2 shows an experiment done at the University of Wisconsin on the cultivar Russet Burbank using the Maxim 4FS liquid treatment. There are significant differences in both emergence and yield of US #1 potatoes.

Table 1. Penn State potato seed treatment experiment, 2001

Treatment	% Emergence	Yield US #1 (cwt/A)
Untreated	98%	483
Maxim MZ*	93%	470

Dithane**	92%	394

*applied as a dust
**applied as a dip

Table 2. University of Wisconsin potato seed treatment experiment, 1999

Treatment	% Emergence	Yield US #1 (cwt/A)
Untreated	98%	190
Maxim 4FS*	97%	158
Maxim 4FS + Fir Bark**	96%	160
Maxim 4FS+ Alder Bark**	81%	146

*applied as a midst
** Maxim 4FS applied as a mist then dusted with Fir or Alder Bark

Rhizoctonia control: dust and in-furrow treatments
There are several seed dusts that are labeled for use against Rhizoctonia. Some of these include: Maxim, Maxim MZ, Moncoat MZ, Tops, Tops MZ, and Evolve. In-furrow treatments used for Rhizoctonia control are Quadris, Blocker 10G, Blocker 4F, and Moncut 70 DF.

Seed dust treatments that are showing high activity against Rhizoctonia are Maxim MZ and Moncoat MZ. The best treatment for both black scurf and stem canker is to use a seed dust treatment followed by an in-furrow treatment, such as Quadris, at planting. However, we have not performed a cost-benefit analysis to see if the extra cost is economical.

Seed borne late blight
Treatments that are effective when seed borne late blight is a concern include Tops MZ and Evolve. These treatments are not curatives and will not provide control on seed that is already infected. The treatments will only protect seed that may be carrying the late blight pathogen but have not become infected.

When using cut seed it is important to allow for a healing period after treatment and before planting. This will result in better emergence, more uniform stands, and higher yields.

Pink rot and pythium leak
Ridomil Gold EC is registered for use as an in-furrow application to control pink rot and pythium leak in storage. To provide the best control, it is better to use one of the foliar

formulations such as Ridomil Gold MZ, Bravo, or Copper. One application can be made at flowering and then again 14 days later to protect against storage rot. Ridomil Gold EC applied at the beginning of the season will move systemically throughout the plant and into the tubers as they form. However, control will only reach the first tubers formed, especially with in-determinant and late maturing varieties. Therefore we recommend the foliar applications, which allow the chemical to be distributed to all tubers.

Keep in mind if you do use Ridomil Gold EC at planting, it does not mix well with Quadris. The two chemicals will form a "cottage cheese" solution when mixed. To effectively combine these two chemicals, first make a slurry of each chemical separately then gradually mix the two slurries together.

References

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Stevenson, W.R., James, R.V., Rand, R.E. 2000. Evaluation of fungicide treatments to control Rhizoctonia stem canker, 1999. University of Wisconsin-Madison. Madison, WI.

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Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

March 18, 2003: Central Vegetable Meeting, Pleasant Gap, PA. Contact: Tom Butzler, (570) 726-0022

March 19, 2003: Erie County Potato and Vegetable Growers Meeting, Quality Inn, Erie, PA. Contact: Andy Muza (814) 825-0900

March 20, 2003: North Central Vegetable Producers Conference, Emporium, PA. Contact: Tom Butzler (570) 726-0022

March 21-22, 2003: Passive Solar Greenhouse Workshop: Design, Construction and Year Round Production, Sonnewald Natural Foods, Spring Grove, PA. Contact: Steve or Carol Moore (717) 225-2489, or sandcmoore@juno.com.

Regional

National

August 16-19, 2003. 31st American Society for Plasticulture Congress. The Crown Plaza, Grand Rapids, MI. Contact: Pat Heuser (814) 238-7045 or http://www.plasticulture.org

International

World Potato Conference. Kunming, China. See www.potatocongress.org