*CONFIDENTIAL

4.17 **STRAW INCORPORATION BY PLOUGHING, 1988** NAS 206 ML
(In co-operation with ADAS - ST09/004) 4th year

Summary

Overall, with winter wheat grown after wheat there were no significant effects from the different straw treatments or the use of extra nitrogen in the autumn. However, there appeared to be yield reductions following pre-ploughing straw incorporation, which were most marked at the lowest level of spring nitrogen.

Ploughing down straw without previous cultivations for incorporation gave similar results to burning.

Object

To assess the effect of incorporating straw by ploughing on the establishment and yield of the following crop and on its long term agronomic effect.

This trial was one of a series carried out on ADAS Experimental Husbandry Farms, in addition to the Norfolk Agricultural Station.

Treatments

All straw chopped at harvest.

	*Within 5 days of combine	*At least 21 days after chopping
1.	Burn and plough	-
2.	Plough	-
3.	-	Plough
4.	Incorporate with tines to 10 cm	Plough
5.	Incorporate with tines to 20 cm to give a thorough mix	Plough
6.	Bale straw and remove	Plough

*In 1987/88 the test crop was winter wheat (var. Galahad) following wheat and all straw treatments were applied as given except that all ploughing was carried out only 18 days after chopping in autumn 1987, because of the late harvest and wet soil conditions.

Nitrogen application (kg/ha) (all combinations of)

1. Autumn applied
   - (a) Nil
   - (b) 40

2. Spring applied
   - (c) 180 (farm standard)
   - (d) (c) - 40
   - (e) (c) + 40

Three randomised blocks are used with cultivations on main plots and nitrogen treatments on sub plots.

*NOT FOR PUBLICATION WITHOUT THE DIRECTOR'S CONSENT. This report deals primarily with only one year's work, so any conclusions given are only provisional.

Site: Morley
Soil type: Sandy clay loam over Chalky Boulder Clay

Results 1988

Winter wheat (2nd cereal after sugar beet) - grain yield (t/ha at 85% dm)

Cultivations	Spring nitrogen	Autumn nitrogen (kg/ha) Nil 140	Nil 180	Nil 220	40 140	40 180	40 220	Mean
(ESE)			(H ±0.267; VI ±0.588)					(±0.240)
Burn and plough early (within 5 days of harvest)		5.81	6.54	7.03	6.05	5.94	6.76	6.35
Plough early		5.81	6.35	6.78	5.96	6.46	6.82	6.36
Plough late (within 21 days of harvest)		6.23	6.70	6.93	6.59	6.82	7.10	6.73
Incorporate early to 10 cm plough late		5.24	5.72	6.52	5.84	6.57	7.09	6.16
Incorporate early to 20 cm plough late		5.08	6.37	6.38	4.91	5.87	6.37	5.83
Bale and plough late		6.34	6.58	6.27	6.16	6.87	6.26	6.41
(ESE)				(±0.109)				
Mean		5.75	6.38	6.65	5.92	6.42	6.73	6.31

S.E. per main plot (10 d.f.) = ±0.416 or 6.6% of G.M.
S.E. per sub plot (60 d.f.) = ±0.463 or 7.3% of G.M.

1. Although there appeared to be a trend for lower yields where chopped straw was worked into the soil by surface cultivations before ploughing, these differences were not significant.

2. Yields increased with increasing spring nitrogen rate.

3. Autumn nitrogen gave no overall yield benefit.

G.M. Palmer
W.E.R. Madge

APPENDIX - NAS 206 ML 88 (ST09/004)

STRAW INCORPORATION BY PLOUGHING

Crop diary

17 September 1987	Straw chopped on appropriate plots
30 September	Straw incorporation cultivations carried out and straw burnt on appropriate plots
5 October	All treatments ploughed to 25 cm and pressed in good conditions
6 October	Drilled - 150 kg/ha Galahad winter wheat
27 October	Avadex (22 kg/ha) applied overall
17 November	Autumn nitrogen applied as appropriate
11 January 1988	Plant counts showed average of 208/m²
20 February	40 kg/ha nitrogen applied overall
5 April	Chlormequat (2.2 l/ha) applied overall
8 April	Advance (2.0 l/ha) applied overall
15 April	100 kg/ha nitrogen applied overall
22 April	Differential spring nitrogen applied to appropriate plots
20 May	Tilt Turbo (1.0 l/ha) applied overall
24 May	Corbel (0.7 l/ha) applied overall
10 June	Sportak (1.0 l/ha) + Corbel (0.5 l/ha) applied overall
17 June	Aphox (0.25 l/ha) applied overall
8 July	Maneb (2.0 kg/ha) applied overall
17 August	Trial harvested.

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NIAB DIARY

Cereals

All the autumn drilled cereal variety trials have established well. There was some hare grazing in the winter barley trials, but this stopped once the adjacent field of sugar beet was harvested and there has been good recovery in the damaged areas. Low levels of mildew and Rhynchosporium have been noted in the winter barley - no strong varietal effect is yet apparent. The fungicide treated plots were sprayed with Tilt Turbo (1.0 l/ha) on 8 December. There is no observable disease on the winter wheat or winter oats. Parade is showing slight signs of frost damage.

Pulses

The winter bean variety trials has been slow to emerge. The early emerging plants were being dug up and eaten. Mice appear to be the problem so the trial area was heavily baited and satisfactory emergence is now being obtained.

Oilseeds

There are areas of unsatisfactory establishment in the trial and marginal establishment in other parts. A final decision on the acceptability of plots will be taken in the spring. Intense bird protection measures are being taken over the whole trial area to prevent any plant loss from pigeon or moorhen grazing - both have been active on farm crops in the area. There has been some winter damage, associated with downy mildew, particularly on the varieties Capricorn and COR87/6.

It is planned to introduce a NIAB Linseed variety trial at Morley this spring.

Potatoes

The seed for the 1989 trial has arrived and is currently being sorted.

Vegetables

The late maincrop carrot trial at Wrentham was harvested in early December and grading of produce has just been completed.

The parsnip trial at Attleborough will be harvested in early January.

J.M. Trounce
20.12.88