MINUTES

MONTANA HOUSE OF REPRESENTATIVES
52nd LEGISLATURE - REGULAR SESSION

COMMITTEE ON AGRICULTURE, LIVESTOCK, & IRRIGATION

Call to Order: By **CHAIR LINDA NELSON**, on January 28, 1991, at 3:00 p.m.

ROLL CALL

Members Present:

Linda Nelson, Chair (D)
Don Steppler, Vice-Chairman (D)
Bob Bachini (D)
Joe Barnett (R)
Gary Beck (D)
Jane DeBruycker (D)
Roger DeBruycker (R)
Jim Elliott (D)
Marian Hanson (R)
Harriet Hayne (R)
Vernon Keller (R)
Don Larson (D)
Jim Madison (D)
Ed McCaffree (D)
John Phillips (R)
John Scott (D)

Staff Present: Connie Erickson, Legislative Council
Claudia Johnson, Committee Secretary

Please Note: These are summary minutes. Testimony and discussion are paraphrased and condensed.

HEARING ON HB 277

Presentation and Opening Statement by Sponsor:

REP. DON STEPPLER, House District 21, Brockton, said this bill will establish a research program within the agriculture experiment station to develop integrated control methods and procedures for management of grasshoppers adversely affecting crop production; providing for outreach programs; providing an appropriation; and providing an effective date. This bill funds a research project at Montana State University (MSU) for biological control of grasshoppers rather than chemicals. **REP. STEPPLER** turned the hearing over to Dr. Dunkel.

Proponents' Testimony:

Dr. Florence V. Dunkel, Associate Professor of Entomology, MSU, said it is estimated that grasshoppers consume an average of 21 to 23 percent of harvestable range forage each year. Regional outbreaks occur only cyclically with 8 to 10 year intervals, and localized severe infestations and potential for invasion of cultivated crops occur every year. Additive effect of biocontrol agents i.e., fungi, viruses, protozoa, when combined have greatly reduced the high grasshopper density. Development of trap cropping, tillage systems, variety selection and field border treatment are used for degrading grasshopper habitat in or near Montana crops. She said vast acreage of highly erodible croplands in Montana have been set aside as Conservation Reserve Program (CRP) areas and seeded with forage plants. If grasshoppers are controlled before their numbers build-up in these ungrazed CRP areas early in the season, then one could reduce the damage that occurs to crops when grasshoppers move into nearby fields late in the summer. In the 1989, the Environmental Impact Statement (EIS), and the Montana Department of Agriculture concluded that producers realize few economic benefits from the state's emergency grasshopper control program and there are potential negative environmental impacts associated with extensive insecticide use. Of the eight possible future actions considered, the department decided to recommend: 1) the state eliminate the emergency grasshopper control program; and 2) the state support research into long-term, low-impact grasshopper control options, especially biological and cultural controls. This bill will fund research programs for the state's grasshopper management and fund a member of the team that will integrate between research and laboratory programs which addresses the biological control program. It will support and fund two personnel, supplies and etc. In total, it will support 3 people; 1) a tenure tract professor who is a top scientist; 2) a full time technician; and 3) a graduate student. The impact of this will provide a three to five year study to; 1) evaluation of an effective alternative grasshopper management study to fund; 2) the development of a research program on trap cropping and tillage systems; 3) initiation of field and laboratory studies on grasshopper feeding; 4) determination of which development will be used as an sample when to be applied for certain management technic; and 5) an integrated dissemination of this information for extension service. She said range and croplands are different, there is a need to explore the insecticides that can be transferred from rangelands to croplands, and adopt the information of resources available for the research insect laboratory. **EXHIBITS 1, 2, 3, 4 AND 5**

Dr. J. A. Onsager, Research Technician, MSU, said the lab at MSU has five permanent scientists with a full time researcher and biologist to study and research grasshoppers in Montana. In the last ten years they have published 110 technical papers on grasshoppers, biology and control. They have the largest concentration of grasshopper expertise in the North American

Continent, in the last four years their studies have been the largest in the world. All the scientists work closely with the Entomology research laboratory located on the MSU campus, but it is not directly run through the college. They are there by invitation of the director of the ag experiment station and conduct themselves in a manner to ensure their reservations are not withdrawn. The federal mandate is for research on rangelands and not croplands. This means not all techniques that work for managing grasshoppers on rangelands will not necessarily work on crops and vice versa. Montana agriculture does not have a scientist whose primary responsibility is to: 1) concentrate on grasshopper problems in crops and cross range crop interfaces; 2) to properly document grasshopper responses in such areas; or 3) to develop and coordinate a system made available for suppressive tactics in a manner that is effective, self-sustainable and ecologically environmentally acceptable.

Chuck Merja, President of the Montana Grain Growers Association, said grasshopper infestations continue to be one of the greatest economic threats to crop production in Montana. It makes sense to transfer the technology that has been developed from the rangelands to the croplands and urged the committee's support of HB 277. **EXHIBIT 6**

Lorna Frank, MT Farm Bureau, spoke in support of HB 277.

Owen Cox, Alternative Energy Research Organization, said pesticide control has not been working and is a danger to those involved in the application of it. He strongly recommended HB 277 do pass.

Chris Kaufmann, Montana Environmental Information Center, said they are concerned with the potential dangers of pesticides and their effect on groundwater. She urged the support of this bill to reduce the dependence on chemicals for grasshopper control.

Kay Norenberg, WIFE, wanted to be recorded in support of HB 277.

Opponents' Testimony: None

Questions From Committee Members:

REP. MCCAFFREE asked where the funding comes from. **REP. STEPPLER** said it comes from the general fund.

Closing by Sponsor:

REP. STEPPLER said grasshoppers are regional. He lives in an area that has been hit hard in the last few years. The emergency grasshopper control program did not work well and the state should support research in long-term grasshopper control. This will be done through the funding of HB 277. MSU is the center of this research in the United States, but the focus has only been done on rangeland grasshopper management. This proposal will

integrate some of the research already done on rangeland to the proposal for croplands using environmentally sound procedures.

HEARING ON SB 3

Presentation and Opening Statement by Sponsor:

SEN. DENNIS NATHE, Senate District 10, Redstone, said this bill extends the sunset provision for the Agriculture Assistance Program (AAP) for two years, to expire in 1993. This is a very necessary program and still needed. The act becomes effective starting July 1, 1991. The Farmers Home Administration (FmHA) lifted the moratorium on farm foreclosures the first of the year. The Great Falls tribune stated the FmHA have hired an additional 13 to 15 in staff and counselors to look at the FmHA delinquencies that are 2 to 3 years delinquent to see what can be done. The farmers and ranchers in this situation are in need of this program.

Proponents' Testimony:

Harley Warner, Mt Association of Churches, said in recent years drought, decreasing land values, high interest rates, low commodity prices, and insects have placed many Montana farmers and ranchers as well as rural communities in jeopardy. These problems are not going to go away by June 30th of this year. He urged the committee's support of SB 3. Without this program, Montana will lose its volunteer mediation ability and the federal funding of $60,611. **EXHIBIT 7**

John Ortwein, Montana Catholic Conference, said both Bishop Curtiss of the Diocese of Helena and Bishop Milone of the Diocese of Great Falls and Billings have indicated the greatest stress found among the people in their respective Diocese are the people in the agricultural community. **EXHIBIT 8**

Neva Hassanir, NPRC, said there are people that come to her with credit problems and she tells them one of two things: 1) work for a better price through their federal farm policy; and 2) talk to the AAP counselors to learn what options are available. She encouraged the committee to support SB 3.

Kay Norenberg, WIFE, in support of SB 3. She said without this program many farmers and ranchers will not have any place to go. It is vital to the industry to continue peer counseling, mediation and financial consultants. Most farmers and ranchers who need this cannot afford to go to the private sector. She said Montana will be affected if the farmers and ranchers go out of business. **EXHIBIT 9**

JoAnn Forsness, WIFE, stated her support for SB 3. **EXHIBIT 10**

Dale Fossen, farmer in Joplin and a peer counselor, stressed the need for peer counselors, financial consultants, and mediators to

farmers and ranchers who are in financial trouble. He has referrals from bankers, farm equipment dealers and the Farmers Union Oil Co., who are affected by the loss of the farms and ranches.

Carol Mosher, Mt. Cattle Women, stated their support of SB 3.

Lorna Frank, Mt. Farm Bureau, spoke in support of SB 3.

George Paul, Mt. Farmers Union, spoke in support of SB 3. For extra consideration, he said the state's largest industry, agriculture, is on the brink of becoming the state's social problem. He said the nation is looking at a 25 to 30 percent drop in farm income. He urged the committee to support SB 3.

Ted Doney, Mt. Journeymen's Association, spoke in support of SB 3.

REP. BACHINI, House District 14, Havre, wanted to go on record in support of SB 3. He said one of the key elements of this bill is communication. The people are able to communicate because of the peer program this bill makes available.

Opponents' Testimony:

Everett Snortland, Director of Department of Agriculture, said the AAP sunset was extended by the 1989 Legislature. The Legislature asked for and received a commitment that the program would terminate on July 1, 1991. The problems continue for the agricultural producers as they have in the past and are not unlike similar difficulties faced by other Montana businesses. The assistance program was intended and supported as a temporary program to help during a critical period and he remains consistent with that position, and therefore, does not support SB 3. **EXHIBIT 12**

Questions From Committee Members:

REP. LARSON asked **Mr. Warner** if the peer counselors are volunteers, why does the fiscal note say they receive $5 an hour. **Mr. Warner** said the fiscal note was based on the peers becoming permanent employees and does not agree with the fiscal note.

REP. BECK asked **Mr. Paul** about the 25 to 30 percent drop in farm income and **Mr. Snortland's** comment about the farm programs that were reduced and what did he mean by this. **Mr. Paul** said the 1990 farm bill that is in place right now, and the budget that was in place to fund the program was cut at the federal level. When the farm bill, which is the only mechanism that supports American agriculture, was being put in place they were considering the fact that the budget would require $15 to $16 billion to adequately fund the farm bill. At the time the farm bill moved into budget reconciliation and the conference committee was required to get the bill done, reduced the funding

to $7 to $8 billion which effectively cut the federal farm legislation in half. The USDA was asked to administer the farm bill, and have now admitted there will be a dramatic reduction in farm incomes across the country. They are saying that 25 percent of agriculture producers in America will go out of business in the next five year period. There are 500 to 600 producers in Montana in serious trouble at this time.

SEN. NATHE said if a grain farmer in Montana has a target price set at $4 with the farm program. The price from June to October is averaged out and if the price is lower, the farmer receives the difference, i.e., if only $3 per bushel the farmer receives the $1 difference. The difference between the target price and the actual market price in that 6 month period will become the farmers wheat, barley and etc., deficiency payment. The farm bill was tied very closely to the Uragauy of GAPP negotiations in Europe. This was to get the European block to reduce their farm subsidies because they subsidize their grain producers to the amount of $7 to $8 per bushel on wheat. They are selling that grain in the world market. The Uragauy of GAPP failed in getting the European block to reduce its farm subsidies. The farm bill was simultaneously cut, and the farm incomes which occurred when they took the wheat base history, took a cut of 30 percent of what the farmer receives payments on.

REP. ELLIOTT asked **Mr. Snortland** why he has taken the position he has on the AAP. He said the department serves as an advocate of and for agriculture for Montana. **REP. ELLIOTT** asked **Mr. Snortland** if he was saying "this is a temporary solution to a permanent problem the department does not want". **Mr. Snortland** said they are always supportive of legislation to help the industry. The program was started in 1987. When the department became involved, the AAP was halfway through the process so they agreed to extend the sunset through 1989 with the promise that date would be the end of it. He said there are a number of programs in state government that are good, but this was a demonstration program, and a good one. There were a large number of lenders and borrowers having problems communicating and using the courtroom lawsuit approach to settle their differences which seems to be the popular way of doing things. Consequently the program is not working because of this. **REP. ELLIOTT** asked **Mr. Snortland** if the reported $190,000 could be applied to another ag program with a better effect. **Mr. Snortland** said the $190,000 is not appropriated in the Governor's budget, if this bill is passed, then this Legislature would have to appropriate for it.

REP. SCOTT asked **Mr. Snortland** if the critical period is over and have the same people been requiring this service since 1987, or have some clients just arrived at this point to need this service. **Mr. Snortland** said Montana is a diverse state, every year there seems to be some kind of a disaster, so it is an ongoing problem. If this sunset is extended for another two years, he felt it would become a problem because that would be making it more of a permanent program, and if that is done it

will need to be better equipped to manage and administer that program.

REP. BACHINI asked **Mr. Snortland** if he had answered **REP. SCOTT'S** question about the critical period being over with and is it. **Mr. Snortland** said the critical periods are never over with in Montana with the diverse climate, etc. **REP. BACHINI** asked if he thought the AAP was a good program and did it help. **Mr. Snortland** said it helped some. **REP. BACHINI** asked if the reason he did not support this bill was because it is not in the Governor's budget. **Mr. Snortland** said his position is based on the promise that was made the end of the 1989 legislative session.

CHAIR LINDA NELSON asked **Mr. Snortland** who made that promise at the end of the 1989 Legislative Session. **Mr. Snortland** said she and her supporters did. **CHAIR LINDA NELSON** said she remembers saying "they hoped they would not have to come back", but did not say that was the end of it.

REP. PHILLIPS asked **Mr. Snortland** how did they measure the effectiveness of this program. **Mr. Snortland** asked **Mike Murphy, Department of Agriculture** to answer. **Mr. Murphy** replied periodic surveys were done on those who received assistance from this program. The response was about 80 percent, or good to excellent category. Trying to find how many dollars or the significance of the impact of the assistance being provided is impossible to determine. Since the extension of the program the 24 hour telephone hotline has received 4,500 calls since June 1986, up to today. The program has had 725 individuals who have received either peer counseling assistance or financial assistance. There have been about 300 to 350 requests for mediation, not all of those have gone to mediation, only about 50 percent were resolved.

REP. PHILLIPS asked **Mr. Murphy** how the peer counselors and mediators were selected. **Mr. Murphy** said the people initially involved in the program when it was set up were selected by a process of advertising in all the newspapers in the state and interviewing individuals. Criteria was established for qualifications, communication skills, agriculture knowledge, financial analysis, etc. Mediators and financial consultants were selected by a series of criteria. Out of 150 applicants, 30 individuals were brought into the program to get it started.

REP. BECK asked **Mr. Snortland** what he meant about this service being combined with the private sector and where would the money come from to do this or for privatization. **Mr. Snortland** said it is already offered, not all producers in trouble are using AAP, but dealing with the private sector, i.e., lawyers, accountants, etc. The FmHA is providing 50 percent of the dollars and the producer is supposed to share half of that cost. The fee averages about $100 for the producers using mediation.

CHAIR LINDA NELSON asked **SEN. NATHE** why the FN is higher than it was last session. Couldn't they make do with the same amount as last session. **SEN. NATHE** said he spoke with WIFE and they requested the current amount and he agreed. He didn't sign the FN because it was too high, but said that amount was based on a permanent basis. **CHAIR LINDA NELSON** said this note is about $40,000 higher than last time and asked if he would sign the FN from last session. **SEN. NATHE** said he would.

REP. DEBRUYCKER (Jane) asked **Mr. Murphy** what the direct cost of the program was for last year. **Mr. Murphy** said in fy 1990, it was approximately $120,000. He said this does not address a big element of those costs associated with fees that are intended to be collected from the borrower. To collect the federal funds the state had to match the increase 1:1 in order to match the amount of dollars necessary to facilitate the programs. The General Fund monies are at least the same amount of the overall budget than the original FN to meet the projected level of assistance.

REP. DEBRUYCKER (Jane) asked **Mr. Murphy** if the committee could receive an exact copy of figures for fy 1990. **Mr. Murphy** said he could. **CHAIR LINDA NELSON** asked him if he would have it to the committee by Friday, February 1.

REP. SCOTT asked **Mr. Snortland** how a farmer/rancher that is three years behind in his payments afford to go to the private sector for help. **Mr. Snortland** said this is where FmHA transfers their problems to the state. He said the FmHA puts up half of the money, about $75,000 per year, and this bill requires match monies from the General Fund. The person being helped pays their portion of the fee, but by the time they come to AAP, it is usually too late for AAP to help.

Closing by Sponsor:

SEN. NATHE thanked the committee for a good discussion and hoped they would extend the sunset.

EXECUTIVE ACTION ON HB 277

Motion: **REP. BACHINI MOVED HB 277 DO PASS.**

Discussion: **REP. LARSON** asked if the $182,000 was in the Governor's budget. **REP. STEPPLER** said it was over and above what had been asked for.

Motion/Vote: Question was called. Voice vote was taken.

Vote: **HB 277 DO PASS.** Motion **CARRIED** unanimously.

EXECUTIVE ACTION ON COMMITTEE BILL

Motion: **REP. BACHINI** made the motion to make a committee bill for the nurserys and change their expiration date for a license from January 1 to a rotating calendar year.

Discussion: **CHAIR LINDA NELSON** asked why the nursery license expiration date is to be changed from January 1 to a rotating calendar year. **REP. MCCAFFREE** said all the small nursery owners requested this change.

CHAIR LINDA NELSON informed the committee if they wanted **Ms. Erickson** to draft this bill, it would have to receive 2/3 of the vote.

Motion/Vote: **REP. BACHINI** made the motion to adopt this committee bill. Question was called. Voice vote was taken.

Vote: The motion **CARRIED** unanimously. **REP. MCCAFFREE** will carry the bill.

ADJOURNMENT

Adjournment: 5:30 p.m.

LINDA NELSON, Chair

CLAUDIA JOHNSON, Secretary

LN/cj

HOUSE OF REPRESENTATIVES

AGRICULTURE, LIVESTOCK AND IRRIGATION COMMITTEE

ROLL CALL **DATE** 1-28-91

NAME	PRESENT	ABSENT	EXCUSED
REP. DON STEPPLER, VICE-CHAIRMAN	✓		
REP. BOB BACHINI	✓		
REP. JOE BARNETT	✓		
REP. GARY BECK	✓		
REP. JANE DEBRUYCKER	✓		
REP. ROGER DEBRUYCKER	✓		
REP. JIM ELLIOTT	✓		
REP. MARIAN HANSON	✓		
REP. HARRIET HAYNE	✓		
REP. VERNON KELLER	✓		
REP. DON LARSON	✓		
REP. JIM MADISON	✓		
REP. ED MCCAFFREE	✓		
REP. JOHN PHILLIPS	✓		
REP. JOHN SCOTT	✓		
REP. LINDA NELSON, CHAIR	✓		

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HOUSE STANDING COMMITTEE REPORT

January 28, 1991

Mr. Speaker: We, the committee on Agriculture, Livestock, and Irrigation report that House Bill 277 (first reading copy -- white) do pass .

Signed: _____

Linda Nelson, Chairman

EXHIBIT 1
DATE 1-28-91
HB 277

HOUSE BILL #277

CROPLAND GRASSHOPPER INTEGRATED MANAGEMENT

Outline of presentation

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1.0. Formal introduction for record (Dunkel) 0.5 min

2.0. Rationale of bill (see "Background Material") (Dunkel) 1.5 min

3.0. What will the bill fund? (Dunkel) 0.5 min

4.0. Plan of work (particularly address the Extension portion of the bill) (Dunkel) 0.5 min

5.0. Why does this plan of work have a special possibility of succeeding? (Onsager) 1.0 min

6.0. Some applicable results from rangeland studies (Onsager) 1.0 min

7.0. Questions (Dunkel and Onsager)

Handouts to committee:

- House Bill #277 Cropland Grasshopper Management - Background Information
- 1990 Grasshopper hazard map, designed to predict area of highest rangeland grasshopper populations in 1990, based on 1989 survey data.
- Users manual of Hopper, a computer expert system designed to aid in decision making in rangeland grasshopper management
- Entomology Research Laboratory brochure, listing faculty involved in rangeland program

EXHIBIT 2
DATE 1-28-91
HB 277

HOUSE BILL #277

CROPLAND GRASSHOPPER INTEGRATED MANAGEMENT

Background Information

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1. Cyclical Nature of Grasshoppers in Montana:

   It has been estimated that grasshoppers consume an average of 21-23% of harvestable range forage EACH YEAR. While regional outbreaks occur only cyclically at about 8- to 10-year intervals, localized severe infestations and potential for invasion of cultivated crops occur every year.

2. Additive Effect Biocontrol Agents:

   Numerous natural organisms, including specialized parasites and pathogens (i.e., fungi, viruses, protozoa) of grasshoppers and general predators of insects, including (spiders, birds, small mammals, and other insects), depend upon 40-odd grasshopper species for food, and thereby contribute additively to maintenance of complex grasshopper populations of low to moderate densities. Unfortunately, chemical insecticides used against high grasshopper densities tend to destroy intricate food webs and allow rapid resurgence of a few resilient grasshopper species.

3. Opportunities for Integrated Management of Grasshoppers in Montana Cropland:

   Integrated pest management is an ecological approach to pest control that provides the desired benefit, minimizes environmental insult, and emphasizes use of a variety of suppression tactics, many of which are non-catastrophic.

Candidate technologies for degrading grasshopper habitat in or near Montana crops include development of trap cropping, tillage systems, variety selection, field border treatment, selective bait treatment, pathogen introduction, parasite or predator conservation, and associated decision support systems.

4. Recommendations of the 1989 EIS (Environmental Impact Statement):

In its 1989 Environmental Impact Statement, the Montana Department of Agriculture concluded that producers realize few economic benefits from the state's emergency grasshopper control program and that there are potential negative environmental impacts associated with extensive insecticide use. Of the eight possible future actions considered, the department decided to recommend 1) that the state eliminate the emergency grasshopper control program and 2) that the state support research into long-term, low-impact grasshopper control options, especially biological and cultural controls.

5. Role of CRP Acres in Cropland Grasshopper Management:

Vast acreages of highly erodible cropland in Montana have been set aside as Conservation Reserve Program (CRP) areas and seeded with forage plants. If grasshoppers are controlled before their numbers build-up in these ungrazed CRP areas early in the season, then one could reduce the damage that occurs to crops could be reduced when grasshoppers move into nearby fields late in the summer.

- Florence V. Dunkel
Head and Associate Professor
Entomology Research Laboratory
Montana State University

- Jerry Onsager
Research Director
USDA-ARS Rangeland Insect Laboratory
Adjunct Professor
Entomology Research Laboratory
Montana State University

EXHIBIT 3
DATE 1-28-91
HB 277

The 1990 Montana Grasshopper Forecast*

William P. Kemp[1,2] and Diana Cooksey[2,3]

Cooperators:

[1]USDA Agricultural Research Service
Bozeman, MT 59717-0001

[2]Entomology Research Laboratory
Montana State University
Bozeman, MT 59717

[3]USDA Animal and Plant Health Inspection Service-Plant Protection and Quarantine
Billings, MT 59101

Recent developments in geostatistics and geographic information systems allow greater precision and flexibility in preparing rangeland grasshopper distribution and abundance maps. Hazard maps thus defined, see attached, are useful in assessing general patterns of grasshopper infestations each year. Legend values on the attached map refer to the number of adult grasshoppers collected per square meter by APHIS-PPQ survey crews July 15 - August 15, 1989. Data from these surveys were then used to prepare a hazard map for 1990. Hazard in this case means potential for high rangeland grasshopper populations. Past research has shown a strong correlation between populations of the current year with populations of the previous year. At a given site, economics will dictate whether populations are high enough to warrant control.

The map is designed to provide a general reference for rangeland grasshoppers in Montana during 1990. Remember, there is a great deal of variability on the rangelands of Montana and there will be pockets of high densities in areas designated as low on the map, as well as vice versa. Also, conditions will be different in the areas around crops (crops statewide are not currently monitored for grasshopper hazard prediction). In general, rangeland grasshopper populations appear to be declining statewide from the high 1985 levels. Statewide, models suggest that there will be a general reduction in the areas estimated in 1990 to be in the 3+ to 8, the 8+ to 15, and 15+ categories. Correspondingly, the models suggest a 15 percent increase in the area expected to have low (0 to 3) grasshopper populations in 1990.

Cooperative research continues to improve the accuracy of these hazard maps. If you have comments and/or suggestions on how they could be more helpful to you, please contact Diana Cooksey at the above Entomology Research Laboratory address.

*Funding for this map was provided by Integrated Crop and Pest Management program, Entomology Research Laboratory, Bozeman, MT and the USDA/ARS Rangeland Insect Laboratory, Bozeman, MT.

The 1990 Montana Grasshopper Forecast

LEGEND		(of the area color-coded)		
Grasshopper counts/m²		Area (%)	Cumul. Area	Area (km sq)
0 - 3		48.87	48.86	170,328
3+ - 8		39.24	88.10	136,792
8+ - 15		11.00	99.11	38,361
15+		0.89	100.00	3,118
Total of 4 classes		100.00		348,599

For publication in:

AI Applications in Natural Resource Management

Send correspondence to:
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Integration of simulation models and an expert system for management of rangeland grasshoppers

James S. Berry, William P. Kemp and Jerome A. Onsager

USDA Agricultural Research Service, Rangeland Insect Laboratory and Entomology Research Laboratory, Montana State University, Bozeman, MT 59717-0001, USA

Abstract

Substantial amounts of knowledge and data exist that could be used for management of rangeland grasshoppers in the western United States. However, much of this information is not available or is in a format that is not useful to people making management decisions. One method of consolidating, assimilating and delivering useful information to managers is by using microcomputers. A previously developed prototype expert system for selection of treatment options for rangeland grasshoppers was refined and embedded in a menu-driven user interface. Simulation models of grasshopper population dynamics and forage growth were integrated into the system. The grasshopper model was used directly by the expert system and, with the forage model, in economic analysis of potential treatments identified by the expert system. This decision support system brings together expert system and quantitative analysis technologies to address a problem that could not be addressed by either technology working alone. The system was released to extension agents, land managers and ranchers in March 1990.

Introduction

There exists a large body of knowledge and data concerning rangeland grasshopper management in the western United States that could and should be used for decision making in the field. However, much of the information exists as expert judgement, scientific literature, simulation models, and large data files (e.g., weather data, historical and spatial data, etc.). In their current forms, these types of information are not readily accessible to decision makers. The Grasshopper IPM Demonstration Project (United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine [USDA APHIS-PPQ]) was initiated to develop and deliver sound management strategies for rangeland grasshoppers. Therefore, as part of the Grasshopper IPM Demonstration Project, a prototype expert system (HOPPER 1.0) for treatment selection was developed by Kemp et al. (1988) to assimilate and integrate current information into a useful management tool. HOPPER 1.0 and a questionnaire for user comments were delivered to interested persons in December 1988.

The use of expert system technology in HOPPER 1.0 proved useful for the problem of treatment selection for rangeland grasshoppers. However, HOPPER 1.0 employed only simplistic cost/benefit calculations for each treatment selected. Therefore, HOPPER could potentially be improved by further refinement of the rule base for treatment selection and by providing for more detailed economic analyses. However, expert system technology is not well suited for economic analysis because economic analysis is inherently procedural and

quantitative. Simulation models, linear programming and sophisticated user interfaces are primary tools for interactive quantitative economic analysis. Therefore, our goal was to integrate expert system, database, computer simulation, and menu oriented user interface technologies into a powerful and flexible DSS tool for grasshopper management.

Methods

System Design Considerations

HOPPER is used primarily by APHIS-PPQ personnel, county extension agents, agricultural consultants and ranchers. Therefore, HOPPER must run on hardware typically available to the majority of these types of users. By surveying this user group it was determined that HOPPER should run on MS-DOS machines with 640K RAM and a hard disk drive. A graphics monitor or math coprocessor is not required; however, many users have these features and HOPPER should use them if available.

There were several software related issues that were addressed during the development of HOPPER. Many potential users have had very little experience with computers. In fact, some users may have a reluctance to use a computer based DSS. Therefore, the user interface had to be very friendly (easy to use and not prone to system failures) and forgiving of a naive user. Simultaneously, the interface had to be flexible so that users could apply the DSS to their specific situations. Also, software had to accommodate multiple programming paradigms such as simulation models, linear programming, hypertext and expert systems. In addition, users may get frustrated when

there are many delays or waiting periods in a software package; therefore, waiting periods should be kept to a minimum (10 to 20 s). Software development environments should provide flexible and rapid program construction and debugging. Also, any software used for HOPPER had to allow royalty free distribution or an unlimited runtime option at a reasonable price.

HOPPER is evolving into a DSS package that must deliver many types of software tools for the manager making decisions. For example, other researchers are developing expert systems and other types of programs that are potentially beneficial to HOPPER users. Many of these programs are developed in expert system shells. Translation from one shell to another is not always desirable nor feasible. Therefore, HOPPER should have the capacity to incorporate other stand-alone software. Often, these programs need most of the 640K RAM available on MS-DOS computers. To use these large programs HOPPER must be able to remove itself from memory when executing a large subprocess. This strategy will be useful as HOPPER grows and hits the 640K limit of MS-DOS.

Selection of Software

There was no expert system shell available that could fulfill the HOPPER design constraints. A programming language requires more low level programming than a shell, but provides great flexibility for the programmer. However, development of user interface, expert system, and other software tools is very costly and time consuming. Programming can be simplified by using one of many programming libraries commercially available that spare the developer from writing low level user interface and other routines (e.g., menus, windows,

online help, linear programming, graphics, etc.,). Therefore, Turbo Pascal 5.5 (Borland International, Scotts Valley, CA) and compatible, commercially available programming tools were selected for the project.

The expert system software chosen was PC Expert Professional (Software Artistry, Depauw, Ill.). PC Expert Professional comes with a traditional development shell that includes a syntax driven editor and rule base compiler. The knowledge base language includes typical rule syntax, method rules for variables, demon rules, demon procedures and a blackboard facility so that control can be passed to and from the calling program. Once the knowledge base has been developed, it can be called from the programming language (C, Pascal, or Modula-2) with a simple procedure statement. The Pascal statement to initiate the inference engine is: SolveFor(goal, chaining method, solution, confidence).

The user interface tools were also purchased from Software Artistry. However, there are many companies producing good, royalty free interface libraries. This software included string handling, windowing, date, and time functions. Also, pulldown menus, context sensitive help, and formfield data entry were provided, complete with source code. On-screen plotting of the simulation results was accomplished with Science and Engineering Tools for Turbo Pascal (Quinn-Curtis, Newton, MA). Public domain software was used to swap HOPPER to the disk drive or expanded memory to execute large subprocesses (Kokken 1989), and for file printing and browsing (Somerson 1988).

System Prototyping

For any software system (for example, our DSS) to be effective it must meet the needs of the end users. Therefore, these users should be included in software design and development. This method is used in management information systems and, more recently, for development of expert systems (Mathieson 1988). The basic approach is to develop rapidly a prototype that illustrates the basic form and function of a program. This early prototype is delivered to users and their feedback is solicited. This information is used to develop a more refined prototype that is then sent to the users for their comments. The process is repeated until the software is acceptable to the users. Prototyping helps prevent difficult changes late in the development cycle of the software. Also, iterative development and evaluation of software allow the developer to design software that is both technically correct and functional for the users.

HOPPER has been distributed at least once per year to about 75 interested individuals and organizations on our mailing list. User feedback concerning form and function is elicited through a postage-paid questionnaire supplied with HOPPER. Suggestions obtained from the release of HOPPER (1.0) were compiled, evaluated and incorporated into HOPPER (2.0). Also, Grasshopper IPM project scientists were asked to evaluate HOPPER (2.0) in September/October 1989 and this resulted in changes to the user interface (HOPPER 2.2, shipped 15 February 1990). Everyone on the mailing list received a copy of this latest version.

System Overview

The main components or modules of HOPPER are the expert system for treatment selection (Consult) and the economic analyses (Economics) of those treatments. Both modules are part of the **Treatment Selection** module (Fig. 1). Simulation models are also accessed by both modules. The user can run either module; however, the economic analysis can only be performed after a list of treatments has been produced from the Consult module. A typical scenario would be for the user to run the Consult module to develop a list of suitable treatments. Then the Economic module would be used to calculate economic benefit or cost for each treatment in the list. HOPPER has facilities that allow the user to easily run alternative scenarios to evaluate the robustness of a decision. Treatment label information (Labels) and outbreak hazard maps (Maps) are ancillary modules that can be accessed from the main menu.

The system (Fig. 1) is integrated both through the user interface and through internal linkages that are transparent to the user. For example, a pulldown menu system allows the user to access HOPPER's modules. However, these modules may call other modules or share data and results. Fig. 2 shows the main menu with the treatment selection menu opened. The menu driven interface provides a means to integrate the system components and still allow the user much flexibility. Also, a menu driven interface is relatively easy to use because the user does not need to remember specific commands.

Treatment Selection Module

The expert system for identifying appropriate treatment options is accessed by selecting Consult, the first menu item in the **Treatment Selection** menu. The basic content and structure of the expert system was taken from Kemp et al. (1988). Also, the rules were translated from VP-Expert (Paperback Software International, Berkeley, CA) to PC Expert Professional syntax. The rule base was modified to accommodate user suggestions from the first release of HOPPER in 1988. Help and expanded definitions of variables are available to explain the reasoning for a question or any of the specific choices presented to the user during a consultation. An explanation of each consultation is written to a file so that the user may see the reason behind the selection or omission of treatments.

A major change in the rule base was to remove any consideration of treatment applicability beyond the treatment date set by the user. This modification reduced extrapolation by the system. Also, simulation models (Berry et al. 1990, W.P.K and J. S. B. unpublished) were linked to the knowledge base. The models allowed some rules to be removed whereas other rules were refined to use the more specific simulation results. Information gained from the simulation was percent of oviposition that would occur by a given date, and grasshopper life-stage estimates. Fig. 3 shows an example of how the expert system interacts with the calling Turbo Pascal program.

Several features were added to increase the utility of the expert system. A What-if facility was constructed (in Turbo Pascal) to allow users to examine and delete from memory any facts the user had entered. There are many other facts in memory that a user does not enter. For example, some facts are derived from simulations or rules. Also, the variable

names used in an expert system may be cryptic to the user. Therefore, a facility that presents system variable names to the user would be confusing and inappropriate. Instead of presenting all system variables, What-if reads a disk file with a list of the expert system variables that can be assigned by the user during a consultation. Along with the variable names are their english definitions. Then, the definitions of currently assigned variables and their values are displayed in a menu. The cursor keys or mouse are used to select and delete a fact from memory (change the value of a variable to unknown). All facts that are derived from that variable also will be deleted automatically by the inference engine. This facility allows the user to evaluate alternative scenarios quickly and accurately. The facts entered during a consultation also can be saved to a disk file and later reloaded using Save Facts and Load Facts.

The second major feature in the **Treatment Selection** module is the economic analysis of the selected treatments (Economics menu item). The economic analysis is based on information the user must enter (Table 1; e.g., amount of forage needed for cattle, value of the forage, cost of each treatment, etc.) and on results of a simulation model of forage production (Berry et al. 1990) linked to grasshopper population dynamics and forage consumption models (W.P.K. and J.S.B). The simulations are used to determine the amount of forage loss caused by grasshoppers and the loss that can be prevented by applying a treatment to control grasshoppers. The benefit of a given treatment depends on grasshopper and forage species present, grasshopper density, treatment efficacy (depends on the treatment), treatment timing, local weather (temperature and precipitation), grasshopper life-stage, and site forage production potential. Typical simulation results that

HOPPER displays to the user are shown in Fig. 4. Data for the economic analysis are entered by the user or restored from a previously saved file. All data are entered or edited via formfield data entry screens. There is online help available for each item on the forms.

After the data have been entered, the economic analysis begins. Some initial calculations are made and baseline simulations are run. Then, simulations are run for each treatment selected by the expert system. The results of the economic analyses are displayed in a window as the analysis for each treatment is completed (Fig. 5). All data input and results are in english units as requested by the users. The top few lines describe some general results of the analyses. Forage required for cattle is calculated from the desired AUMs/acre (Animal Unit Month, a measure of forage quantity) and the lbs of forage in an AUM. The yields, predicted by the simulations, are dependent on the weather scenario (values in the Weather and Forage Parameters window) and temperature file. The yield with grasshoppers present accounts for grasshopper consumption during the third instar and beyond. Egg pods deposited/yd² is an estimate of the density of egg pods deposited if the grasshopper population is not treated. Yield with grasshoppers absent indicates the yield as a function of only weather and forage related parameters. The adjusted value of an AUM is calculated to reflect the long term value of an AUM. The following formula was used to calculate the adjusted value:

Adjusted value = AUMvalue * ForageNeeded/(YieldNoTrt * (1.0 - GrazingLevel)) (1)

where,

AUMvalue = dollar value of an AUM

ForageNeeded = AUMs needed/acre

YieldNoTrt = AUMs available when grasshoppers are not controlled

GrazingLevel = proportion of forage left after grazing (e.g., 0.5).

The dollar return/acre is calculated from the adjusted value of an AUM, the cost of control and the AUMs gained from control. The gain (AUMs/acre) is derived from the results of the simulations. The mortality functions for the treatments used in the simulations were derived from published literature (Foster et al. 1983, Onsager 1978, 1988, and Onsager et al. 1980). The break-even AUM value is the dollar value of an AUM needed to equal the cost of control given the gain in forage that results from control.

In some situations the value of forage saved from a treatment does not justify the application of that treatment. However, there may be carry-over benefits for the coming year that cannot be quantified economically. For example, the number of egg pods deposited may be reduced and possibly prevent a continued outbreak during the next growing season. Egg pods deposited/yd² is shown for each treatment in the last column. These densities can be compared to those simulated for the untreated grasshopper populations (shown at the top of the window). In this way, relative effectiveness of the treatments (and application dates) for reducing next year's potential population may be

evaluated. However, treatment benefits for a subsequent year are difficult to assess and more supporting biological research is needed. A report containing all the information used for the current results (including facts entered for the expert system) and the results can be saved for later printing or viewing.

Labels and Maps

HOPPER is intended to deliver knowledge and information that pertains to decision making for management of rangeland grasshoppers. Therefore, two additional modules were included as part of HOPPER. **Labels** is a menu driven facility for displaying and printing treatment label information. The user can see application rates, toxicities, endangered species restrictions by county, and directions in the case of medical emergencies. For example, if several treatments compare favorably with each other economically, the user may make the final decision based on which treatment has the lowest toxicity. The next module is **Maps** and is used to display grasshopper outbreak hazard maps. These maps are interpolated from APHIS-PPQ adult grasshopper counts from the previous year using block kriging (Kemp et al. 1989). Users can view the map to get a general idea about the seriousness and extent of grasshopper populations throughout a given state.

Results and Discussion

User acceptance depends on both the validity and functionality of the system. For example, a system that gives accurate answers, but frequently aborts or crashes because of

poor logic or programming will frustrate and alienate users. Therefore, the user interface is a major component of HOPPER (at least half the code and development time). Also, HOPPER was tested extensively to make sure the system was robust and not prone to "crashes." For example, a programmer spent several hours running HOPPER through many expert system and simulation scenarios, testing the menu system and function keys. The components of HOPPER were also verified for computational accuracy. The entire system was delivered to five knowledgeable users for pre-release testing. Minor modifications were made to the user interface and expert system based on their comments. Total development time from HOPPER 1.0 to HOPPER 2.2 was about 10 person-months. This includes the development of the forage simulation model. Now that the user interface is in place and the basic structure of HOPPER is established, continued development should proceed more rapidly.

Software Integration

The use of Turbo Pascal and the embeddable expert system (PC Expert Professional) provided the flexibility needed to integrate the system components. The expert system was developed and tested in the shell provided with PC Expert Professional. Only minimal programming was needed to include the expert system into HOPPER. Also, the user interface libraries allowed the development of a sophisticated window and menu system by non-professional programmers. Therefore, this combination of software provided the benefits of an expert system shell (rapid prototyping and debugging) and the flexibility of working directly in a programming language. All software used in HOPPER allows royalty

free distribution. The memory to disk swapping software (Kokken 1989) released HOPPER from memory constraints and allowed other large modules written in any language or shell to be included in HOPPER.

Economic Analysis

The inclusion of the simulation models allows additional and important factors to be considered in the economic analysis (Table 1). Many of these factors (e.g., effect of weather, forage required by cattle, site production potential, etc.) were not incorporated into HOPPER 1.0 (Kemp et al. 1988) or the management guidelines currently used by APHIS. Some factors are used by the models to predict yield and damage (e.g., density of grasshoppers, peak estimated production, etc.). The remaining factors are used directly in the economic calculations (e.g., control costs, AUM's needed, etc.).

When any of the variables listed in Table 1 are altered the cost/benefit results will be affected. Many variables will change from year to year or site to site. For example, rainfall is variable and is the primary factor that determines rangeland forage production (Wight et al. 1984). Therefore, the forage simulation model includes in its calculations the effect of rainfall. Clearly, in drought years there is less forage available to both grasshoppers and livestock. Therefore, high densities of grasshoppers would be expected to be more serious in dry years (Berry et al. 1990, Onsager 1984). The effects of rainfall and timing of control on the economic results are shown in Table 2. Given the same grasshopper density (16 grasshopper/yd^2) at two different treatment dates, the later date results in less economic return. Generally, treating at an earlier date would be expected to protect more forage and,

thus, produce more economic benefit (Table 2). When drought is superimposed over both scenarios, less than adequate forage is produced and forage becomes more valuable on a per unit basis ($/AUM). This causes the benefit of control to increase relative to the no-drought scenarios (Table 2). Table 2 represents only a small subset of the number of possible scenarios. A land manager probably would not be able to consider all these factors without computer aided decision support. However, HOPPER can determine the economic return for any situation within its design constraints. Therefore, very dynamic economic estimates can replace a single action threshold that is based on a single variable such as grasshopper density. In the past, static thresholds were required because a dynamic analysis could not be achieved without computer and software technology that is available today. Simulation models in Integrated Pest Management projects can incorporate and provide information that can lead to greater risk reduction and more optimal solutions (Szmedra et al. 1990).

Future Plans

Currently, HOPPER is being linked to an economics module that uses linear programming and optimization. Other plans include the use of APHIS databases to determine site-specific grasshopper species composition. Also, geographic information systems, geostatistics, satellite imagery and neural networks are being tested to enhance predictions of grasshopper densities over large geographic areas.

Acknowledgements

We thank Dr. Mike Foster and Mr. Jack Hanson for reviews and comments of early drafts of this manuscript. In addition, we thank J. Scott Alexander for assisting with the Pascal programming. Also, thanks go to S. Osborne for manuscript preparation.

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Table 1. Parameters and their values used in the economic analyses and simulations. Rainfall frequency values represent non-drought conditions.

ACEPHATE	2.30
CARBARYL BAIT	4.00
CARBARYL SPRAY	3.45
MALATHION	2.30
NOSEMA BAIT	5.00
% Warm Season Grass	23.00
% Cool Season Grass	50.00
% Forbs	27.00
Density Grass Eaters (sq yard)	8.00
Density Mixed Eaters (sq yard)	8.00
Desired Grazing Level	0.50
Value ($) of AUM	11.00
Cow Weight (lbs)	1000.00
Forage(lbs)/AUM	780.00
AUMs needed/acre	0.20
Dry days since soil was at field capacity	15.00
Inches of rain to fill dry soil to field capacity	5.00
Soil Water Holding Capacity (% by wt)	25.00
Days for saturated soil to dry to 5% water	65.00
Expected Rainfall Frequency (0.0 to 1.0)	0.08
Mean size of rainfall events (Inches)	0.30
Peak est Production	800.00

Table 2. Results of the economic analyses module showing differences between dates and between rainfall regimes using 30-year average temperatures from Richland county, MT. The grasshoppers averaged between 4th and 5th instar on 07/15/90, and predominately fifth instar on 07/22/90. The parameters for the non-drought scenarios are shown in Table 1. Drought scenarios also used the parameters from Table 1 except "Expected Rainfall Frequency" was reduced to 0.07.

Treatment	Date	Benefit ($/acre)	AUM gain/acre	AUM Break Even Value ($)	Egg Pods/yd²
No drought					
ACEPHATE	07/15/1990	-0.50	0.26	8.77	3.7
CARBARYL BAIT	07/15/1990	-2.60	0.20	19.62	21.3
CARBARYL SPRAY	07/15/1990	-1.69	0.26	13.50	3.7
MALATHION	07/15/1990	-0.48	0.26	8.68	3.5
NOSEMA BAIT	07/15/1990	-3.98	0.15	33.73	18.1
ACEPHATE	07/22/1990	-0.68	0.24	9.76	3.4
CARBARYL BAIT	07/22/1990	-2.73	0.18	21.73	20.6
CARBARYL SPRAY	07/22/1990	-1.88	0.23	15.10	3.4
MALATHION	07/22/1990	-0.66	0.24	9.65	3.2
NOSEMA BAIT	07/22/1990	-4.13	0.13	36.63	21.6
Drought Conditions					
ACEPHATE	07/15/1990	0.61	0.26	8.76	3.7
CARBARYL BAIT	07/15/1990	-1.74	0.20	19.62	21.3
CARBARYL SPRAY	07/15/1990	-0.62	0.26	13.50	3.7
MALATHION	07/15/1990	0.64	0.26	8.68	3.5
NOSEMA BAIT	07/15/1990	-3.36	0.15	33.73	18.1
ACEPHATE	07/22/1990	0.31	0.24	9.76	3.4
CARBARYL BAIT	07/22/1990	-1.96	0.18	21.73	20.6
CARBARYL SPRAY	07/22/1990	-0.92	0.23	15.10	3.4
MALATHION	07/22/1990	-0.34	0.24	9.65	3.2
NOSEMA BAIT	07/22/1990	-3.60	0.13	39.63	21.6

Figure Captions

Figure 1. Overview of the interaction of the HOPPER user interface and internal routines.

Figure 2. Screen from HOPPER showing the main menu with the treatment selection menu selected.

Figure 3. The use of a method rule and corresponding Pascal code to show how the expert system inference engine can interact with a calling program.

Figure 4. Screen from HOPPER showing graphic representations of the simulations used in the economic analyses.

Figure 5. Typical economic results screen from HOPPER.

EXHIBIT 4
DATE 1/28/91
HB 277

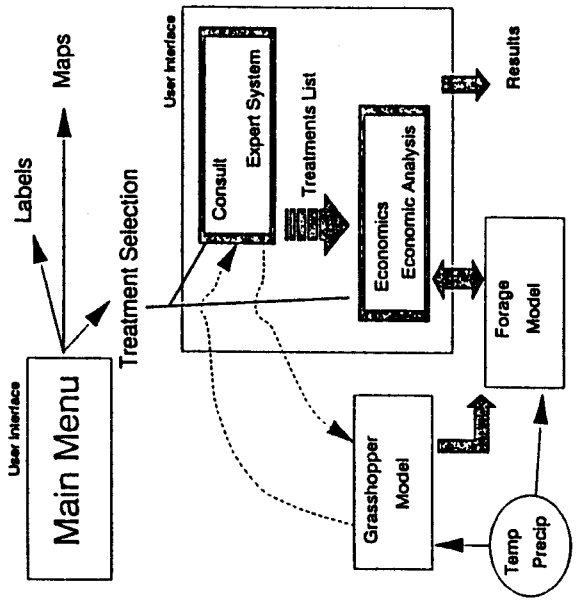

Fig 1

Treatment Selection Labels Maps Quit

Consult
What-If
eXplain
Economics
Save Facts
Load Facts
Print Report
weAther

HOPPER (version 2.22)
Grasshopper Decision Support Software
Treatment Selection and Economic Analysis

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In Cooperation with USDA APHIS-PPQ
Grasshopper IPM Project
3380 American Terrace
Boise, ID 83706

Expert system for treatment selection
Arrow keys to move, <ESC> to Exit a menu, <Enter> to select, <F1> for help

Fig. 2

EXHIBIT 4
DATE 1/28/91
HB 277

Treatment Selection Labels Maps Quit

Economic Analysis Results

Weather data from --> RICHLAND, MT 30 year average
Census date was June 28, 1990. Forage requested for cattle is 156 #/acre.
Yield without any treatment for grasshoppers is 309.8 #/acre.
Eggs deposited per square yard = 79.0
Yield assuming no grasshoppers present would be 559.1 #/acre.
Adjusted value of AUMs lost to hoppers is $11.09/AUM.

Treatment	Appl Date	$ Return/acre	Gain (AUMs/acre)	Break Even AUM $ value	Egg per yd2

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PC Expert Professional Method Rule.

```
DECLARE(EggPercent,Real);
METHOD EggPercent: IF   EggPercent = SUNKNOWN
        THEN    ACTION = Solve(Treatment_Date,'B')
                ACTION = SUSPEND('PERCENT EGGS DEPOSITED').
```

Pascal code to interface with the Method Rule.

```
{------------------------  Calculate percent eggs deposited ------------- }
    IF blackBoard = 'PERCENT EGGS DEPOSITED' THEN

      BEGIN
                    { Erase the current blackboard }
        Delete(blackBoard, 1, 4);

            { Get treatment date from the inference engine }
        GetParameterValue(
```

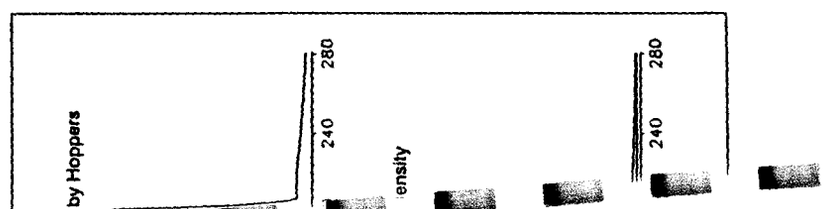

Fig. 4

EXHIBIT 6
DATE 1-28-91
HB 277

Montana Grain Growers Association

P.O. Box 1165 • 750 6th Street S.W. • Great Falls, Montana 59403 • 406/761-4596

Testimony of the Montana Grain Growers Association
on HB277
Before the House Agriculture Committee
January 28, 1991

Madam Chairman, members of the Committee, my name is Chuck Merja. I am a wheat and barley producer from Sun River and the President of the Montana Grain Growers Association. I rise in support of HB277.

Grasshopper infestations continue to be one of the greatest economic threats to crop production in Montana. Every year some part of this state is seriously impacted by grasshoppers and most years all of us have some losses. While we do have insecticides that are useful and cost-effective in reducing local infestations, they have been somewhat ineffective in addressing the overall problem. In addition, we in agriculture are facing increasing public concerns about widespread use of insecticides for grasshopper control. While in the past, we have relied on the Emergency Grasshopper Control Program in cases of severe infestations, it appears the recent development of an Environmental Impact Statement on that program has rendered it useless.

We need to develop a integrated control program for grasshoppers that not only addresses the immediate economic threat of infestations, but looks toward long-term, conventional and non-conventional solutions to the problem. This bill would provide such a program. The USDA/ARS-Rangeland Insect Lab and Entomology Research Laboratory at MSU is doing excellent work in developing a grasshopper management plan. However, this federally funded and mandated program only looks at grasshopper control on rangeland. This bill, for a very small amount of money, would adapt that work and apply it to grasshopper control on cropland.

Madam Chairman and members of the Committee, I urge this Committee to support HB277. Investing in this program will provide excellent returns to the State of Montana, both in terms of improved economic health for Montana farmers and increased tax collections.

EXHIBIT 1
DATE 1-28-91
~~HB~~ SB 3

Montana Association of Churches

MONTANA RELIGIOUS LEGISLATIVE COALITION • P.O. Box 745 • Helena, MT 59624
PHONE: (406) 442-5761

Date Submitted: January 28, 1991

Bill Number: SB 3

Submitted by: Harley E. Warner

Madam Chairperson, members of the Committee, I am Harley Warner. I am here this afternoon representing the Montana Association of Churches.

We urge your support of Senate Bill 3.

In recent years, drought, decreasing land values, high interest rates, low commodity prices, and insects have placed many Montana farmers and ranchers as well as rural communities in jeopardy. These problems are not going to go away by June 30th of this year.

We see the problems of tight money for agricultural borrowers continuing. At the present time 85 percent of Montana's soil is rated abnormally dry.

The goal of the Agricultural Assistance Program is to aid agricultural producers in continuing to be productive and self-sufficient members of society.

These farmers and ranchers need the assistance of peer counselors in order to be prepared for meetings with financial consultants and lenders. They need someone who is more knowledgeable of regulations to sit down with them before mediation and help them take an objective look at their options.

The peer counselor can help the farmer cope mentally with the situation and get on with life, whether that life is on or off the farm. The peer counselors are volunteers who are not paid for their time, but who's service to this project are invaluable.

With out this program we will lose the volunteer mediation ability and we will lose the Federal funding of $60,611.

As of December 12, 1990 there were 4430 calls received; 754 of the calls were for mediation. The balance of the calls were for various other services such as legal and general information. We feel the project is very worthwhile and should be continued.

We therefore request you give Senate Bill 3 a do pass recommendation.

EXHIBIT 2
DATE 1-28-91
HB SB 3

Montana Catholic Conference

January 28, 1991

MADAM CHAIRPERSON NELSON AND MEMBERS OF THE HOUSE AGRICULTURE COMMITTEE

I am John Ortwein representing the Montana Catholic Conference.

Both Bishop Curtiss of the Diocese of Helena and Bishop Milone of the Diocese of Great Falls-Billings have indicated to me that the greatest stress to be found among the people in their respective Dioceses are the people to be found in the agricultural community.

The two Dioceses are members of the Montana Association of Churches and as such have helped in the sponsorship of the Agricultural Assistance Program.

The Montana Catholic Conference supports SB 3 and the continuation of the Agriculture Assistance Program.

a program
Tel. (406) 442-5761 P.O. BOX 1708 530 N. EWING HELENA, MONTANA 59624
CARE & SHARE

Jan. 28, 1991
Kay Norenberg
SB 3 - Nathe
Support X

EXHIBIT 9
DATE 1-28-91
~~HB~~ SB 3

Chairman Nelson, and members of the committee. My name is Kay Norenberg, representing WIFE (Women Involved In Farm Economics). We would like to go on record in support of SB 3.

Again we are here before you asking that the sunset be moved forward on the Ag Assistance Program. We had hoped that agriculture would begin to get on its feet but that hasn't been the case.

Without this program many farmers and ranchers who need help will not have any place to go. We believe it is vital to the industry to continue to have peer counciling, mediation, and financial consultants. Most farmers and ranchers who are in need of this connot afford to go to the private sector for this assistance.

The effect of farmers and ranchers going out of business has a dominal effect on the whole state of Montana. Let us put out our best effort in keeping all of Montana on sound financial footing.

We thank you for this opportunity to speak on this issue and hope you will give consideration to our concerns. We would like to recommend a do pass to SB 3.

Thank You.

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CHAIRMAN JERGESON AND SENATE AG COMMITTEE MEMBERS
1 14-91 (SB3)

Mr. Chairman, members of the committee. My name is JoAnn Forsness and I currently serve as a hotline co-ordinator for Women Involved in Farm Economics and am a peer counselor for Montana Association of Churches through the Ag Assistance Program.

We cannot believe the deterioration of the economy of agriculture in the last two years. Two years ago when we came to ask for your assistance, we were sure that things couldn't get worse, believing that restructure of ag loans would be the norm. We were about as wrong as it's possible to be. Restructures are not the norm and FmHA has hired 15 new staff people with three of that number being attorneys to begin in March to clean up their delinquencies. Many borrowers of the FCS still experience interest rates much too high and a reluctance by FCS toward any meaningful restructuring. Restructuring most times is accomplished only through bankruptcy or long costly drawn out negotiations by attorneys for both sides.

We are still finding far to many farmers and ranchers who do not have food for their families for at least a part of the year causing main streets in all of eastern Montana's communities to have many boarded up buildings.

When we got out a file last month to look at records to re-record our brand it was abundantly clear why in comparing numbers from a diary of J. Wall's mother we found the following:

1951: wheat-$2.13/1991-wheat $2.35; 1951-stamps 3¢/1991-stamps 25¢; 1951 brands $3.00/1991-brands $50.

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DATE 1-28-91
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Farm Credit Services

West 601 First Avenue
P.O. Box TAF-C5
Spokane, Washington 99220-4005
509/838-9300

January 15, 1991

Jo Ann Forsness
Hotline Coordinator
Box 5035
Wolf Point, Montana

Dear Jo Ann:

Farm Credit Services supports the Montana Agricultural Assistance Program implemented by the State of Montana. Al Haslebacher, a Farm Credit Bank representative, served on the original advisory committee. We have participated in the mediation program and with financial and peer counselors.

It is our objective to maintain open and constructive communication with all our customers. With some distressed customers, we have been unable to maintain this relationship. Programs offered through the Agricultural Assistance Program have assisted customers with distressed loans and Farm Credit staff reach acceptable resolutions.

We supported the implementation of this program, and we continue to support its objectives. Given the difficulties and, in some cases, significant personal decisions which many Montana farmers and ranchers will face, we support the continuation of this important program.

Sincerely,

Philip W. Kimmel
Senior Vice President-Credit

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ICT 1
Lodge, Dillon, Helena, Kalispell, Missoula, Polson
3 borrowers
25 Active borrowers
1,851 loans
82 delinquent
15.6% delinquent borrowers
8,4% delinquent over two years

DISTRICT 2
Billings, Bozeman, Forsythe, Hardin, Miles City, Red Lodge
DISTRICT 2
701 borrowers
2,137 loans
681 active
120 delinquent
17.6% delinquent borrowers
9,8% over two years delinquent

DISTRICT 3
Baker, Glasgow, Glendive, Malta, Wolf Point
798 borrowers
2,775 loans
702 active borrowers
175 delinquent
24.9% delinquent borrowers
11.0% over two years delinquent

DISTRICT 4
Choteau, Cut Bank, Great Falls, Havre, Lewistown, Shelby
1,108 total borrowers
2,727 2,727 loans
1,020 active ~~loans~~ borrowers
126 delinquent
4.6% over two years delinquent

State Totals
Total Borrowers 3,160
Total Active 2,928
Total Delinquent 503
Total Loans 1,892
22.5% Delinquent Borrowers
10.3% over two years Delinquent

FCS
248 Borrowers - Today or near delinquent

Fiscal note
[illegible]

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9[illegible] to DECEMBER 1990 Hotline report

operators

ours hotline manned

r imburse expenses -approx 50¢ per hour

hour recorded calls

i formation or to register hay or request hay
recorded calls.

"Each time a [person] stands up for an ideal, or acts to improve the lot of others... he sends forth a tiny ripple of hope, and crossing each other from a million different centers of energy and daring, those ripples build a current that can sweep down the mightiest walls of oppression and resistance."

TIME, SEPTEMBER 25, 1989

sness
Coordinator-WIFE

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55
23
8
9
10

19.8& Del.
19.5% Del.
29.1% Del.
16.5% Del.

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f system. FmHA
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foreclosures 1990

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Malta to North
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Poplar, Sidney,

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HB SB3

TESTIMONY PRESENTED TO THE HOUSE AGRICULTURE COMMITTEE

Presented by--Dale Fossen
Box 102
Joplin, Montana 59531
292-3230

Date--January 28, 1991

Subject--SB 3

Members of the House Agriculture Committee:

My name is Dale Fossen and I farm at Joplin. I am here to testify in support of SB 3. I have been activily involved in the peer counseling part of the Agriculture Assistance Program since its inception in the special legislative session in 1986 and with the counseling program with Montana Association of Churches and Montana Farm Counseling Coalition since its beginning in 1985. I have also served on the Governor's Advisory Board that worked with the Department of Agriculture concerning the Ag. Assistance program.

On the surface this bill seems rather insignificant and such a small thing. So who cares about a bill that provides peer counselors, financial consultants, and mediators to farmers and ranchers who are in financial trouble? Think about that for just a second. The problem with this thought is that none of us here can tell you which people will be in financial trouble next week, next month, or next year. It is such a simplistic answer to say "They got themselves into this mess. They can get themselves out of it." It is far easier to turn our backs on our friends and neighbors as if they didn't matter in our communities. Oh sure, we are disturbed by the loss of farms and ranches and the people that go with them; but Gosh, that's the way it is! Is it really?

Agriculture today is too complex and too dependent upon the political whims of a select few. Today's farmers and ranchers need a way to fight back for themselves and their communities. We need to return to the old American ethic of befriending our neighbor. This bill provides that and a lot more. It helps agriculture in our state. It helps open the lines of communication. It keeps families in our communities and farms viable again which in turn provides money to our state through goods, services, and of course taxes. There are so many people in our state touched by agriculture that it becomes difficult to name the industries not affected by it or businesses not associated with it.

Many of the farmers and ranchers that we are helping today didn't suspect 3 or 4 years ago that they would be facing such terrible financial problems and need our help. Our program provides them with much more than appears on the surface of this program. Farmers and ranchers learn that others care about them. So many tell me, "I didn't know that anyone cared." With that realization a bond is formed and self-confidence can again be built upon. Self-worth grows. The added benefit is that they become better at their profession--farming or ranching.

I'm not here to tell you that this bill can save all the farms in this state. It can't. I am here to tell you that it does provide an invaluable service to the agricultural communities of this state. The success can't be measured in dollars but in the smiles of

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people who now know that this state cares enough about them to fund a program that can help them help themselves. A significant number of farmers and ranchers really feel that the state could care less if they lived or died. Maybe that is why they seem almost shocked that someone really does care and that this program doesn't have its hand out like the rest of the world. This program has put many a feather in the Montana State Government's hat.

People need to know that there is help out there. This program has built a reputation for honesty and integrity especially with the financial institutions. These people welcome us into their offices because they know we are there to help. Farmers and ranchers trust us because we provide the honesty, friendship, and understanding they so desperately need in order to build back the confidence they once had.

SB 3 can continue the cooperation between the private sector and the public sector. It can be another sign that this legislature cares about agriculture in Montana. I think it's time to stand up and say "Agriculture is the number one industry in Montana and this bill will help Montana."

I urge your support for this bill. I ask your help with your vote in favor of SB 3.

Thank you,

Dale Fossen

Dale Fossen

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STAN STEPHENS
GOVERNOR

STATE OF MONTANA
DEPARTMENT OF AGRICULTURE
OFFICE OF THE DIRECTOR
AGRICULTURE/LIVESTOCK BLDG.
CAPITOL STATION
HELENA, MONTANA 59620-0201

TELEPHONE:
AREA CODE 406
444-3144

FAX 406-444-5409

EVERETT M. SNORTLAND
DIRECTOR

MONDAY, JANUARY 28, 1991
SENATE BILL 3
HOUSE AGRICULTURE COMMITTEE
TESTIMONY OF MONTANA DEPARTMENT OF AGRICULTURE
EVERETT SNORTLAND, DIRECTOR

Madam Chairman Nelson and members of the committee. When the Agricultural Assistance Program sunset was extended during the 1989 legislative session, the legislature asked for and received a commitment to the legislature that the program would terminate July 1, 1991.

Agricultural producers continue to face as they have in the past; drought, low prices, and reduced farm programs. These problems may vary, but are not unlike similar difficulties faced by other Montana business.

When established during the 1986 special legislative session, the assistance program was intended and supported as a temporary program to help during a critical period. We remain consistent with that position and the commitment made to the 1989 legislature and therefore do not support Senate Bill 3.

wordperf/market/dm/SB3.HOU

HOUSE OF REPRESENTATIVES

VISITOR'S REGISTER

Agriculture COMMITTEE BILL NO. SB 3

DATE 1-28-91 SPONSOR(S) Sen Nathe

PLEASE PRINT PLEASE PRINT PLEASE PRINT

NAME AND ADDRESS	REPRESENTING	BILL	OPPOSE	SUPPORT
Dale Fossen - Box 102 Joplin, MT.	Montana Farm Counseling Coal.	SB 3		✓
Everett Knudsen	Mt Dept of Ag		✓	
HARLEY WARNER Box 745 HELENA 59624	MONT. ASSOC. OF CHURCHES	SB 3		✓
Kay Nordberg	WIFE	SB 3		✓
Carol Mosher	Mt. Cattle Women	SB3		✓
John Ortwein	Mt Catholic Conf	SB3		✓
Ted J. Doney	MT. Dairymen's Assn.	SB3		✓
Neva Hasanei	NPRC	SB3		✓
George Paul	MT Farmers Union	SB3		✓
LORNA FRANK	Farm Bureau	SB3		✓

PLEASE LEAVE PREPARED TESTIMONY WITH SECRETARY. WITNESS STATEMENT FORMS ARE AVAILABLE IF YOU CARE TO SUBMIT WRITTEN TESTIMONY.

HOUSE OF REPRESENTATIVES

VISITOR'S REGISTER

Agriculture COMMITTEE BILL NO. HB 277

DATE 1-28-91 SPONSOR(S) Rep Stapley

PLEASE PRINT **PLEASE PRINT** **PLEASE PRINT**

NAME AND ADDRESS	REPRESENTING	BILL	OPPOSE	SUPPORT
OWEN COX PO Box 8936 Missoula 59807	AERO	HB 277		X
Florence V. Dunkel 324 Leon Johnson Entomology Montana St. Univ.	technical resource	HB 277		X
~~HARLEY WARNER~~ P.O. Box 745 HELENA 59624	~~MONT. ASSOC. OF CHURCHES~~	~~SB3~~		~~X~~
Kay Norenberg	WIFE	HB277		X
Gary Gregory	Resource Information Mt. Dept. of Agric.	HB 277		
LORRA FRANK	FARM Bureau	HB277		X
Pam Langley	Montana Agri Business Assn	HB277		X
Chuck Merja	Montana Grain Growers	277		X
J.A. ONSAGER RANGELAND INSECT LAB. BOZEMAN, MT 59717	Tech. Resource	277		X

PLEASE LEAVE PREPARED TESTIMONY WITH SECRETARY. WITNESS STATEMENT FORMS ARE AVAILABLE IF YOU CARE TO SUBMIT WRITTEN TESTIMONY.