BARNES Welding & Machine

Farm & Shop Magazine

Volume 6, Number 1 Winter 1988

GROWING CRP GRASS

What works
What doesn't

SPRAYING

Cheat
Experimentation
Rig Conversions
Cost Cutting

NEW METHODS FOR

Planting in Rocky Soil
Conserving Soil

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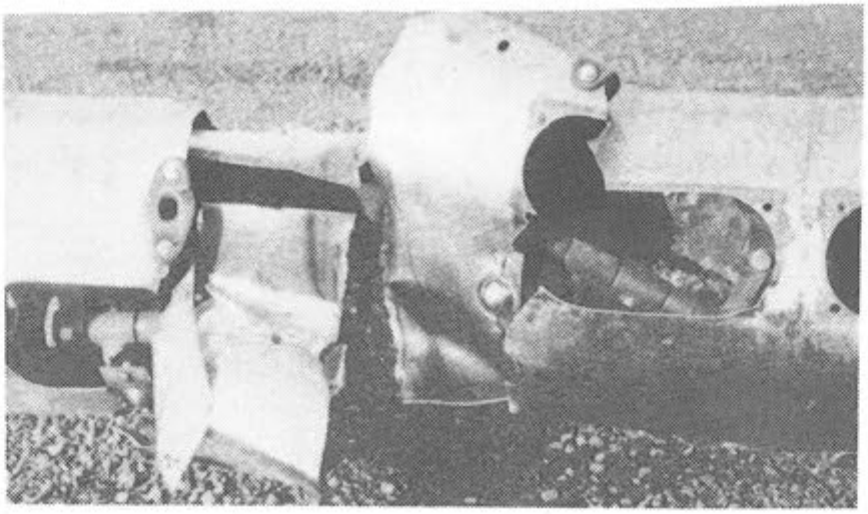
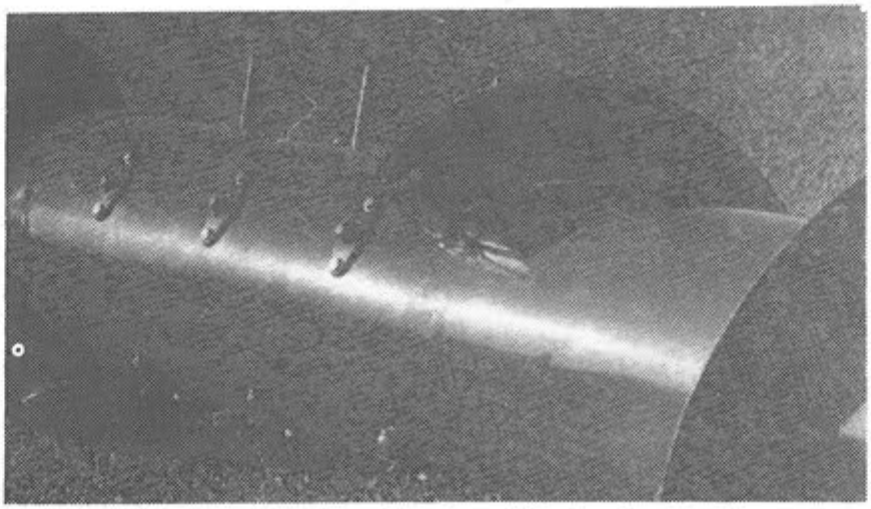
Don't Let A Damaged Finger Section Cost An Arm & A Leg

Damaged Finger Section >



New Auger Cost: $1500 - $2000

Rebuilt Finger Section >



Rebuilt Auger Cost: $450 - $550

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BARNES Welding & Machine

Farm & Shop Magazine

(509) 745-8588 PO Box 614 Waterville, WA 98858

Publisher's Dedication: There wouldn't be any shop stories in this publication if it weren't for my father, Weldon Barnes--he's the one who teaches me about welding. He's the most patient teacher, the best example and the greatest father a son could have.

Published by Dave Barnes
Executive Editor Charles Herring
Managing Editor Kristina Wainscott
Editorial Consultant Lennie Davis
Circulation Director Marge Chambers

INTERVIEWERS WANTED

As we expand our coverage of grain growing activity in Washington, Oregon, Idaho, Montana and mid-western grain growing states, we need more people to interview farmers about local farming practices. When you request them, we'll supply you with interview questions. Your job will be to tape record what an excellent farmer in your area says and then type it into a transcript. A photo of the farmer would be appreciated--perhaps a shot of him working on his favorite implement or project (for example, if he talks a lot about a spray rig modification, take a shot of him/her with it).

Include the farmer's name and a description of his farming circumstances: rainfall, crops, soil conditions, etc.. Tell the farmer that we'll contact him or her at a later date to clarify any ideas that need it. Include the farmer's phone number and the best time to call.

We'll pay you $10 for a usable photograph and $25 for 3 - 6 pages of typed copy.

Hardfacing Problems

WRONG ROD, TOO MUCH

The Story of a bucket with a bowed cutting edge

The greatest challenge of applying hardfacing is selecting the correct rod and knowing how much to apply. Many times in the course of a year we see excellent welders bring us problems that resulted from one of these two factors. Frequently, these customers don't even realize that the hardfacing procedures used actually caused the problem. The example we're using in this article is a case in point. The hardfacing was applied very well and the welder did an excellent job.

A bowed cutting edge

This welder probably does dozens of welding jobs each year and most likely all of them work out very well. However, in this case, he used the wrong rod because it did not relieve it's own stress (we'll explain what that means in a minute) and he applied so much that the parent metal overheated and as a result of that, it bowed.

When the bucket came to us, the center tooth of the cutting edge was 2-- 3/8ths inches lower than the corner teeth (see photo to the left). It

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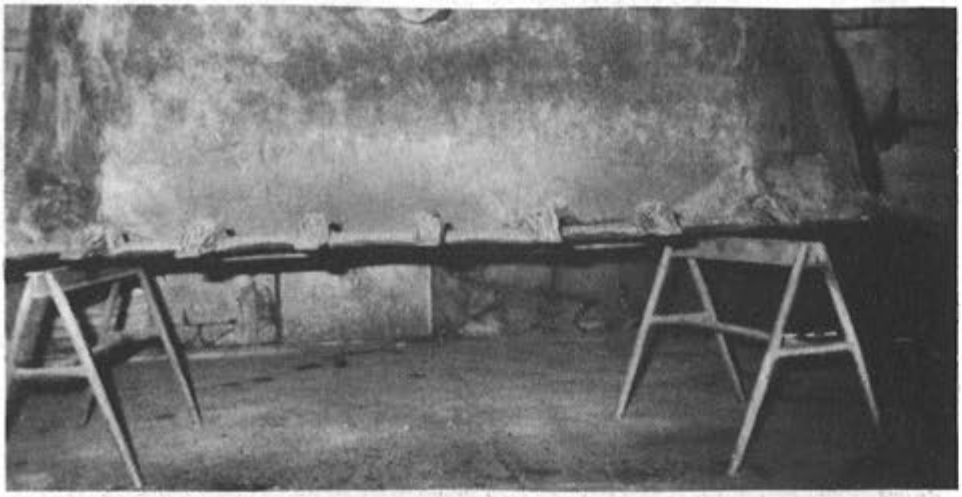
WRONG ROD TOO MUCH



was our job to make the cutting edge even (see photo on the right). The bucket's bottom had worn considerably and to increase the life of that bucket they applied hardfacing to the entire bottom of the bucket in rows that were approximately 3/8th of an inch apart. Because of this a great deal of heat was applied to the bottom of the bucket. Since the sides of the bucket and the back of the bucket were all secured to each other, the cutting edge was the only unsecured area that could move when the bottom was overheated and that's why it bowed as much as it did.

Since excessive heating to the bottom of the bucket caused the bottom to bow up, we applied heat to the opposite side on the inside of the bucket. To speed up the cooling we applied water to the areas we heated. This process flattened the inside bulge. However, the cutting edge was still bowed down. We then applied pressure and heat to the bottom side of the cutting edge. After many

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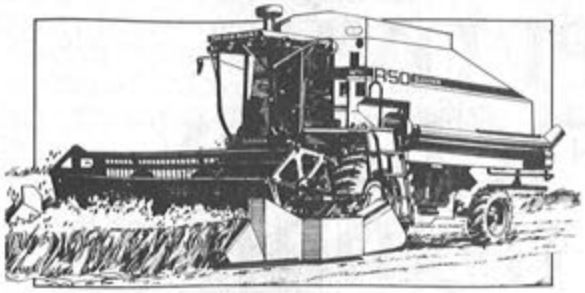
Introducing the new-size rotary Gleaner combine.



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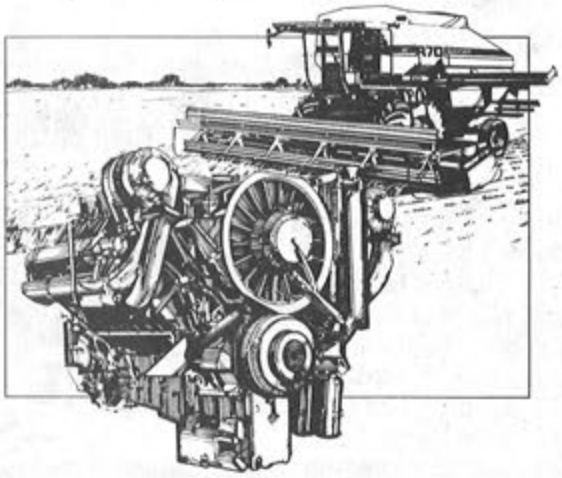

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DEUTZ ALLIS

See what sets us apart.

From page 4

WRONG ROD TOO MUCH

applications of both heat and pressure, we brought the edge up straight. (The pressure was applied underneath with a hydraulic jack.)

The net result of this process was that the cutting edge was perfectly straight and none of the hardfacing fell or chipped off. The customer was delighted with this because it meant that the excellent hardfacing job was still intact and now they had a super strong bucket.

The bow in this bucket wouldn't have been so bad if a different welding rod had been used. A non-stress relieving rod was used and a stress relieving rod would have reduced the bow a great deal. A stress relieving rod is a rod that after it is applied, in the cooling process the weld bead cracks thus relieving the heat stress that is being added. The beads crack so much that you might think that the weld is faulty, but that's not the case--it just needs to crack that much to relieve the stress.

We need to mention that there is a tradeoff between the amount of hardfacing (which creates a longer life of the implement) and the warp or bowing problem that comes with overheating. The more hardfacing you apply, the greater are the chances that there will be overheating. In the job described above, the bowing might have been minimal if a stress relieving rod had been used and if the weld rows were about twice as far apart.

INVENTIONS IMPROVE EFFICIENCY OF HZ DRILLS

--Seed in Rocky Land
--Seed Through Heavy Trash

When a split packer wheel clogs going through heavy trash or gets damaged by rocky ground, nobody gets more upset than Bob Zimmerman, a farmer in Almira, Washington. Bob takes these problems to heart because he invented the split packer wheel drill twenty years ago. Now, he's invented and patented two major improvements: the spring-trip and the notched packer wheel.

Editor's note: In a recent interview, we asked Bob to describe and explain his inventions. He begins with the spring-trip.

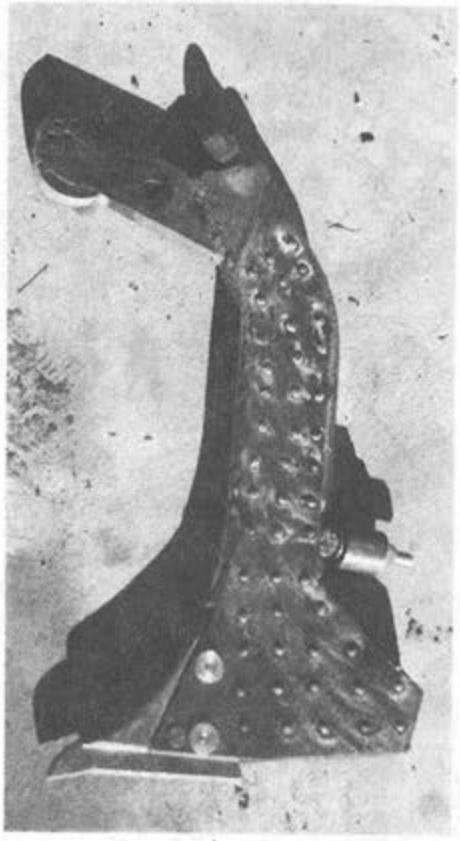
"The boot on the HZ drill is placed inside the split-packer wheels (a packer wheel on each side of the boot). Due to this design, the drill's seed placement is very accurate. However, these drills were not made for rocky conditions. The boot is held in place by a shear pin (cotter key) and the angle of the boot is set by this pin. When a rock was hit, the pin was sheared causing the boot to be shoved back into the packer wheels. The boot remained in this condition until detected by the operator, thus the boot wouldn't be seeding for a period of time.

"The spring-trip mechanism allows each drill boot to kick back between the press wheels and then spring back. So when a rock is hit, the boot automatically comes back out to resume seeding. Another advantage of the spring-trip is that the side-bending of the boot is virtually eliminated when a

INVENTIONS IMPROVE EFFICIENCY OF HZ DRILLS

rock is hit.

"Due to the spring-trip, the operator has an infinite number of angle settings for the boot. Prior to this, the angle was predetermined by factory-made positions. The spring-trip adjusts for any tension, whether rigid or flexible. When able to have some movement, the boot will have a small amount of vibration and will go through the trash easier."



"Another drill option is to use steel rollers in conjunction with the rock trip to stop any misaligned boot from rubbing and wearing on the side of the press wheel. (See steel roller coming out of boot, lower right, in the above photo.) The

(continued on page 8)

ALERT

The Washington Wheat Commission (WWC) receives money for research when wheat is sold. These monies go to WSU so they can develop more uses, varieties and markets for wheat. This is essential research for the welfare of the wheat community.

The problem is that since 1982 wheat production is down 35 million bushels and this means WWC research funds have gone down.

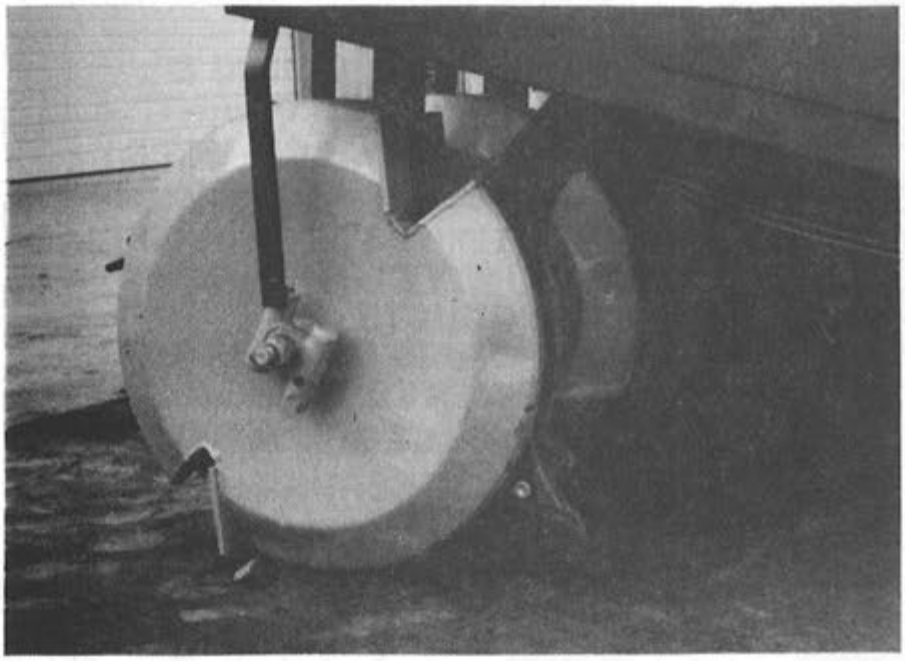
The solution is an increase in assessment. The increase will be from the current rate of $6.25 for 1,000 bu. sold at $2.50/bu. to $12.50 for 1,000 bu. sold at $2.50/bu. Please approve this.

boot can only rub against the roller, which allows mobility in the boot action.

THE HZ NOTCHED PACKER

Editor's note: The second invention developed by Zimmerman is the notched press wheel. Here is his description and explanation of it:

"There are two aligned notches per press wheel and two press wheels per boot. There are two purposes for these notches."



Two aligned notches per press wheel

"The first purpose of the notched packer wheel is to enable the drill to go through more trash. The packer grabs the straw and mulch, and the notches pull it through the drill. Any build-up ahead of the packer is also pulled through. When the notch rotates forward, toward the ground, the top portion of the notch is parallel to the ground at the level where the trash builds up. If any residue gets in this area, the notch grabs it and pulls it through the drill.

"As the packer rotates out of the ground, the notch allows the dirt to remain built up, undisturbed, in the form of a dam.

"The notch has to be at the right angle, depth and width--otherwise it would not catch the trash and build the dams.

"The second purpose of the notched packer wheel is to build these little dams. Every three feet of drill movement, the packer will leave a dam in the ground.

"The dams hold moisture when the ground thaws in the spring and help erosion control as well as

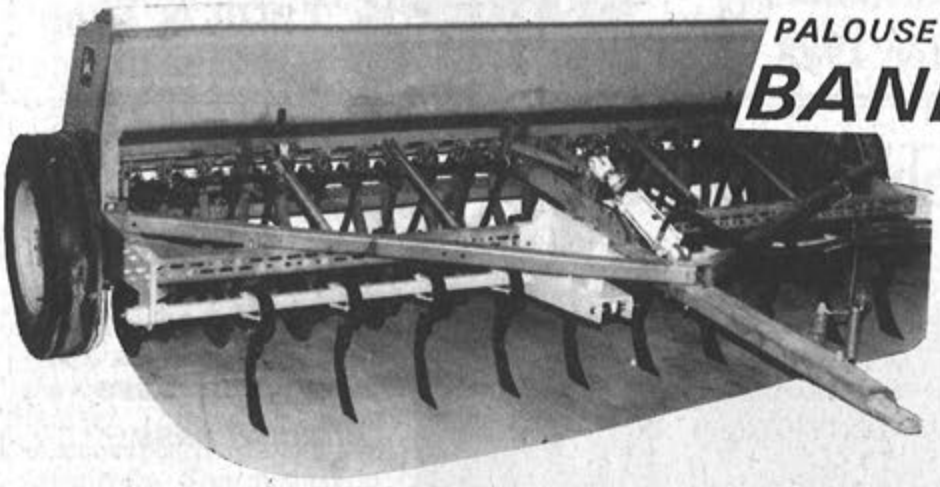
Notice small dams in furrows

freeing the packer from the dirt that the packer is pushing at that time. This enables the packer to start fresh every half a rotation.

"A better furrow is made by using the notched packers. Less dirt remains over the seed allowing the shoot to have an earlier emergence."

Editor's note:

Zimmerman made the notches and the spring-trip last winter. They were tested this spring on standing irrigated 70 bushel per acre winter wheat stubble. They easily went through the tough straw. This fall, the modified drills were seeded side by side with conventional drills. Both drills had excellent stands of wheat, the obvious difference was that the modified drill had less soil over the seed and the dams appeared every three feet.



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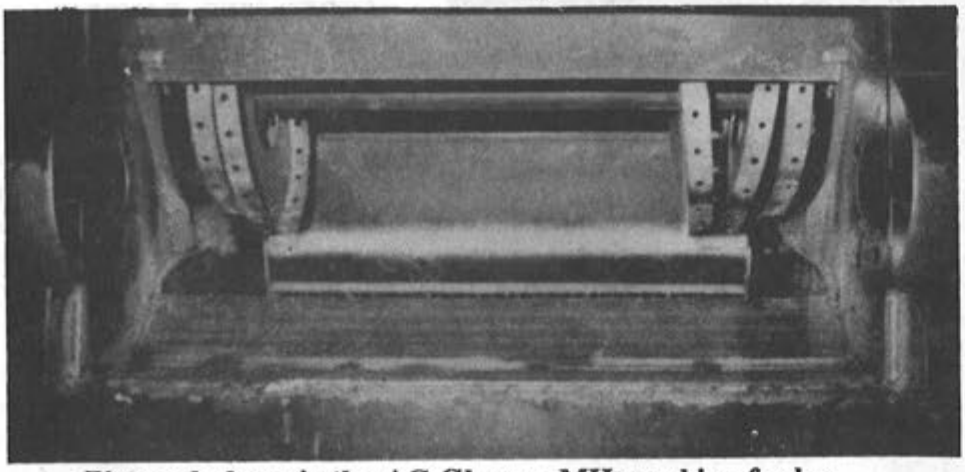
Combine Feeder House Throat Repair



Pictured above is the AC Gleaner MH combine feeder house. You can see the continous weld along the front edge and the skip welds on the sides.

A customer ran so many bushels of wheat through his AC Gleaner MH combine that the bottom metal of the feeder house was worn through. The metal was so worn that wheat could fall through to the ground in some spots. The original material was less than one eighth inch thick and the customer elected to replace the original metal to 3/16 inch plate.

We made a template of the correct contour of the bottom and formed the new material to that configuration. It's important to mantain the exact contour because the feeder beater runs right above that surface.

We then postioned the new plate into the feeder house and secured it by welding. The front edge of the feeder house, where the new material starts, had to be welded continously. The reason we had to have a continous weld was that all the wheat goes across this edge and if there were any voids the wheat would get caught in them.

We pressed the center part of the material down against the old contour to assure adequate beater clearance. The center section was plug welded throughout it's length--from side to side of the feeder house. The edges of the new material were skip welded. The back side of the new material, the concave end, was folded over to allow the wheat to flow freely into the concave.

After all the welding was done we ground the welds down so that they were flush like an original surface. The plug welds in the center section (the part that was pressed down to conform to the contour) were ground to conform to the contour.

To combat the corners wearing on the feeder house, we put a hardface material at those locations. But, since the corners were already worn, we first had to build the corners back up with a mild steel rod and then hardfaced them.

SPRAYING

How to reduce costs

How to increase effectiveness

Editor's note: There's a constant need to increase production and reduce costs. With that in mind we interviewed a number of farmers around the northwest. What follows are the thoughts of a few people who are doing interesting things. If you have additional questions, or if you know of someone we should interview, please let us know.

Jim Leifer was born and raised on the family farm near St. John, Washington. After high school he attended Montana Tech and graduated with a degree in petroleum engineering. After working for Texaco and Dow Chemical for a few years, he did post-graduate work at WSU in agronomy. Then he worked for Agri-Management in Yakima as a consultant before returning to the family farm in 1976. He's been farming and experimenting ever since.

How do you reduce chemical costs?

Jim: The best way to cheapen up chemicals would be to use an injection pump and by respraying problem spots.

What is an injection pump?

Jim: An injection pump is a

chemical injector that allows me to use a weaker chemical, then have a stronger chemical on a different line. When a problem area is seen, the injector pump can be kicked on. I use this method in the spring. For winter wheat, I can use a pint in one line, than one and a half pints on the second line.

Explain respraying.

Jim: For spring crops, a weaker chemical is used, then 24-36 hours later, the places with bad weeds are resprayed. The initial spraying makes the leaves curl, so the underside of the leaves turn up. Then, when I respray, the spray hits this unexposed area and this kills the weed more effectively. This method doesn't work after 4-5 days, because the plant will harden up. It's easier to kill plants when they're small. As the plants grow, they develop a better root system and get stronger. They are also easier to kill when they move nutrients down, when they bloom.

How do you know where to respray?
Jim: I ground spray, so I know where the problem weeds are. Then, I make a map, either mentally or physically on paper.

How do you spray?

Jim: I have converted an old combine into a sprayer. **(See the related article: From Combine to Efficient Sprayer.)** This gives me good vision and a wide boom. My boom is 65 feet wide. Some others in the area are 72 feet wide.

It's important to calibrate the boom so that you have effective and uniform nozzles that put on spray over the width of the boom. This reduces under and over spraying.

I put on new nozzles every couple 1,000 acres.

I also get better coverage by using a stronger chemical at less of a rate.

How do you know when to reduce rates and how much to reduce them? Can you give us specific examples?

Jim: I experiment. I experiment on small acreages--10 to 20 acres, then expand the areas. I study the chemicals so I know their limitations and variations. Sometimes I have been able to use three quarters of a recommended rate.

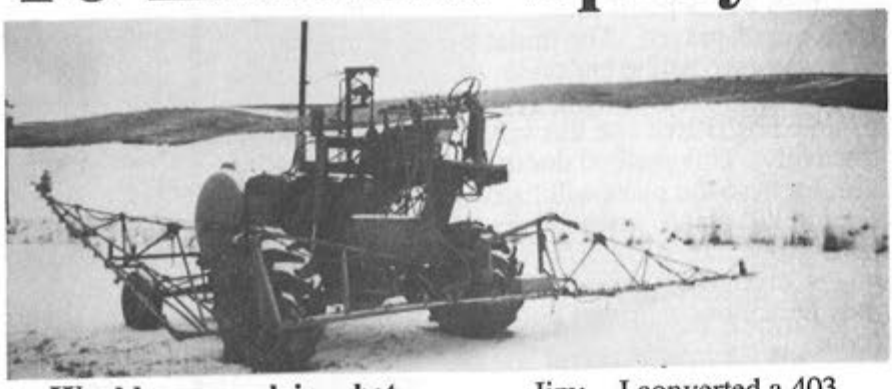
One example is with Landmaster. The label recommends 54 ozs./acre and I've found, from careful experimentation, that I can cut this to 40 ozs. on my ground. This wouldn't be true

on all ground, everywhere--but it's true on my ground. The label has to recommend an amount that would be enough anywhere, so the farmer has to experiment to see what's best in any given place.

Another example: Bronate recommends 1 1/4 pints/acre and I've found that I can effectively kill weeds at 9/10ths of a pint/acre.

I should add that it's the configuration of my sprayer that helps me to get this kind of efficiency. (**See the related article: From Combine to Efficient Sprayer.**)

From Combine To Efficient Sprayer



Would you explain what you did to your combine and why you did it?

Jim: I converted a 403 International Combine (see the above picture) because I

had one and because it had 2-way leveling, so the boom can stay level to the ground. (I suppose you wouldn't need 2-way leveling if you were farming level ground.)

The 403 had conventional gears and I knew this wouldn't work. The reason for this was that with conventional gears you're locked into 3 speeds and you have to stop to change gears. It's tough to re-start the combine and the spray at the same time because you have to re-pressurize the boom when you re-start.

The solution to this is to use hydrostatic drive because you can change speed in response to heavier or lighter crop conditions. For example, using hydrostatic drive, you can go from zero to 10 (approximately) in second gear. Using conventional gears you could only go from 2 1/2 to 5 (approximately).

Another advantage of using hydrostatic drive is that you can drive all the way to the end of the field and then stop immediately and still keep the boom pressurized.

I used conventional tires and wheels because they produce less compaction and less dust over the weeds than a tractor pulling a ground sprayer.

I run the sprayer at 4 mph and use a wet boom with Tee-Jet nozzles. There is a 40 inch wide fan from the nozzles and I put them on 20 inch centers. Normally, you'd have a 40 inch fan and 40 inch centers, but I use half the chemical on 20 inch centers and that means I hit each weed twice because the fanning action overlaps. Also, I use a smaller nozzle with a higher boom pressure. The higher boom pressure creates more droplets, smaller droplets and more uniform droplets.

Why is the number, size and uniformity of droplets so important?

Jim: You have to understand what the chemical does to the weed. It does two things: 1) it breaks down the natural waxes that are in the plant so the plant will absorb the spray; and 2) the bottom leaves don't have waxes, so spraying more concentrated droplets, at higher pressures, from two different angles, will get these bottom leaves and then the weed will absorb the chemical more rapidly.

Could you give us an example of how you'd do this?

Jim: Let's say you are using
(continued on p. 14, bottom of first column)

WORKING WITH CAST IRON

Rebuilding International Weeder Drive-Wheels

A customer brought in six International weeder drive-wheels with brand new bushings for installation into the wheels (see photo A). It turned out that the metal around the bushings was so worn that the new bushings would not fit snuggly in place. The effect of this is that the bushings rub against the bushing housing and the friction wears metal off the housing. Our job was to rebuild the bushing housing so the bushings would fit snuggly and prevent wear of the bushing housing.

The housing was cast iron so we built it up with a cast iron welding rod. Because the housing was cast iron it was pre-heated and we did all the welding while maintaining a consistent temperature of at least 250° F. The weld temperature is over 1700°F and it will cool very rapidly if the cast iron is not preheated--the weld will actually pull away from the metal if pre-heating is not done. After the welding process was over, we controlled the cooling time by wrapping it thoroughly in insulation. We slowed the cooling to prevent cracking of

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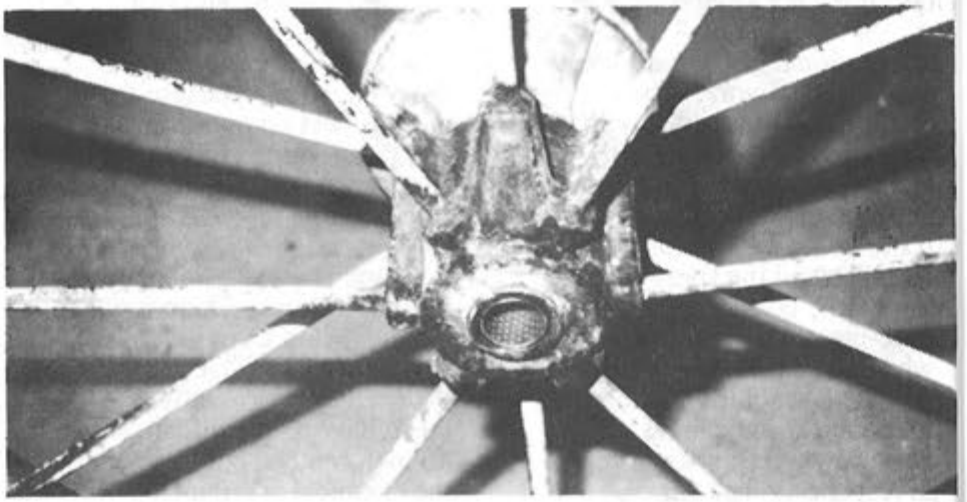

Photo A

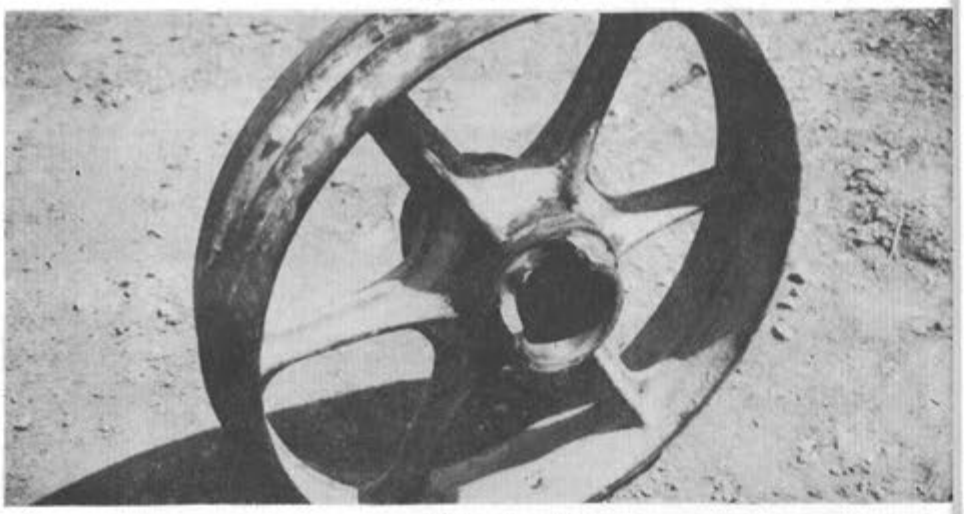

Photo B

the cast iron housing. (One property of cast iron is that when it cools quickly, it cracks.)

After completing the weld, we machined the housing back to its original specifications. Then we installed the bushings.

The easy thing about this repair was that only the housing was cast iron and the rest of the wheel was steel, but when repairing a John

(Continued from page 13)

From Combine To Efficient Sprayer

chemicals that are set up to be on 10 gallon nozzles/acre with a 40 inch fan and 40 inch centers. We take that chemical and use 5 gallon nozzles/acre with a 40 inch fan and 20 inch centers. The weed still gets 10 gallons/acre, but it gets two 5 gallon shots instead of one 10 gallon shot. The chemical becomes stronger because there is a higher ratio of chemical to water (10 gallons to 1 pint compared to 5 gallons to 1 pint).

Also, the weed gets sprayed from both sides instead of just from the top.

Deere crawler idler wheel, the entire wheel is cast iron and thus the problems of pre-heating and post-cooling are multiplied (see photo B on page 14).

When welding the crawler idler we put it into a forge and wrapped it with a heat-resistant (ceramic wool) blanket. Then, we made an opening at the point that needed to be welded and proceeded as we described above. Cooling was easier because the forge had built up so much heat, that all we had to do was turn the forge off and it and the idler slowly cooled together.

The idler needed its housing rebuilt too, but it was more difficult because the housing was tapered and we had to match it exactly to the tapered axle. This may not sound very difficult, but it was hard to match a worn axle. If we were machining the housing to fit a new axle, we would have specifications to follow, but matching a worn axle we had to take many measurements and do many trial fittings.

Welding cast iron is as easy as welding mild steel if pre-heating and post-cooling procedures are followed carefully. It goes without saying that the correct cast iron welding rod also must be used.

BEATING CHEAT GRASS

Editor's note: We originally called Dennis Stone to find out if he had any tips on reducing spray costs, but instead we found that he'd made a discovery that led to a whole new approach to weeding and fertilizing his fields.

Dennis Stone, who farms near Almira, Washington, used to have draws that were solid cheat grass and borders that were more cheat grass than wheat. Some of his

ground gets 12-13 inches of rain while other areas get only 10.

Tell us what observation led to your new approach to attacking cheat grass.

Dennis: I took a field that had a bad cheat problem and decided that the only way I was going to cure it was to turn it around and put in a spring crop (using a 3-year rotation). That spring, as I worked the field, I saw a lot of unsprouted cheat seeds. After sowing and fertilizing we got a half inch of rain and I was afraid that the cheat grass would take over. It didn't--I had a fine crop.

I thought the moisture, by itself, would be enough to start the cheat growing. But the cheat didn't come until the fall when the ground started to cool. This made me realize that moisture wasn't the only factor--cooling ground temperatures were just as important.

Since you can't control ground temperature, what did you decide to do?

Dennis: I fertilized a summer fallow field **immediately before** applying Treflan granules to the top two inches of dry soil. This was done on June 1. The fertilizer remained **below** the Treflan .

Over the summer I watched for weeds and weeded a couple of times.

Reducing Chemical Costs Through

BIDDING

Editor's note: We called Dick Lloyd to find out what he did to reduce spray costs and found among other things he had an interesting way of buying sprays. Here's what he said.

(Continued from column 1)

BEATING CHEAT GRASS

Then I seeded winter wheat **below** the Treflan at the normal time--end of August or start of September. The Treflan is tied up to the surface soil and doesn't leach down into the seed.

When I applied the Treflan, I cultivated at the same time so the granuals wouldn't stay on the surface. (They'll breakdown if they are exposed to the sun.)

The Treflan label requires two harrowings, but that would pulverize the soil so finely that it would be susceptible to wind erosion.

How did your experiement work?

Dennis: It worked so well that I could hardly find any cheat where I had used this method. Then I tried it on 250 acres and I couldn't find cheat in the draws or borders.

Is Treflan expensive?

Dennis: It cost about $10/acre, including the equipment.

Dick Lloyd, the inventor of the Lloyd's Loop, has been farming near Lewiston, Idaho for many years. He farms silt-loam soils, with about 16-17 inches rainfall. The soil is shallow: from 12-15" and the average crop is about 55 bushels to the acre. Dick says, "Everything we do is geared to farming in rock."

How do you reduce spray costs?

Dick: I buy chemicals on bid. (In order to make this work, you must have your own sprayer so that you don't have to rent equipment from a dealer.) We call our local dealers and tell them that we're going to need "X" amount of whatever chemical it might be. We're going to need so many pounds of one and so many gallons of another and ask them if they would like to give us bids on those. Most all of them do. It has worked real well. The only thing that you must do is **only give them one chance to bid.** Make sure they know that you won't be back around. This gets them bidding against each other. They'll give you their best bid first and you must **keep their bids in confidence.** Don't tell anyone else what they bid or who was bidding. They've all been very good and it's worked real well.

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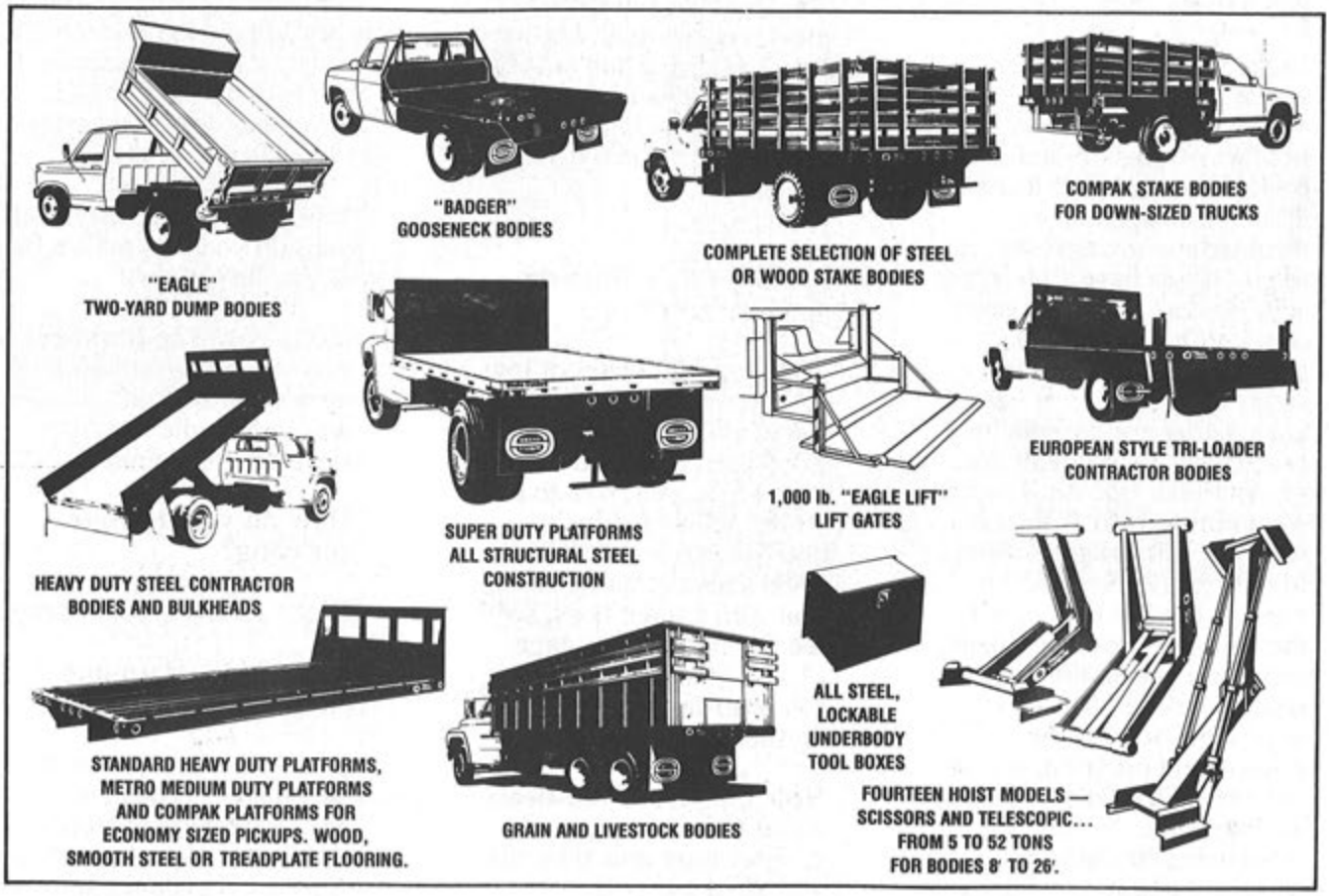

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Merv Witherup, *Truck Equipment Manager*

Do you do this on a year-to-year basis?

Dick: Yes. Either year-to-year or season-to-season, like spring and fall. Primarily, ours is all fall. We do this on both fertilizer and spray chemicals.

What kind of crops do you grow?

Dick: Continuous winter wheat: Daws and Hill 81. We don't have soil enough to hold water, so summerfallow isn't the answer. We learned 25-30 years ago that summerfallow wasn't the way to go. If you have 1 bucket of soil, you can't put 2 buckets of water in it. So, we do better having a crop that struggles all its life, rather than having a summerfallow crop that starts out real well, grows and is really lush, then when it runs out of water it withers. If it struggles all its life, there will be some kernels, but if it uses up all the moisture growing foliage, and never gets to the kernel point, we don't have anything. Now, in the government program, we do have chemical fallow for set-aside ground. Normally though, we recrop back, wheat-on wheat-on wheat.

What kind of weed problems do you have?

"Grassy weeds are a real problem. Of course, with any continuous crop, that is a real problem. We are going to have some spring wheat this year, but we haven't had any for years. Normally, this is very poor spring wheat country, but we're hoping with no-till we'll get it in early enough that it will do well. We're going to try it. When we first started continuous cropping, we tried to have about a third spring wheat, two thirds fall wheat. But the spring wheat was too erratic in yield, so finally we gave up and had nothing but fall wheat. So with the straight fall wheat rotation, we get into trouble with cheat and with wild oats. The broadleaves don't provide any more problems than with any other cereal or spring and fall rotations. Ideally, if we can raise a spring crop , it would help us greatly in our weed control."

In what other ways do you cut costs?

Dick: I use low rates of low volume applications. I use less chemical with less water to get a concentrated droplet. If you have that, you do an efficient job. **(Editor's note: it turns out that Dick does the same thing that Jim Liefer does, so see the articles on page 11 and page 13 that relate to his spraying method.)**

How long have you been using the concentrated droplet idea and why did you start using it?

Dick: We've used the concentrated droplet idea for about 7-8 years.

Through experimentation we discovered that we would get a better job by going with lower chemical rates. Monsanto Company has come to that too and has started to recommend lower rates for their chemicals, for Round-up primarily. Not all chemicals respond to that. However, 2, 4-D does, as do Round-up and Landmaster. For example, when Round-up first came out they recommended 1 1/2 pints/acre and then they dropped to a pint and later they came down to 12 ozs.. Now they recommend 8 ozs..

I've had luck going as low as 4 ozs. when the weed was extremely healthy, but if the weed is drought stressed, then sometimes, you can't kill it with 8 ozs.. The reason for this is that the weed shuts down and doesn't absorb more chemical.

When you reduce chemical rates do you also reduce the surfactant?

Dick: No! The surfactent is very important and we don't reduce the amount. In effect we increase the ratio of surfactant to chemical.

How do you do your spraying?

Dick: I use a ground sprayer.

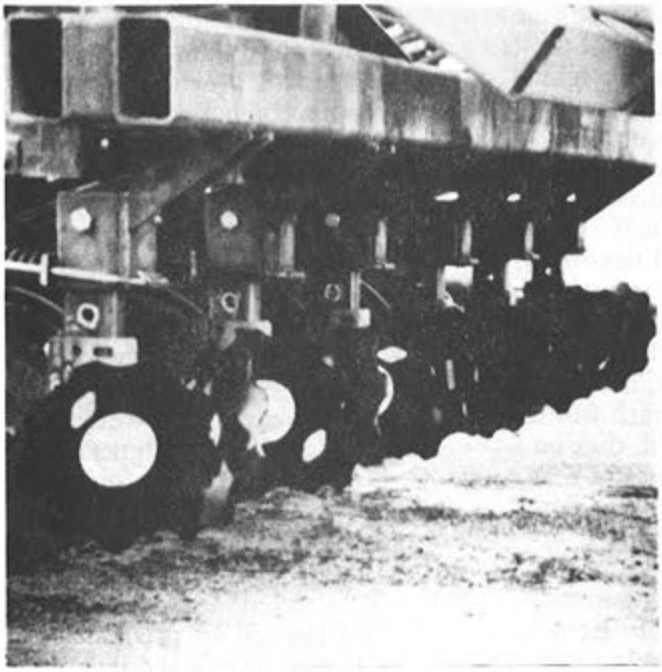
What kind of ground sprayer do you use?

Dick: The one that we've been using is built on a Military 6-by-6 Chassis. The new one that we haven't finished yet is built on a 4100 International 4-wheel drive tractor. It's a unit that was built about 20 years ago and we've lengthened the frame and then widened it and had the tank mounted on it. The booms will then hang on it.

I've also used hooded sprayers and I think they are the sprayer of the future. The hooded sprayer has a hood over the boom and curtains in the front and rear. **(continued on the bottom of page 19)**

Seed Bed Preparation

A new way to remove trash in seed rows



In the 9" - 11" moisture areas the double-disk drill is rarely used because it doesn't penetrate deep enough--the hoe opener drill is the normal implement used. However, one customer who has successfully used no-till operations on his dryland, had a Haybuster Double-disk no-till drill that worked very well. Upon investigation

(continued from page 18)
Reducing Spray Costs Through BIDDING

This traps the chemical material. I bet that within 4-5 years, you won't see anything but hooded sprayers. You should be able to do the same job with less chemical, because the coverage will be so much better than with a conventional sprayer.

With the hooded sprayer you can spray in a more timely fashion because you won't lose effectiveness in a slightly breezy day as you do with a conventional sprayer. This is especially true of a contact chemical, but less true of a wetable powder that is primarily soil-active. The combination of a hooded sprayer and a wetable powder will reduce spraying costs.

of seedlings throughout his field, however, he found that there was damage to the root system. This damage was caused by the surface residue being forced into the seed bed by the double-disk configuration.

The double-disk is important because it plants the seed without disturbing the available moisture, it also incorporates fertilizer in a paired-row pattern. This is especially important in drylands where the seed bed tends to be crusty--resistant to penetration-- if not conventionally tilled. Another advantage of the double disk is that it places the seed and fertilizer very accurately. Therefore, the customer was motivated to solve the root damage problem without eliminating the double-disk.

The solution that he found is new to this area, but well established in Kansas. In the picture (on page 19), notice the round, serrated disks in front of the double-disks on the drill. You can see that these trash-disks work in pairs--the forward motion of the drill rotates them. As these trash-disks move they throughly clean residue from the soil surface. Now the soil surface is ready for the double-disk to plant the seed.

Proper Installation Is The Key to Success

The frame of the drill has to be substantial enough to resist the constant hammering of the trash-disk while it's working. By hammering we mean that the trash-disk **assembly** is spring-loaded. If the trash-disks are mounted rigidly, we would lose all depth control. The lack of depth control would mean that the trash-disk would cut too deeply into a slight rise in the ground and would go over the top of the soil when there was a slight dip; in addition, we would lose the trash-disk entirely when striking a large rock.

The trash-disk also needs to have vertical adjustment capabilities--the amount of residue in each field would dictate the setting used at any time. For example, a field with especially heavy trash would dictate that the trash-disk be set lower than in a field with light trash.

The mounting assembly needs to be strong enough so that the operator can make turns in the field without bending the whole assembly. (We might note here that this customer tried an alternative turning procedure: rather than going around and around a field, he also tried making a pass, stopping, pulling the trash-disks out of the soil, then reversing direction and returning to his starting point--he completed the field going back and forth rather than around and around.) On this particular drill the completed assemblies were welded to the drill--on other drills, it's possible that the trash-disk assemblies could be bolted to the drill frame.

Using these trash-disks the customer was able to increase plant population by 20% - 25% on his entire farm. The primary reason for this improvement is that the seedlings didn't suffer root damage as a result of trash in the seed bed.

Repairing Bellhousing for Melroe Spray Coupe

The problem with repairing the bellhousing for this spray coupe is that it is made out of aluminum which was alloyed with magnesium. In the past it would have been easier to contact wrecking yards around the state and ask for a VW van bellhousing--it turns out that these two bellhousings are the same. The VW van bellhousing is hard to find and if you need it in a hurry you're out of luck.

Until recently we couldn't help you either because we couldn't weld the aluminum with a magnesium alloy. However, we found a filler-rod that was very comparable to the alloy of the bellhousing--thus we can now weld this unique bellhousing. The filler-rod we use is made by Welco Alloys and it is called AZ92A. The welding process we used is called Heli-arc, also known as TIG (Tungston Inert Gas).

The VW van bellhousing is still less expensive, but if time is a factor you now have the option of using this rod.

Learn More About

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SWATHING SEED CROPS

How to Save $50 An Acre Growing Alfalfa Seed

Editor's note: We interviewed Larry Riddle and Jack Hooley when we heard that they had found a way to save $50 an acre by changing a harvesting method and modifying an implement.

Larry Riddle is a supervisor for Adams County Weed District. He was in the seed business for 23 years. He oversaw the production of alfalfa, clover and grass in Washington, Oregon and Northern Idaho.

Jack Hooley is a supervisor for inter-county Weed District #51 in Warden. He grows irrigated barley and alfalfa for seed. He also does custom swathing.

Tell us how you can save money by swathing.

Larry/Jack: To harvest alfalfa it needs to be dry. The ideal is to have green stems, and dry leaves so the crop will go right through the combine and have less shatter and better separation.There are two ways to dry alfalfa: defoliation and swathing.

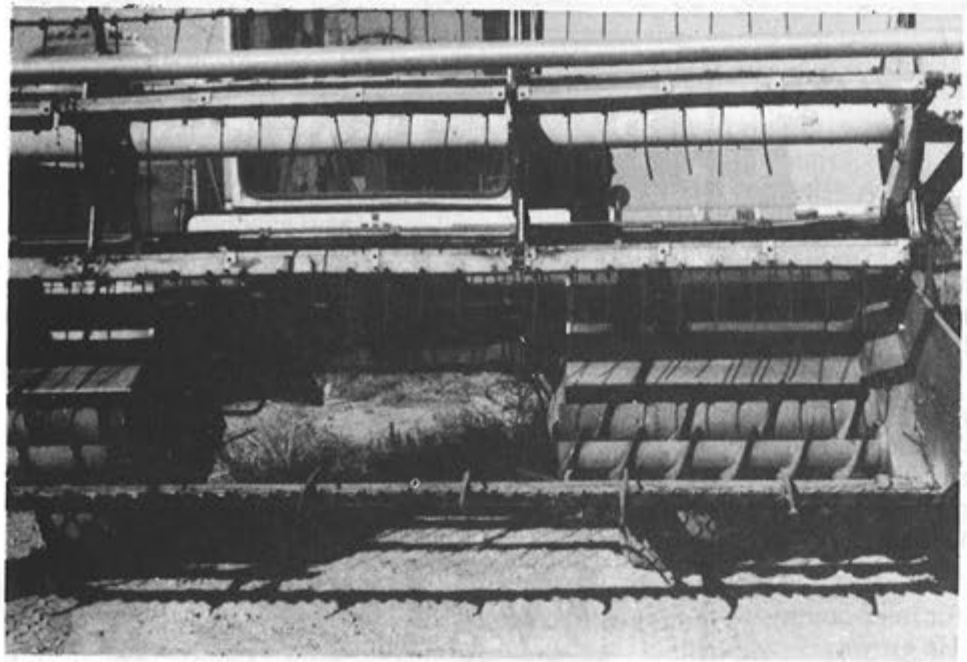
Could you explain defoliation?

Larry/Jack: This is the use of chemicals to dry the plant. It leaves the plant standing while drying the season's growth. For perennials, the annual growth is dried up and after cutting for harvest, the plant will start growing again. For example, alfalfa. But for annual plants, the entire plant is killed. For example, radishes and carrots."

The biggest problem with defoliation is dry-down, which is the complete drying of the plant. This process may not occur and the seeds may not be completely dried out. This causes the loss of seed over the back of the combine because the seed will still be wet and won't separate from the plant. It may take two operations to do this at $25 per acre each. There is also a problem with defoliating chemicals being taken off the market."

Now you're using the swathing method. Could you tell us why this is better?

Larry/Jack: We have started to use a swather,



Reel Raised to Show the Widened Throat

last year, in 1986, we did over 100 acres. This year we did about 300 and we hope to increase this in the future.

Swathing is better because it only costs about $20-$30 an acre, which means you can save a minimum of $50/acre. The savings are even greater because less seed is thrown over the back of the combine. The plant is totally dried throughout the entire swath, there is a quicker dry-down, there is less wind shatter, and there are no chemical costs. We can also start combining as soon as four days after swathing. For defoliation, the first spraying dries the top growth in 1-4 days. The second spraying, on the 5th and 6th day, goes to the ground area. This can add up to 7-8 days and possibly longer."

Do you use a regular swather?

Larry/Jack: No, we have widened the swather throat. A regular swather has a 40 inch throat; we widened ours to 72 inches.

Why do you widen the swather throat?

Larry/Jack: The wider throat lays the wind row flat, which helps it to dry out quicker, so it can be harvested sooner. Alfalfa has a lot of foliage after an entire season and it is very light and fluffy. This can cause the crop to become packed in the middle of the machine and the fluffy bulk won't go through. The bulk can also wrap itself around the reel and ruin some of the reel parts.

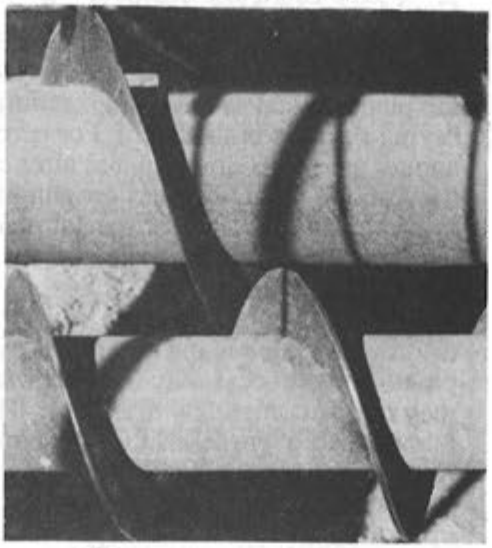
The swather can be used for other hay crops as well as seed crops.

Could you explain the throat modifications?

Larry/Jack: We cut the augers to the bearings and the upper plates were cut even with the augers. Because of this, certain braces were eliminated. We then reinforced the full length of the cutter bar with a square-tubed bar which gave middle support after the braces were taken off. This was especially important for rocky areas.

What other modifications did you do?

Larry/Jack: There are two sets of augers, one on the top and one on the bottom. We found that we needed heavier flighting. The original wore real thin and knife-like. This made the augers grab the alfalfa and wrap it around itself. This pulled the flighting down and changed the flighting angle. We took the augers to Barnes Welding who made new shafts, tubing, and flighting. The flighting is thicker and of heavier material. It has never wrapped and will last longer than the original. To replace original augers would have cost $1200 and they won't last very long. Barnes charged half that and will last the life of the machine."



The top auger is the original and has worn thin. In comparison, the lower auger is thicker and will last much longer.

CRP

What works

Editor's note: More than 25% of the farm land in Douglas county is now contracted to CRP grass. We noticed that a couple of fields looked exceptionally good, so we wondered what was done to them. One such field is pictured on the cover of this issue--the rainbow goes right down into the field. This field belongs to Bob and Neil Nelson of Waterville. We called them to see if the rainbow was what made the difference or if they did something else. We also interviewed Don Barnes, who also farms near Waterville, to see what he did.

Bob and Neil Nelson are cousins who farm together about thirteen miles northeast of Waterville. They are in the 9 - 12 inch moisture range.

Could you tell us what you did to get such a beautiful stand of grass?

Bob/Neil: We seeded into barley summer fallow on November 4th and 5th. We seeded as shallow as possible. We used 10 lbs. of Mandan Pubescent to get 8 lbs. of pure live seed. We used John

Deere Common Drills at 7 inch spacings. Our post-emergence spraying was done at the 4 to 5 leaf stage. We used one pint of Amine, plus surfactant, with 4 gallons of water/acre and applied it with a Melroe Spray Coupe, nozzles pointing down. We drove the sprayer at about 8 miles an hour.

Don Barnes farms east of Waterville, near Supplee, in a 9 - 12 inch moisture area

Could you tell us what you did to achieve such a good stand of grass?

Don: I planted in late November into summerfallow. I planted as shallow as possible. Actually, it had rained just before planting so the ground was slightly crusted. I used an International 150 split packer (boots on 14 inch centers).

Seeding was 10 lbs of actual seed/acre, which was 8 lbs. of pure live seed. The seed was Mandan Pubescent.

On post-emergence I sprayed at the 3-4 leaf stage and this was earlier than SCS recommended at that time. I sprayed early because it's best to kill the weeds when they are small and I havedone experiments that made me believe it would be safe.

I sprayed with one pint of Amine, plus the spreader sticker with 4 gallons of water. I used a Melroe sprayer, but I positioned the nozzles pointed straight back, parallel to the ground. I know that most sprayers point the nozzles straight down, but I've found I get better results if I point them straight back.

I drove the sprayer at top speed while spraying--this was usually 21 miles an hour, but in some places I could only go 14.

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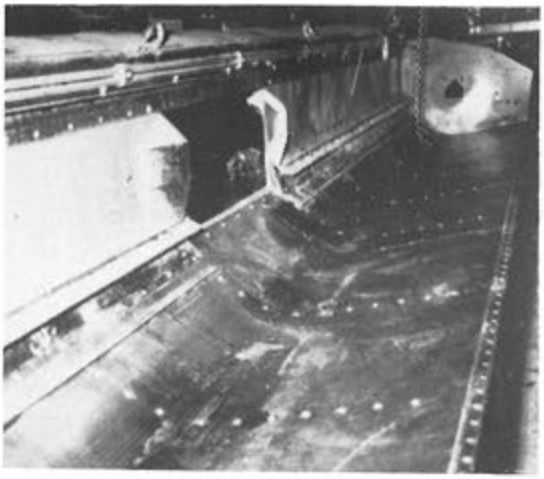

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