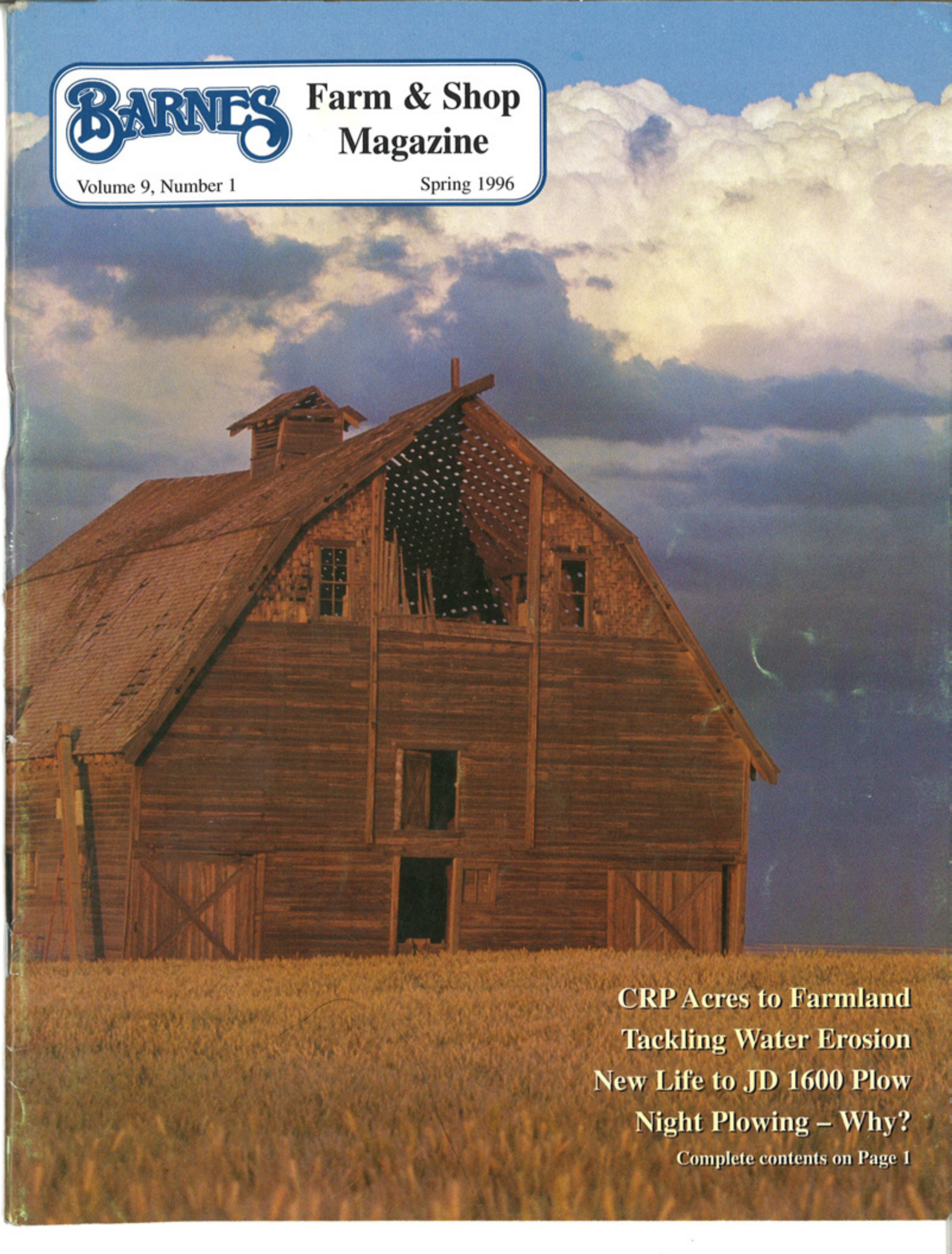


BARNES Farm & Shop Magazine

Volume 9, Number 1 Spring 1996

CRP Acres to Farmland

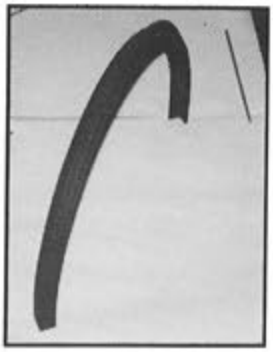
Tackling Water Erosion

New Life to JD 1600 Plow

Night Plowing – Why?

Complete contents on Page 1

Single Packer Repair Caps



* *Fits like a duck in a mud hole!.*
* *Easy to install*

Price each ***$26.95*** *in quantity*

BARNES Welding, Inc.

Waterville Industrial Air Park
(509) 745-8588

Direct Fit Replacement Parts

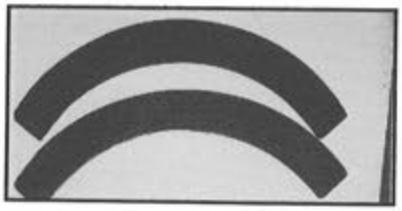
"Is our Speciality!"

Split Packer Repair Bands

* *Fits packer wheel.*
* *2 ½" wide material.*

Price ***$16.95*** *in quantity*

Taper Wheel Segment



* *¾" wide / 3 per wheel.*
* *Fits wheel perfectly.*

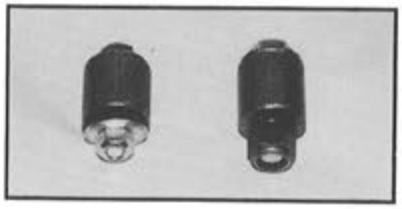
Price ***$18.50*** *in quantity*

Modified LZ & 9000 Boot Points

* *Recycle your own part.*
* *Up to 5 times more life.*

Price each ***$12.50*** *each installed*

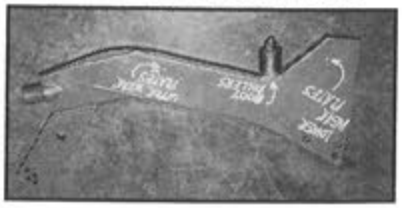
HZ Boot Rollers



* *Sacifice its own life for the packer.*
* *Easy to install.*

Price each ***$5.75*** *in quantity*

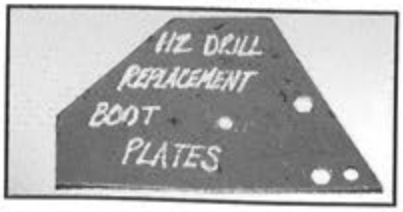
New Heavier HZ Boots



* *Direct Fit*
* *Heavier Side Plates*
* *Alloy reinforced bars*

Price ***$240.00*** *in quantity*

HZ Boot Repair Plates



* *Holes pre-punched*
* *Direct Fit*
* *1/8" & 3/16" plates*

Price each ***$12.50*** *in quantity*

"Better Than New"

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Barnes Farms & Shop Magazine Credits

(509) 745-8588, P.O. Box 614, Waterville, WA 98858

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Editor ..... **Maryann Sprauer**
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Circulation Director ..... **Jason Barnes**

Thank you to all the Farmers mentioned in the articles for their time and information.

Sibby Slagle Meisner & Maryann Sprauer

Tom Williams

Cover picture credits:

Tom Williams from East Wenatchee took the beautiful picture of a barn in a wheat field 6 miles north - east of Waterville.

Tom is a Wenatchee native who is a photo journalist with the Wenatchee Daily World. He has had a life long ambition to master photography. This photo shows he is indeed a master photographer.

In addition to enjoying skiing and mountain biking, he is also a freelance stock photographer.

For comments or help from Tom, please call (509) 884-2634.

"In The Groove" Three Innovative Farmers Tackle Water Erosion

The purpose of this story is to look at how to save moisture and top soil in planted and emerged winter wheat although tests have shown this method produces equal results in stubble ground. Our top soil is such a scarce commodity that anybody who has a suggestion for saving even just a little bit of it perks up our ears.

The three farmers you will meet have a combined experience record of 20 years in the ripping of their winter wheat. Each one professes that this is the best way to save top soil especially on steeper slopes.

This picture is typical of runoff on winter wheat ground without erosion control measures, such as grooving, ripping or slicing.

Harold Clinesmith

Farms 7 miles south of Benge WA in an 11" Rainfall area. He and his wife Dorothy farm 1400 acres of which 700 acre were grooved this past fall around Thanksgiving. Harold has been farming for 47 years on his ranch, "Skyline Wheat Ranch". His spring wheat yield is 28 - 30 bu/acre and winter wheat yield is 40 bu/acre. He prefers to seed all of this with his JD HZ 16 " drills.

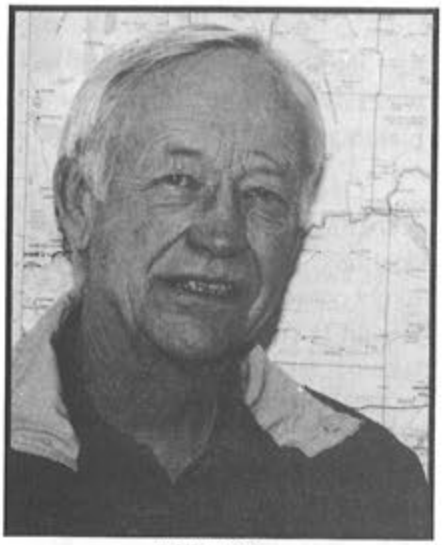
Harold is probably the most well-known of these farmers as he has been written about in other publications as well as receiving grants to further his research. He is the only one who has test data to prove his system works.

Harold mounted 1/2" thick by 12" wide steel flat bars on a Calkins CFC cultivator frame with4 1/2' centers. The shanks are fixed to the plow and he has a shear pin to protect the unit if it hits something hard. He runs these shanks 10" deep in the seeded ground about 3 1/2 to 4 1/2 miles per hour.

Harold noted that you can pull this unit at any speed with his crawler but slower speeds build a better groove. This operation is done in the late fall (around thanksgiving) after you have received considerable moisture following the contour of the hillside to stop runoff. If it is November and you do not have adequate moisture not all is wasted. However, if the ground is dry then most of the dirt will fall back into the groove giving you considerably less open area to collect runoff.

Harold's process must be done before it freezes. His ripping operation is done with slight zig-zags to the furrow to minimize wheat damage.

Harold has been "grooving" since 1989 and has tests to prove that he has saved up to 5 tons of top soil per acre compared with the untreated piece of land. He also noted that there has been no apparent reduction in harvest yield and the moisture and soil saved far outweighs the minimal damage to the wheat. If a farmer wanted to build this unit it would be relatively easy utilizing the equipment most farmers own.



Bill McKay

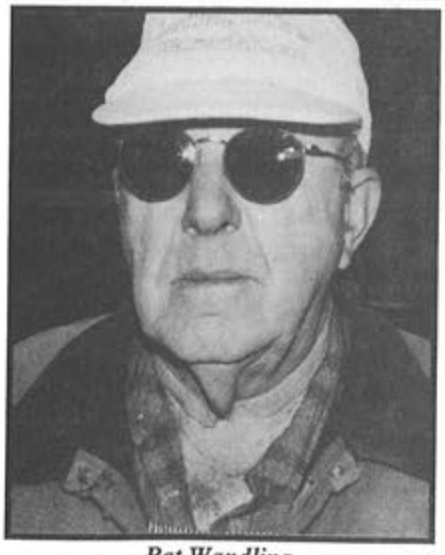
Farms in a 14"-15" rainfall area 10 miles north of Almira. The soil type is Bagdad silt loam. Spring wheat yields 40 bu/acre and winter wheat yields 60 bu/acre.

Bill and Dave McKay have farmed together on their farm in Lincoln Co. and are responsible for about 3000 acres of farmland.

Bill and his son, Dan, started the McKay Seed Company in 1981. Bill is senior partner of the seed business.

Dave's family also partners in the seed company are Andrew, Stewart and Connie. Dave passed away in 1995.

Bill has taken a different approach to installing grooves in his wheat - he slices em'! Bill made a 48" diameter disc 2" thick that was sharpened to a "Vee" to slice into the moist fall dirt. He mounted each disc (coulter) on oil filled truck hubs and installed them, spaced 20 feet apart on each end, on an R&R sub soiler frame. This process needs to be done late in the fall after fall rains give you adequate moisture. Bill contoured his hills with the large coulters into the emerged winter wheat. This must be done before it freezes. In his first year trial Bill observed no apparent wheat damage and there were significant soil and moisture savings due to the process. He tried to make sure that the coulter went at least 12" deep. Bill noted that the rolling effect on the groove left smooth and somewhat packed sides allowing the groove to collect more soil and moisture. Also, noted that it appeared to collect more moisture in ground that had been seeded with a 16" drill versus ground that had been seeded with a 10" drill. If a farmer wanted to build this unit it would be difficult utilizing his own equipment. He would have to hire outside machine shop services to make the disc plus own a large hitch unit like the R&R sub soiler.



Pat Wandling

Farms 9 miles south of Mabton in Yakima County. He is 73 years old and has farmed most of his life. His farm is in an 8" rainfall area where winter wheat yields 28 to 30 bu/acre. He seeds all his ground with IH150 18" drills.

Pat has been ripping his winter wheat ground since 1983 with more than satisfactory results in top soil and moisture savings.

Pat's approach takes this science one step further. His unit has the capabilitity of **leveling on the hillside**. He only pulls 1 shank that is 7/8" thick but is 20" wide and set up to rip 18" to 20" deep on the contour of the seeded hillside.

Pat feels that if the point is always kept vertical then he is able to collect more runoff. When he gets ready to rip he uses his wheel tractor to pull the ripper. Pat's **ground must be frozen** before the operation. He would like to haveat least 3" to 4" of frost in the ground. The frozen ground offers distinct advantages: 1. The ditch that this unit makes at 20" deep is clean and no top soil falls back into the groove allowing more potential water storage. 2. If the ground is frozen then the furrows will hold the tires up away from the wheat and does not injure it. Come harvest, Pat said, "There is no apparent wheat damage due to the ripping operation".

Pat rips on contour ,any where from 20 to 90 feet a part depending on the slope of the hillside.

After the first two runoffs Pat caught every drop of top soil and water. This last runoff was right after a week of 15 degrees below zero and then it rained 2". Pat's grooves were already full so he lost some soil but nobody kept any soil during these conditions.

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Bringing CRP Grass Back To Farmland

Just thinking about returning the Conservation Reserve Program (CRP) back to farm land raises many questions. How do we keep this marginal crop land from wind erosion? What about run off? The CRP has been a very good sponge to slow down or stop water erosion. Is there any current farm practice that does not bring the rocks to the surface so that a good portion of our time is not spent picking rock? Can we afford to farm this marginal land again? After 10 years will our existing equipment even be able to run (Those who have 100% of their land in CRP)? How many years will it take to get a normal crop from this land? What about wildlife? Can we break it out and not harm new life and if we take many acres out will the wildlife be able to survive in other protected areas (Ditches and draws)?

Beginning in 1994 Washington State University has been coordinating a CRP take-out research program with replicated on-farm trials and growers' field-scale equipment. The project focus is to help growers identify local take-out options that optimize agronomic performance and profitability of the first crops after CRP, provide effective crosion control, and help retain soil quality improvements gained under CRP.

Four CRP take-out trials are underway on winter wheat after summer fallow (seeded in 1995) in Adams, Lincoln, Franklin and Garfield Counties. The trials include a variety of tillage and residue management options and timings including: early fall flail, mow or harrow; fall disc; fall chisel, spring disc; spring sweep; and spring burn-sweep.

Three CRP take-out trials have been conducted in Columbia County with spring CRP take-out seeding spring wheat or spring barley. Treatments included moldboard plow, burn-sweep, disc, sweep and direct-seeding. Four spring take-out trials for spring cereals are planned in Douglas, Adams and Lincoln Counties in 1996. The trials will focus on direct seeding options and residue management practices and include intensive tillage comparisons.

Residue management is a top priority for saving and maintaining moisture in this marginal land. Of course the more moisture the better chance for increased yield.

The NRCS suggests that growers consider the farm program provisions. Your base acreage restriction may not allow you to convert all of your CRP acreat one time.

Spring planting should be considered if: 1) There is adequate moisture for a spring crop. 2) Shallow soils where the sod profile fills completely with moisture each winter. 3) There is a high potential for crop infections with winter annual grass weeds such as downy brome and jointed goatgrass.

Fall planting after summer fallow could be considered in areas where spring crops have not been profitable, particularly if soil water content is low at spring planting time.

One special consideration for preparing CRP land for crop production: Spring takeout will most likely conserve the most winter precipitation. The WSU CRP take-out research that fall discing or other practices that remove residue cover, exposing bare soil, reduced overwinter water storage by about 2 inches compared to spring take-out options.

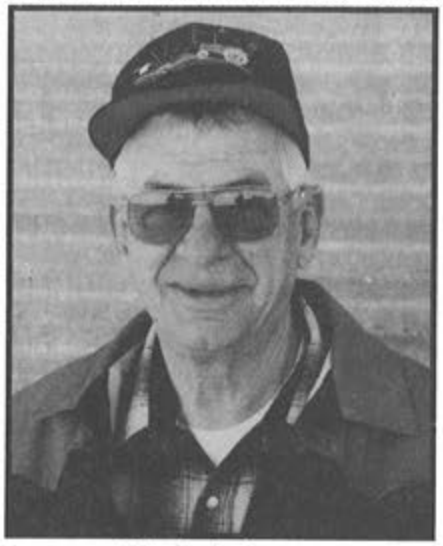
We at Barnes Farm and Shop want to know what you, the operators of the farm, would actually do today if you had to convert your CRP acres into producing farm land.

Read Smith

Read Smith of J.W. Smith & Son, Inc. farms near St. John in Whitman Co. has farmed since 1973 with 1700 acres in the CRP. His first contract will end in 1996. The soil type is Walla Walla Athena. Read is in a 13" to 15"annual rainfall area which raises 30 - 35 bu/acre spring wheat and has a 50 - 65 bu/acre winter wheat average.

Due to the lush growth of grass, timing is important! If Read could not get started early in the spring, he would probably burn the grass in the winter and next spring would spray with Glyphosate to kill all growth. Finally, he would take soil tests to determine which fertilizer is necessary. He would probably spring crop for several years to clean up the cheat grass and using the Blankenship Drill, a 1 pass drill.

His first year yield after CRP takeout Read could expect an average yield of 30+ bu/acre.



Marvin Ludeman
Clar Mar Farms in Douglas Co. is owned and operated by Marvin Ludeman.

He has been farming since 1959 east of Waterville in an 11" annual rainfall area. He has 1800 acres in the CRP which will be up in 1996. Winter wheat average yield is 46 bu/acre.

Marvin wants to strip farm his CRP acres. The way he takes it out depends on how early he is allowed to work it. Since this interview was based on a no earlier than October take out, this he would wait until Spring to spray Glyphosate to kill all growth. His next operation would be to sweep about 4" deep and then continue summer fallow by keeping it weed free. He would weed as

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CRP vs. Farming Cost - Would you Re New?

The Conservation Reserve Program (CRP) is the talk of the area and has a huge impact on our economic stability. In the Pacific North West there are thousands of CRP acres in question and awaiting the decision of Congress as the Farm Bill is being debated.

These charts are a guide to help with the decision of bidding for a CRP contract.

First you have to figure your net profit from farming. Assume you have 2000 acres of dryland on a 50/50 plant/idle rotation.

1) Equipment	Est. Purchase price*	Repl. cost/year**	Cost/acre (1,000 acres)
Plow	$10,500	$1,050	$1.05
Chisel plow	6,500	650	0.65
Vibrashank	9,000	900	0.90
Harrow	2,500	250	0.25
Culitivator	6,500	650	0.65
Air seeder/tank	29,500	2,950	2.95
Harvester	90,000	9,000	9.00
Tractor	80,000	8,000	8.00
Two trucks	35,000	3,500	3.50
Pick-up	11,000	1,100	1.10
Equipment shed	27,000	900	0.90
Grainery	12,000	800	0.80
TOTAL	**$319,500**	**$29,750**	**$29.75**

The first Chart is the Equipment cost which comes to $29.75 per acre. The second chart is the cost of doing business. Add the equipment cost of $29.75 to the cost of doing business (Labor, Fuel, etc.) and the cost goes up to $95.82 per acre.

2) Calculate your costs	Cost/acre	Cost/bu @ 30 bu./acre
Labor	$8.23	$0.27
Fuel	6.75	0.23
Repairs	9.49	0.32
Other	28.60	0.95
Taxes & Ins.	13.00	0.43
Avg. equip. Repl.*	**29.75**	0.99
TOTAL	**$95.82**	**$3.19**

The third Chart figures your income per acre less the cost of $95.82. When you subtract your cost from your income, you get your net income. Now go to the third chart and see if you can find your income range. Once you find that you move to the right and if the CRP bid is in the shaded area you should consider renewing your contract. Generally speaking, you need to receive at least 30 bu/acre @ $4.00 to think about farming these acres.

3) It takes good yields and ***priced to beat the CRP***

Yield/ acre		Price/bu. ($)		Total revenue/acre ($)		Less cost ($)		Net income ($)	FARMING NET INCOME OVER CRP RENTS* HIGH BID $38	MEDIUM BID $26	LOW BID $16
35	x	4.50	=	157.60	-	95.82	=	61.68	25.68	35.68	45.68
35	x	3.60	=	126.00	-	95.82	=	30.18	-5.82	4.18	14.18
35	x	2.70	=	94.50	-	95.82	=	-1.32	-37.32	-27.32	-17.32
30	x	4.00	=	120.00	-	95.82	=	24.18	-11.82	-1.82	8.18
28	x	4.50	=	126.00	-	95.82	=	30.18	-5.82	4.18	14.18
28	x	3.60	=	100.80	-	95.82	=	4.98	-31.02	-21.02	-11.02
28	x	2.70	=	75.60	-	95.82	=	-20.22	-56.22	-46.22	-36.22
21	x	4.50	=	94.50	-	95.82	=	-1.32	-37.32	-27.32	-17.32
21	x	3.60	=	75.60	-	95.82	=	-20.22	-56.22	-46.22	-36.22
21	x	2.70	=	56.70	-	95.82	=	-39.12	-75.12	-65.12	-55.12

TABLES: UTAH STATE UNIVERSITY

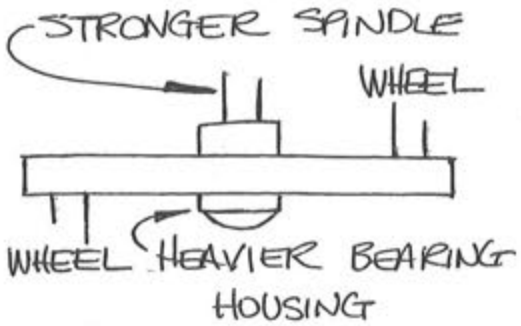
*Net after $4 / acre property taxes.

Adding Life To John Deere 1600 Plows

A customer came to us during his spring plowing operation with a unique problem. He was complaining about how his most useful John Deere 1600 plow was not maintaining the accuracy in depth control that it used to. He thought it was getting worse this last fall but he figured it was because of deep chiseling and come spring the sweeping operation would be just fine.

Unfortunately, spring is where precise depth control is very important in your early tillage passes and when your favorite plow does not perform up to expectations then there is "Trouble in River City".

His plow needed attention! The 1600 plow utilizes a walking beam system to control the depth of tillage. Unlike the old single wheat plows, this walking beam uses two wheel assemblies tied to one pivot point exactly in the center between both wheels. Both wheel spindles are welded on a rectangular tube - opposite each other.



The purpose of this system is to improve depth control in the field. For example, if we were using a single wheel plow and we drove over a 3" rock then the sweeps would rise out of the ground 3" where the wheel rolled over the rock. If we went over the same rock with our walking beam then the maximum rise of the wheels would be cut in half with only 1 1\2" of vertical movement. This system makes this and other plows that have a walking beam system twice as accurate as a single wheel unit. Very good design! The other advantage is that this system can carry more weight, making transporting a larger plow down the road a simple task.

When these plows were manufactured the walking beam pivot was made with a brass bushing and normal maintenance required daily greasing. There were no seals in these assemblies. This is where the grease would always attract and hold the dust and thus accelerate the wear in the brass bushing. In no time the bushing would wear out and the first outward sign of trouble would be the gradual leaning of the wheels. If this walking beam is not attended to then many things can happen. The most obvious would be allowing the tires to lean sideways and exert excessive wear and pressure on the sides of the tires they would not follow each other and would allow the beam to wander left and right compounding the existing wear many times over. The next worry, if left unchecked, the pivot spindle would eventually wear through the metal housing holding the brass bushing. This could lock up the walking beam so there would be no movement to follow the ups and downs of the terrain. The biggest scare would come when a person folded up his plow to transport and the pivot spindles, being excessively worn, could break off leaving the plow resting onthe ground. This customer's plow was really worn to the point where the spindle had worn past the brass bushing and part way into the steel housing. He needed help but his plow could be easily repaired and made "Better then new".

When we convert the walking beam to lifetime bearings we change everything except the tires, hubs and spindles. We make heavier bearing housings which hold two tapered bearing races and one inner seal plus a dust cap (same concept as the front wheel bearings on your car). Because our bearing housings are

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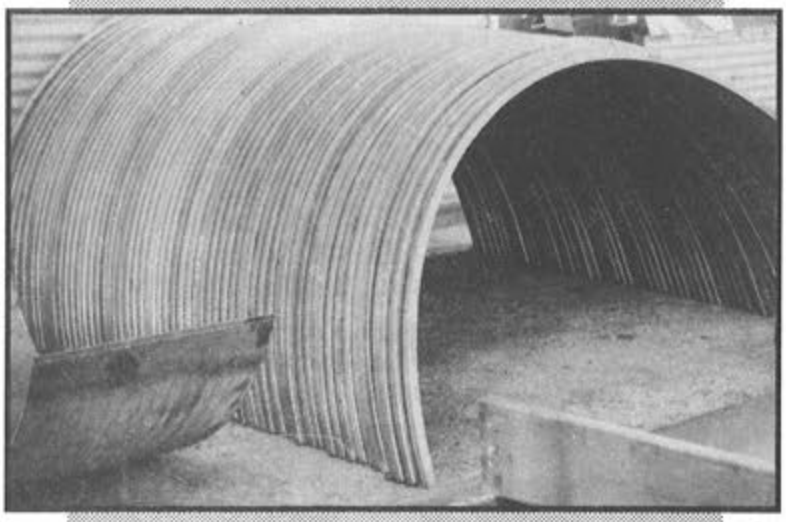
The Crew

Chris Wright

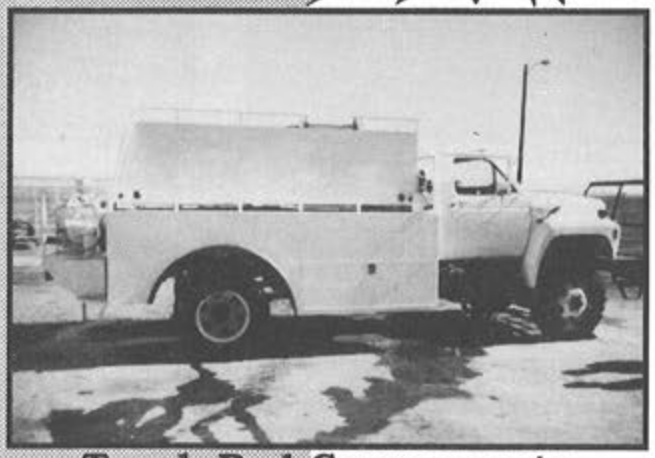
Hi I'm Chris Wright. I have 14 years experience repairing all types of farm equipment. I'm here to listen to your problems and discuss new ideas.

Custom Metal Forming



Header Bottoms

Better Than New!



Truck Bed Components

Some common products from our machines:

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Feeder House Tins • Tool Boxes • Truck Frame Channels
Grain Chutes • Fuel Tanks • Truck Bed Kits

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Waterville Industrial Air Park

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Plowing at Night - Why?

There are few ways to control weeds in your fields. The most common weed control is the use of chemicals which is costly and can cause damage to the environment and our health. The need to find "Alternative Approaches To Weed Management", was a topic for Iowa State University Integrated Crop Management Conference, in November, 1995.

The approach which caught our eye was an experiment done in Rosemount, Minnesota in 1994 and 1995 by Douglas D. Buhler of USDA's Agricultural Research Service which studied the effect of tillage in the dark. In our terms, plowing at dark. The idea is simple. With the absence of sunlight weed seedlings will not grow which cuts down on weed infestation in the fields.

Plowing or tillage in complete darkness was necessary for this experiment to work because even the light on the front of the tractor or moonlight can cause weed seedlings to grow. Special equipment would be needed to allow the farmer to see at night.

Do you remember the Night Vision Goggles our soldiers wore in Desert Storm? The same goggles were issued to Keith A. Kohler, Agriculture Research Service Technician, to use in this experiment.

The use of Night Vision Goggles allowed enough vision to plow between rows safely but was tricky. The goal was to plow between 11 pm and midnight using no chemicals.

The field was moldboard plowed the previous fall then plowed at night mid to late May. The studies were limited to 13 different weeds:

Annual grass species - barn yard grass and green, yellow, and giant foxtail.

Large-seeded broadleaf weeds - cocklebur, giant ragweed, and velvetleaf.

Small-seeded broadleaf weeds - lambsquarters, ragweed, wild mustard, nightshade, smartweed, and pigweed.

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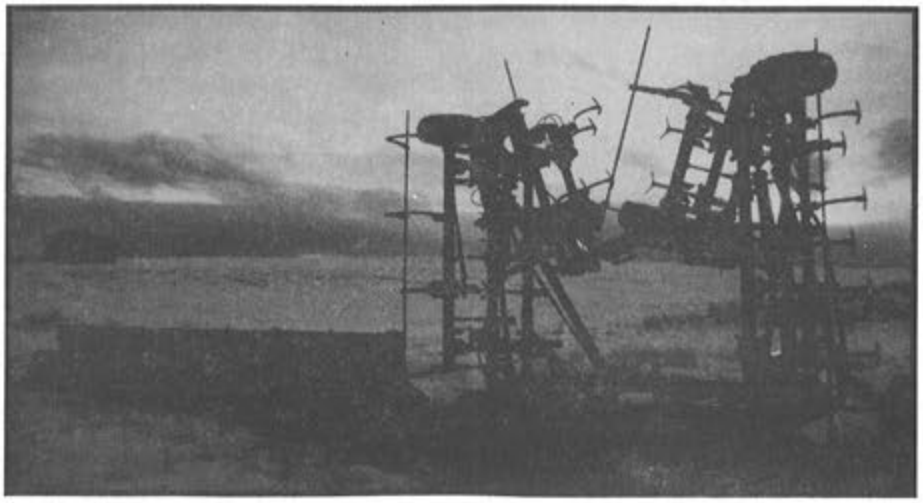
Night Vision Goggles

Night Vision goggles you may think of as "Star Wars" technology but not necessarily! We talked with Lynn & Carol DeLozier with Valley Pawn Shop in Wenatchee, (509) 662-9713, who offer a complete line of goggles for as little as $1,100 to $1,500

The process of illuminating the night is very interesting. Do you know ambient light the human eye can see is in a range of 300 to 600 NM (nanometers). While the infra-red light which is the technology used for night vision goggles starts at 625 NM. The most amazing fact is that there are many more times of infra-red light available at night than there is ambient light.

When purchasing night vision goggles you have to consider what your use is going to be. For night plowing you probably want the strongest generation available on the market. There are 3 generations. The first, sensitive to 750 NM, is simular to a flashlight with a built in illuminator, the second, sensitive to 875 NM, needs at least star light to work and the third, sensitive to 1,100 NM, will allow you to see clearly on an overcast night.



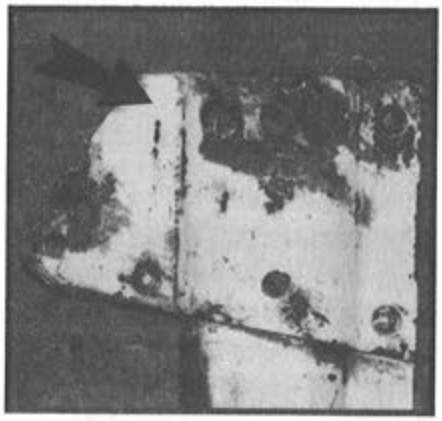
International 150 & DSA Boot Improvement

Addressing the grain drill improvement budget can be a very taxing undertaking! With the replacement costs of new drills ranging from $1,100.00 a lineal foot to upward of $1,500.00 a foot for the most complex drill. It takes the cost of a small house to own 40 ft. of drills.

In just about every case of Drill repair we have seen, small basic improvements were all that were necessary to bring the unit up to original if not better performance.

Have you ever noticed on your International 150, DSA drill that the packers DO NOT always follow the boot? Maybe some of the boots are slightly bent sideways? With the boots out of the ground have you noticed excessive side play in the "A" frames and boots? Could some of your boots be leaning too far back? (Too close to the packers?) If your drill has some of these symptoms do not worry many other drills have the same problems. The only way to keep your drills from wearing out is to never use them!

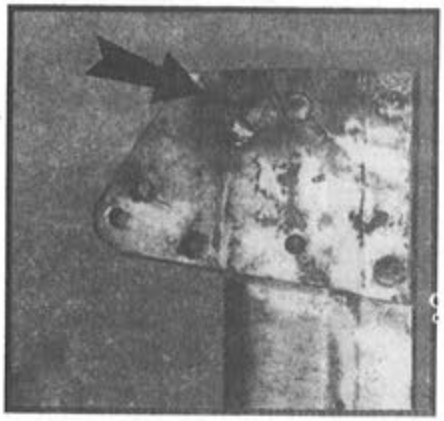
The IH150 has a very good spring trip system which allows the drills to be used in more rocky conditions. However, this advantage causes more wear in the pivot of the boot itself. Originally the factory just bored the pivot hole through both sides of the boot and then installed the pivot pin. This is OK for the short term but for more longevity more meat needs to be added.



The arrow points to the oblong pivot pin hole in the high speed boot. This is before repair.

We take the worn high speed boot and bore the pivot hole extremely oversized, then we machine heavy wall tubing to the exact length and bore and ream the tubing to fit a new pivot pin. Reaming each pin is important to insure a precise fit.

Our next step is to weld the machined bushing in place in the high speed boot framework. This improvement allows at least 10 times more surface area for the pivot pin to work. The increased surface area gives you many more years of trouble free service.



This shows the completed high speed boot after we have installed the heavy bushing.

We are not finished yet! We need to address the "A" frame that holds the boot.

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Grain Drill Shop Talk *(Continue on Page 14)*

This past year, after many requests, we are performing complete drill rebuilds. This service is not basic - it is very thorough. The drills are completely torn apart, repaired as necessary and then completely sandblasted and repainted to bring your older drills to "Better than new" specs. This is truly a cost effective way to get more life and service out of your existing drills. Besides what better drill is there than the one you own now?

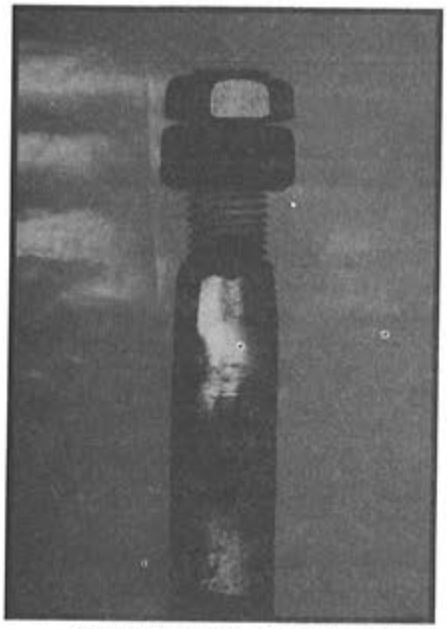
In order to itemize this extensive service we have broken it down to basic subject matter and placed each item in an easy to read chart. If you have questions please call as each item warrants in depth explanation.

BARNES SPECIALTY	REPAIR DESCRIPTION	DRILL
✔	Complete drill rebuild	ALL DRILLS
✔	Sandblast entire drill	ALL DRILLS
✔	Cap packers or rebuild packers	150, HZ
✔	Install sealed bearings	150, HZ *
✔	Install threads and heads on packers axle	150 *
Barnes Kit	Install hydaulic lift kits to replace hand lever	150, HZ
Barnes Kit	Install hydaulic transports to enable you to move the drills endways	150, DSA
	Rebuild walkways when required	150, HZ
✔	Rebush axle walking beams	150
✔	Straighten boots, "A" Frames	150, HZ *
✔ Special Steel	Change twisted tool bars to stronger iron	150, HZ
	Replace hydaulic hose	150, HZ
	Reweld and reinforce seed boxes	150, HZ
	Straighten bent yokes for caster wheel	150, HZ
	Modify or make new hitches	150, HZ
	Straighten and / or reinforce main frame	150, HZ
✔	Remove and replace tubing on packer axles	150, HZ *
✔	Respace packers to 2 3/8" on packer axle	HZ
✔	Replace packer axles	HZ

*In this issue

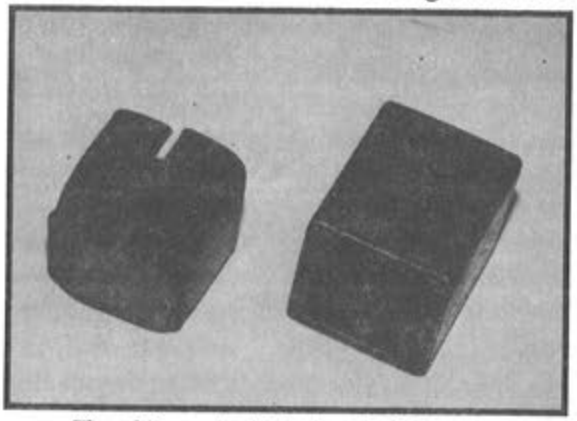
International 150 Drill Axle Dilemma

In a customers search to improve his International 150, DSA drills accuracy for seeding, he installed his own threads and heads on his factory built cotter keyed axle. His procedure was correct and he did a good job welding. However, he reinstalled his old spacing tubing (split) and his old spool and block bearings. He did buy new case hardened washers for the outside of the old bearings and then re-assembled the axles and fastened them back under his drill.



The way the axle should look once the threads are installed. Notice the thin lock nut.

After thoroughly greasing the bearings and every moving part he filled the drill with seed and was ready for the journey to the field. On the way something did not feel right. It was harder to pull than before he made the repairs. He thought to himself that if it is this hard to pull on level ground, it will be alot harder in the field.



The tubing on the left is the original International spacer tubing. This tubing has .109 wall. You can clearly see the split that weakens the tubing. On the right is what we use it is .165 wall.

Going back over his repair process he remembered that when he was assembling the bearings to the drill he could hardly turn the bearing housings upright for the bracket to bolt on but thought grease would solve the problem. ***Maybe it would just wear in!*** What was happening was that the pressure was too great for the new washers on the old bearings. They were pushing the outer bearing housing just as if it was in a vise! Remember, he put threads on his axles but used old parts! After a few rounds there was no improvement. Out of frustration he called us for help.

After analysing the problem and going over the repairs he had done, it was easy to solve. All we

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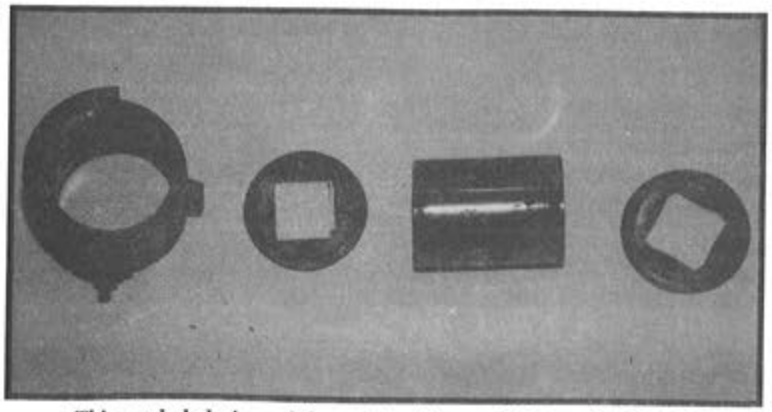
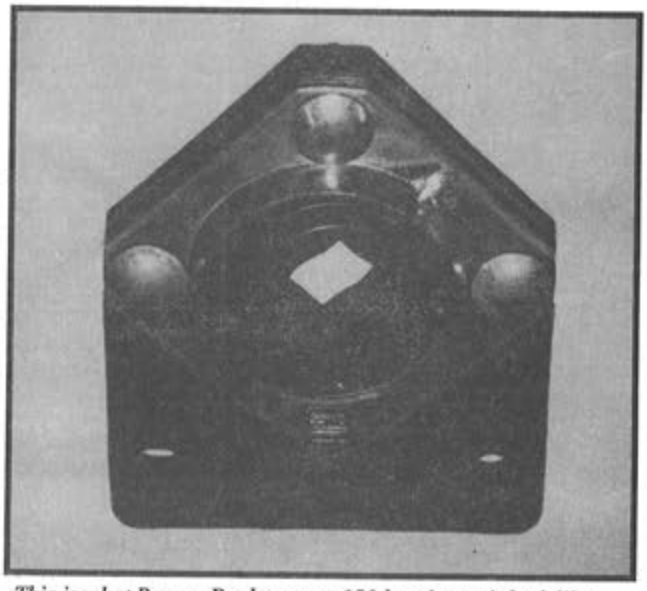


This exploded view of the original Internatioal spool & block bearing, here you can see how the case harden washers wear on the housing.



This is what Barnes Replacement 150 bearing unit look like.

Weldon shares the saga of John Deere HZ Replacement Bearings:

Interview with Weldon Barnes.

By "Barnes Farm and Shop" Magazine

Weldon Barnes was instrumental in the design and production of the Barnes HZ Bearing replacement. 1996 makes the third year of production of this bearing assembly and we wanted to know how this all came about.

What ever made you want to change John Deere's bearing set up?

Weldon: "There are a couple of reasons. The first one is for easier rolling. Compared to other drills I have pulled the HZ seemed to pull so much harder! Especially when the boot point is only 7/8" wide this drill should not pull this hard!"

You mentioned another reason - what was that?

Weldon: "Greasing. I got so tired of bending over and greasing all those axle bearings. Every now and then I would have a bearing that would not take grease so I would have to jack up the drill, rotate the wheels and re-grease until grease finally came out! I was never comfortable running 5 HZ drills knowing 1 or 2 bearings did not take grease so I took the extra time to make sure they had grease!"

Did you have any problems in the design of the bearing?

Weldon: "Yes we did! We tried many designs and were not satisfied with any of them. I wanted to use a single bearing since that was more than adequate for load handling capabilities but every design I came up with made installation on the drill very difficult."

What helped you achieve the design you have now?

Weldon: "Well, one day Lawrence Loebsack, a good customer and special friend of mine from Waterville, came in to see how I was coming with the design. Being very frustrated I showed him what I had so far. He simply said "Why don't you try 2 bearings instead of one?"

Lawrence Lobesack
Farms near Waterville. Provided much of the inspiration throughout the design process of the HZ Bearing.

Why didn't you try that before?

Weldon: "I had thought about using 2 bearings back at the beginning. But I thought the use of 2 would be cost prohibitive and I abolished the thoughts and designs I had with 2 involved! But with Lawrence's weekly encouraging words I had a renewed desire to make 2 bearings work."

What other factors were important in the design?

Weldon: "Each bearing assembly had to be the exact same length as the original so that any farmer could buy a set of 4 and install them himself. I wanted it to be simple enough that I did not have to send a page of instructions with each bearing! Also, I wanted the change to be made quickly so they could be changed in the middle of seeding and not loose much time!"

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Grain Drills Shop Talk *(Continued from Page 10)*

BARNES SPECIALTY	REPAIR DESCRIPTION	DRILL
✔	Replace packer hubs with heavier tubing	150
✔	Surface grind each end of packer axle	150, HZ
✔	Reinforce packer axles with 4", 6" and 8" washers	150, HZ
✔	Install notches for better residue management	HZ
	Make and install wedges for residue management	HZ
	Build and install straw straightners	HZ
✔	Build and install toolbars for fertilizer attachments	HZ
	Repair and rebuild hopper lids	150, HZ
✔	Build and install corner tie brackets	150, HZ
✔	Modify drill points with chrome and install	150 **
✔	Replace inferior HZ boots with Barnes direct fit reinforced boots	HZ
✔	Repairing existing boot with heavier side plate for reinforcement	HZ
✔	Complete boot repair and straightening	HZ

**See below

The Crew

Dave Barnes

Hi, I'm Dave. Dad has been so kind to share his experience and expertice with me. Without him Barnes Welding Inc. would not have a chance to survive! I look forward to try to help solve your unique challenges.

Better Than New! Recycling Old Grain Drill Points

We have been installing new wear resistant chrome points to worn out drill shovels for 7 years! All we need is a set of shovels or points on make a complete matched set. They will all be the exact same length to assure accurate seed placement.

What we do is take the shortest used point in a set and cut all of the others to the same dimension. With special jigs we weld a hard chrome point to the drill point at the exact same angle the manufacturer designed for the original point.

Depending on your specific soil types, we have seen as many as 8000 acres worked with one set of Barnes Rebuilt Points. These points can also be hardfaced to further extend their life expectancy. They can be applied to John Deere's LZ, LZB and 9000 series points, IH150 and DSA shovels, Dempster Noble and many other points.

Continued From Page 3

Pat mentioned, "If he had gone back in late January and re-ripped between each groove he probably would not have lost much, if any, top soil".

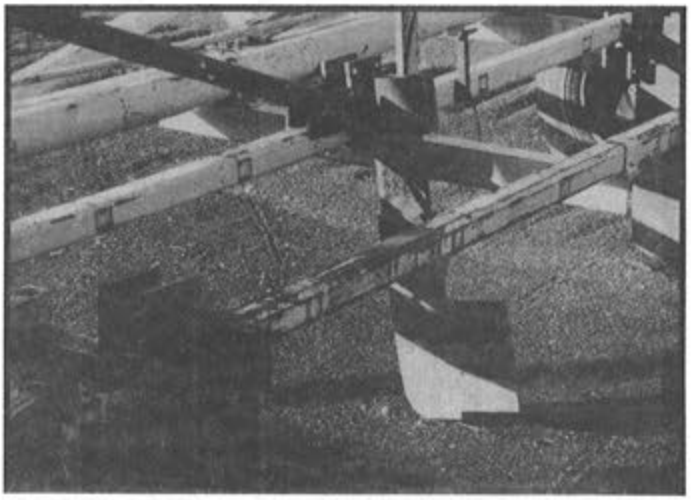
Also, due to the design of the shank and the depth that he is running (below plow pan), the ground is shattered and raised up slightly allowing more moisture to penetrate the soil.

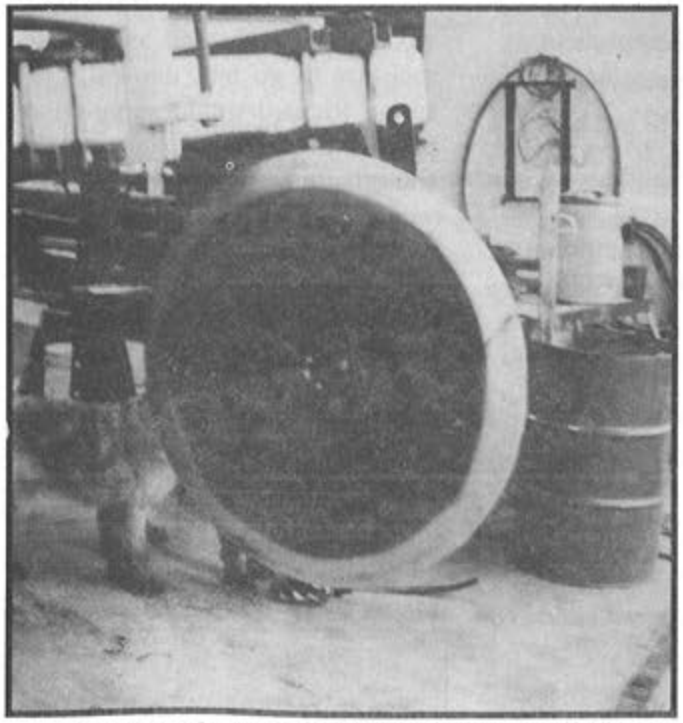
Come harvest, the ditches are almost all filled in which makesth e ground slightly rougher than the normal 18" deep furrow seeding.

If a person wanted to build Pat's leveling ripper, it would be possible but somewhat difficult utilizing the average farmer's equipment. He uses a couple of long hydraulic cylinders plus some pivot joints in the ripper construction. This unit would need to be built entirely from the ground up.

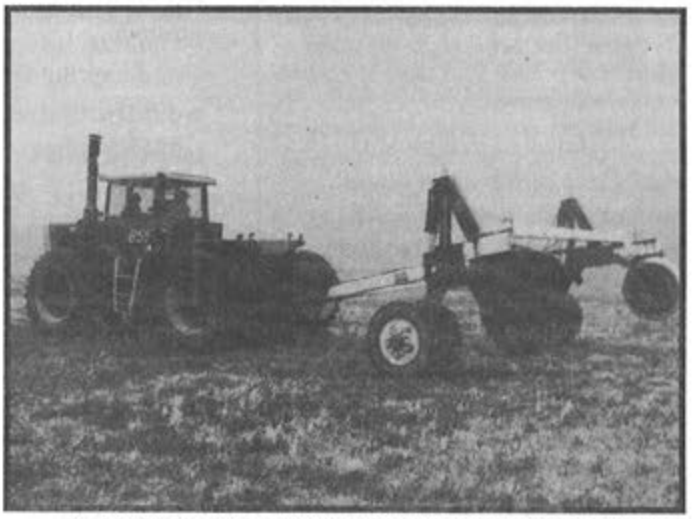
This is what your field will look like in the spring after using Harolds "Groovemaster" the previous fall. Notice how the grooves are almost fill up after a winter runoff. The grooves are 4½' apart.

Harold used a Calkins CFC Cultivator frame to mount his shanks. This shank has been the best performing one yet. The shank is ½" by 12" at the widest point, making distinctive grooves. (Picture on the right)





This shows the 4' diameter 2" thick, 750 lbs. disc blade that Bill uses to slice grooves into his winter wheat.



Bill uses an 855 versital tractor to pull a R&R subsoiler, framed with these 2 disc mounted 20' apart.

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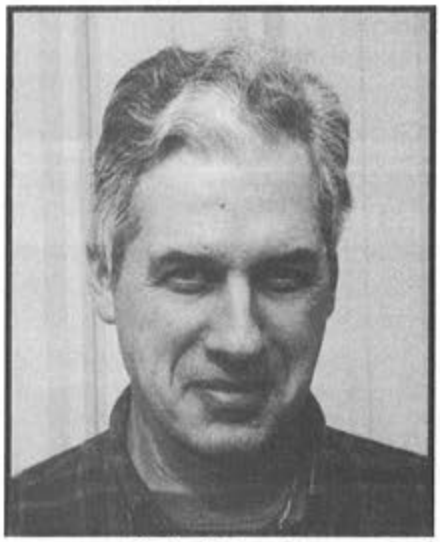
necessary and take soil tests to determine how much fertilizer is needed. The final operation would be to fertilize and seed with his HZ drills for a winter wheat planting.

He expects about 20 bu/acre his first crop yield.

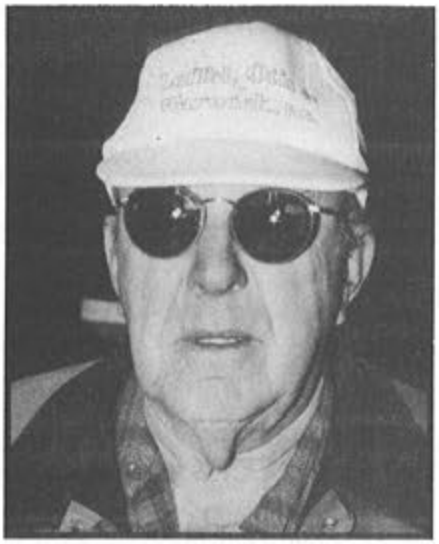


Dale Galbreath

Farms with his brother Gary near Ritzville in Adams Co. Their farm name is Galbreath Land and Livestock. He has been farming since 1962 and has 1000 acres in the CRP which will come out in 1997. Dale farms in an area where the annual rainfall is 11" to 12" which allows a 45 bu/acre average winter wheat crop. The farm has been recropping spring wheat back to back for 4 years to achieve a 26 bu/acre average.

If Dale had to take out his CRP acres this year he would burn early enough in the fall to get some regrowth and follow it with a Glyphosate spray. In spring the first operation would be to spray again with Glysophate and then seed with a yielder no till drill which incorporates fertilizer at the same time as seeding.

Dale expects his first year yield to be an 18 to 20 bu/acre crop.



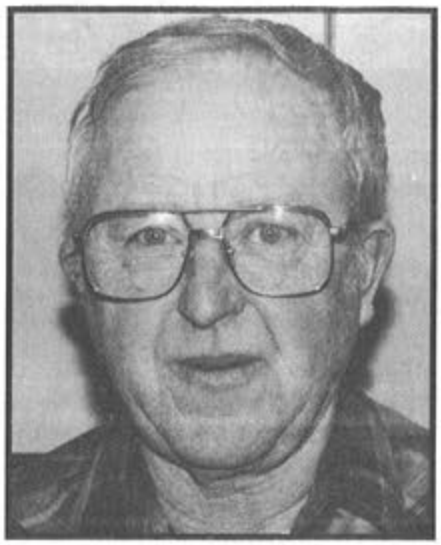
Pat Wandling

Age 73, has been farming most of his life in Yakima Co. north of Bickelton. He has 2000+ acres in the CRP and hopes this program never ends! His first CRP to come out would be in 1996. Ritzville Silt Loam is the main soil type which is fed by an 8" yearly rainfall. Pat tries to avoid spring crops because of minimum moisture levels but in the past his spring yield has been 15 to 16 bu/acre. His winter wheat yield is 28 to 30 bu/acre.

In the fall Pat would spray his CRP land with Glyphosate to kill it all, harrow to break the grass up and chisel until he could get his sweeps through the ground.

In spring the first operation would be to sweep. He would take soil tests to determine whether to fertilize. If fertilizer is necessary, Pat will fertilize with his plow when he sweeps it then seed with his IH150 drill. He is able to add phosphorous with his drills and would apply accordingly.

His first year expected yield would be a little less than average which would be around 25 bu/acre for winter wheat.



Richard Wainscott

Richard Wainscott of Wainscott Brothers farms north of Mansfield with his brother Bill. Their farm which is in Douglas Co., has an annual rainfall of 10"-12". He has farmed since 1950. He has 400+ acres of CRP acres which will come out in 1996. Richard farms where the Glacier stopped! He has to deal with rocky conditions. His average spring crop is 22 bu/acre and the winter wheat is 37 bu/acre.

To take his CRP out Richard would disc in the fall and allow moisture to go into the soil. In spring Richard would apply Glyphosate as late as possible to kill emerging new weed growth, next would disc or sweep depending on heavy areas and conduct soil tests and apply fertilizer with a fertilizer machine. Next he would pull a cultivator and weeder in one operation to clean up for seeding operation - his last operation would be to seed with his LZB hoe drills.

For his first crop he expects 25 to 28 bu/acre winter wheat yield.

Did You Know!
There is 13,000 kernels in 1 lb. of wheat!

Pete Goldmark

His farm is situated east of Okanogan in Okanogan County. He owns the Double "J" Ranch. He has been farming for 30+ years. He is responsible for 155 acres of the CRP which comes out in 1997. His soil type is Timentwa Loam. His farm is in a 12" - 14" rainfall area. His summer fallow spring crop yield is about 50 bu/acre where as winter crop yields 60 bu/acre.

If Pete had to put his CRP acres into crop land he would begin his operations in the fall. He would cross chisel (2 Chisel operations at 90 degrees to each other) about 8" deep without any harrow. Next spring Pete would sweep twice without harrow. In very heavy growth areas Pete may disc as needed.

In the summer rod weeding would be in order but to be done in the least amount of time possible. Subject to soil tests fertilizer would be applied prior to seeding with his HZ drills for winter wheat. In order to get the grasses to decompose Pete would prefer to work the CRP as early as May or June.

Pete expects his first year yield to be above average if he receives average rainfall.

Don Phillips

He farms as Phillips J.V., east of Harrington WA. in Lincoln Co. and has 350 CRP acres. He has farmed since 1970. His CRP contracts will expire in 1998. Annual rainfall is 11" to 13" per year and his soil is Bagdad silt loam. His spring wheat average yield is 40 bu/acre and his winter wheat yield is 55 bu/acre.

If he would take his CRP acres out to farmland this year he probably would do nothing this fall, in the spring he would spray a Glyphosate and then disc. He prefers a disc to keep his residue within residue tolerance. If there was adequate moisture Don would perfer spring wheat, if not then he would cultivate and work the ground in a typical summer fallow pattern to seed for winter wheat. He has the ability to fertilize while seeding using his IH150 drills.

He expects 2/3 of normal yield the first year of production.

Annoucement!

There is a video and publication on the preliminary results of the CRP takeout research effort will be available through the County Extension and Conservation District offices in early March. A preliminary slide series is currently available and can be accessed through these offices (For more information, contact Roger Veseth @ (208) 885-6386.

Sage Hen Alert

Washington State's Douglas Co. has had such a substantial increase in the sage grouse population that the Department of Fish and Wildlife's, Mike Schroeder says the birds should be a consideration when the Federal Government or farmer makes a decision on the CRP conversion.

The fact that the CRP acres have been undisturbed for 10 years and the climate of Douglas Co. made a favorable home for the sage grouse. It has been reported by the Game Department that 40% of all nests in the County have been found in the CRP fields.

Schroeder would like to make the farmer aware of the nesting patterns of sage hens and consider it when making their decision on how to convert their land.

April and May are the months the birds incubate their eggs. These are the months that are the most critical for the birds populations. By fall the birds are mature enough to relocate when the field is disturbed.

It is Schroeder's opinion that it would be best to mow the field in the fall as the first operation. Waiting for spring to disturb the field may be too late for the birds who will have already made their nests and laid their eggs. He would also like to see some CRP acres left intact to aid against the displacement of these birds.

Continued From Page 6

so heavy, we have to change the walking beam tubing to a heavier stronger peace. This gives the farmer piece of mind knowing that he is getting more load carrying capacity for the dollar. We also change the spindles on the plow lift arm to a much stronger one to complement the walking beam.

After all this work was done our client had a plow that not only would accurately maintain his plowing depth but also gave him a walking beam that would out last the plow!

We did all the work for him in the field to get him plowing again but if you prefer to do the installation yourself, No Problem! We have put together a pair of easy to install kits with enough parts to rebuild two walking beams. There are many advantages to these kits: Stronger, heavier, frictionless bearings, sealed from dust and the elements, and no need to grease daily (check once a year). After installation your plow will be "Better then new"! Also, maintainance will be easier and inexpensive. The taper roller bearings are tighter than any bushing and this allows for constant service due to minimal wear on moving parts.

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The experiment was very successful. When plowing at night, there was a 30% to 70% reduction of the small seeded broadleaf weeds and amazingly the smartweed was reduced as much as 80%.

There was very little reduction of annual grasses or large seeded broadleaf species.

But what about the sunlight in the morning? The 30% of weeds that do grow may be the result of it or any other incidental light source.

If night vision goggles aren't for you, there is a research farmer in Boone, Iowa, Dick Thompson, who is eager to try any alternative farming method but won't wear the goggles. He is experimenting with the theory of night plowing in different ways. First he purchased a set of lights for his plow that shine only out in front and second he modified his planter by building a cover to exclude light. This allows him to plow during the day. With either method he is trying to prevent light from hitting his freshly tilled soil.

Another piece of equipment is being developed to help plowing at night to be more feasible. It is called Cultivator Row-Tracking System it is in its early stages and no information is out on it yet.

Because of Buhler and Kohler's success they conclude that there is a huge need to study the biology of weeds. Studying the make up of each weed and depriving it of a basic need to grow may be the solution to our weed problems. As with the small-seeded broadleaf species, the need for light is an initial need. Possibly altering moisture or soil makeup could limit the other two species from growing.

So, for now, plowing at dark is still in the experimental stage but will be added soon to your "Weed Management Arsenal".

The Crew

Dale Snyder

Hi, I'm Dale. I've been welding, fabricating and doing machine work since 1981. Whether, it is a simple weld job or cutting left hand metric threads on a lathe, I will do your job as if it were my own.

The Crew

Geri Creel

I am the secretary & accountant for the business. I've been with the company since Oct. 1989 and will be the first person you speak to when you call.

I can take your order, help with pricing questions or answer any questions you may have with your billing.

When you call let me know what it is we can help you with and I'll direct your call to the qualified person in that department.

Continued From Page 9

We hold the "A" frame in our mill & precision ream the pivot hole to match the bushing in the boot for a very close fit. Our next step is to make sure the spring trip system functions correctly. After this we re-assemble the boot/framework and are able to see if the assembly is bent (Picture A & B). When we find one that is bent we go to our press and press the unit true.

There is one more step left to guarantee accuracy! The boot/framework assembly is reinstalled on the drill frame and we check to make sure the rivets on the channel bracket are tight. In most cases there will be considerable left and right movement of the boot.

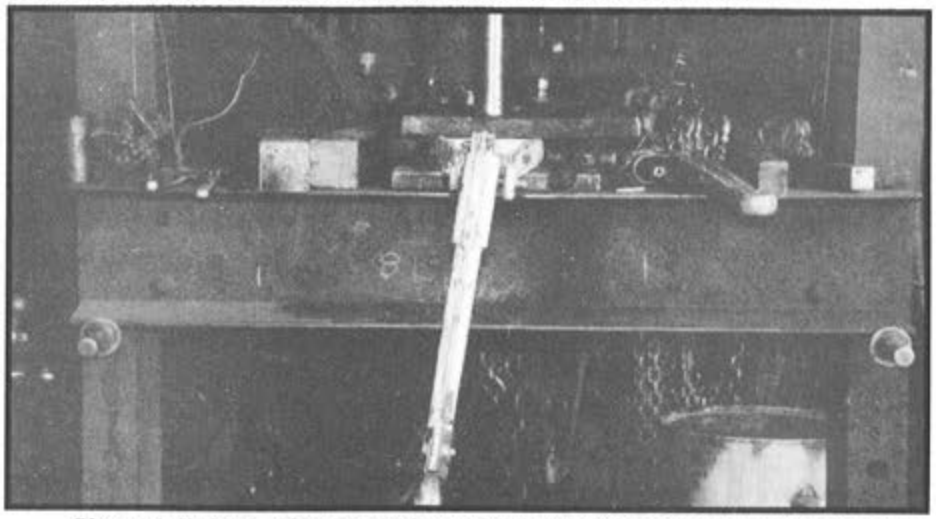
If necessary we will bore out the end holes of the "A" frame along with the channel piece then re-assemble with a larger diameter pin.

There is definitely a lot of work in getting each boot/spring trip/"A" frame back into "Better than new" condition. We also know that the seeding operation is so important that corners cannot be cut.

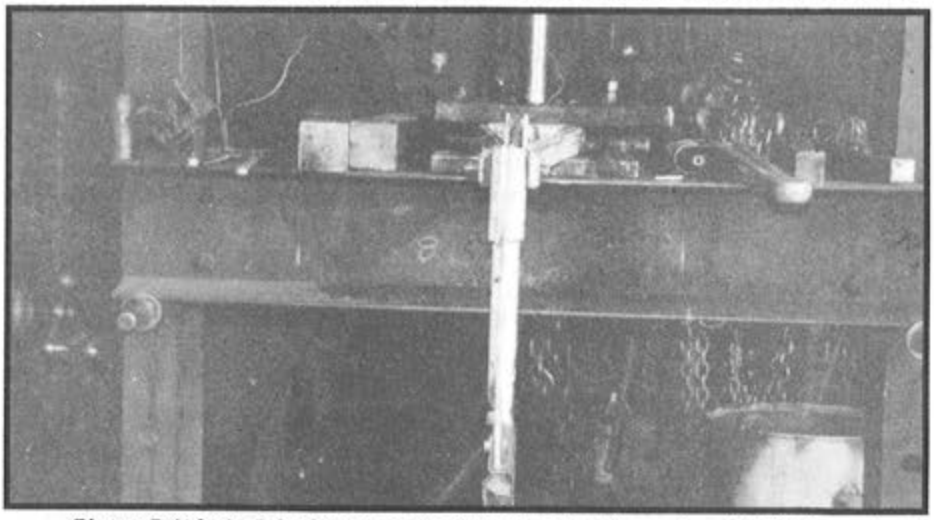
The Crew

Weldon Barnes

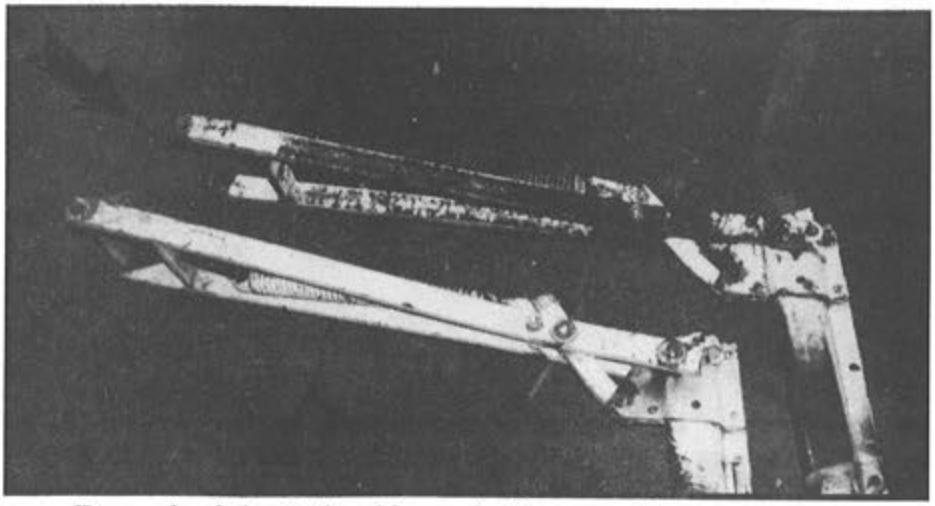
Hi, I'm Weldon, I enjoy all the happenings that are going on in the shop. It's always enjoyable to address new and different challenges that arise daily. I look forward to meeting your expectation this coming year.



Picture A (Before) - This picture shows obvious "A" Frame bending. Notice we press on the "A" Frame where the channel bolts to the drill which gives a more accurate reading.



Picture B (After) - It is plain to see the improvement we have given the "A" Frame boot assembly.



Here we show before & after of the completed boot assembly. The bottom assembly shows the channel iron.

Continued From Page 11

had to do was sell him a set of Barnes International Bearings and new axle tubing and he was on his way. He had done the hardest part - threads on axles! With our bearings and new tubing everything is "Better than new."

He improved the life of his packers by insuring that they would not move on the axle anymore because they were held tight by new tubing. The new triple lip sealed bearing has no side movement what-so-ever and will keep all the packers directly behind the boots. Best of all he has a product that will last for many more seeding seasons!

When he chose his bearings he had a choice of sealed or re-greaseable bearings. His choice was to never grease again!

Latest CRP Info From Washington D.C.

Eligible owners and operators with contract acreage who also have a CRP contract must be offered the option of entering into a conservation farm option contract for a period of 10 years, as an alternative to the market transition payment contract. The Secretary shall provide participating producers with the estimated payments and benefits expected to be received during the 10-year period under conservation cost-share programs; CRP rental and cost share programs; market transition payments; and loan programs. In return, the eligible producer shall forego eligibility to participate in these programs and comply with a conservation plan for the farm consistent with the State conservation farm option plan, designed to protect wildlife habitat, improve water quality and reduce soil erosion. [Sec. 103(k)]

"Agricultural Reform and Improvement Act of 1996". Conservation Reserve Program: Extends the CRP until 2002, with an upper limit of 36.52 million acres. New acres can be added as contracts expire. Water bank acres are added to the CRP. [Sec. 1541]

The Crew

Matt Regan

Hi, my name is Matt Regan. I enjoy all aspects of HZ Packer repair. Please call me with any questions about what we can do for you. If your work is time sensitive let us know and we will work with you on a timely schedule.

Continued From Page 13

Was this design easy to manufacture?

Weldon: "Well, easy is relative! Once you know how to fly an airplane it is very easy but getting there is quite difficult and very time consuming! Now that we have the process figured out it seems quite simple but still takes considerable time to build each one. We had to utilize a different milling process to cut the groove for the bolt assembly to keep it exactly perpendicular with the bearing axis. When we welded everything in place we had to be very careful with the heat to reduce warp to the outside housing. Then we had to be especially accurate to make sure all three diameters were very close to tolerance. (Plus or minus 1/2 thousand of an inch)"

Is there anything special about the bearings you used?

Weldon: "Yes there is. We looked at many suppliers of bearings until we found what we wanted. Each bearing had to have the balls heat treated and both races needed to be case hardened (for longer life). Each bearing had to have adequate grease packed inside the seals. (To our surprise, after destroying half a dozen bearings, we only found 2 that had what we thought was enough grease!) The seals on both sides of the bearing had to have steel frame work with 3 lips on each side to keep the grease inside the bearing and the dirt out!

The most important factor was that the bearing had to be manufactured in the United States and the company had to have enough pride in its product to back it up if we had any problems!"

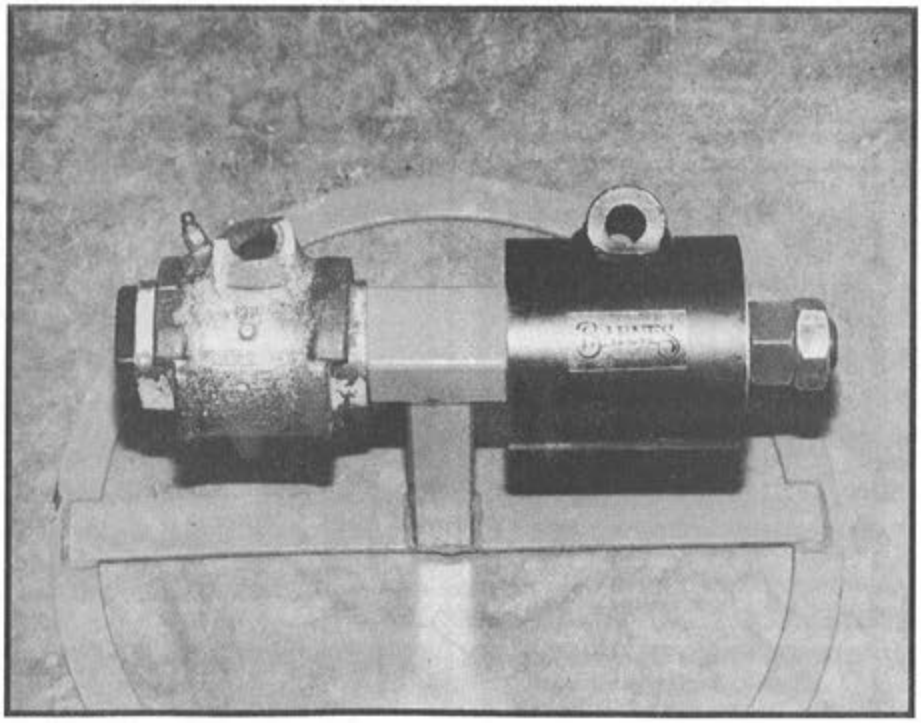
Have these new bearings performed like you expected?

Weldon: "Much more than I expected! Yes, we did reduce friction on the axles! The drill pulls easier! Since the drill pulls easier we were able to go through more residue in the fall. Since the wheels slip less in heavy residue we are still maintaining our accuracy in rate of seeding, even in very difficult spots! Also, the cost of fuel consumption is reduced as friction is reduced. It takes less horsepower to pull the drill through the fields.

One very distinct benefit is the fact that the axles do not move back and forth in the boots! Before we changed bearings we had the packers set open to 2 3/8 " wide and the packers would still rub on the boots no matter how hard I tried to keep the boots aligned right. Now there is no chance that the packers can move left or right.

The most enjoyable benefit is the time I save not having to grease 20 bearings! I get to enjoy a coffee without having to drink on the run! Plus I have to turn down the stereo and TV in the tractor cab now that our drills don't sound like a rock crusher when we are seeding!

Most important, we have had no failures in 3 seasons and do not expect any because of the overall design of the "Barnes Sealed Bearing Replacement for the John Deere HZ drill!"



Here we are trying to show both bearings side by side. Notice the heavier construction of the Barnes Bearing on the right.

Thawing Frozen Water Pipes - A Few Tips

While arc welders are not specifically designed for thawing frozen water pipes, they have been used for this purpose. The reason for this is welders are a good source of low voltage, high current electric power which, when flowing through the pipe, causes it to heat and melt the frozen water. Properly used welders are a fast low cost method of thawing pipes without digging up the pipe or the need for an open flame. When pipes are accessible however, they can be thawed more safely easily and quickly by careful use of a small electric heater or heat lamp. Because of the potential dangers in thawing pipes with high electric current, it is of the utmost importance that it be done only by a qualified person after carefully reviewing all the variables of each job. Before any thawing is to be done your local utility company needs to be called so they can disconnect the power to the house to prevent unnecessary damage or fires!

WARNING: The use of electrical current to thaw frozen pipes if not done properly can result in fire, explosion, damage to wiring which may make it unsafe, damage to pipes, burning up the welder, or other major hazards.

When electric current passes thru the pipe (which has to be metal), the pipe's electrical resistance causes heat to be generated which thaws the frozen water. The factors which affect the time and amperage of the welder are: pipe size, pipe material, distance of frozen pipe, and the amperage of the welder that is available.

Smaller pipes heat faster because of their smaller cross section, also and steel heats faster than copper because of the increased electrical resistance it possesses. Of course the greater the current, the faster the pipe will heat up and thaw (melt the ice).

Lincoln Electric Co. in Cleveland Ohio performed tests on pipe sizes vs. time and distance. Here are two examples: (We will use a 200 amp. welder for both examples) First is a 3/4" steel pipe which takes 6 to 8 minutes per lineal foot of frozen pipe where as a 1 1/2" steel pipe takes 25 to 30 minutes to thaw a lineal foot! This job is not for the impatient soul!

What kind of welder should I use? Since most frozen water pipes are outside the house or

Continue Page 24

The Crew

Tom Sherwood

Hi, my name is Tom. I have worked for Barnes welding for 6 years. I have enjoyed serving you and all your farm repair needs: Headers, Augers, IH and HZ boots. I can help you with them all.

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There are 2 things in this picture we need to point out. The first is to notice on the low side of the hill (Joel's side) the ridge is higher enabling a mini dam to stop runoff. The second point is no apparent winter wheat damage undet the tractor tires. This was achieved because the ground was frozen and the furrows held the tires up. (Pat Wandling's field)

Imagine this angled framwork running parallel to the ground when Pat has this ripper in operation. Notice the long hydraulic cylinders on top of the framework which is used to pull the shank out of the ground. The leveling mechanism is in the front of the unit.

Calling all Modern Farmers

Remember how your Grandfather knew every square foot of his land? According to Dale Hinderer at Western Farm Service, Waterville, "GPS (Global Positioning Satellites) is the way of the future." Using this technology, a farmer can monitor the condition of every inch of his fields no matter how many acres he farms.

There are several different GPS models on the market and a few field-size experiments using them. Some of the models on the market today are Rockwell's Vision System, Micro-trak Systems, Inc.'s Trak-Net or Ashtech's Ag Navigator. All send plotted information to a satellite to record exact positioning of the different conditions or location of the fields.

Montana State University conducted an experiment in 1994 using the Ag Navigator model and discovered that there is a difference in yields than that which is visible to the eye. This knowledge would surely be advantageous in planning your future and should help you make better decisions.

A portable computer collecting data about your fields can save you money and time by mapping your fields for rocks, weed infestations, moisture levels, or soil survey. By pinpointing where your weed clusters are and size of the infestation for example, you are able to calculate the right amount of chemicals and adapt your equipment to spray ONLY the problem area automatically.

Obviously GPS will open the door for more information and exploration including determining what makes the difference in yields, variation in moisture content, diseases or weeds that affect the moisture, etc. Definitely the 'Way of the Future' for saving time and money.

The Crew

Dale Bortz

I'm Dale Bortz, I'm new at Barnes Welding, though I grew up here in Waterville. I've been pressing the international packer caps for both "V" packers and standard round packers, sand blasting, painting, and helping where needed.

Plastic - Not Just For Tupperware Any More!

One of our newest services at Barnes Welding Inc. is the addition of a Plastic Flame Coat System. This thermoplastics product is usually applied when paint fails. Thermoplastics are widely recognized for their toughness, flexibility, strength to weigh ratio and chemical and corrosion resistance, plus ease of application, shop or portable.

The surface to be coated needs to be very clean. If it is metal, we need to sandblast first. If we were going to apply wear resistant plastic on a header bottom or elevator door we would apply, after sandblasting, a wear resistant powder for the first coat and a different color for the second coat. The reason this is done is to monitor the wear. If the top coat starts changing color we know it is time to recoat. Because of the low coefficient of friction, thermoplastic lends itself nicely to the agricultural industry to aid in the moving of grain. Another excellent place for this plastic is on the face of a snow plow blade! There are so many more uses! Please call and we will be glad to explain the possibilities to you.

Continued From Page 22

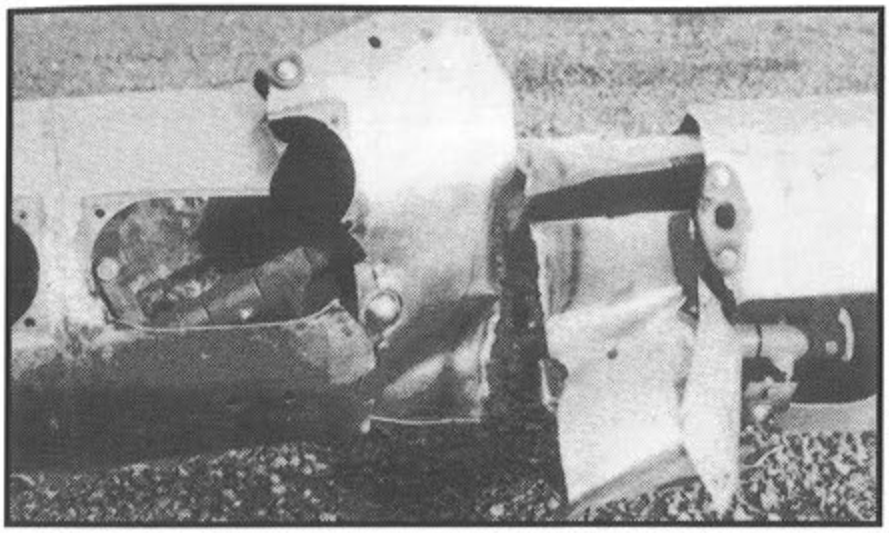
building, a motor driven welder (portable) is most useful. If you have a choice of AC or DC current, which is the best to use? There has been much thought on this. Use the welder that gives you the most protected amperage (usually written on the panel of your welders.) 300 amps. DC will generate more heat than a 175 amp AC welder just because of the increase in amperage. Some welders say AC is better than DC because it vibrates the ice. AC is the best current to use mainly because it is the easiest on the welder. The people of Lincoln Electric Co. conclude that heat is heat! (for the purpose of raising the temperature in an object where short circuit is involved and using welding equipment as the heating instrument).

In conclusion, pipe thawing is dangerous. Qualified people need to be involved and utility people need to be there also! There is so much at risk that burning up your welder will seem trivial if every thing else goes wrong!

We wanted to share what we have learned about pipe thawing in the past 26 years. Our intent is not to scare but to inform you of the responsibilities and the decisions we have to make every time we are called out on a pipe thawing job!

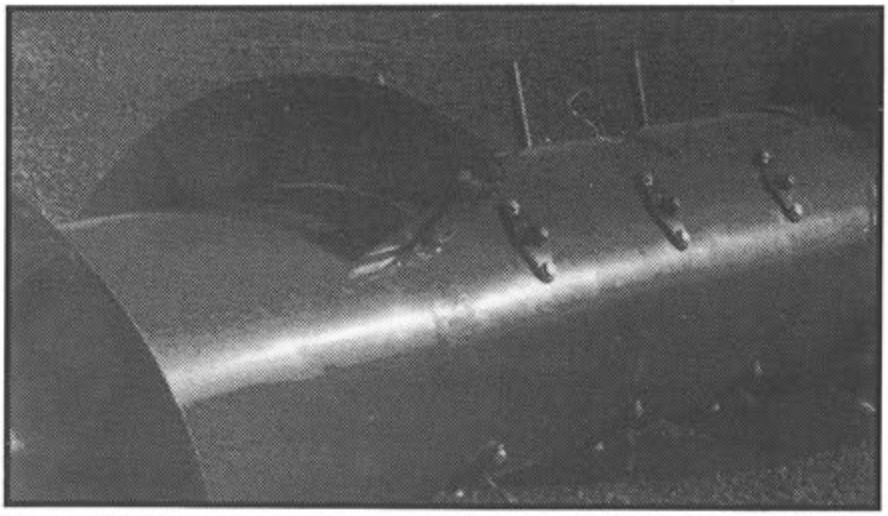
Don't Let A Damaged
Finger Section Cost An Arm & A Leg

BEFORE



New Auger Replacement Cost $1500.00 to $2500.00.
Does Not include internal parts or hardfacing to the flighting.

AFTER



Barnes rebuilt auger centers cost from $500.00 to $600.00
Which is guaranteed to be perfectly straight.

We rebuild your finger section using 60% heavier tubing for added strength.
We can straighten any auger to within 1/8" runout at our shop or in your combine!

BARNES Welding, Inc.

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