Using Electronic-mail Discussion Groups on the Internet to Enhance Communication in Specific Commodity Groups

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SUMMARY. The rapid evolution of electronic technologies is providing researchers, educators, and consumers increasingly fast access to information. On the Internet (Net), electronic mail is a rapid, efficient, and economical medium for communication. Mail list management software (Listserv, Almanac, Majordomo, and Liststar) now allows users with interests in specific topics to address production and marketing issues across state and international boundaries by posting messages to a discussion group (DG) at one electronic address. Replies from anyone interested in responding may be sent to the entire DG, constituting a discussion, or returned directly to the originator of the message. Three commodity-oriented, horticultural DGs—Apple-Crop, Veg-Prod and Direct-Mkt—established over the last 30 months now provide on-line forums for >600 subscribers from 46 states, 4 Canadian provinces, and 21 other countries. Twenty-seven percent to 31% of these DGs' subscribers responded to a survey evaluating the effectiveness of DGs as communication tools. Responses showed that DGs were a valuable communication tool for reaching a broad resource pool rapidly and economically. Information requests, meeting announcements, and resource listings have dominated the activity of these DGs. Cooperative extension specialists and county agricultural agents represent most users (69%), followed by researchers (14%), farmers, and those with unlisted job descriptions (7% each). Ease of use, quickness (often within 24 hours), quality and quantity of replies, and the ability to glean timely information for files and newsletters were cited as the most important reasons for using these DGs.

ADDITIONAL INDEX WORDS. apple, vegetable, direct marketing, computer, e-mail, network, Almanac, Major-domo, Listserv

The size and scope of the Internet (Net) [>19,000 computer networks linking an estimated 3 million hosts with >37 million individuals communicating electronically on the system (Treese, 1996)] is allowing “a shift from knowledge management in the hands of the experts to knowledge access in the hands of the users” (McLellan, 1995). Concurrently, the role of educators is changing from distributors of information to providers of access to resources according to USDA Acting Extension Administrator Leodry Williams in an address to participants in a National Extension Leadership Development workshop (Fredericks, 1994).

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Lawrence (1994) also described how the Net is reducing barriers to "enhanced information access" by negating the factors of distance and limited numbers of information resources available to rural Americans.

Electronic-mail (e-mail) is one tool on the Net that educators, researchers, and clientele are using for information access (Lawrence, 1994; Wilson, 1994). Risdon (1994) equates e-mail with the placement of messages in a personalized newspaper where only the receiver gets that part of the newspaper. Electronic discussion groups (DGs) are databases of e-mail addresses managed to allow a message sent to a single group address to be distributed simultaneously to all members of the group (Berge, 1994; Krol, 1995; Levine et al., 1995). Software designed to screen and target information is required to manage DGs on the Net (Arthur, 1993; Buckley, 1987; December, 1993). DGs began after Listserv e-mail list management software was written for BITNET, a hardwired network of academic institutions. Listserv combines e-mail distribution with a subscription database processor. Originally developed for IBM mainframe computers, the subsequent updates of Listserv and competing list management programs (Almanac, Majordomo, Liststar) have allowed a proliferation of DGs on most computer systems by correcting incompatibility problems among computers. Conveniently, most mail list management software packages accept similar sets of commands. (Berge, 1994; Krol, 1995; Levine et al., 1995)

Burton (1994) reviewed several advantages of DGs for academic discussions, citing convenience (messages can be sent at the leisure of the author, and read when the recipient chooses), the ability to broadcast messages to large groups or direct them to individuals, the elimination of time and distance as barriers between sender and recipients, and removal of the need for recipients to be at their place of work. Although intellec-

tual stimulation from wider contacts is welcomed by individuals at remote sites, Burton (1994) suggests that, compared to a face-to-face conversation or phone discussion, having time to consider responses may be "the main advantage of the medium". E-mail and DGs were limited to university and government workers until the recent advent of commercial and local network providers, which now make commodity-based DGs accessible to anyone with a personal computer, telephone line, and modem (Tweney, 1994).

DGs may be managed in a variety of ways. Open forums have no subscription limitations, while closed forums restrict use to members of a particular group. Messages sent to a moderated DG are routed through a list manager who may have editorial authority to decide the appropriateness of a message. Unmoderated DGs receive messages directly from the author (Milles, 1994; Levine et al., 1995)

Continually updated directories of DGs indicate a wide range of topics can be discussed on-line, but the number of DGs devoted to horticulture and agriculture is small (Shaffer et al., 1993; Balraj, 1995; Neou 1995). Dairy-L, created in 1990, was one of the first agriculturally oriented DGs (Varner and Cady, 1993). After participating in on-line Net training offered by extension service (ES)-USDA and realizing the potential to network efficiently and at low cost with colleagues beyond state borders, we initiated DGs to complement our areas of interest and expertise.

This paper summarizes a subscriber evaluation of these DGs. Responses echo the reaction found by Varner and Cady (1993) to Dairy-L. Also presented are modifications suggested by the survey responses and current directions for accessing the DGs.

Materials and methods

Since October 1993, we established, modified, and are managing three topic-fo-

Table 1. Subscription statistics as of 10/95 and current participation directions for three horticultural electronic discussion groups.

	Discussion group			Total
	Apple-Crop-mg	Veg-Prod-mg	Direct-Mkt	
Start-up date	9/93	4/94	4/95	
No. Subscribers	251	223	158	634
No. States represented	32	38	38	47
No. Countries represented	8	13	9	22
To join DG, send this e-mail:	To: apple-crop@orchard.uvm.edu Subj: help Message: <leave blank>	To: majordomo@reeusda.gov Subj: <leave blank> Message: subscribe veg-prod	To: majordomo@reeusda.gov Subj: <leave blank> Message: subscribe direct-mkt	
To post a message to a DG, send e-mail:	To: apple-crop@orchard.uvm.edu	To: veg-prod@reeusda.gov	To: direct-mkt@reeusda.gov	
List-owner e-mail address for information:	cowgill@aesop.rutgers.edu	vanvranken@aesop.rutgers.edu	vanvranken@aesop.rutgers.edu

Fig. 1. Speed of response to e-mail survey of Veg-Prod-mg and Direct-Mkt DGs.

cused DGs to facilitate rapid exchange of information among colleagues working on apple production, vegetable production, or direct marketing. DGs need a host computer housing mail list management software. ES-USDA program leaders for horticulture and marketing approved proposals to develop Apple-Crop-mg, Veg-Prod-mg, and Direct-Mkt on the USDA computer system. Apple-Crop-mg and Veg-Prod-mg were started using Almanac mail list management software at the ES-USDA site (almanac@esusda.gov), while Direct-Mkt went on-line in early 1995 using Majordomo mail list software at the new cooperative research education and extension service (REEUSDA) site (majordomo@reeusda.gov). In December 1995, the vegetable production DG was renamed Veg-Prod and moved to the REEUSDA Majordomo host. Shortly thereafter, the apple DG

was renamed Apple-Crop and sited on a dedicated personal computer server using Liststar DG management software at the Univ. of Vermont (apple-crop@orchard.uvm.edu). Although the host address and directions for development and management are slightly different for the various list management software packages, the steps for joining and participating in the DGs are basically the same. Table 1 describes the current directions for joining and participating in these three DGs.

Potential participants were prompted to join Apple-Crop-mg, Veg-Prod-mg, and Direct-Mkt by distributing invitations through traditional modes of communication: word-of-mouth, direct and e-mail to individuals,

Table 2. Internet and discussion group activity of survey respondents.

	Discussion group			Total
	Apple-Crop-mg	Veg-Prod-mg	Direct-Mkt	
Mean no. DGs respondents subscribe to:	4	3	4	3
Mean no. e-mail messages received daily:	16	13	17	15
No. respondents who have sent messages to DG:	40	40	15	95
Mean no. messages sent/respondent sending messages to DG:	4	3	7	5
Mean no. responses received/message sent:	10	5	15	10

conference presentations (Cowgill, 1994), and news releases to trade journals and other DGs. Analysis of all e-mail addresses on each DG's subscription list (October 1995—before the recent host site changes) revealed the number of subscribers and their geographic distribution, also summarized in Table 1. The three groups were surveyed at that time; an identical evaluation form was distributed electronically to participants to gain an understanding of the usefulness of these DGs in providing forums for communication.

Results and discussion

More than 600 subscribers from 46 states, 4 Canadian provinces, and 21 other countries had joined Apple-Crop-mg, Veg-Prod-mg, and Direct-Mkt as of October 1995. Each DG also had 20 or more subscribers through private Net service providers, and messages posted to two of the DGs were redistributed to other discussion groups of unknown size. While the subscription list for Direct-Mkt reached >200 by April 1996, the new Veg-

Table 3. Evaluation of discussion groups by subscribers.

		Discussion group			Total n = 183
		Apple-Crop-mg	Veg-Prod-mg	Direct-Mkt	
		%			
		n = 72	n = 69	n = 42	
Response (n/total no. subscribers)		29	31	27	29
How learned about DG					
Don't remember		7	15	5	9
List owner		24	15	5	16
E-mail message		8	9	29	13
E-mail training		4	3	2	3
Surfing the Net		9	10	5	9
From a colleague		43	33	33	37
Trade publication		5	13	14	10
Other		0	1	7	2
Ease of use					
Were subscription directions ok?	Yes	90	85	95	90
	No	3	3	0	2
Have you had difficulty utilizing DG?	Yes	13	25	5	15
	No	76	71	88	77
Is DG useful to communicate with coworkers/are discussions useful?	Yes	67	74	61	68
	No	8	6	15	18
Have you responded to messages?	Yes	50	58	48	52
	No	28	36	48	36
Usefulness in solving problems					
Did you receive responses to messages posted? (n = 40, 40, 15 & 95, respectively)	Yes	73	73	67	72
	No	13	15	7	13
If a problem was posted, was solution received? (n = 21, 23, 6 & 50, respectively)	Yes	95	91	83	92
	No	5	9	17	8
Did responses prompt further discussion? (n = 40, 40, 15 & 95, respectively)	Yes	45	23	13	31
	No	30	38	33	34
Who should participate?					
Extension agents, specialists and researchers	Yes	87	87	80	85
	No	7	2	6	15
Teachers and students	Yes	55	51	57	54
	No	39	119	13	25
Growers and industry representatives	Yes	67	72	75	71
	No	28	8	5	15
General public	Yes				
	No				
How to manage activity					
Have you accessed archived messages?	Yes	NA	1	2	1
	No	---	96	93	57
Should messages be archived?	Yes	50	39	55	47
	No	18	10	10	13
Do you use the World Wide Web?	Yes	65	65	74	67
	No	26	30	26	28

Prod and Apple-Crop DGs experienced a 20% to 30% drop in subscriptions during the transition to their new hosts. However, the numbers of subscribers to all three groups continue to grow daily.

One of the most common comments received regarding use of DGs was that questions were answered quickly. For example, the first person to reply did so within 25 min of distribution of the survey questionnaire, and most responses were returned within 2 working days of the original posting (Fig. 1).

The survey received a 29% response ($n = 183$), which is summarized in Tables 2 and 3. Extension specialists and agents returned the largest number of surveys (Fig. 2). Table 2 indicates how heavily subscribers to Apple-Crop, Veg-Prod, and Direct-Mkt use e-mail DGs. Participants in these three DGs subscribe to a mean of 3 to 4 DGs and receive a mean of 15 messages per day overall. Slightly more than half of all respondents (52%) had sent messages to the DG and they had sent a mean of 5 messages per respondent.

Of greater importance is the usefulness of the DGs for solving problems (Table 3). Seventy-two percent of those sending messages indicated responses were received. A mean of 10 responses were received per message sent. The number of responses received appeared to depend on the type of message sent. Specific questions received 1 to 12 responses, while announcements of new publications or resources received 12 to 150 requests to obtain the product. However, those sending questions to the DG received solutions to the problem they were investigating 92% of the time.

Table 3 also indicates the response regarding the ease of use of these DGs was generally favorable. Ninety percent indicated the directions for participating in the DGs were adequate. Of the 10% not indicating the directions were adequate, 7% did not respond to the question, 1% did not remember, and the remaining 2% indicated they would like to

see directions posted at regular intervals as reminders, or that they couldn't remember how to reply to messages to the entire group. Sixty-eight percent responded that the DGs were useful tools for communicating with other workers in the same field. Comments regarding the usefulness of the discussions and the value of communications indicate participants joined these DGs to tap the expertise of specialists and to network with co-workers they would not contact otherwise, to glean information for newsletters or reference files for later use, and to keep informed of timely issues affecting the respective industries.

Three areas of concern surfaced in the evaluations: a higher number of Veg-Prod participants indicated having problems using the DG, the question of who is responsible to answer questions posted, and the volume of activity on each DG.

Most problems with using Veg-Prod were related to the many undeliverable messages returned to a sender. This is partly a management function to remove bad addresses from the subscription list if they become recurring problems. However, comments like, "Its value has been worth far more than the annoyance of getting returned messages," indicate that participants are willing to live with a degree of frustration. Hardware overload may be a potential problem as the popularity of the Net soars faster than the system can be updated to manage the traffic. The sheer volume of messages may create occasional hardware overloads blocking transmission to and through certain nodes on the system.

Posting a message to a DG, although quick and easy, is a shotgun approach to getting a response that depends on who is listening and who cares to reply. As one extension specialist noted, responding to all, or even a good portion, of the queries posted to a DG would increase the user's workload significantly. While tapping a large and expe-

Fig. 2. Job descriptions of discussion group survey respondents.

rienced resource base, there is no guarantee that anyone will take the time to respond. This is not borne out in these DGs, as indicated by the number of responses to messages received per inquiry and the fact that most problems were solved by those responses.

The most consistently reported concern was the potential burden of too much activity in a DG. Participants in the three DGs surveyed indicated they already subscribe to an average of three other DGs and receive, on average, 15 mail messages per day. The highs for the groups were 75 messages per day, and 24 DG subscriptions, although these were not from the same respondent. There were several comments suggesting users would like to see more discussions, more research reports, and responses to questions posted to the entire group. However, there was greater concern over creating too much volume. This was most evident in the answers to whom should be invited to participate: extension specialists and agents received the greatest number of "yes" replies compared to other suggested groups; the general public was the only group to receive more "no" than "yes" replies. These often were accompanied by comments such as, "the discussion is too technical," "keep it on a professional/academic level," and "there are other forums [DGs] for discussing home gardening topics."

Conclusion

Based on the survey responses, comments, and suggestions, the Veg-Prod DG has been transferred to its new host site and is experiencing increased appropriate activity since the user survey was completed. Part of the overload problem experienced in late 1995 involved misuse of the DG by nonsubscribers to send lengthy advertisements, the electronic equivalent of junk mail, which can be time consuming and expensive for subscribers. The switch to Majordomo has stopped this misuse of Veg-Prod to date, but Apple-Crop may have a better deterrent. Liststar software allows only subscribers to post messages to the DG.

Consistent with the number of subscribers who indicated they are accessing the World Wide Web (WWW), Apple-Crop has been, and eventually Direct-Mkt and Veg-Prod will be, integrated into existing or new WWW servers. Clements (1995) and Cowgill initiated an apple production WWW home page, The Virtual Orchard (VO), at <<http://orchard.uvm.edu/>>. It is operated on a dedicated personal computer, a Macintosh 6150 Power PC Server. VO provides for the dissemination of information over the Internet on all aspects of sustainable apple production. VO will also house WWW pages for research projects dealing with apples and other tree

fruit production and marketing issues, such as the NC-140 Regional Rootstock Project and the NE-183 Regional Apple Cultivar Trial.

With the formation of this WWW site, Apple-Crop DG activity has been enhanced with the addition of interactive forums on specific topics. The topics are selected by the VO site managers Clements and Cowgill. In addition to this powerful communication tool, DG activity is being expanded into multimedia formats beyond text messages. On-line participants can post digital color photographs, formatted documents, and video clips. The WWW format gives individuals the ability to view graphics and text documents on-line, download and print them while maintaining all original formatting, or continue to exchange text messages. A multimedia database on the WWW also can contain a searchable file of frequently asked questions (FAQs) as requested by one survey respondent.

While indicating high interest in adopting evolving electronic communication technologies for the horticulture industry, participant evaluations of three commodity-specific horticultural e-mail DGs support previous work (Varner and Cady, 1993; Burton, 1994) that DGs are easy, convenient, cost-effective means of networking with others having similar interests. Although many respondents indicated they would like to see a greater exchange of news and more responses to specific questions, some expressed, consistently with Levine's et al. (1995) suggestions for "Netiquette", concern that too much volume or misuse would jeopardize participation by those the DGs were designed to serve. To date, Apple-Crop, Veg-Prod, and Direct-Mkt have been low volume, professional forums for rapid exchange of commodity-specific information around the world.

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