

March-April 2000

# Agrimanagement Newsletter

CHECK OUT  
OUR WEBSITE  
[WWW.AGRIMGT.COM](http://WWW.AGRIMGT.COM)

E-MAIL US  
[INFO@AGRIMGT.COM](mailto:INFO@AGRIMGT.COM)

## Inside this issue:

Asparagus Fern Sampling	2
Working With GPS	3
Winter Water Watch	4
IPM Outlook	5
Section 18 Exemptions for 2000	5
Water is a Nutrient	6

We all consider winter to be the "slow part" of the year, a time for us to relax and prepare for the future growing season. Yet it also serves as an important time for Agrimanagement consultants to expand our collective knowledge. We take the opportunity to further our education and correspond with growers and colleagues. Many meetings throughout the area provide us with resources to further advise customers in their specific needs.

As many of you may know, I've been a member of the National Alliance of Independent Crop Consultants since 1981, having served as president during 1996. This year, for the first time, the NAICC meetings were held relatively close to home, in Portland, Oregon. While I have made an attempt to attend each annual meeting, it was possible this year for other members of our staff to attend, including Garrett Henry, Scott Stephen, and David Marshall. Other local region attendees were members from Ron Britt and Associates, and Mick Qualls from Ephrata. This meeting was followed in mid-February by a meeting of Independent Crop Consultants in Yakima where we continued to learn about new and current chemical products. We attend these and other commodity meetings for the same reasons you attend, simply to keep up with a fast moving and ever-changing industry.

Aside from all the regulatory issues affecting the industry, there is always more information to add to our inventory of agronomic knowledge. We hope to be able to bring this into beneficial use, as we approach the wide

array of new farming questions this spring and summer.

Finally as our past NAICC President Roger Carter from Louisiana suggested in October of 1999, we consultants must continue to renew our dedication to our producer clients to:

- Continue being an advocate voice in Washington D.C.,
- Voice our concerns to our Congressmen, Senators, and the EPA,
- Provide information to farmers to manage risk,
- Evaluate variety planning strategies and how much technology to buy in the seed,
- Provide standard practices of recommendations of selection, timing, rates and methods of application of insecticides, herbicides, fungicides and harvest aids,
- Realize that every dollar saved, or extra ounce of commodity, contributes to risk management,
- Continue to be observant, be a filter of issues that we see, and transfer that information to the producer.

All said above, we do look forward to contributing to the production questions and challenges for 2000. We have a sound team of staff and 7 returning sampler/scouts from 1999. John Beam of Beam Application Technologies and Agrimanagement have established a relationship to provide service work in GPS field location mapping, and zone or grid soil sampling. As always, we are excited about the opportunities to serve you. ☐



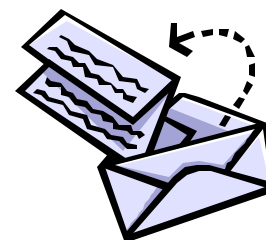
Look for these articles  
in the May-June 2000  
issue:

- ☐ Data Mgt in Your Agri-Business
- ☐ Nutrition Mgt in Your Crops
- ☐ Apple Outlook

As we are all pulled forward in this information age we are becoming more dependent on the Internet and the speed of e-mail. If you would like to correspond with us through e-mail please feel free to contact a consultant at their e-mail address.

**Info@agrimgt.com   Newsletter@agrimgt.com   Billing@agrimgt.com**

Don Jameson:	<a href="mailto:djameson@agrimgt.com">djameson@agrimgt.com</a>
Garrett Henry:	<a href="mailto:ghenry@agrimgt.com">ghenry@agrimgt.com</a>
David Marshall:	<a href="mailto:dwmarrshall@agrimgt.com">dwmarrshall@agrimgt.com</a>
Scott Stephen:	<a href="mailto:sstephen@agrimgt.com">sstephen@agrimgt.com</a>
Chris Catron:	<a href="mailto:ccatron@agrimgt.com">ccatron@agrimgt.com</a>
Joyce Adcock:	<a href="mailto:jadcock@agrimgt.com">jadcock@agrimgt.com</a>
Marty Close:	<a href="mailto:mclose@agrimgt.com">mclose@agrimgt.com</a>
Gene Cole:	<a href="mailto:tgcole@agrimgt.com">tgcole@agrimgt.com</a>



## Presenting a New Service: Asparagus Fern Sampling

The current growth market in human foods is for healthful foods and while Asparagus should qualify as an example of a health crop, that is not the theme of this article. Rather, it is the concept that just as certain foods can provide fiber or antioxidant to reduce cancer risks, so too, certain plant nutrients and nutrient ratios do affect plant health and disease resistance.

Some of these relationships are well founded, and are factored into our routine soil fertility advisements. For instance, soil P concentrations suppress potato surface scab by reducing the Ca:K ratio of the tubers. Also, in the Florida system for fusarium wilt control on tomatoes and chrysanthemums, fusarium wilt control was improved by both calcium fertilization and applying the correct form of nitrogen, in essence a chemotherapy system.

With that introduction of a concept,

we became interested in research performed in Connecticut in 1997 and 1998 to improve the health of asparagus by balancing the uptake of cations Ca, Mg, K and Na with chloride ions. We realized some attempts to acidify high lime asparagus fields may actually have been counterproductive to attaining fusarium tolerance and there are other biotic factors to consider too.

Now, as growers move away from manure fertilization on asparagus, and disease management becomes key to stand survival, we proceeded with developing a leaf fern sampling program to monitor the uptake balance of these important nutrients.

Key evaluations to be made from fern analyses are:

- Sufficiency of N uptake from residual soil levels or as supplemented by commercial N,
- Ratio of K, Ca, Na to each

other and Cl and maintaining balance within a “safer condition” zone,

- Evaluation of micro elements that in excess can also be stimulating to fusarium awakening, and
- Seeing these levels and ratios in the fern tissue helps us in turn more accurately assess soil chemistry and fertility test values to see if corrective soil amendments are needed.

We currently recommend a complete soil analysis every three years on asparagus and a nitrogen/pH evaluation the other two years. Our fern sampling program consists of three samplings, one each taken in July, August and September. This is done in conjunction with our pest management scouting visits.

If we've not visited with you – contact us for a quote on the full monitoring program on asparagus. ☞

### Water is a Nutrient (continued from page 6)

serve as a fail-safe check. Finally, we are using another technology, a hand held device used to measure the variation of moisture in the top one foot of soil. This device will be useful in finding patterns of poor coverage or even for finding correct placement of a fixed point rod or access tube in hard to sample areas, such as in tree sprinkler blocks.

We are also providing another type of soil moisture monitoring by utilizing Watermark sensors. These can be uniquely valuable for crops in soils which are quite variable, crops on slopes or shallow soil zones, or when data is desired at multiple points within a field or within multiple fields, as generally they are less expensive. These sensors yield themselves to monitoring soil moisture within cropping systems that are routinely not kept at overly wet regimes. Crops where these can work best

are those more permanent crops, such as grapes, asparagus, or alfalfa hay. We will finish this topic by a little reflection on what yield monitors are now teaching us about soil moisture availability.

- ✓ Midwest corn yield monitors frequently record higher yields over areas of buried drainage lines.
- ✓ In juice grapes, the area of greater winter deep freezing injury will be where the drier soil patterns developed in the fall.
- ✓ Higher yields of juice grapes will be found in soil above greater subsoil wetness.
- ✓ In a circle of mint, poorer overwintering will show in the corner serving arm zones of less water application and poorer infiltration.
- ✓ Smaller apples develop in the sprinkler pattern areas of deficit watering

during May and June.

- ✓ Spur Red Apples on M.11 showing poorer renewal wood or whisker growth are often benefited by more water in April and May.
- ✓ Improved asparagus production this year will be from the parts of the field better watered last August, September, and October.
- ✓ Orchard trees (corn will show this also) grown in coarse 11% field capacity soils will show growth and vigor reductions when soil field capacity is diminished by as much as 1-1.5% (i.e. 9.5% compared to a typical field). *This is why calibration for absolute soil moisture evaluation, beyond just a relative trend line is important.*

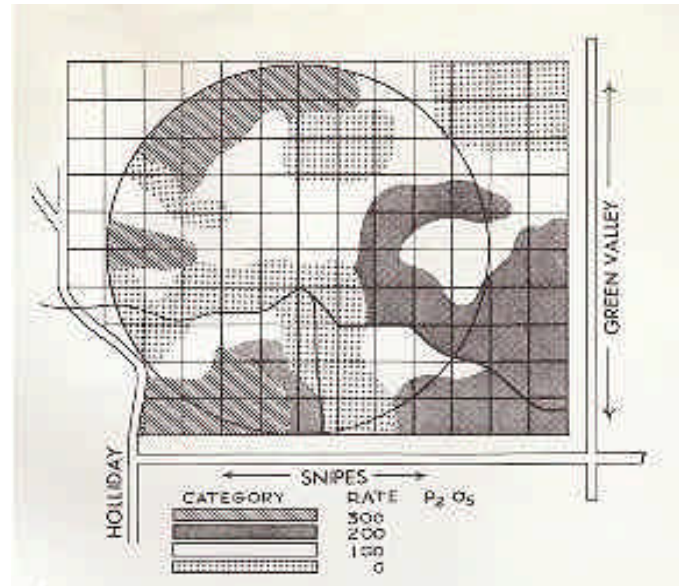
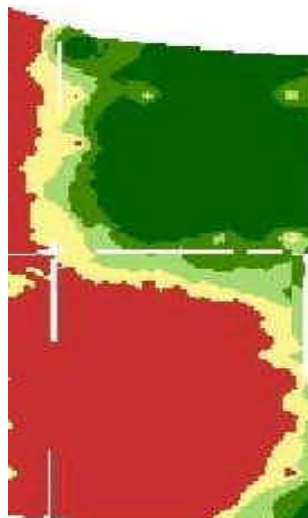
If you have any questions please feel free to contact us. ☞

## Technology Changes but the Goals Stay the Same

It was in 1969 when Agrimanagement staff first experimented with the concept of grid soil sampling in the Mabton area. In this case, the grower had problems dealing with a circle that had been leveled. Using a GIS system comprised of graph paper and slide rule, we were able to recommend a "rather costly fertilizer program" of variable rates of  $P_2O_5$  in "serpentine bands of marked areas". (See Figure 1 at right.) While this particular grower benefited from this intensive experiment, the concept never took off as a service because without GPS technology, it was very costly to actually do anything about the observed variability. However, this was the origin of our modern fertility monitoring service, which involves a "compromise" approach of taking a composite sampling over the entire field, together with sampling in special "variability sites" where appropriate, say at a land cut or along a ridge-line. Over the years, we have found that some specialized fertilizer applications can practically be made in these areas, simply by applying an additional pass or different mix to a given area.

Farming has often been described as putting together a very large 1000 piece puzzle. Our job as crop consultants is and has always been to assist farmers in taking various pieces of disparate *information*, combine them meaningfully into *knowledge*, and then to help them make wise *decisions* with some measure of *benefit*. Our approach to precision ag is the same, to take soil samples, aerial photos (IR, VI, Normal Color), yield monitoring data, petiole data, soil moisture data, electrical conductivity readings, pest or disease populations, etc., and combine them into a picture of crop health. The

**Figure 2:**  
An example of a soil nutrient map sampled by Agrimanagement this winter, using modern GIS technologies.



**Figure 1:** A specialized grid phosphate program worked out by Agrimanagement on the Pat Bleakney farm near Mabton (*Washington Farmer*, November 6, 1969).

challenge is to find the most cost effective way of developing this picture. In some cases this can be best done *without* employing precision ag technologies, although we believe that these can be profitably used in the right circumstances.

### Current Capabilities

For the first time this last fall, we have ventured into the realm of soil nutrient mapping on GIS. (See Figure 2 at left.) In addition to soils data, we are now tooled up to geographically represent field boundaries, insect populations, petiole nutrient values, bin locations, or any other in-field observation. We are proponents of putting yield monitors on harvesters where appropriate and can furnish information on companies providing conversion equipment. All of these observed values can be integrated with any georeferenced aerial or satellite image. These maps can either be managed and stored by us, or added to your own GIS database.

### Where we are headed

While variable rate fertilizer application is only one objective of GIS analysis, we are working to provide an interface with AgChem variable rate and variable rate & blend applicators by this fall's fertility season. This will enable our customers to utilize this variable rate technology to apply our independent recommendations. Our longer-term hope is that this data will help us manage the long term health of the plant and soil, as well as identify key trends and relationships. ☐

## Winter Water Watch

As is the case every year, we as consultants and you as farmers need to consider the possible impact of leaching. Leaching occurs when excess soil moisture carries the negatively charged nutrients, nitrogen ( $\text{NO}_3^-$ ), boron ( $\text{BO}_3^{3-}$ ), sulfate ( $\text{SO}_4^{2-}$ ), chloride ( $\text{Cl}^-$ ) and molybdenum ( $\text{MoO}_4^{2-}$ ), below the active rooting depth of the crop (or at least further down into the profile). These negatively charged nutrients move with the soil water because they are not attracted to the negatively charged soil particle surface.

This past winter has been a rather interesting one in that we received very little moisture in Oct.-Dec., but quite a significant amount in Jan.-March. With a drier late fall/early winter it would seem that leaching of valuable nutrients would be reduced, as the soil profile would have had plenty of time to “dry down” and prepare for moisture. Of course this depends upon how the soil moisture profile entered into the winter. If the soil was fairly dry through the profile it could “hold” significantly more moisture than a soil that entered the winter moist to wet. For example, if a 4' silt loam soil (2.1" holding capacity per foot) entered the winter at 50% available water at all depths it would have the ability to hold roughly 4" of moisture (one inch per foot). So, if through the course of the winter 4" or more of precipitation falls it could be assumed that some leaching will likely occur. If your soil is “sandier”, leaching would be inevitable as sandier soils hold less water (less storage). This leaching may only occur within the 4' profile, but it could also carry nutrients out of the profile (making them not available).

Therefore, it should be noted that if you have received over 4" of winter precipitation in your area you should use the upper amount of fertilizer recommended by either adding more through the drip or by shanking some additional in this spring. Summer petiole analysis can also indicate

if additional nitrogen may be needed.

In light of this, Table 1 shows the precipitation totals received between November 1<sup>st</sup> and March 14<sup>th</sup> for several areas in the Columbia Basin.

Areas where four or more inches of precipitation have fallen are more likely to have had some leaching and more susceptible to future leaching. Of course, the amount of leaching depends on such factors as fall soil moisture, soil texture, the presence of a cover crop, etc.

Throughout February and March, we have examined the soil moisture profile in several locations throughout the Columbia Basin and Yakima Valley and have found that most soil profiles contain room for additional rainfall. However, there have been profiles that have been “full” and additional rainfall will likely cause further leaching. Table 2 shows the average profile moisture throughout the valley. This decrease in soil moisture as you move down into the profile is advantageous to limiting the leaching of nutrients out of the profile.

On another water issue, the snow-pack of the Columbia Basin is at 98% of average and the Yakima Basin is at 108% of average. All in all, the snow-pack trend this year almost exactly follows the 40-year average, so it could be said that this is the most normal year that we have had in a while. (National water and Climate Center - <http://www.wcc.nrcs.usda.gov/>) So, if this spring is cool and moist as predicted, we will yet again have an adequate supply of irrigation water.

With spring fast approaching it's time to start thinking about summer irrigation monitoring. As you've heard us say many times, “proper water management can help you put the right amount of water on at the right time to reduce leaching (save \$ in fertilizer), possibly increase yields, reduce disease pressure, etc.” If you think an irrigation-monitoring program could assist you, feel free to give us a call. ☎

**Table 1: Total Precipitation**  
(11/01/99-3/14/2000)

Region	Total Precipitation (inches)
Cowiche	5.67"
Moxee	3.94"
Wapato	4.10"
Harrah	4.57"
Sunnyside	3.25"
WSU-Roza	4.79"
Paterson	2.81"
Mattawa	2.70"
WSU-Othello	4.35"

Data gathered from  
PAWS-WSU <http://index.prosser.wsu.edu/>

**Table 2: Average Profile**  
**Moisture**

Depth	Soil Moisture
1 ft	100 % “full”
2 ft	75 - 95 %
3 ft	60 - 90 %
4 ft	50 - 75 %

## Mission Statement

*Agrimanagement is an agricultural consulting company that provides production services, independent of product sales, to farmers and orchardists. Our main objective is to enable growers to be more efficient and achieve higher profitability. We achieve this by applying ag-science principles and techniques to address the needs and problems of the modern farmer. Our reputation is based on providing reliable, objective, timely, and affordable services adapted to individual client needs. We maintain a high level of professionalism and respect the proprietary nature of the information we collect and analyze.*



## IPM Outlook

In an attempt to comment on what we might expect, with regards to disease pressure this summer, we have gone back, from 1995 to present, and compared disease incidence to min-max temperatures, precipitation and dew point. Although there appeared to be general trends between disease incidence and weather, which are important to monitor, the findings were not always consistent. Reviewing data such as this strengthens our belief in the need to evaluate fields on an individual basis. However, as an overall general statement, if we continue to receive above average precipitation into this spring, then, regardless of the temperature, we will likely see moderate to heavy disease pressure. For example, if the temperature remains cool through May, we would recommend watching baby and second year asparagus closely, as these are the conditions that would favor a disease such as asparagus rust. Conversely, if the spring is relatively warm and wet then other diseases such as powdery mildew will likely be more of a threat and therefore early protective measures will be important, e.g. sulfur applications on mint at 4" of growth would be suggested.

Insect pressure after a mild "open" winter is generally thought to be greater than after a cold "open" winter. Although this may be true with most insect pests and predators, we do not believe that temperatures affect over-wintering spider mite populations in this area. Spider mites are able to withstand sub-zero temperatures, and can actually be frozen solid for short periods of time. Therefore, mites will typically survive eastern Washington winters. However, a mild winter does seem to favor predator mites. The winter of 1998-1999 was one of the milder winters in recent history and we consistently detected greater numbers of predator mites during the 1999 season. In several mint fields, predator mites were present at levels sufficient for biological or natural control of two spotted spider mites. Due to the mild winter and last year's populations, we should expect to find healthy numbers of this predator while scouting fields this spring and summer.

It is important to be one step ahead when it comes to disease management. Disease control in many crops is difficult due to

lack of adequate products, coverage issues, pre-harvest intervals, etc. Therefore, understanding the epidemiology of the diseases affecting your crops is important in determining when a given spray is needed and what should be used. For example, Dr. Dennis Johnson at W.S.U. uses a late blight model he has developed for eastern Washington to provide a weekly area-wide late blight update. This has been and will continue to be useful for predicting late blight incidence in eastern Washington and is the basis for which most fungicide spray intervals are based. This year we will be using environmental sensors in potatoes and possibly other crops to provide field specific temperature and humidity data. We will use this data along with the area-wide information to make recommendations suited for the conditions of a given field. The use of in-field sensors provides another tool to make better crop management decisions.

Finally, it seems that there has been a recent increase in the number of alternative crops grown in the area. We are currently working with a few of these crops. This year we may have the opportunity to expand into carrot seed pest management and look forward to other opportunities. ☐

### New Regulations for 2000

Ann George, of the Washington Hop Commission, has brought to our attention a new requirement for some of this year's Section 18 pesticides. WSDA has identified several watersheds, including the Yakima, that are affected by the recent listing of several salmon species as "threatened" under the Endangered Species Act. WSDA requires notification for the use of any Section 18 pesticides rated with moderate to very high toxicity, when applied within approximately one mile of the selected watershed and its tributaries. Notification must occur no less than 48 hours before application. For more information on this new requirement, please contact us.

#### Washington State Section 18 Exemptions Not Granted As Of 3/9/2000

Registrant	Product	Crop	Pest	Expiration Date
Novartis, Bayer, Rohm & Haas	Flint 50WG, Folicur 3.6F, Rally 40W	hops	powdery mildew	N/A
Novartis	Mycosheild	apples	fire blight	N/A
Rohm & Haas	Rally 40 W	mint	powdery mildew	N/A
Elf Atochem	Pennstyl 5F	hops	two-spotted spider mite	N/A

#### Washington State Section 18 Exemptions Granted As Of 3/9/2000

Registrant	Product	Crop	Pest	Expiration Date
American Cyanamid	Prowl 3.3EC	mint	kochia, redroot, pigweed	8/15/2000
Novartis	Tough 5.0EC	mint	Broadleaf weeds	12/31/2000

For the complete listing of the products in which a Section 18 Exemption has been requested or granted, go to the Pesticide Information Center online at <http://picol.cahe.wsu.edu/>.

# Water is a Nutrient

Perhaps when we classify water to the rank of a nutrient input, it is easier to discuss its application in terms of appropriate rate and best timing. Agrimanagement has always attempted to address the best timing as more than just replenishing the soil profile. Our greater objective is to aid the allocation and timing of water to affect the plant in a favorable way to induce the desired physiological results.

This requires knowing the cultivars, their response reactions, the development stage, the soil water content, and the size or dimensions of the root system.

Present equipment provides many choices for monitoring the soil moisture levels within the soil profile. It may be useful to review several of these choices and explain what Agrimanagement is doing in 2000.

Systems monitoring at a set point in the field include the neutron probe, capacitance probe, Enviroscan, and T.D.R. (time domain reflectometry), and buried tapes.

These will provide trends, but require calibration to accurately reflect actual inches of stored water. This may require knowing the percent field capacity value and the bulk density of each monitored soil.

Instruments acting as an “artificial root” to measure soil moisture tension are the tensiometer and resistance blocks such as gypsum blocks or the improved variation called Watermarks. These are at fixed points, but lend themselves better to permanent crops. Tensiometers require more maintenance and careful manipulation and are not as popular anymore.

The last, but first in time is actual soil sampling (coring), with visual assessment, and oven bake-out analysis. Even though gravimetric sampling has the perception of being “behind the times” and not very technical, it is the method by which all the above-mentioned sensors and instruments are calibrated. Gravimetric sampling allows for varied coring

points and flexibility of sample patterns within a field. Where soils are also periodically sampled during the season for nitrates, as in potatoes or sugar beets, this technique allows for acquisition of the soil sample during the same visit as the moisture sample.

In 2000, Agrimanagement is providing three levels of service with differing advantages. First, we provide soil moisture coring (gravimetric) for all crops, but especially for row crops and field crops and when we want to retain soil nutrient samples or visually check subsoil moisture (remember a permanent crop being shorted on moisture, dries out from the subsoil up). Secondly, we use T.D.R. rods for fixed-point data collection on a weekly or biweekly schedule. This data can be useful in permanent fields such as orchards, vineyards, and hop yards. When these electronic readings are taken, 1-2 soil cores are also removed and visually observed to (continued on page 2)



## Agrimanagement

“Measuring Crops Needs For Greater Profits”

408 North First Street  
P.O. Box 583  
Yakima, WA 98907-0583

Phone: 509-453-4851  
Toll Free: 800-735-6368  
Fax: 509-452-6760  
Website: [www.agrimgt.com](http://www.agrimgt.com)  
Email: [info@agrimgt.com](mailto:info@agrimgt.com)